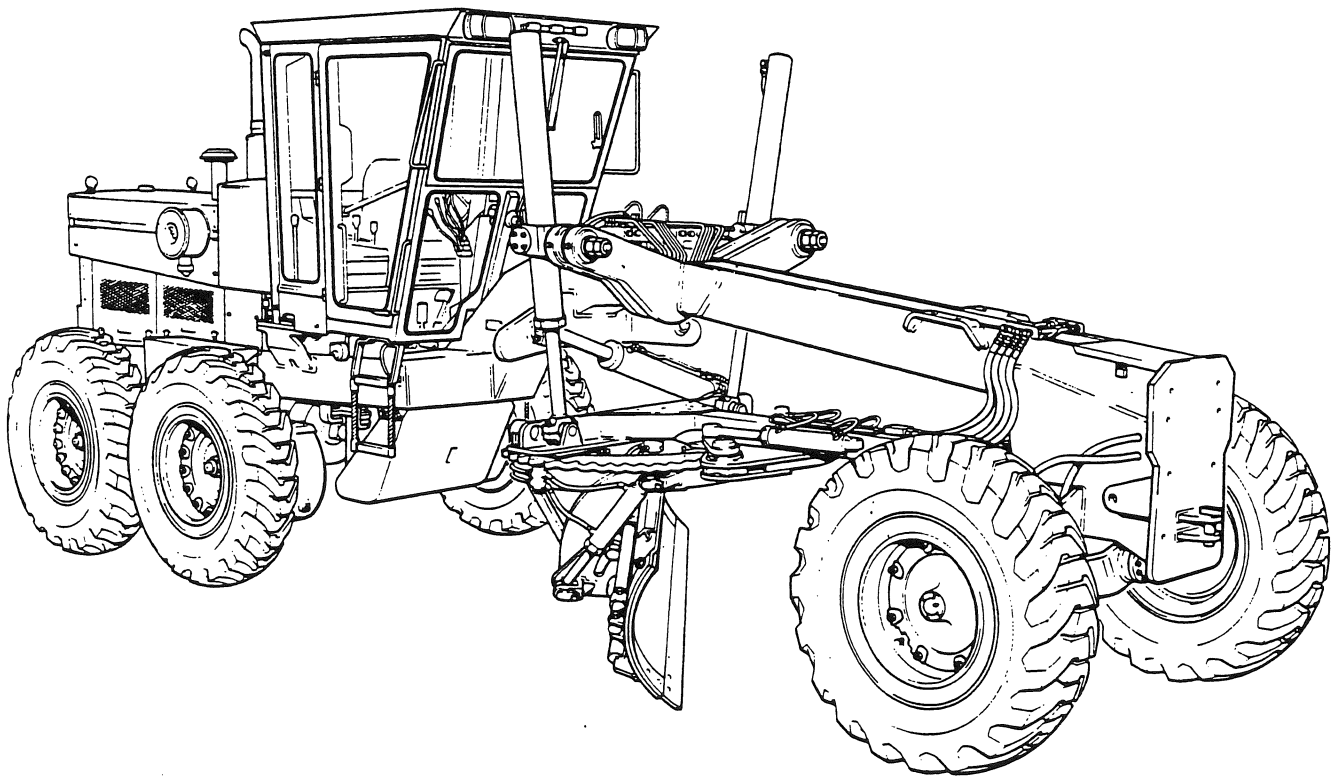


700 SERIES SHOP MANUAL

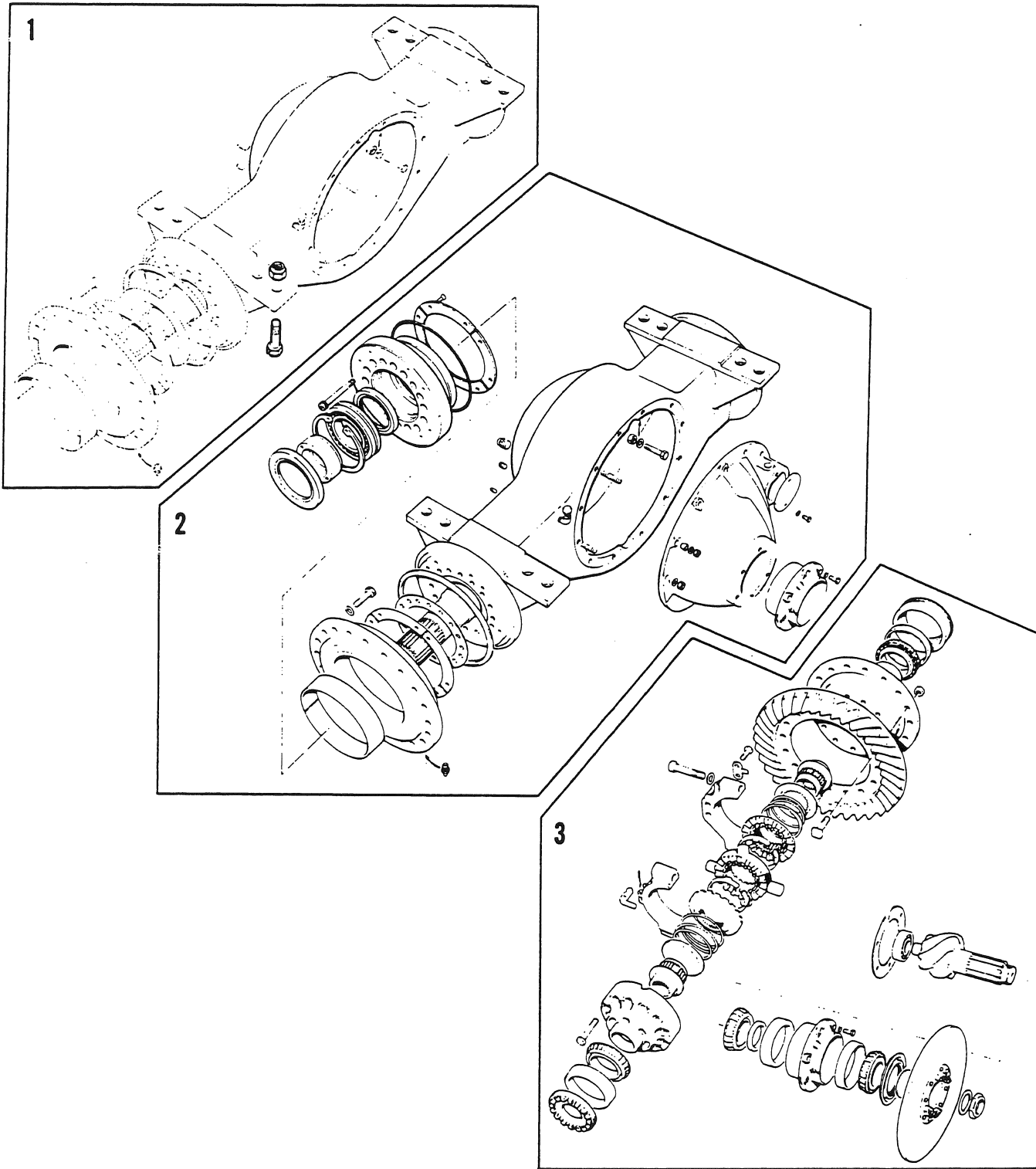
**SECTION 9A**

**SINGLE REDUCTION FINAL DRIVE**

Models: 710/710A S/N 16224, 16245 to 19481  
U.S. S/N 2012-2 to 2658-2



700 SERIES SHOP MANUAL  
SINGLE REDUCTION FINAL DRIVE



**700 SERIES SHOP MANUAL  
SINGLE REDUCTION FINAL DRIVE**

**Description and Operation**

The single reduction final drive, equipped with NoSpin, is used on models 710 and 710A graders. Since the only reduction is provided by the ring gear and pinion the tandems must provide a greater reduction ratio than on other Champion graders.

However, in a sharp turn the outside wheels may "unlock" and overspeed while the inside wheels turn at ring gear speed. This allows minimum tire scuffing in turns and tighter turns. This action is completely automatic in operation.

NoSpin provides the advantage of a lock/unlock action. When operating in a normal forward or reverse operation both tandems are locked together. This provides the same speed and torque at either wheel regardless of traction.

Housing construction is cast iron for maximum strength and rigidity. Also, to support the axles an outboard double barreltype, self-aligning bearing is used. Two seals are used to keep oil in the final drive and dirt out.

**Torque Guide**

<b>Application</b>	<b>Torque Value</b>		
Pivot Ring Retainer Bolts .....	285 N.m	29 kgf.m	210 lbf-ft
Carrier Assembly Nuts .....	285 N.m	29 kgf.m	210 lbf-ft
Pinion Locknut .....	854 N.m	87 kgf.m	630 lbf-ft
Pinion Cage & Cup Assembly Bolts	149 N.m	15 kgf.m	110 lbf-ft
Differential Case Bolts .....	210 N.m	21 kgf.m	155 lbf-ft
Ring Gear Nuts .....	210 N.m	21 kgf.m	155 lbf-ft
Bearing Cap Bolts .....	508 N.m	52 kgf.m	375 lbf-ft
Ajuster Lock Bolts .....	285 N.m	29 kgf.m	210 lbf-ft
Pivot Ring Bolts .....	230 N.m	23 kgf.m	170 lbf-ft
Axle Housing Bolts .....	1301,5 N.m	133 kgf.m	960 lbf-ft

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**Troubleshooting**

<b>Problem</b>	<b>Cause</b>	<b>Remedy</b>
<b>Noisy final drive.</b>	<b>Incorrect tooth contact or backlash setting.</b>	<b>Adjust the tooth contact and backlash setting as recommended in this section.</b>
<b>Oil leaks.</b>	<b>Loose bolts or nuts.</b>	<b>Tighten all bolts and nuts to the recommended torque.</b>
	<b>Defective oil seals, O rings or gasket sealant.</b>	<b>Remove defective parts and install new components.</b>
<b>Excessive vibration.</b>	<b>Worn or damaged gears or bearings.</b>	<b>Completely disassemble the final drive assembly. Remove defective parts and install new components.</b>
	<b>Loose mounting bolts.</b>	<b>Tighten the mounting bolts to the recommended torque.</b>
<b>Frequent loud snapping or cracking noises.</b>	<b>Defective differential.</b>	<b>Disassemble the differential. Remove defective parts and install new components.</b>

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General



Before starting any service procedure, make sure the work area is clean and safe. A clean work area will reduce the chances of foreign matter entering the final drive and causing damage. Make sure proper tools are available and in good working order. For a complete overhaul, you will require a safe lifting device rated at not less than 12,700 kg (28,000 lb), a press, and a gear puller.

Discard all oil seals, O rings and snap rings. Clean and inspect final drive components (refer to **Cleaning and Inspection**). Refer to the 700 Series Parts Manual when ordering replacement parts.

Refer to Lubrication Specifications detailed in the front of this manual for the recommended final drive and tandem lubricants.

ALWAYS PUT THE GRADER IN THE SERVICE POSITION BEFORE ATTEMPTING ANY OVERHAUL, MAINTENANCE OR INSPECTION PROCEDURE.

PARK THE GRADER ON A LEVEL SURFACE AND FULLY LOWER THE MOLDBOARD AND ALL ATTACHMENTS. IF IT IS NECESSARY TO ADJUST OR SERVICE THE MOLDBOARD OR ATTACHMENTS IN A RAISED POSITION, SUPPORT THEM WITH ADEQUATE STANDS OR BLOCKS. APPLY THE PARKING BRAKE. TURN THE IGNITION SWITCH TO THE "OFF" POSITION AND REMOVE THE KEY. OPERATE ALL HYDRAULIC CONTROLS TO ENSURE THAT NO ACCUMULATED PRESSURE REMAINS IN THE HYDRAULIC SYSTEM. INSTALL CHOCKS AT THE FRONT AND REAR WHEELS. TURN THE ISOLATION SWITCH TO THE "OFF" POSITION. THE ISOLATION SWITCH IS INSTALLED BEHIND THE LEFT FRONT ENGINE COVER. ON ARTICULATED MACHINES, INSTALL THE BLOCKING PINS ON BOTH SIDES OF THE HINGE. ALLOW THE ENGINE AND HYDRAULIC SYSTEM TO COOL BEFORE WORKING IN THESE AREAS. THE GRADER IS READY FOR SERVICING.

NOTE

Weights, measures and tolerances appear in Metric (SI), Imperial and U.S. quantities. Following the internationally accepted standard, the decimal point is denoted by a comma in all Metric measurements.

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Troubleshooting (Continued)

Problem	Cause	Remedy
Continuous clicking sound when the grader is moving straight forward.	Rolling radii are unequal for the driving wheel tires.	Adjust tire pressures or install correct size and type of tire until the radii are equal.
	Excessive load on one side of the grader.	Reduce the load or raise the tire pressure on the heavily loaded side until the rolling radii are equal on both sides.
	Defective differential.	Disassemble the differential. Remove defective parts and install new com-

Cleaning and Inspection

Cleaning - General

Immerse small parts, gears and machined components into a mild alkali cleaning solvent. Agitate the parts to remove all foreign matter.



**WARNING**

**ALKALI CLEANING SOLVENTS AND VAPORS ARE EXTREMELY HARMFUL AND CAN CAUSE SERIOUS INJURY TO EYES, LUNGS AND SKIN. ALWAYS WEAR PROTECTIVE CLOTHING, GOGGLES AND RESPIRATOR. USE UT-MOST CARE WHEN HANDLING CHEMICALS.**

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**Cleaning and Inspection (Continued)**

**Cleaning - General (Continued)**

Parts should remain in the solvent long enough to be thoroughly cleaned and heated. This will help evaporate the solvent and rinse water. Thoroughly rinse parts to remove all traces of cleaning solvent.

After rinsing, immediately dry the parts using moisture-free compressed air. Lint-free, uncontaminated wiping rags can be used. Ensure all oil passages are unblocked.

**Cleaning - Bearings**

**CAUTION**

**YOU ARE RECOMMENDED TO WEAR COTTON GLOVES WHEN HANDLING BEARINGS. THIS PREVENTS SKIN ACIDS AND PERSPIRATION CONTAMINATING THE RACES AND ROLLING ELEMENTS.**

Immerse bearings in cleaning solvent. Rinse the cleaned bearings and dry with moisture-free compressed air. **DO NOT**

spin bearings when drying. Rotate bearings slowly by hand to assist drying. Lubricate all bearings; wrap in clean, lint-free cloth or paper and store in a cool, dry place.

**Cleaning - Axle Housing and Carrier**

Thoroughly clean the interior and exterior of the axle housing and carrier to remove all traces of oil and dirt. These parts can also be steam-cleaned. Dry immediately.

**Inspection - General**

A careful and thorough inspection of all parts is extremely important. Replace all parts showing indications of wear or damage.



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**Cleaning and Inspection (Continued)**

**Inspection - Bearings**

Carefully inspect all rollers, cages and cups for wear, nicks or chipping. When replacing bearings, **ALWAYS** install new cups and mating cones. After inspection, lubricate all bearings; wrap in clean, lint-free cloth or paper and store in a cool, dry place.

**Inspection - Oil Seals, O Rings and Snap Rings**

Replace all oil seals, O rings and snap rings. Lubricant loss through a worn seal can cause expensive parts of the assembly to fail. Handle sealing components carefully, particularly when being installed. Cutting, scratching or curling of the seal lip seriously reduces efficiency.

Apply a thin coating of 'Permatex No. 2', or equivalent, onto the outer diameter of the oil seal carrier. This ensures an oil-tight fit in the bore. Lubricate all oil seal lips and O rings before installation.

**Inspection - Gears and Shafts**

If crack detection equipment is available, use the process to check parts. Examine teeth of all gears for wear, pitting, chipping, nicks, cracks and scores. If gear teeth show spots where the case hardening has worn through or cracked, replace the gear.

Always replace the ring gear and pinion as a matched set. Small nicks can be removed using a suitable grinding stone. Inspect shafts for signs of bent or twisted splines and replace any deformed axles.

**Inspection - Axle Housing and Carrier**

Inspect the axle housing and carrier. Ensure that they are thoroughly clean and all mating surfaces and bearing bores are free from nicks and burrs. Check for evidence that would cause subsequent oil leaks.

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**Cleaning and Inspection (Continued)**

**Inspection - Differential Assembly**

Inspect the splines of the side gears and clutches. Remove any burrs or small chipped edges. Check the side gear hubs for fractures.

Replace the differential cases if the trunnion grooves or end thrust surfaces are worn or scored.

Check the differential case thrust and bearing surfaces for signs of metal pickup or wear. Replace excessively worn parts.

Check each clutch and holdout ring assembly for precise alignment of holdout ring to the spider center cam. Ensure the holdout ring rotates in the groove with little resistance.

Replace holdout rings if teeth are excessively worn, fractured or chipped.

Check the center cam for free movement. The cam must rotate within the limits of the spider key. **DO NOT** remove the center cam from the spider. If either part of the assembly is damaged or excessively worn, replace the complete spider-center cam assembly.

Inspect the clutch teeth on the spider and driven clutches. Remove small chips and restore the teeth using a fine grinding stone. Replace mating components if one part has excessively worn or rounded teeth.

Cams on the center cam and driven clutches must not be excessively chipped. A smooth wear pattern up to 50% of the cam width face is acceptable.

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**Cleaning and Inspection (Continued)**

**Inspection - Differential Assembly**  
(Continued)

Check the side gear outer splines for wear or distortion. Ensure that the side gear and drive axle splines do not bind.

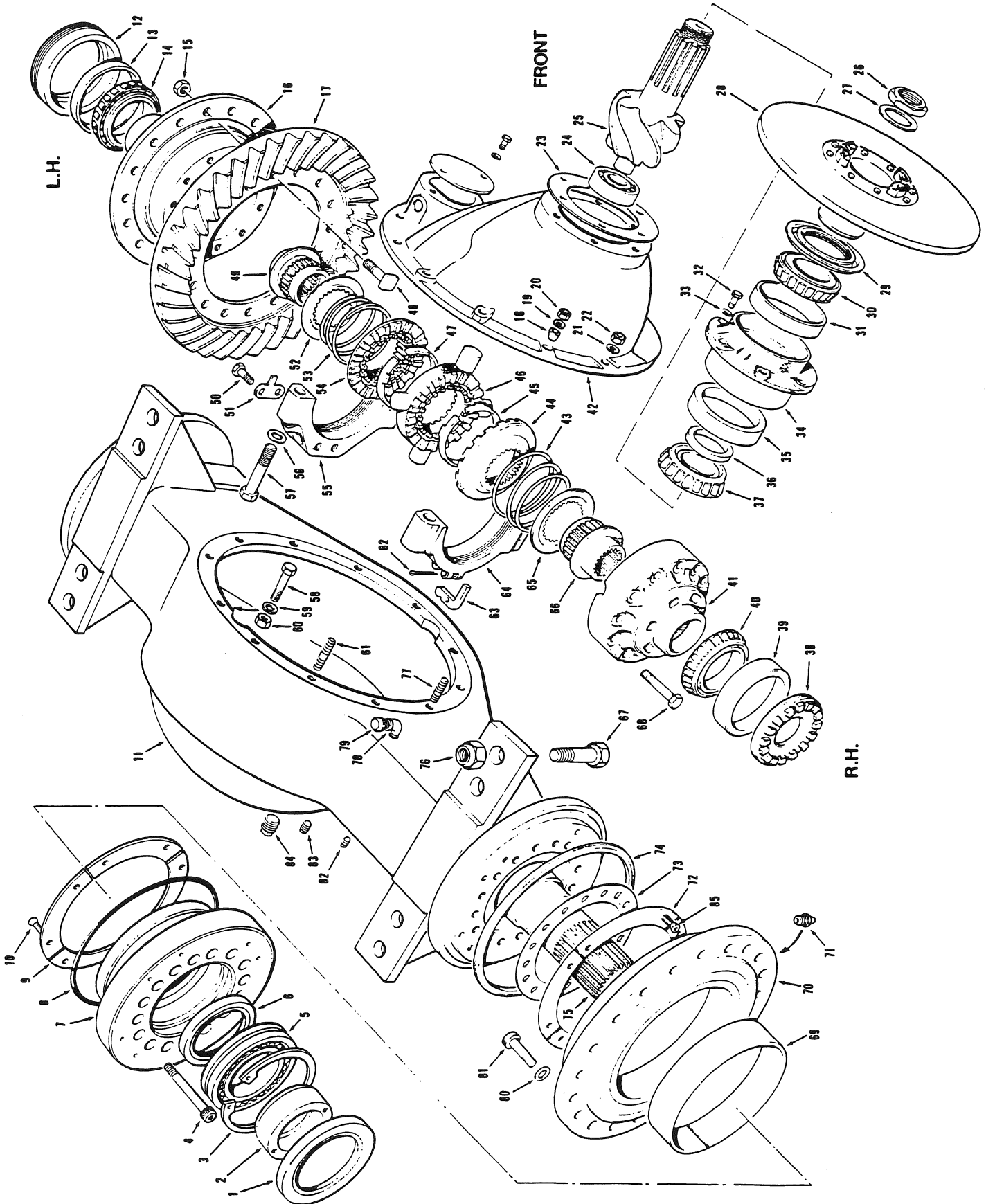
Check the springs of the NoSPIN assembly for a spring load measurement of (13 N.m; 1,3 kgf.m; 115 lbf-in.) at the operating height of 23 mm (0.9 in.).

**NOTE**

A dial indicator type spring tester is the best tool for the procedure described above. If a tester is not available, a weight equal to the specified can be placed on the spring and the operating height can be measured.

Replacing springs in the NoSpin should only be done when the proper spring load and operating height is not the same as specified.

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<b>Item</b>	<b>Description</b>	<b>Item</b>	<b>Description</b>	<b>Item</b>	<b>Description</b>
1	Outer oil seal	29	Oil seal and retainer	55	Bearing cap
2	Spacer		assy.	56	Washer
3	Snap ring	30	Outer bearing cone	57	Bolt
4	Bolt	31	Outer bearing cup	58	Bolt
5	Bearing	32	Bolt	59	Lockwasher
6	Inner oil seal	33	Internal tooth lock-	60	Nut
7	Pivot ring retainer		washer	61	Stud
8	O ring	34	Cage and cup assy.	62	Cotter pin
9	Thrust plate	35	Inner bearing cup	63	Right hand adjuster
10	Bolt	36	Spacer		lock
11	Axle housing	37	Inner bearing cone	64	Bearing cap
12	Left hand bearing	38	Right hand bearing	65	Retainer
	adjuster		adjuster	66	Side gear
13	Left hand bearing	39	Right hand bearing	67	Bolt
	cup		cup	68	Bolt
14	Left hand bearing	40	Right hand bearing	69	Bushing
	cone		cone	70	Pivot ring
15	Nut	41	Right hand differen-	71	Grease fitting
16	Left hand differen-		tial case	72	Thrust plate
	tial case	42	Carrier assembly	73	Shim
17	Ring gear (matched	43	Spring	74	"Uniring" seal
	set)	44	Clutch	75	Drive axle
18	Conical washer	45	Holdout ring	76	Locknut
19	Lockwasher	46	Spider assembly	77	Stud
20	Nut	47	Holdout ring	78	90° elbow
21	Lockwasher	48	Special bolt	79	Breather
22	Nut	49	Side gear	80	Lockwasher
23	Shim	50	Bolt	81	Bolt
24	Pilot bearing	51	Left hand adjuster	82	Pipe plug
25	Pinion (matched set)		lock	83	Pipe plug
26	Pinion locknut	52	Retainer	84	Pipe plug
27	Washer	53	Spring	85	Bolt
28	Brake disc and yoke	54	Clutch		
	assembly				

**Key to Fig. 1**

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SINGLE REDUCTION FINAL DRIVE

SINGLE REDUCTION FINAL DRIVE ASSEMBLY

Removal from Grader

**Fig. 2**

Place a container under the drain plug (84). Remove the plug and drain the lubricating oil. Analyze the drained oil. If metal particle contamination is present, completely disassemble the final drive assembly to remove defective parts.

**Fig. 3**

Turn the isolation switch to the "ON" position. Start the engine. Lower the moldboard and lift the front wheels off the ground. Stop the engine. Turn the isolation switch to the "OFF" position.

**Fig. 4**

Disconnect the tube from the brake master cylinder to the three-way connector located on the inner right hand side of the rear frame. Immediately plug the tube and connector to prevent dirt and moisture entering the brake hydraulic system. Wipe up any spilled brake fluid to prevent paint damage.

**Fig. 5**

Disconnect the emergency brake cable.

**Fig. 6**

**CAUTION**

**THE EMERGENCY BRAKE CALIPER ASSEMBLY IS EXTREMELY HEAVY.**

Remove the bolts, lockwashers and flat-washers. Carefully remove the emergency brake caliper assembly. Remove the bolts, lockwashers, brake disc fender and two spacers.

**Fig. 7**

Disconnect the lower drive shaft universal joint from the final drive input yoke. Secure the two halves of the slip yoke with lockwire.

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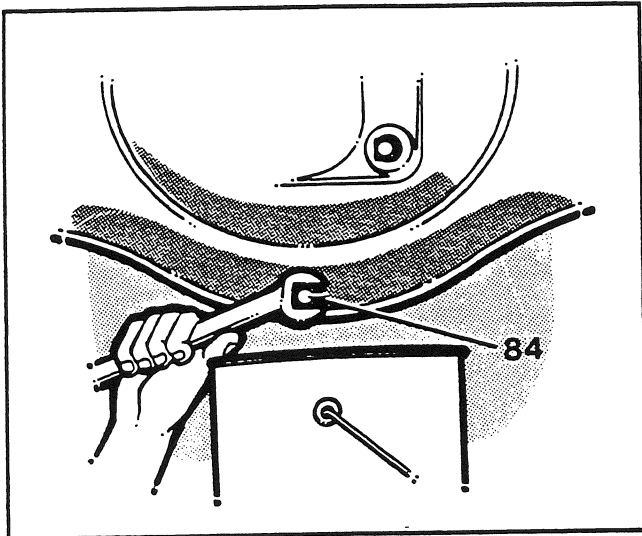


Fig. 2

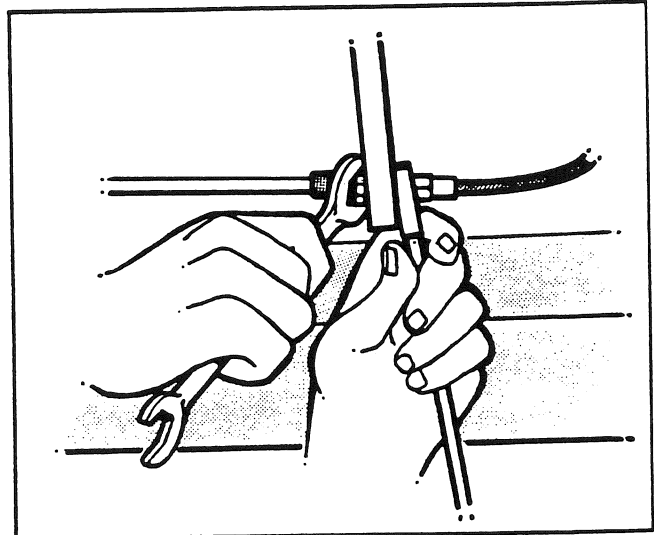


Fig. 5

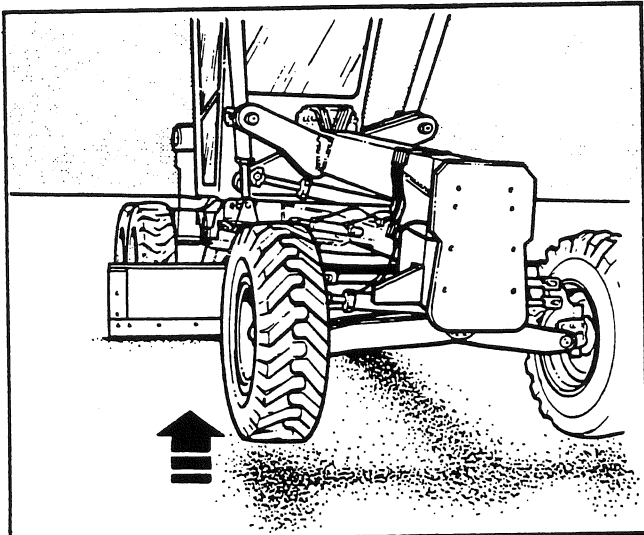


Fig. 3

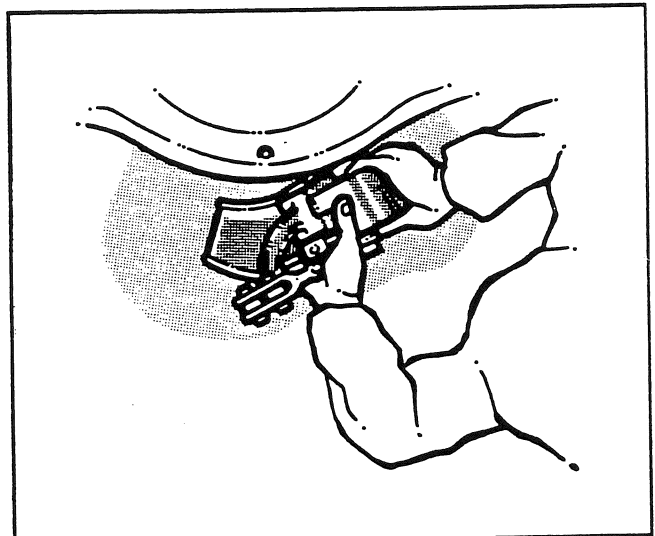


Fig. 6

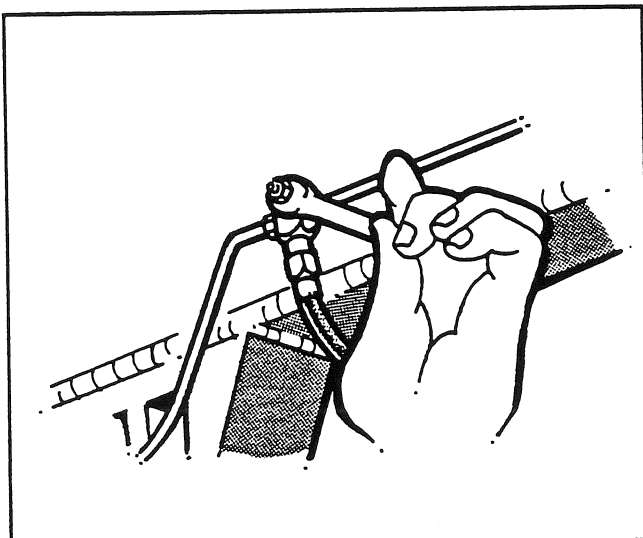


Fig. 4

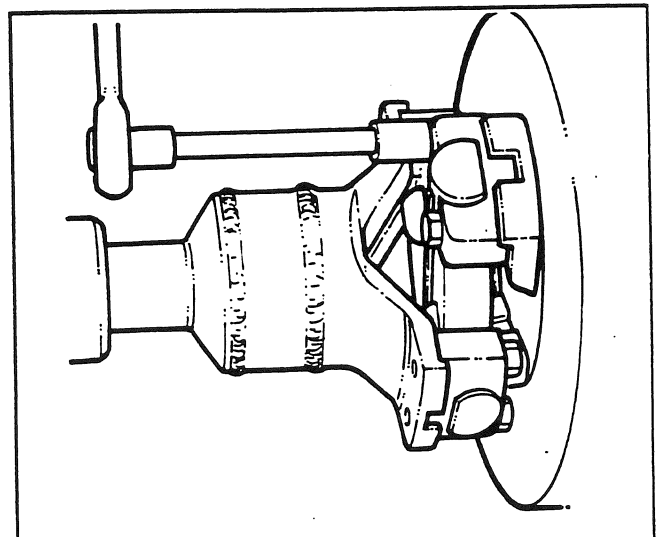


Fig. 7

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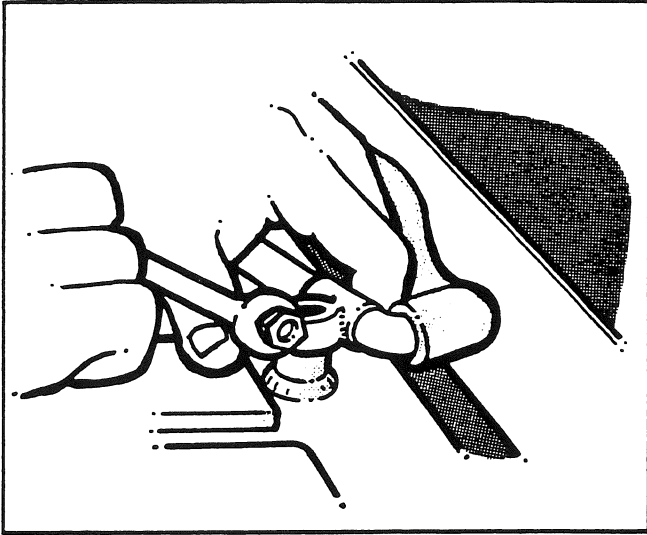


Fig. 8

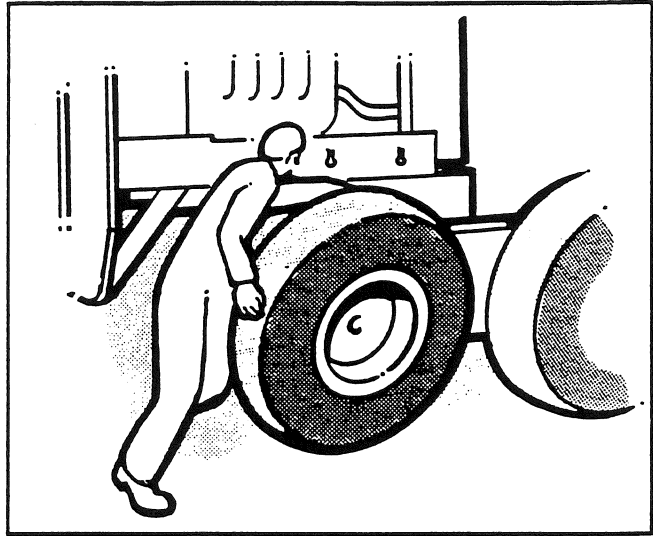


Fig. 10

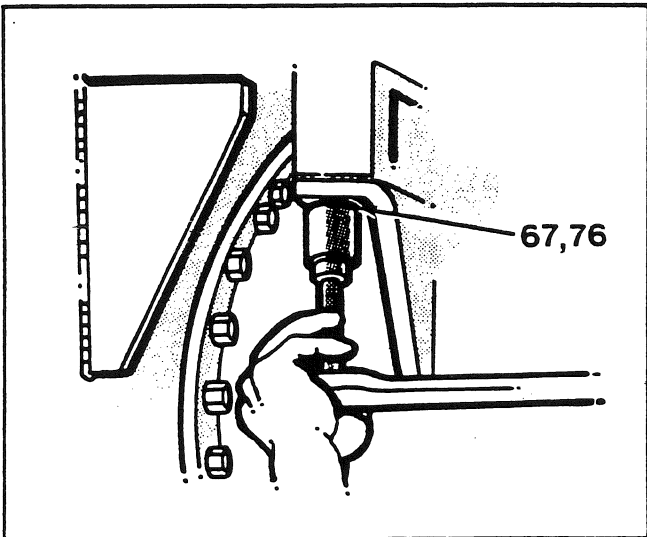


Fig. 9

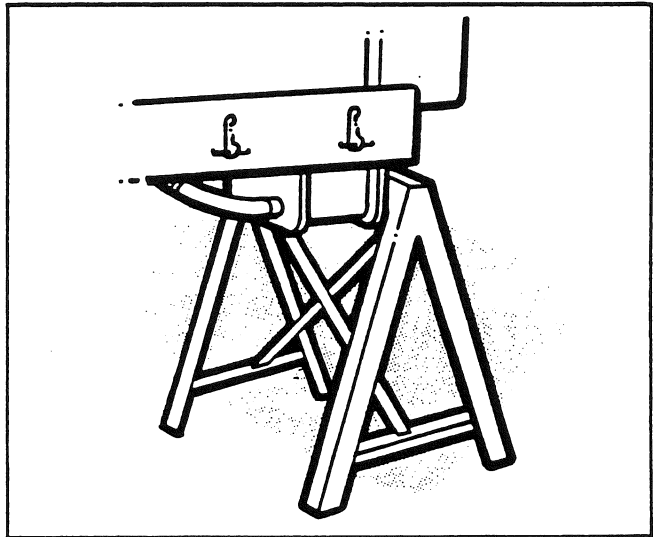


Fig. 11



**700 SERIES SHOP MANUAL**  
**SINGLE REDUCTION FINAL DRIVE**  
**SINGLE REDUCTION FINAL DRIVE ASSEMBLY**

**Removal from Grader (Continued)**

**Fig. 8**

Open the battery box(es) and disconnect the battery cables. Remove one battery and pass the cables through the grommet.

**Fig. 9**

Attach a safe lifting device to the rear of the grader frame. Remove the bolts (67) and locknuts (76) retaining the final drive assembly to the frame brackets.

**Fig. 10**

Raise the rear end of the grader clear of the final drive. Roll out the final drive and tandem assembly from under the grader.

**Fig. 11**

Lower the rear end of the grader onto safe, adequate stands

700 SERIES SHOP MANUAL  
SINGLE REDUCTION FINAL DRIVE

MAJOR COMPONENTS

**Removal and Disassembly**

**Fig. 12**

Install wedges in front and behind the tires. Place a container under the tandem drain plug. Remove the plug and drain the lubricating oil. Clean and install the drain plug.

**Fig. 13**

Remove, clean and install the deep reach magnetic plugs. If the oil and magnetic plugs are contaminated with metal particles, completely disassemble the tandem to remove defective parts.

**Fig. 14**

Disconnect and remove the transverse brake line. Immediately plug the line and connector. Wipe up any spilled fluid to avoid paint damage.

**Fig. 15**

Remove the bolts securing the cover plate and remove the plate. Discard the gasket and remove any traces of sealant.

**Fig. 16**

Remove the bolts, lockwashers and end plate.

**Fig. 17**

Support the final drive assembly on safe, adequate stands. Attach a safe lifting device to the tandem. Remove the bolts (81) and lockwashers (80) retaining the final drive to the tandem.

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SINGLE REDUCTION FINAL DRIVE

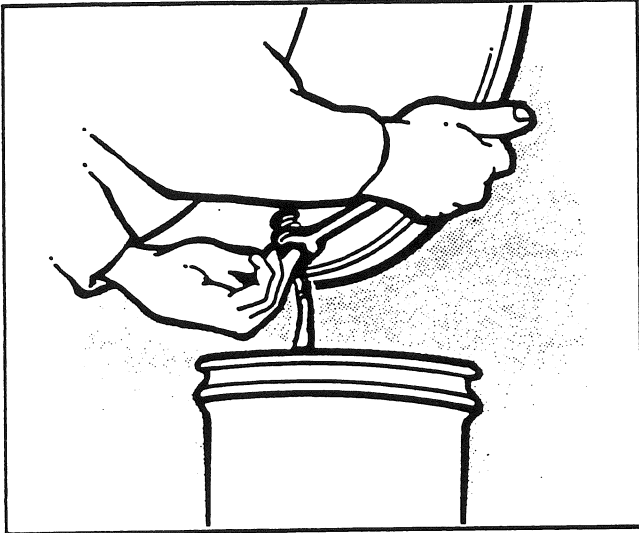


Fig. 12

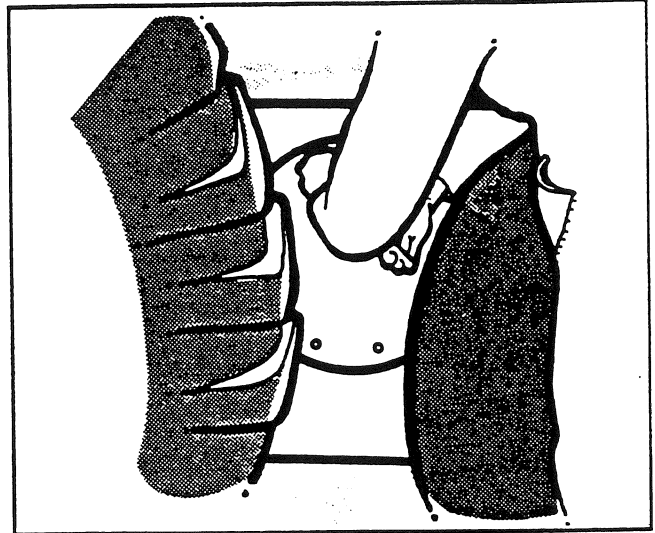


Fig. 15

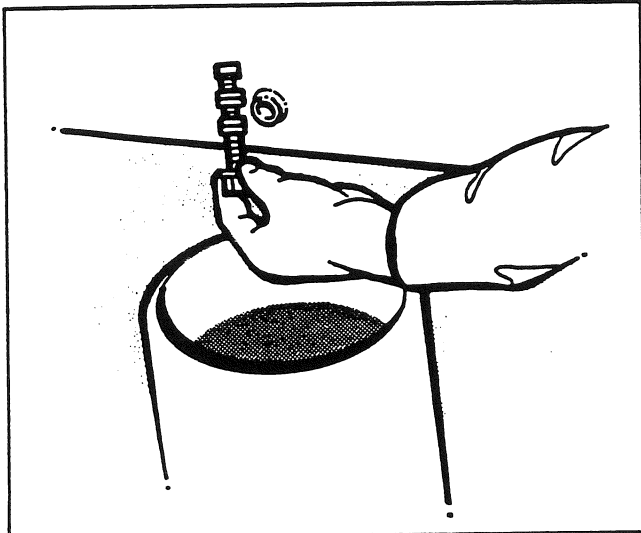


Fig. 13

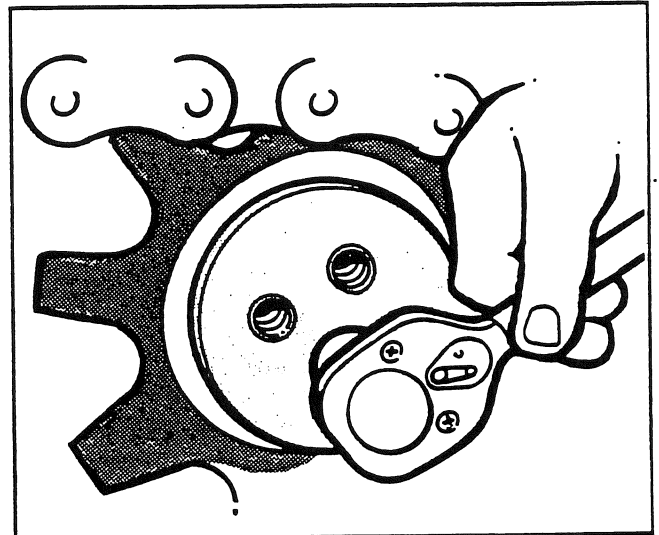


Fig. 16

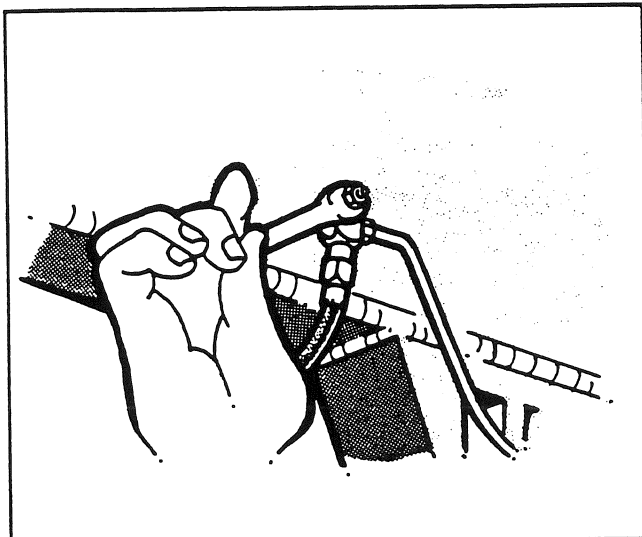


Fig. 14

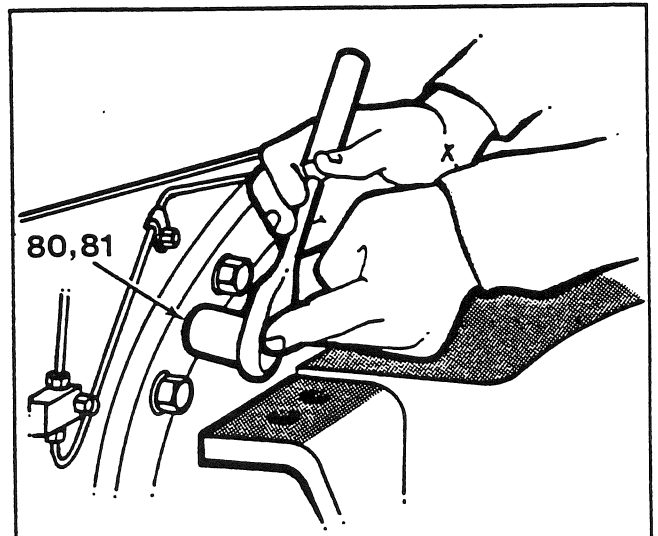


Fig. 17

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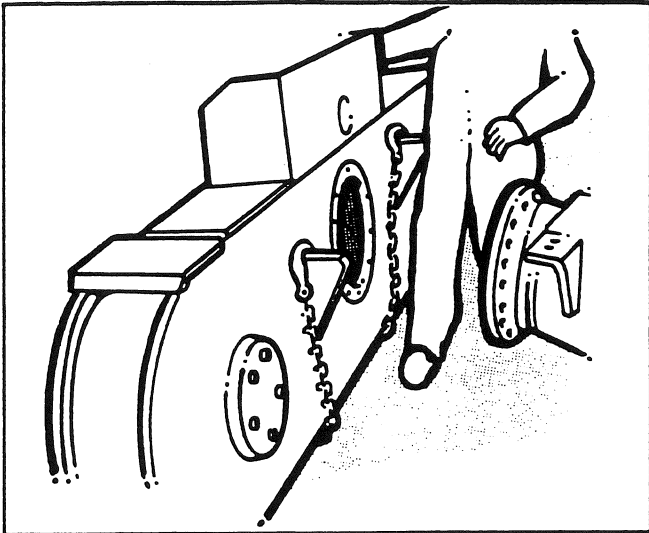


Fig. 18

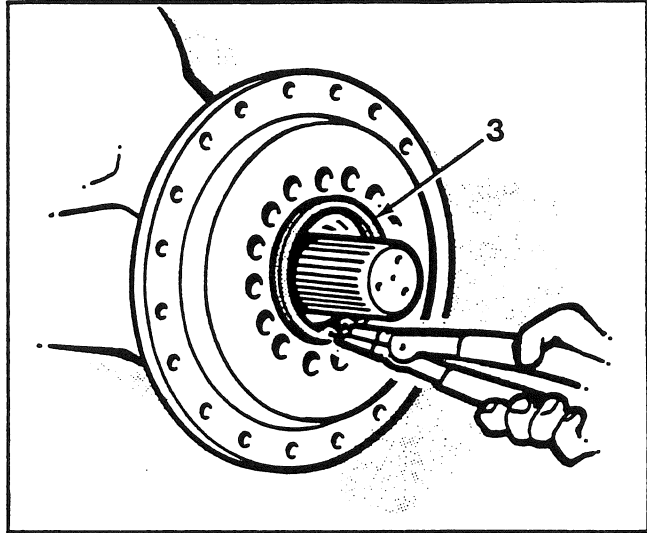


Fig. 21

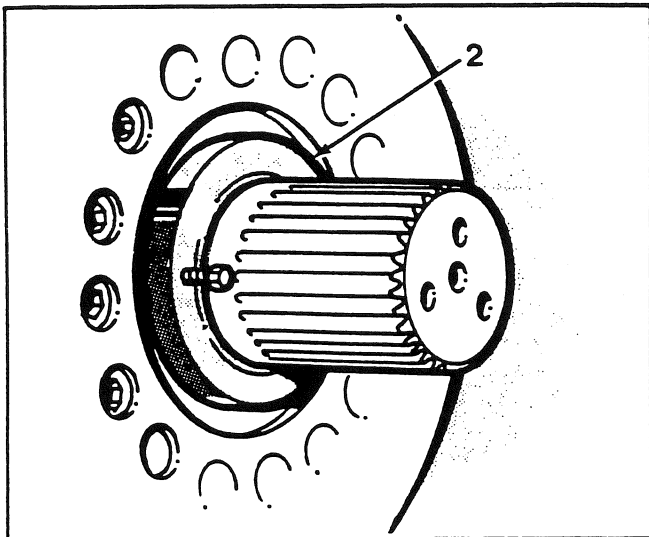


Fig. 19

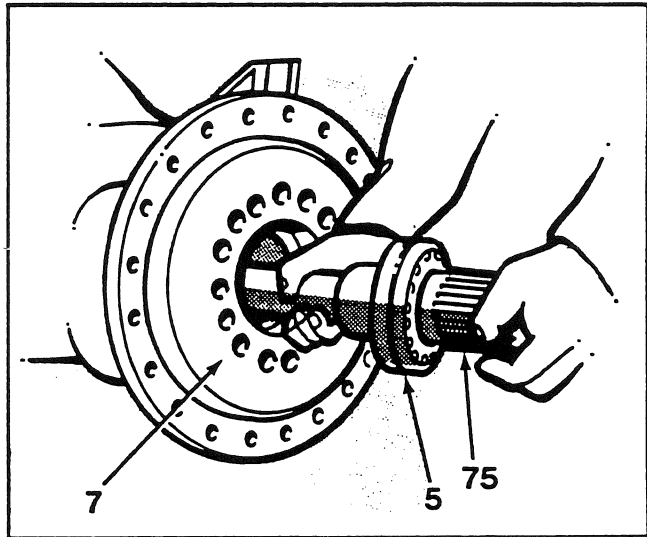


Fig. 22

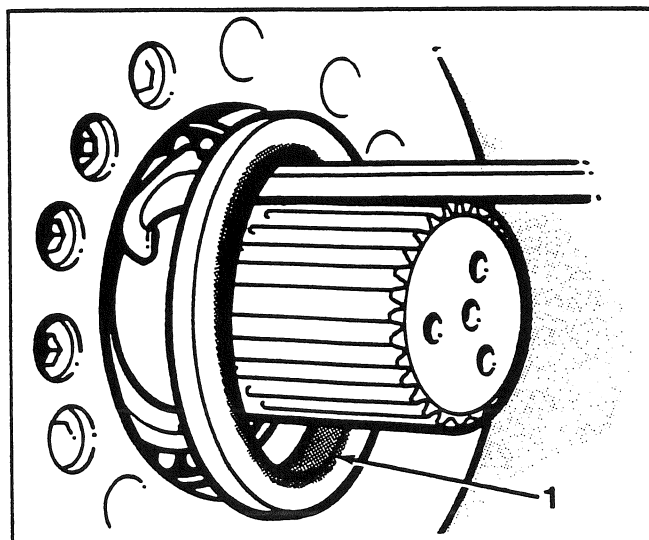


Fig. 20  
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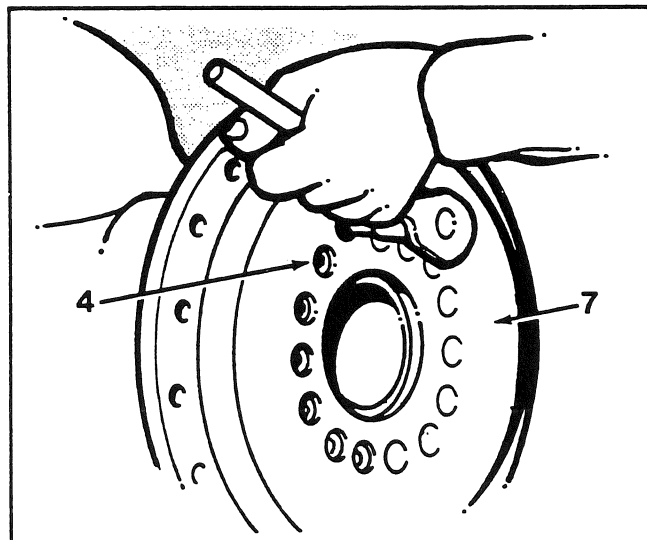


Fig. 23

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SINGLE REDUCTION FINAL DRIVE

MAJOR COMPONENTS

Removal and Disassembly (Continued)

**Fig. 18**

Carefully remove the tandem. Use a pry bar to remove the drive sprocket and chains. Repeat the previous steps for the other tandem.

**Fig. 19**

Place the final drive assembly with the input carrier assembly at the top. Remove the spacer (2).

**Fig. 20**

Remove and discard the outer oil seal (1).

**Fig. 21**

Remove and discard the snap ring (3).

**Fig. 22**

Remove the drive axle and bearing assembly from the pivot ring retainer (7). Remove the bearing (5) from the drive axle (75). Place the bearing and drive axle to one side for cleaning and inspection.

**Fig. 23**

**CAUTION**

**THE PIVOT RING (70) MAY BE LOOSE.  
TAKE CARE WHEN SEPARATING.**

Remove the bolts (4) securing the pivot ring retainer (7).

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SINGLE REDUCTION FINAL DRIVE

MAJOR COMPONENTS

Removal and Disassembly (Continued)

**Fig. 24**

Carefully remove the pivot ring retainer (7). Also remove the bolts (10) retaining the thrust plate segments (9).

**Fig. 27**

Carefully remove the pivot ring assembly (69), (70).

**Fig. 25**

Remove the shims (73).

**Fig. 28**

Remove and discard the "Uniring" seal (74).

**Fig. 26**

Remove and discard the inner oil seal (6) and O ring (8).

**Fig. 29**

Remove the bolts (85) retaining the thrust plate segments (72). Remove the segments. Repeat the previous steps for the other side. Place all parts to one side for cleaning and inspection.

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SINGLE REDUCTION FINAL DRIVE

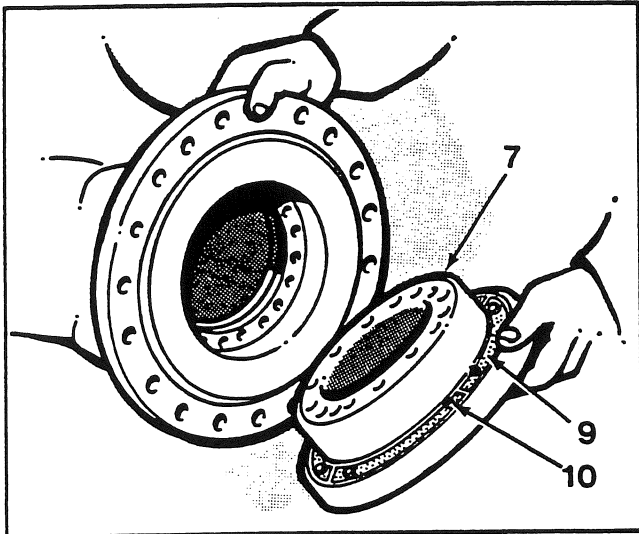


Fig. 24

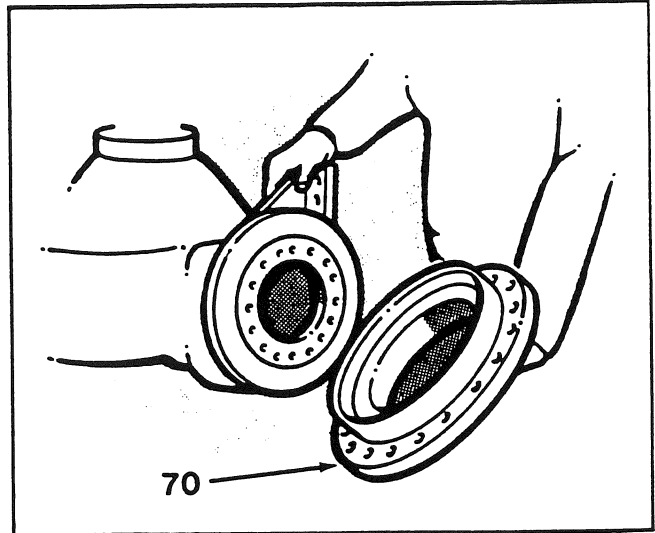


Fig. 27

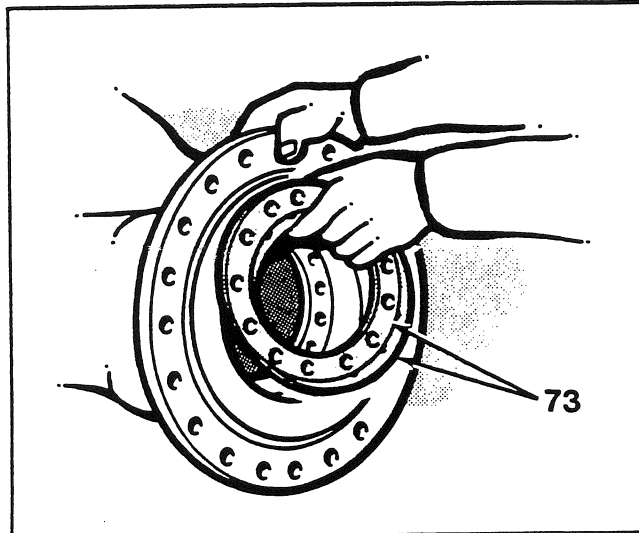


Fig. 25

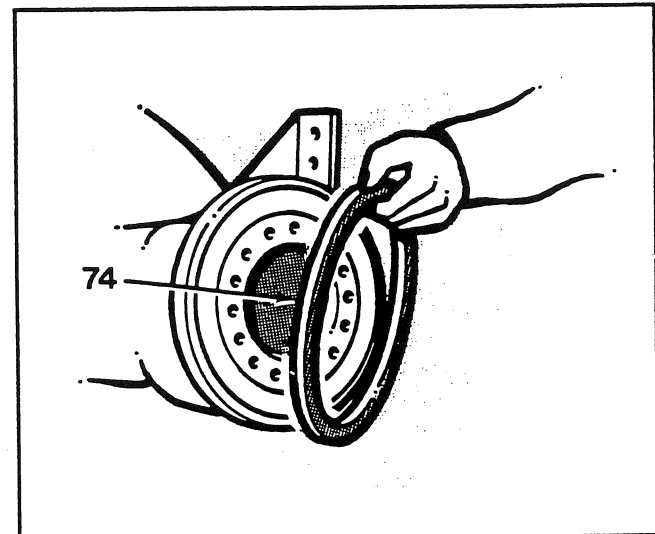


Fig. 28

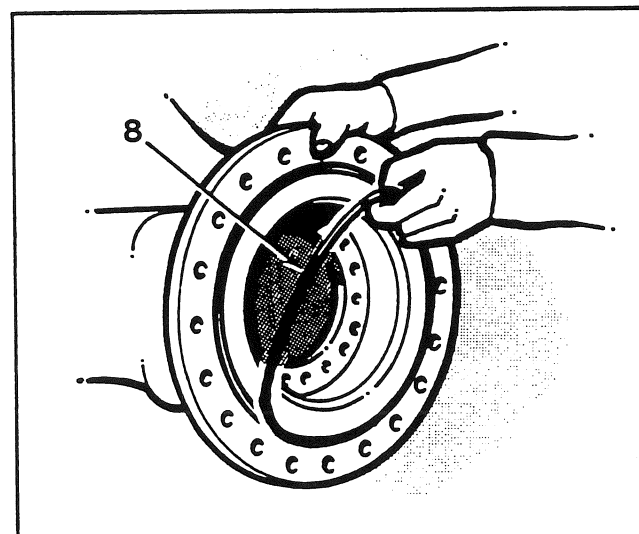


Fig. 26

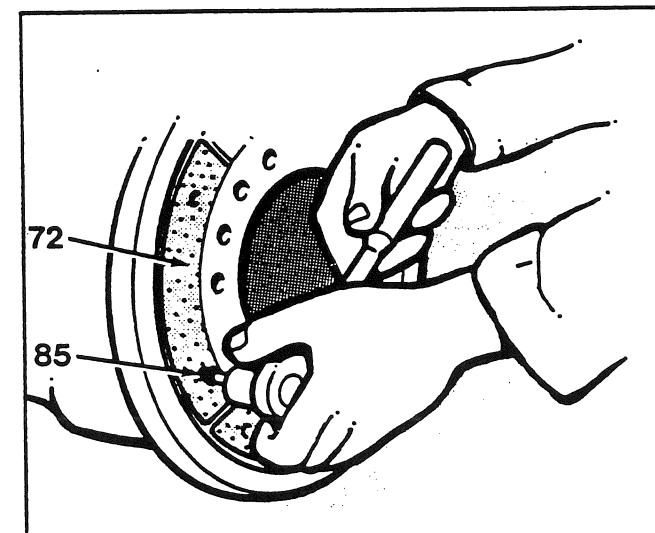


Fig. 29

700 SERIES SHOP MANUAL  
SINGLE REDUCTION FINAL DRIVE

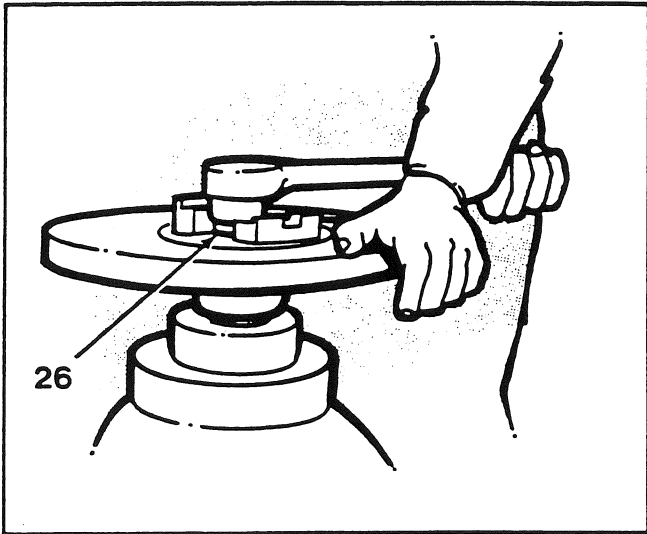


Fig. 30

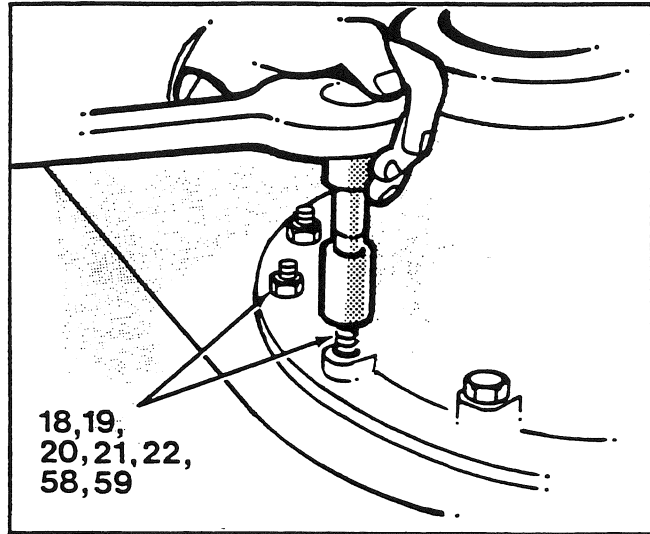


Fig. 32

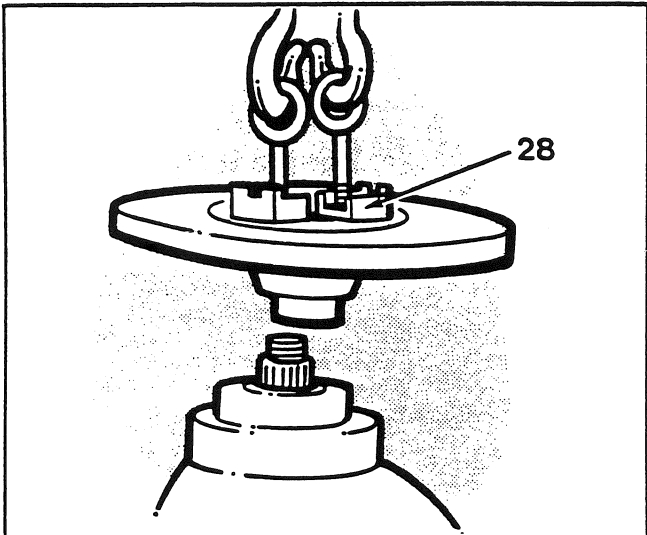


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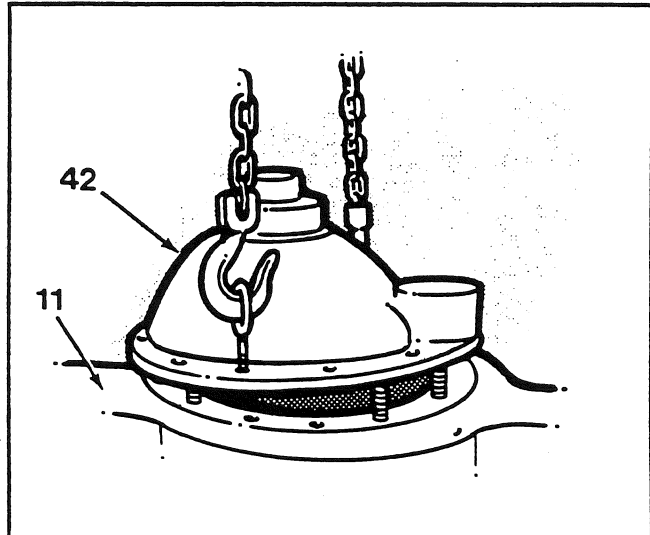


Fig. 33



700 SERIES SHOP MANUAL  
SINGLE REDUCTION FINAL DRIVE

MAJOR COMPONENTS

Removal and Disassembly (Continued)

**Fig. 30**

Remove and discard the pinion locknut (26).

**Fig. 31**

Install two lifting eyebolts into the yoke (28). Remove the washer (27), brake disc and yoke assembly.

**Fig. 32**

Remove the bolts (58), nuts (20 and 22), lockwashers (59, 21 and 19) and conical washers (18).

**Fig. 33**



**WARNING**

THE CARRIER ASSEMBLY IS EXTREMELY HEAVY. SUPPORT THE ASSEMBLY IN A SUITABLE SERVICE FIXTURE OR ON A STRONG WORKBENCH.

Install two lifting eyebolts and attach a safe lifting device. Using a pry bar, carefully separate and remove the carrier assembly (42) from the axle housing (11). Install the carrier assembly into the service fixture or on the workbench.

700 SERIES SHOP MANUAL  
SINGLE REDUCTION FINAL DRIVE  
DIFFERENTIAL HEAD ASSEMBLY

Disassembly

NOTE

If using the original gear set, check and record the tooth contact pattern and backlash BEFORE disassembly. DO NOT perform this step if replacing the gear set.

**Fig. 34**

Remove and discard the lockwire retaining the bearing cap bolts (57).

**Fig. 37**

Remove and discard the cotter pin (62) retaining the right hand adjuster lock (63).

**Fig. 35**

Punch mark the bearing caps (55 and 64) and bearing adjusters (12 and 38) to ensure correct assembly.

**Fig. 38**

Remove the right hand adjuster lock (63).

**Fig. 36**

Remove the left hand adjuster lock bolts (50). Remove the left hand adjuster lock (51).

**Fig. 39**

Remove the bolts (57) and washers (56) securing the left and right hand bearing caps (55) and (64).

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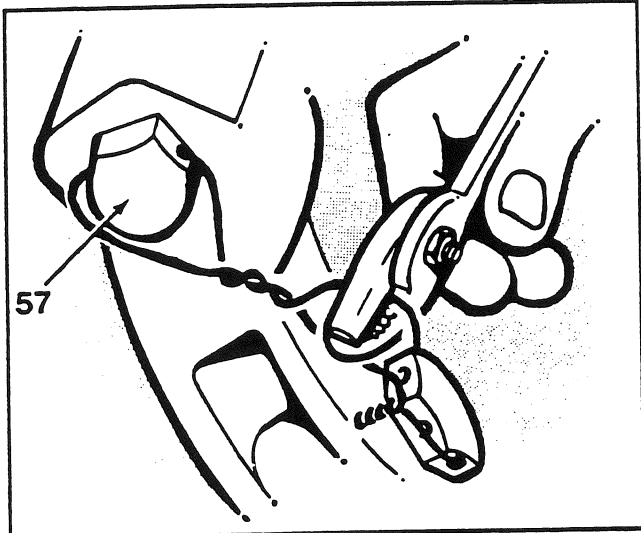


Fig. 34

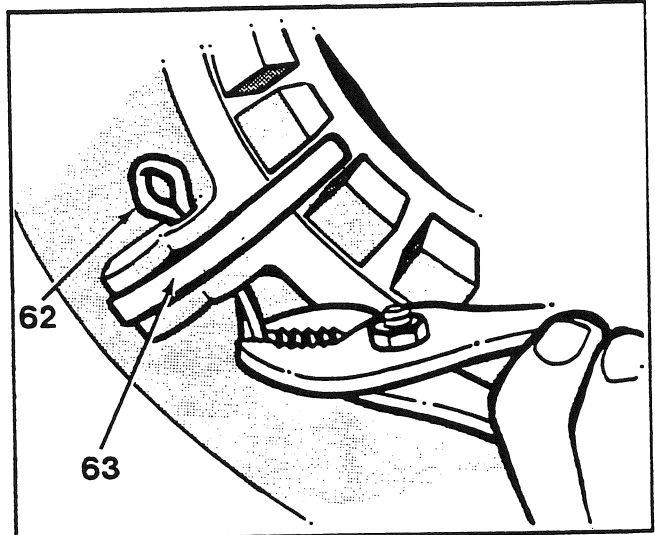


Fig. 37

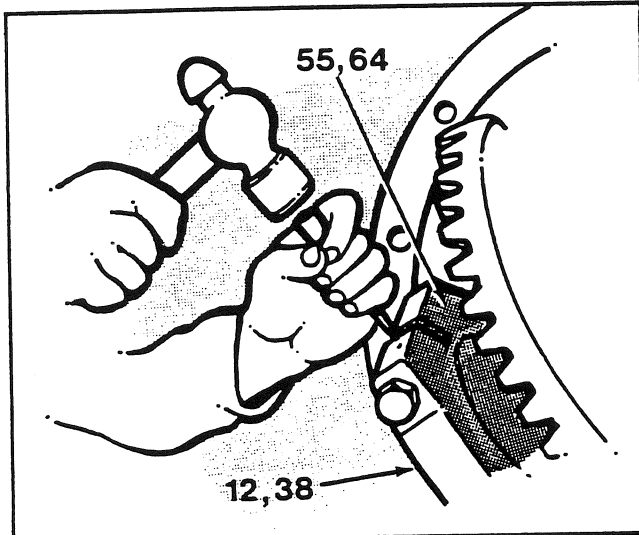


Fig. 35

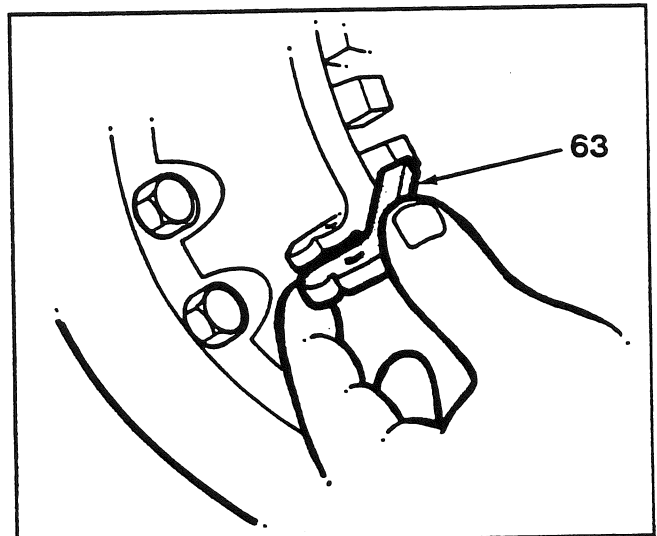


Fig. 38

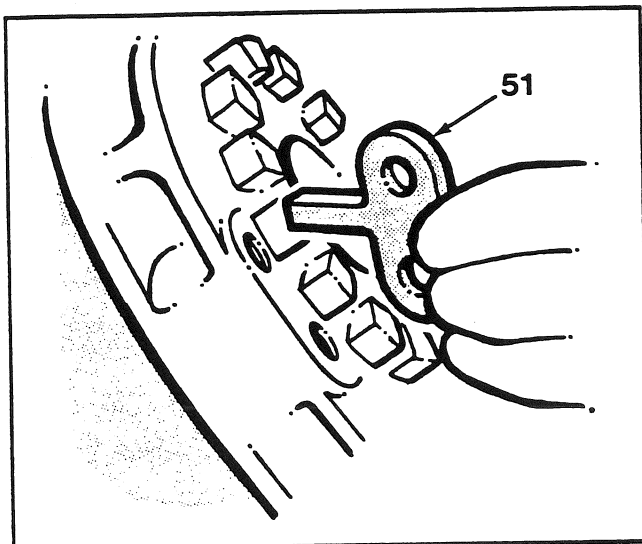


Fig. 36

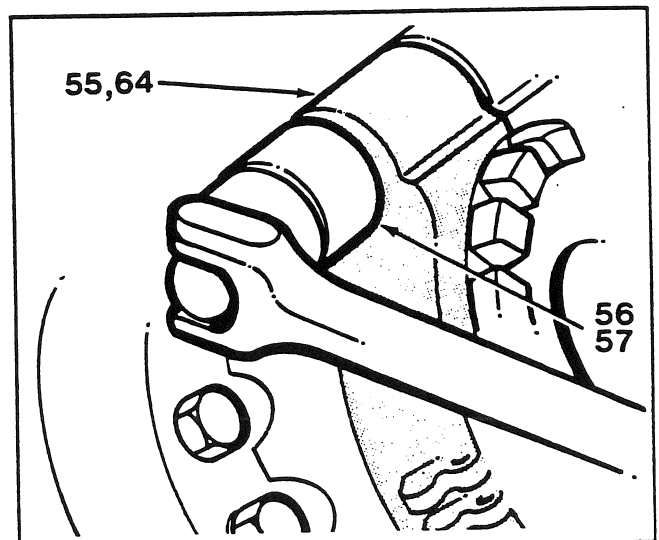


Fig. 39

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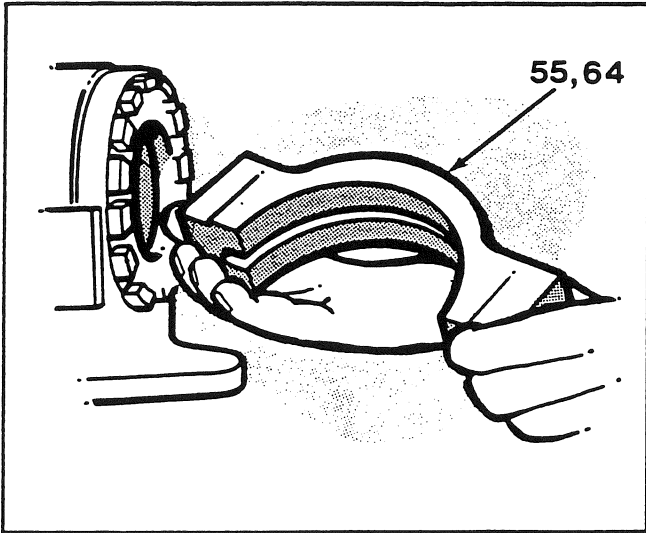


Fig. 40

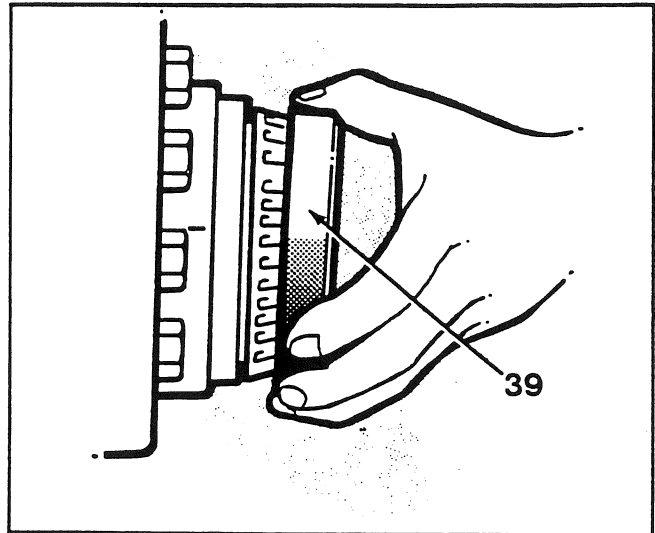


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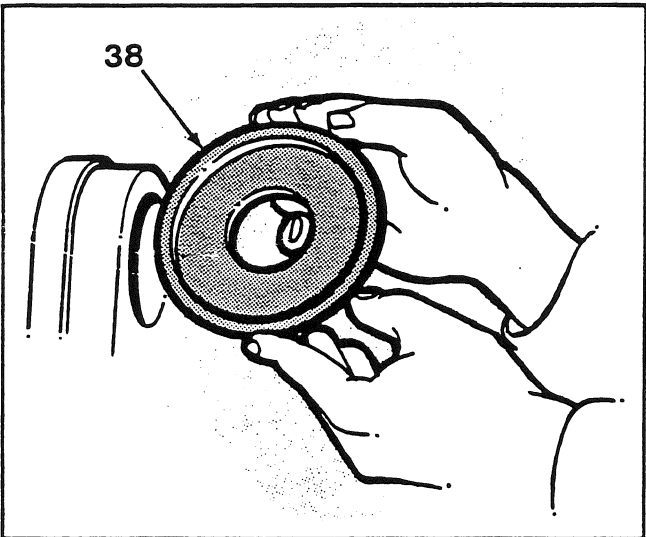


Fig. 41

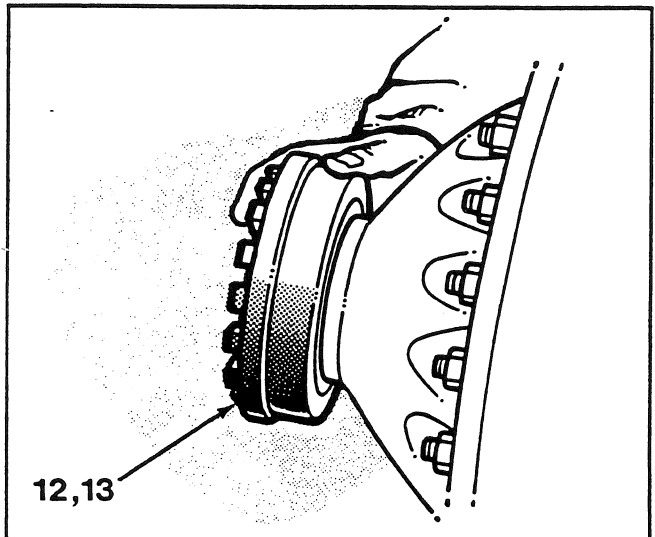


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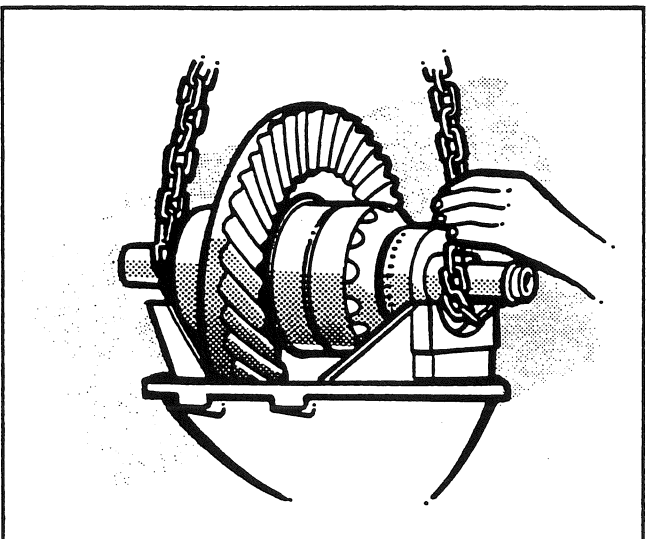


Fig. 42

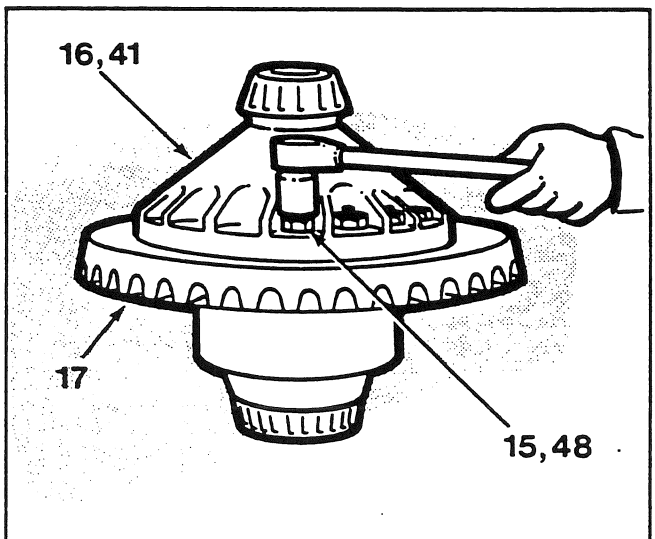


Fig. 45

**700 SERIES SHOP MANUAL**  
**SINGLE REDUCTION FINAL DRIVE**  
**DIFFERENTIAL HEAD ASSEMBLY**

**Disassembly (Continued)**

**Fig. 40**

Remove the left and right hand bearing caps (55) and (64).

**Fig. 43**

Remove the right hand bearing cup (39).

**Fig. 41**

Remove the right hand bearing adjuster (38).

**Fig. 44**

Remove the left hand bearing cup (13) and adjuster (12) assembly.

**Fig. 42**

Use a safe lifting device to remove the differential assembly from the carrier housing.

**Fig. 45**

Place the differential assembly on the workbench. Punch mark the differential cases (16 and 41) to ensure correct assembly. Remove the nuts (15) and special bolts (48) retaining the ring gear (17).

700 SERIES SHOP MANUAL  
SINGLE REDUCTION FINAL DRIVE

DIFFERENTIAL HEAD ASSEMBLY

**Disassembly (Continued)**

**Fig. 46**

Remove the ring gear (17).

**Fig. 49**

Carefully release and remove the differential case (41).

**Fig. 47**

Slowly loosen the differential case bolts (68) in a diagonal sequence to gradually release the spring compression.

**Fig. 50**

Remove the side gears (49) and (66).

**Fig. 48**

Press down on the differential case (41) when removing the bolts (68).

**Fig. 51**

Remove the spring retainers (52) and (65).

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SINGLE REDUCTION FINAL DRIVE

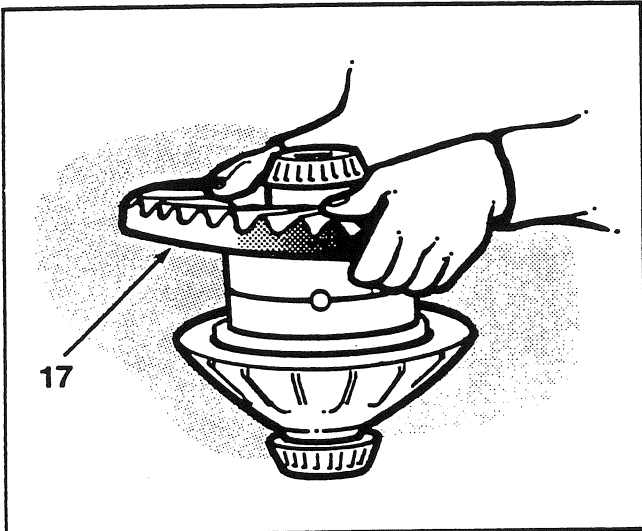


Fig. 46

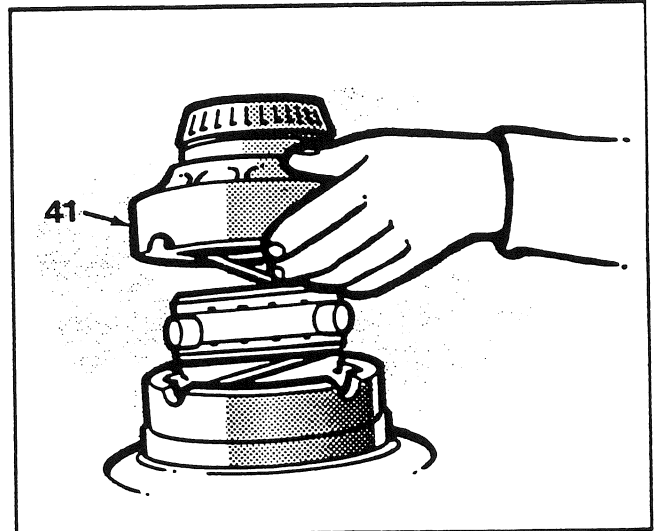


Fig. 49

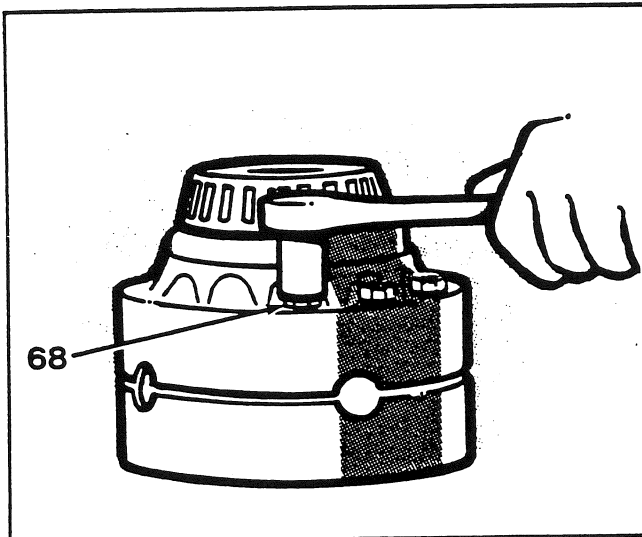


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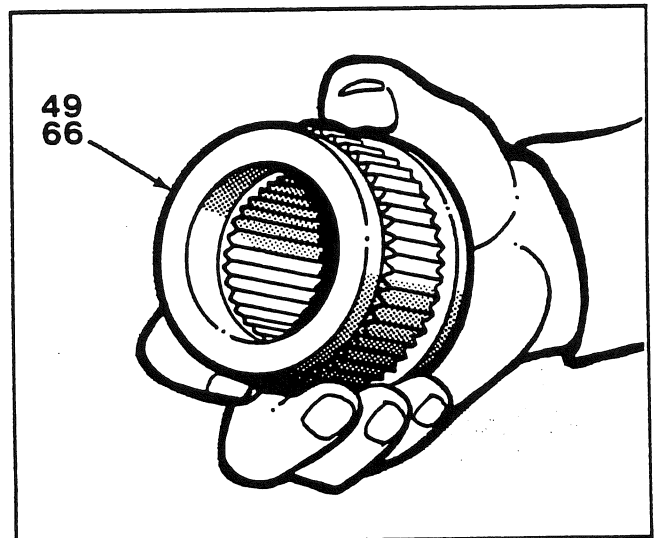


Fig. 50

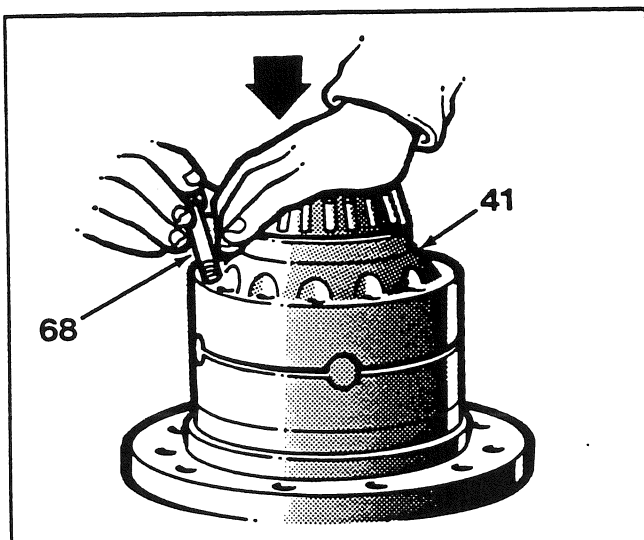


Fig. 48

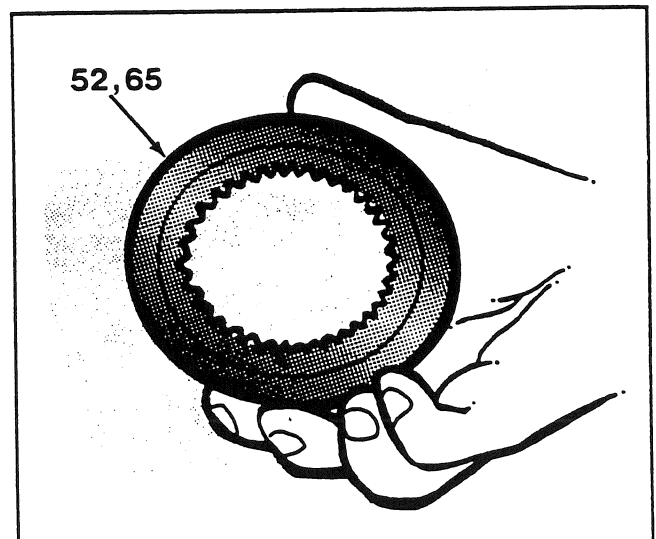


Fig. 51

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SINGLE REDUCTION FINAL DRIVE

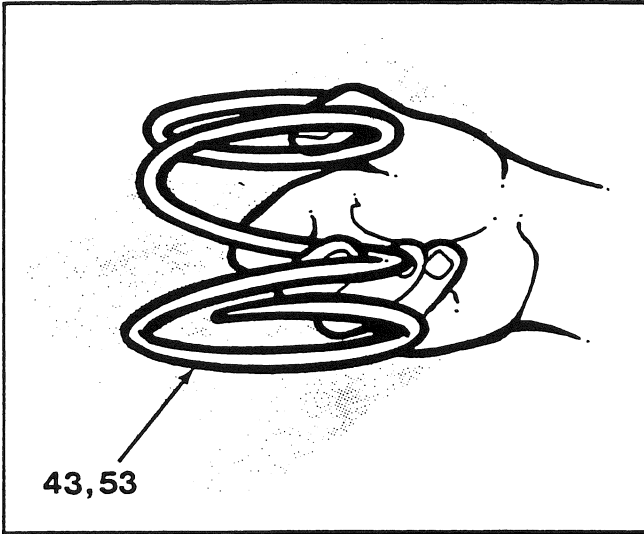


Fig. 52

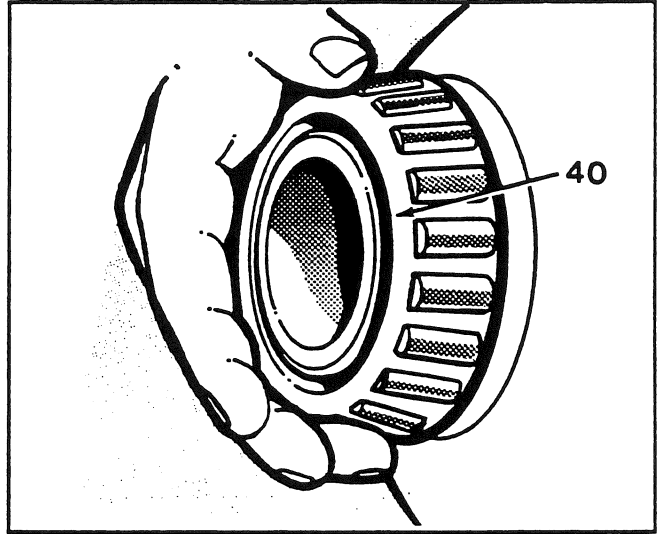


Fig. 55

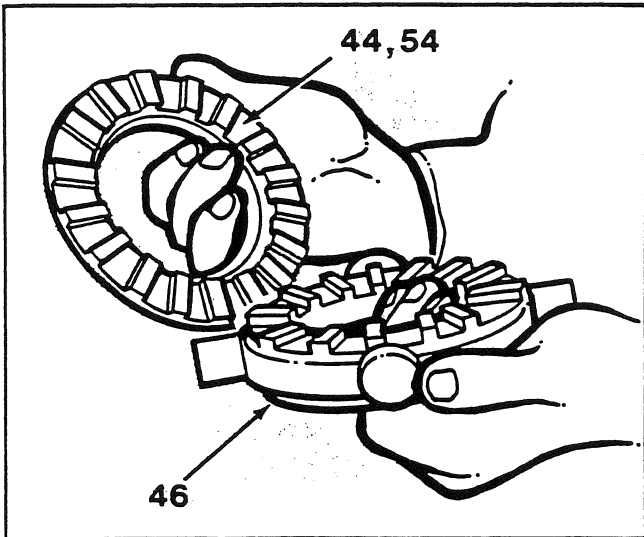


Fig. 53

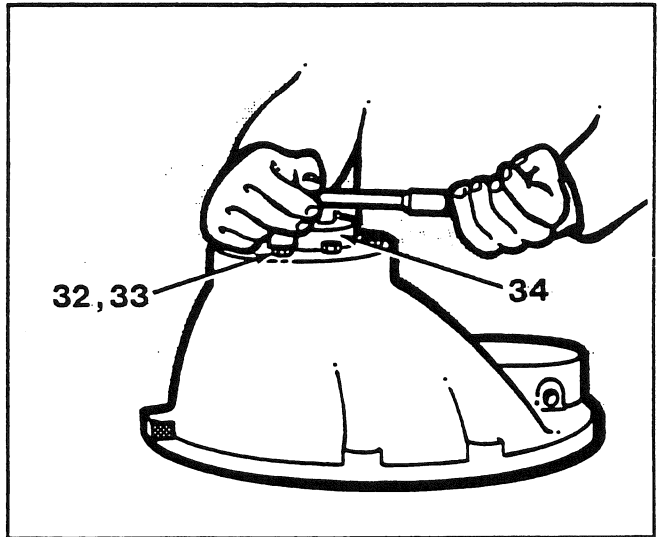


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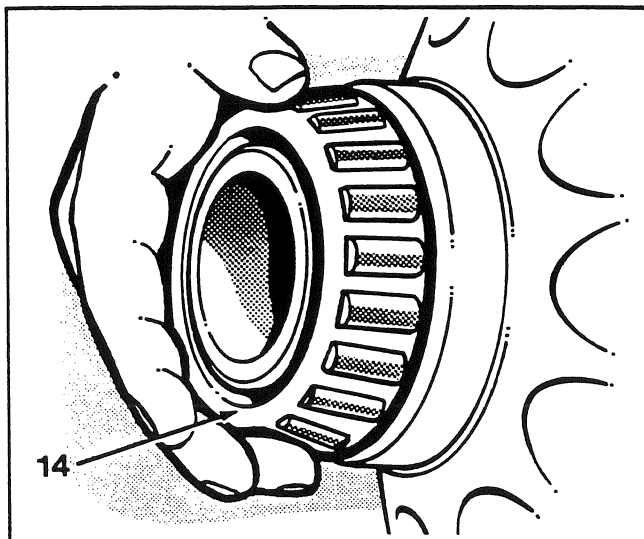


Fig. 54

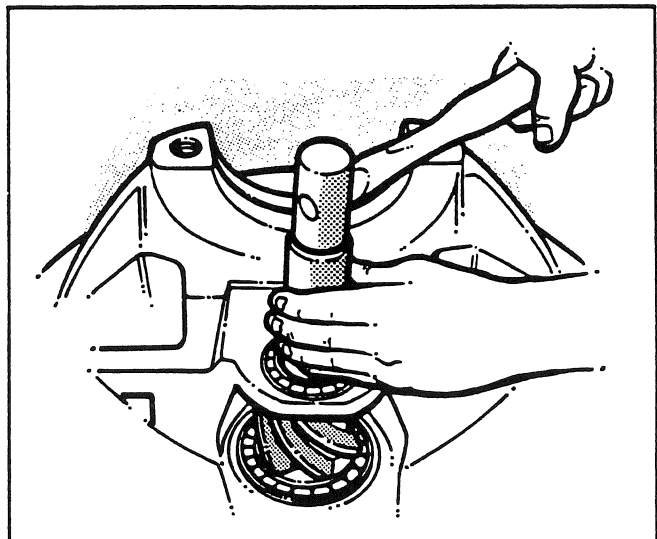


Fig. 57



700 SERIES SHOP MANUAL  
SINGLE REDUCTION FINAL DRIVE

DIFFERENTIAL HEAD ASSEMBLY

Disassembly (Continued)

**Fig. 52**

Remove the springs (53) and (43).

**Fig. 53**

Remove the clutches (44) and (54) and spider assembly (46).

**Fig. 54**

Check for damage and wear of the left hand bearing cone (14). Replace the cone if required.

**Fig. 55**

Check for damage and wear of the right hand bearing cone (40). Replace the cone if required. Place all parts to one side for cleaning and inspection.

**Fig. 56**

Remove the bolts (32) and lockwashers (33) retaining the pinion cage and cup assembly (34).

**Fig. 57**

**CAUTION**

**DO NOT STRIKE THE OUTER RACE OF THE PILOT BEARING. DO NOT ALLOW THE PINION AND BEARING ASSEMBLY TO FALL OUT OF THE CARRIER DURING DISASSEMBLY.**

**CAUTION**

**IF THE ORIGINAL GEAR SET IS TO BE USED, KEEP THE SHIMS (23). RECORD THE NUMBER AND SIZE OF SHIMS.**

Remove the pinion and bearing assembly using a hammer and brass drift, by striking the pilot bearing end.

**700 SERIES SHOP MANUAL**  
**SINGLE REDUCTION FINAL DRIVE**  
**DIFFERENTIAL HEAD ASSEMBLY**

**Disassembly (Continued)**

**Fig. 58**

Remove the pinion cage shims (23).

**Fig. 61**

Remove the outer bearing cone (30).

**Fig. 59**

Secure the pinion cage and cup assembly (34) in a vise. By striking the non-threaded end of the pinion (25). Remove the pinion, pilot bearing (24) and inner bearing cone (37).

**Fig. 62**

Remove the inner bearing cup (35) using a hammer and brass drift.

**Fig. 60**

Remove and discard the oil seal and retainer assembly (29).

**Fig. 63**

Turn the pinion cage and cup assembly over and remove the outer bearing cup (31) using a hammer and brass drift.

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SINGLE REDUCTION FINAL DRIVE

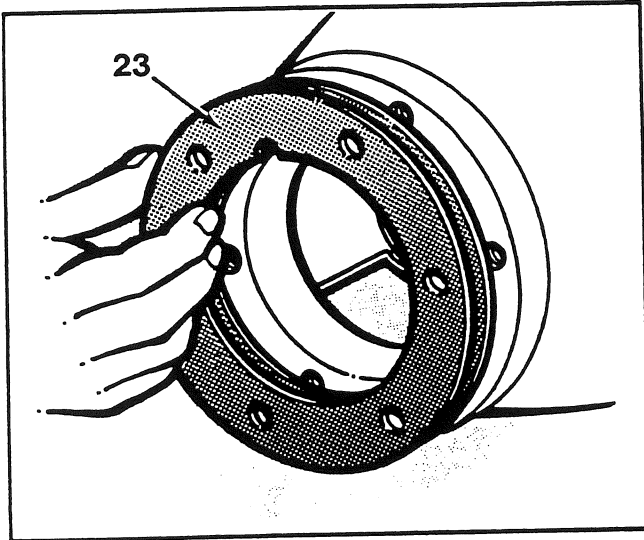


Fig. 58

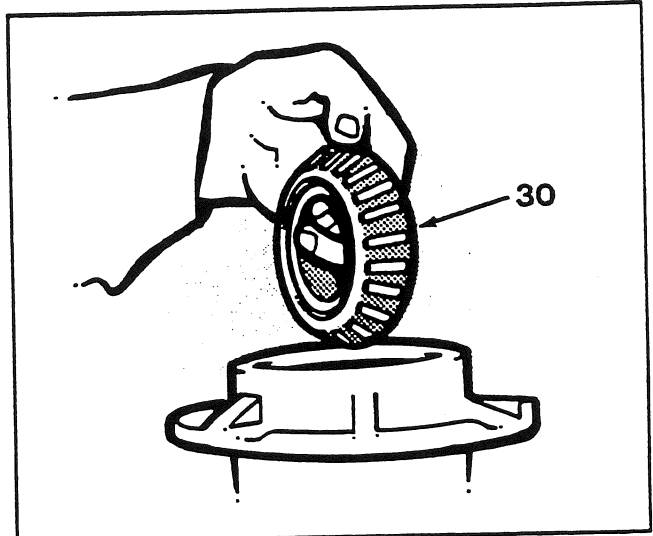


Fig. 61

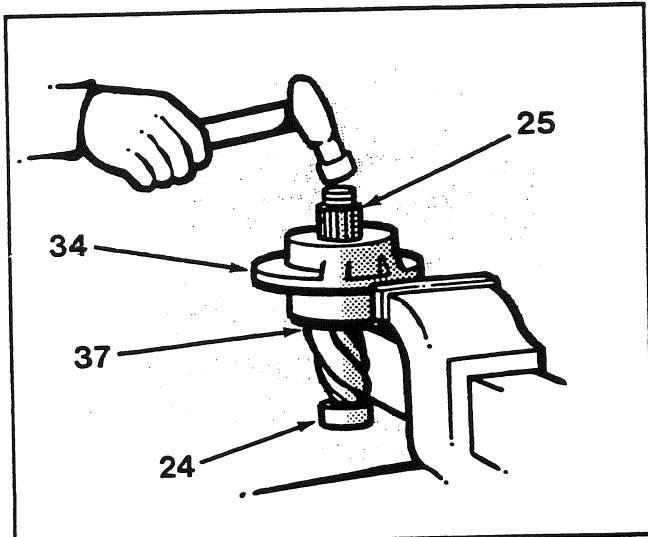


Fig. 59

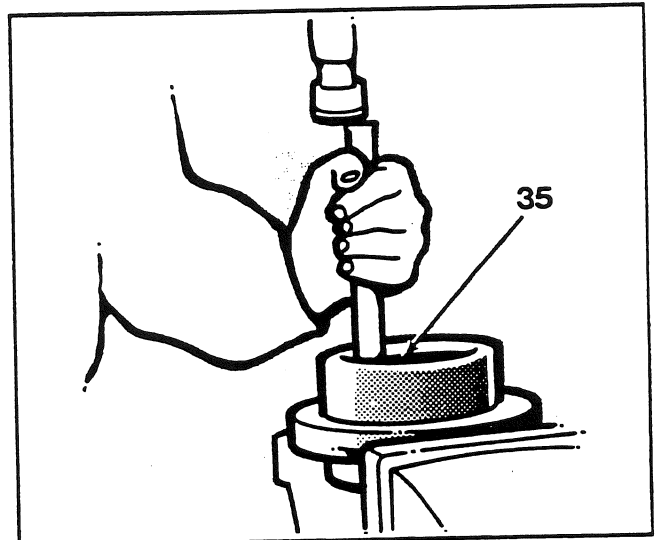


Fig. 62

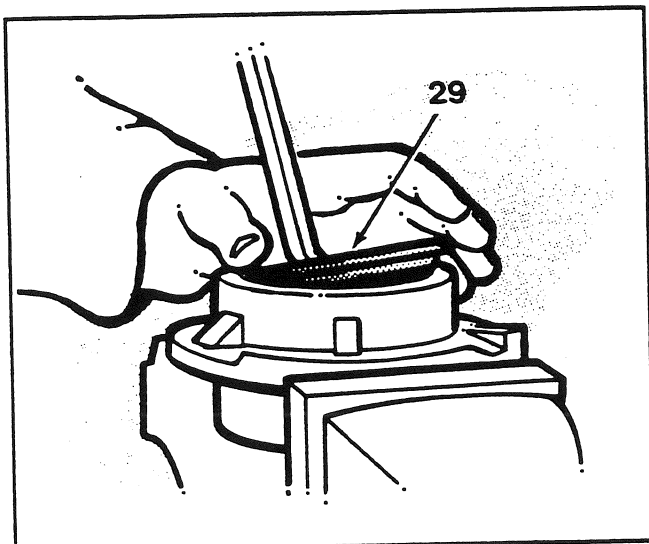


Fig. 60

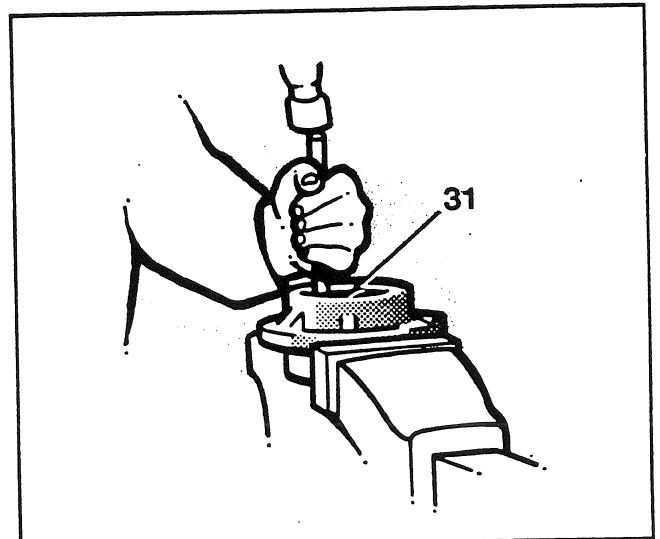


Fig. 63

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SINGLE REDUCTION FINAL DRIVE

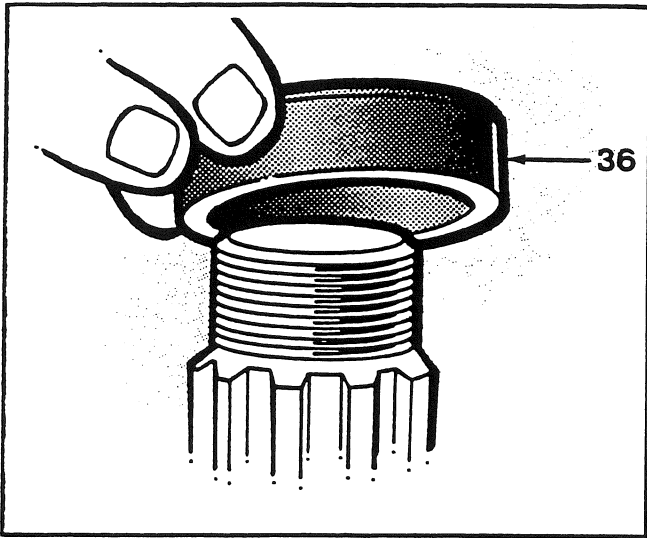


Fig. 64

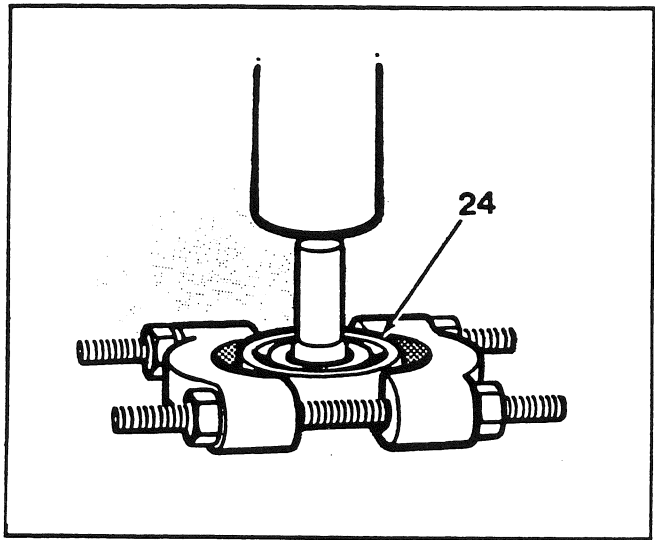


Fig. 66

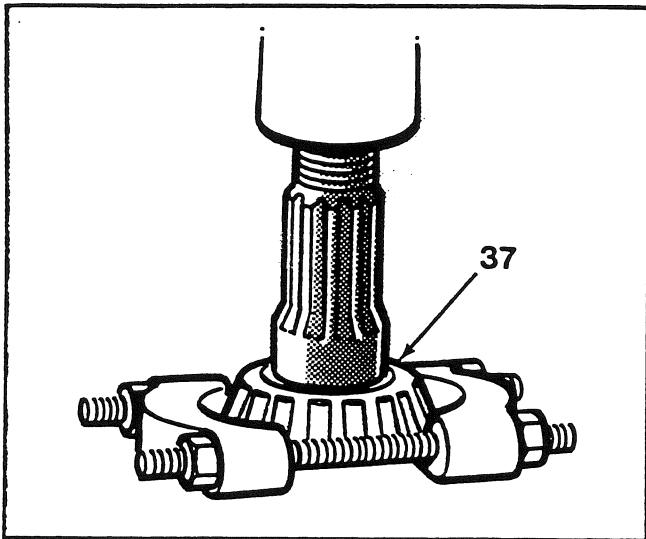


Fig. 65

700 SERIES SHOP MANUAL  
SINGLE REDUCTION FINAL DRIVE  
DIFFERENTIAL HEAD ASSEMBLY

**Disassembly (Continued)**

**Fig. 64**

Remove the spacer (36).

**Fig. 65**

Use a split-type bearing puller to remove the inner bearing cone (37).

**Fig. 66**

Use a split-type bearing puller to remove the pilot bearing (24). Place all parts to one side for cleaning and inspection.

700 SERIES SHOP MANUAL  
SINGLE REDUCTION FINAL DRIVE  
DIFFERENTIAL HEAD ASSEMBLY

Assembly and Adjustments

Fig. 67

**IMPORTANT**

DURING ASSEMBLY, THE PINION AND DIFFERENTIAL BEARING PRELOAD MUST BE ADJUSTED. PERFORM THE FOLLOWING TRIAL TEST BEFORE CONTINUING THE ASSEMBLY.

Use a brass hammer to install the inner bearing cup (35) into the pinion cage and cup assembly (34).

Fig. 68

Use a brass drift to install the outer bearing cup (31).

**NOTE**

The cups must be firmly seated and recessed below the outer surfaces of the cage.

Fig. 69

Lubricate with final drive oil and install the pilot bearing (24) and inner bearing cone (37).

Fig. 70

If necessary, adjust the bearing preload by changing the spacer. A thicker spacer will decrease preload and a thinner spacer will increase preload. Lubricate with final drive oil and install the spacer (36).

**NOTE**

Spacer thickness for this differential model is 16,205 mm (0.638 in.). Test results may determine altering spacer thickness.

Fig. 71

Install the pinion cage and cup assembly (34) over the inner bearing cone (37).

Fig. 72

Lubricate with final drive oil and install the outer bearing cone (30).

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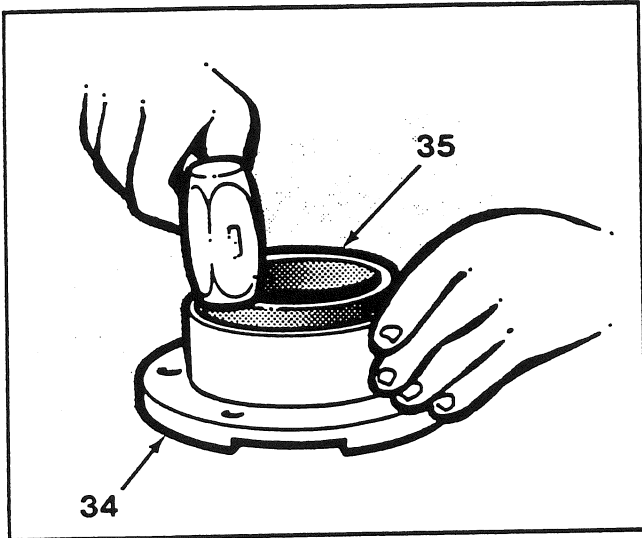


Fig. 67

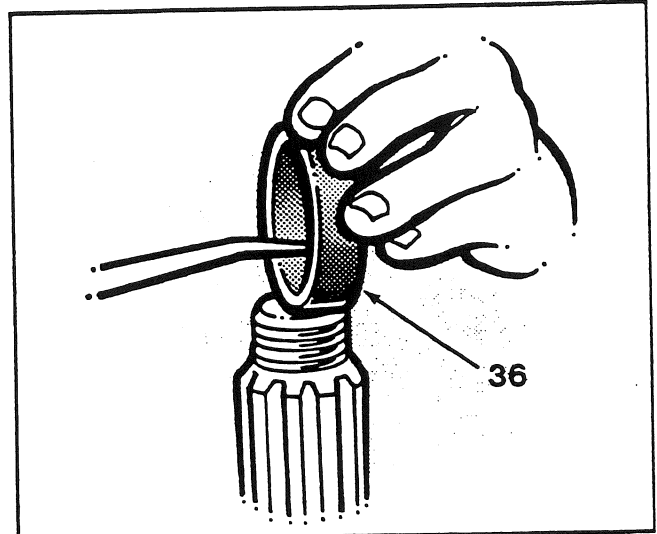


Fig. 70

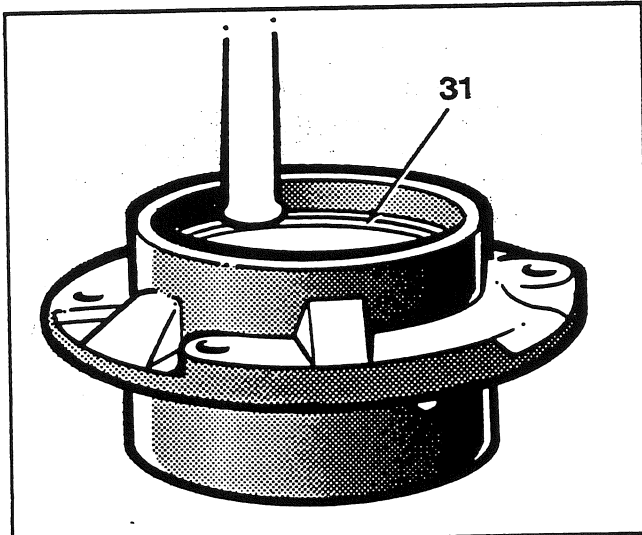


Fig. 68

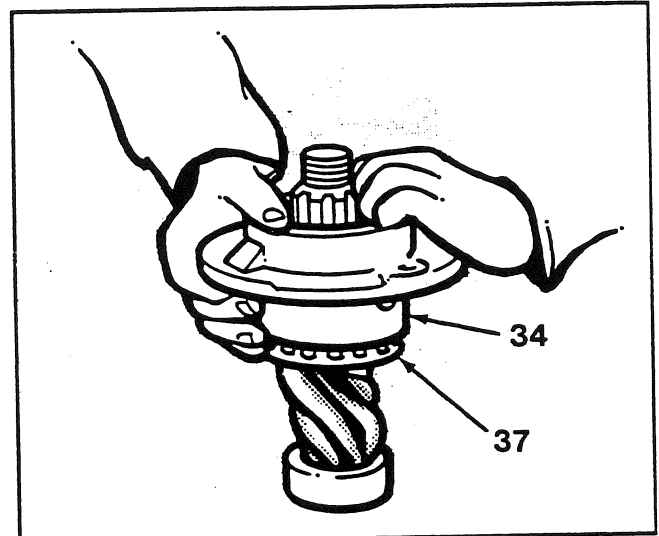


Fig. 71

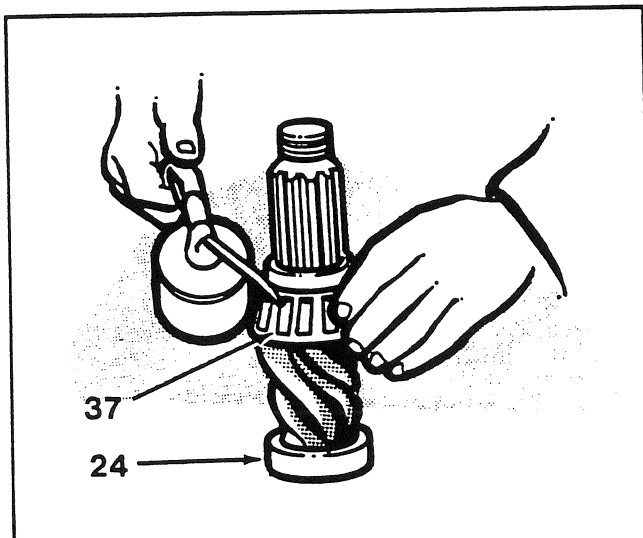


Fig. 69

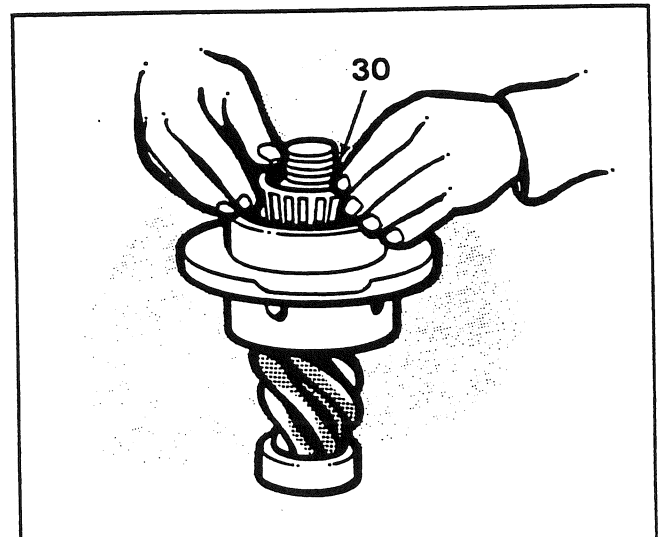


Fig. 72

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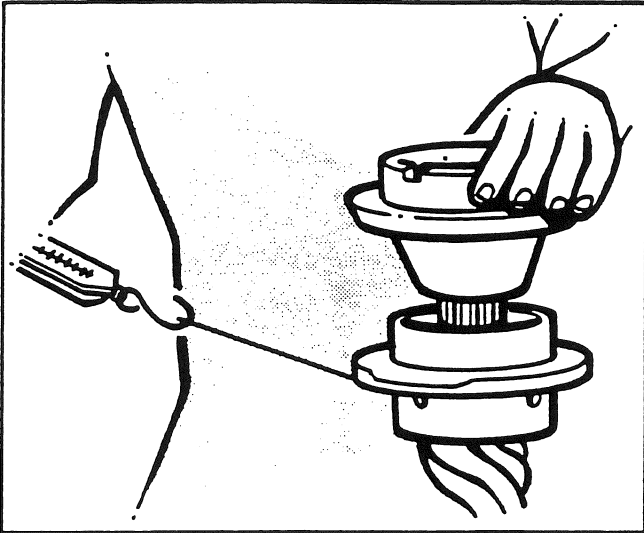


Fig. 73

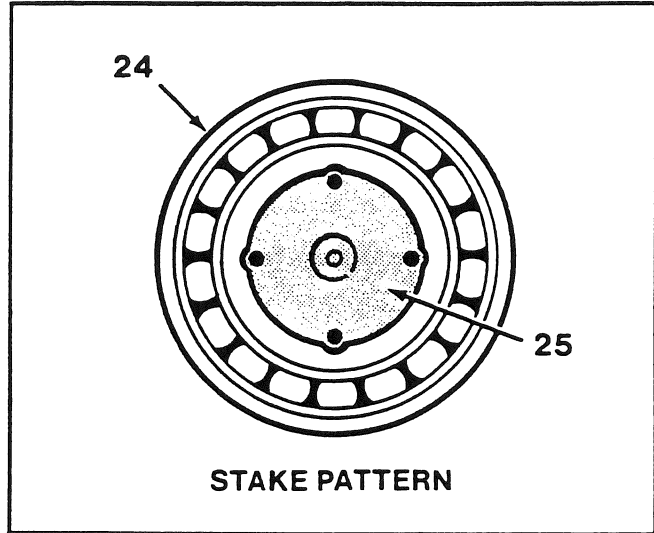


Fig. 76

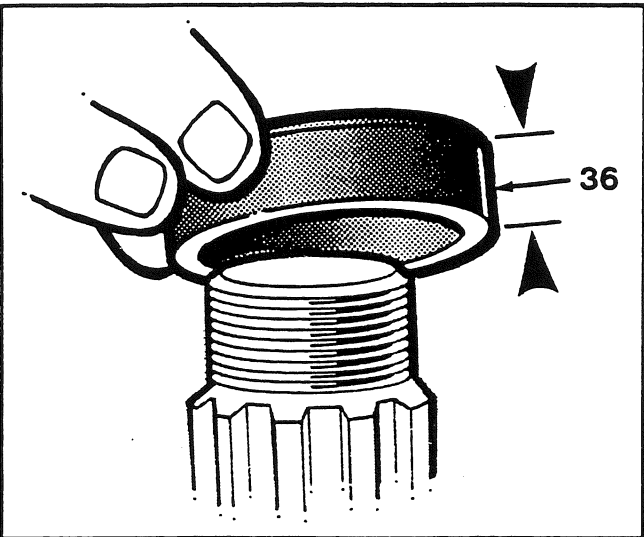


Fig. 74

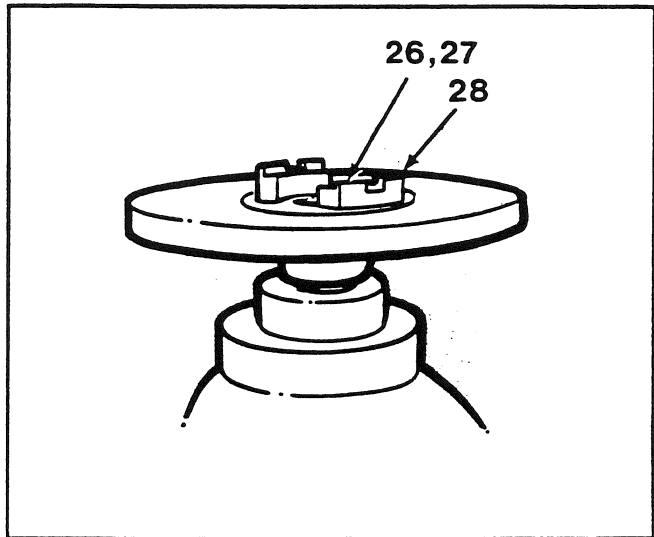


Fig. 77

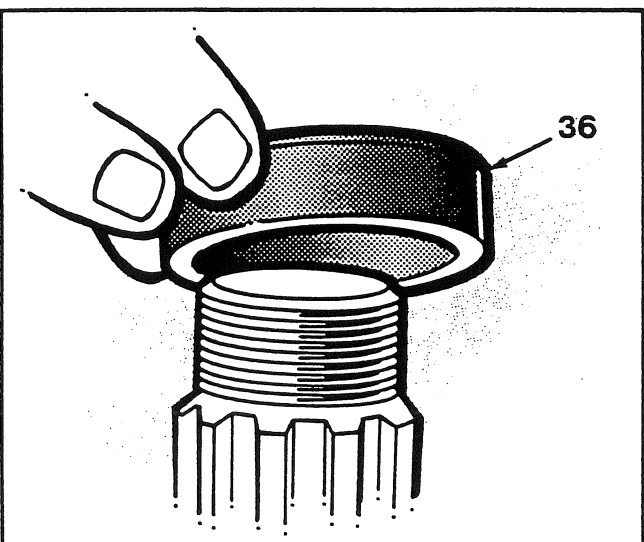


Fig. 75  
Section 9A  
Page 37

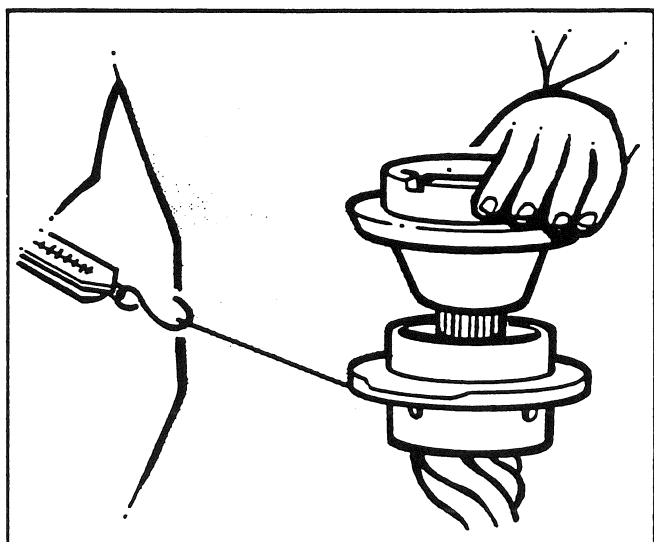


Fig. 78



**700 SERIES SHOP MANUAL**  
**SINGLE REDUCTION FINAL DRIVE**  
**DIFFERENTIAL HEAD ASSEMBLY**

**Assembly and Adjustments (Continued)**

**Fig. 73**

Check the assembly rolling torque. Wrap soft wire around the cage, attach a spring balance and pull the wire to rotate the assembly. Correct bearing preload is a rolling torque of 1,1 to 2,3 N.m; 0,11 to 0,23 kgf.m (10 to 20 lbf-in.) or 2 to 3 kg (4 to 7 lb) on the spring scale.

**Fig. 74**

Note the spacer size determined by the trial test. Select a spacer (36) 0,0254 mm (0.001 in.) larger for installation at final assembly. The larger spacer compensates for any size increase when the bearings are pressed on the pinion shaft.

**Fig. 75**

**CAUTION**

**A FINAL PRELOAD TEST MUST BE MADE FOLLOWING COMPLETE PINION ASSEMBLY.**

Disassemble and re-assemble the pinion and bearing assembly. Install the spacer (36) selected in the previous step.

**Fig. 76**

Use a center punch to secure the pilot bearing (24) on the pinion spigot (25).

**Fig. 77**

Temporarily install the yoke (28), washer (27) and old pinion locknut (26). Torque-tighten the locknut.

**Fig. 78**

**CAUTION**

**MAKE THE FINAL PRELOAD TEST BEFORE CONTINUING THE ASSEMBLY.**

Install the yoke of the pinion assembly in a vise with soft face jaws. Check the rolling torque in the same way as the trial test. Wrap soft wire around the cage, attach a spring balance and pull the wire to rotate the assembly. Correct bearing preload is a rolling torque of 1,7 to 4,0 N.m; 0,17 to 0,4 kgf.m (15 to 35 lbf-in.) or 3 to 6 kg (6 to 13 lb) on the spring scale.

**700 SERIES SHOP MANUAL**  
**SINGLE REDUCTION FINAL DRIVE**  
**DIFFERENTIAL HEAD ASSEMBLY**

**Assembly and Adjustments (Continued)**

**Fig. 79**

**CAUTION**

**USE ONLY THE CORRECT SIZE SPACER. DO NOT GRIND SPACERS OR USE SHIMS. THIS CAN ACCELERATE THE LOSS OF BEARING PRE-LOAD, AND GEAR OR BEARING FAILURE.**

If necessary, adjust the bearing preload by disassembling the cage and cup assembly and changing the spacer (36). A thicker spacer will decrease preload and a thinner spacer will increase preload. If no adjustment is necessary, remove the pinion assembly from the vise. Remove the pinion locknut, washer and yoke.

**Fig. 80**

Coat the outside of the oil seal and carrier (29) with 'Permatex No. 2', or equivalent. Lubricate the oil seal lips. Carefully install the oil seal.

**Fig. 81**

Install the emergency brake disc, yoke (28), washer (27) and torque-tighten a new locknut (26).

**Fig. 82**

Lightly lubricate all parts with final drive oil before assembling the differential assembly. Place the left hand differential case (16), with the open side facing up, on a clean workbench.

**Fig. 83**

Install the side gear (49), spline side up, into the bore of the differential case (16). Ensure that the side gear rotates freely in the case.

**Fig. 84**

**CAUTION**

**INCORRECT INSTALLATION OF THE SPRING RETAINER CAN RESTRICT SPRING ACTION AND PREVENT PROPER DIFFERENTIAL OPERATION.**

Install the spring retainer (52), with the side gear flange firmly seated in the cupped portion of the retainer.

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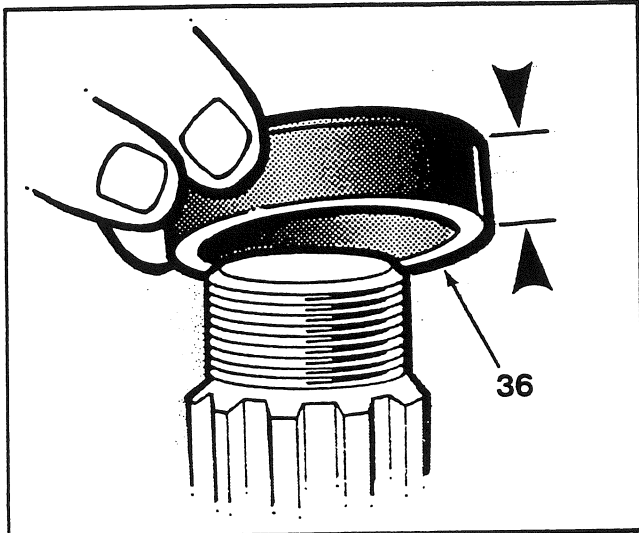


Fig. 79

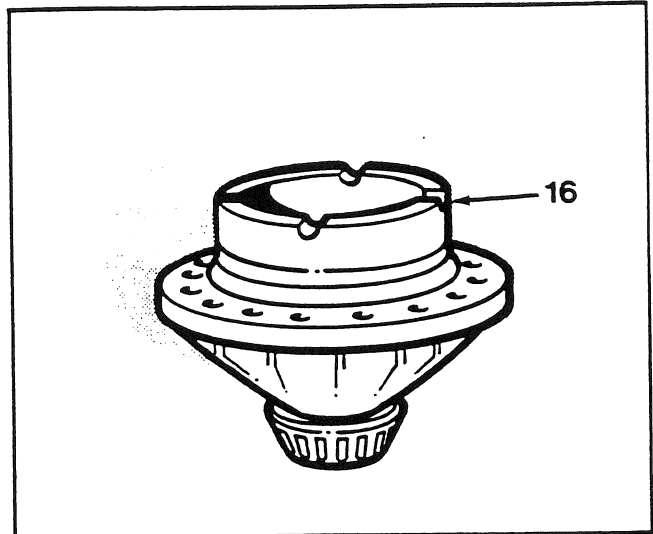


Fig. 82

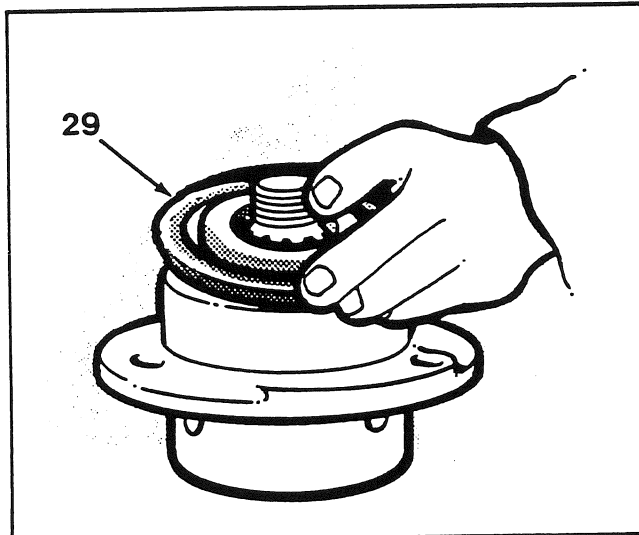


Fig. 80

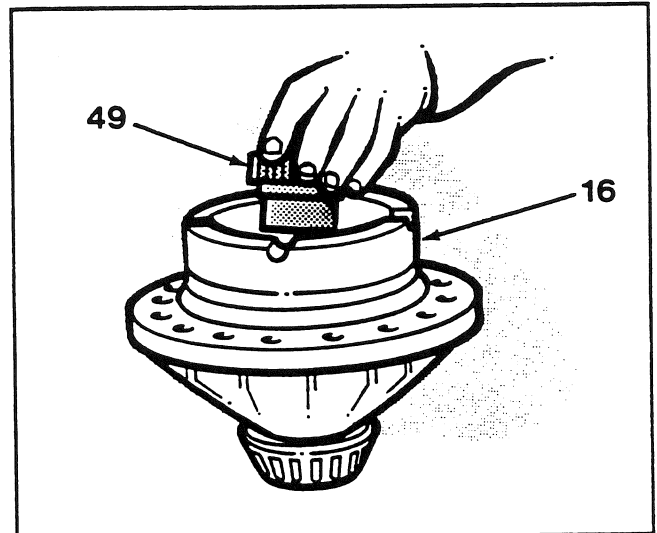


Fig. 83

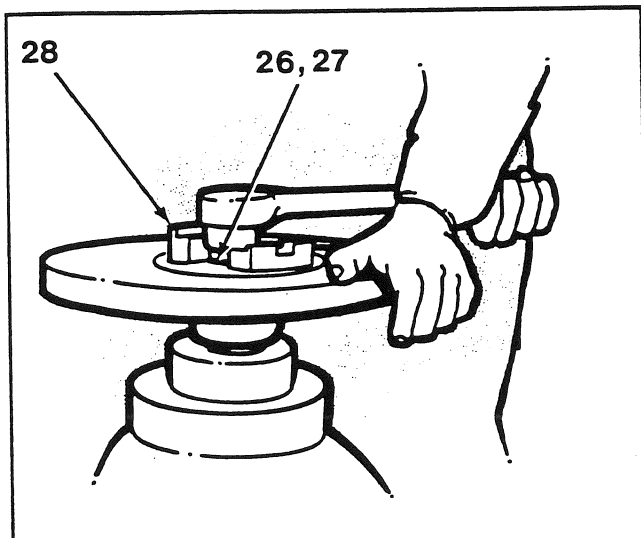


Fig. 81

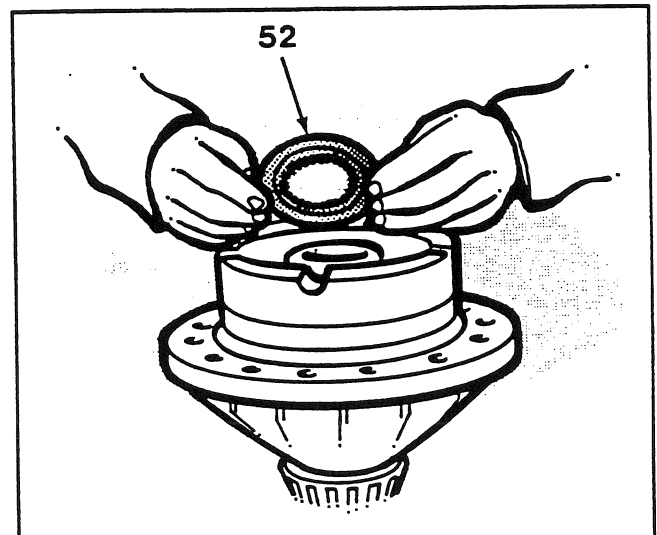


Fig. 84

700 SERIES SHOP MANUAL  
SINGLE REDUCTION FINAL DRIVE

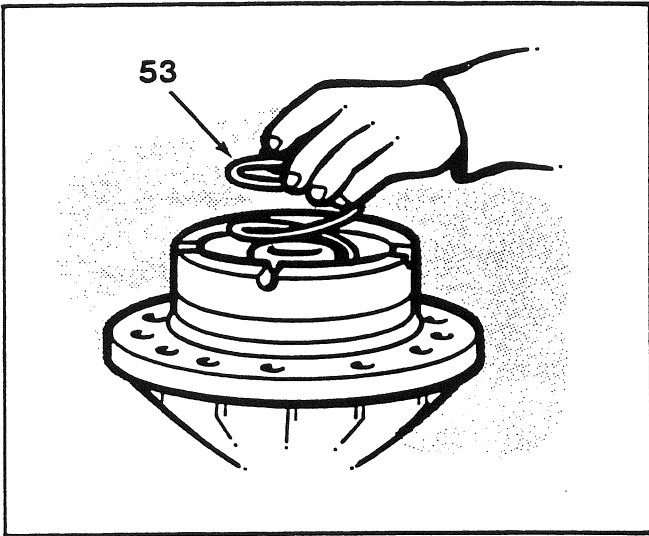


Fig. 85

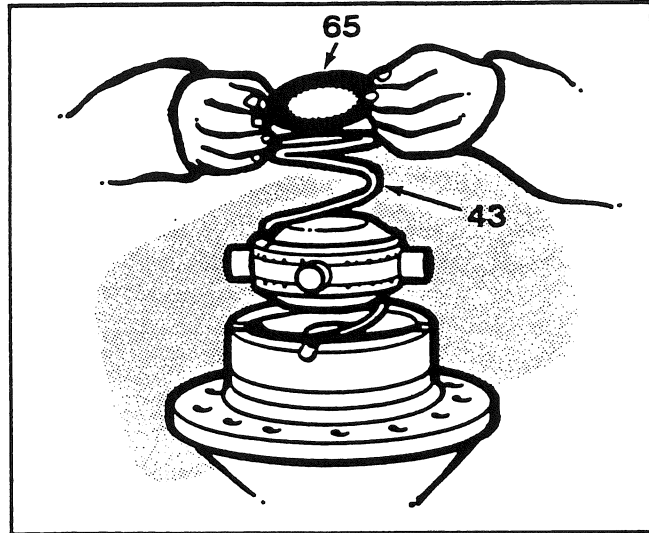


Fig. 88

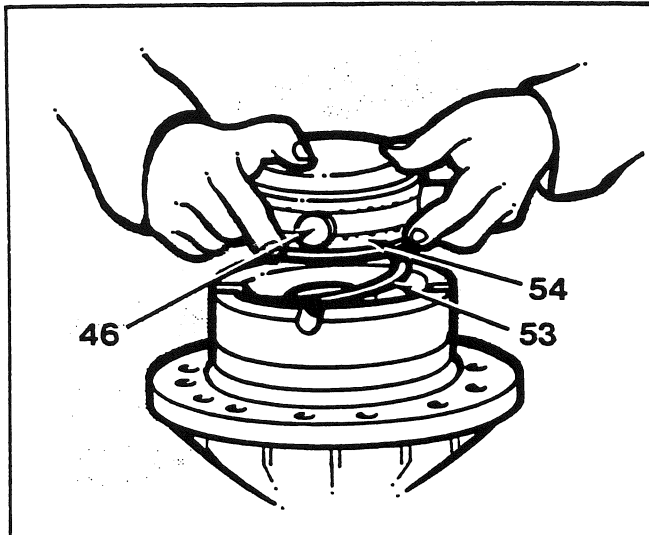


Fig. 86

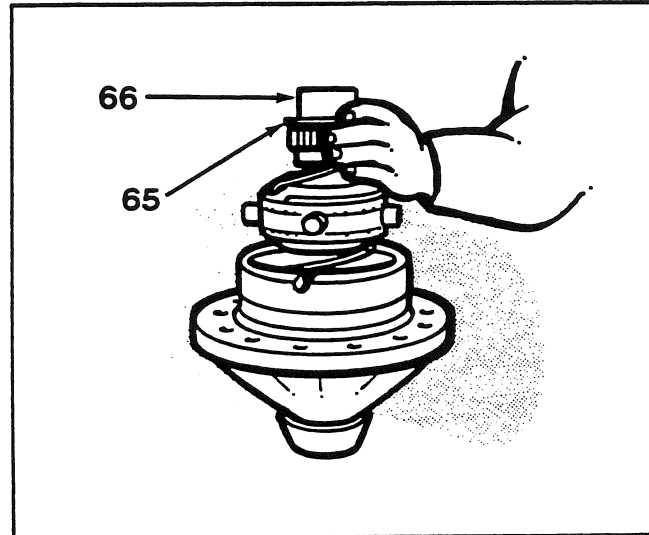


Fig. 89

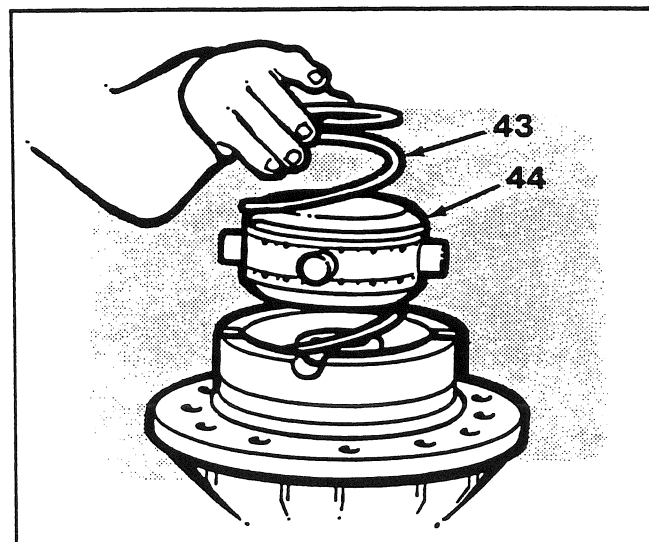


Fig. 87

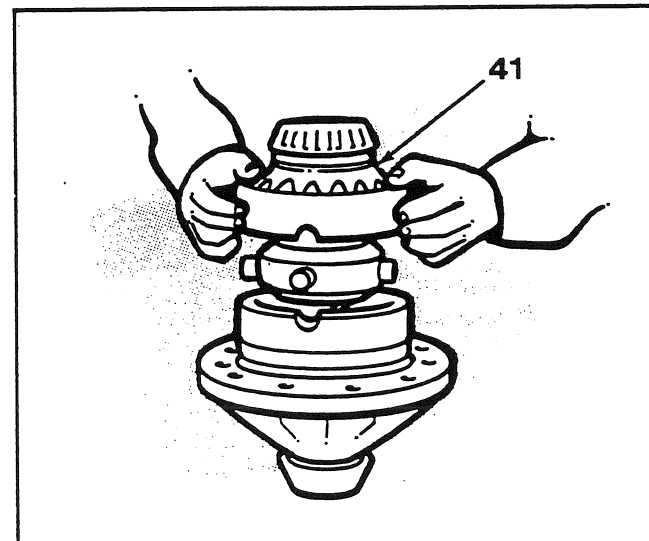


Fig. 90

**700 SERIES SHOP MANUAL**  
**SINGLE REDUCTION FINAL DRIVE**  
**DIFFERENTIAL HEAD ASSEMBLY**

**Assembly and Adjustments (Continued)**

**Fig. 85**

Install the spring (53), with the smaller diameter against the spring retainer.

**Fig. 88**

Install the spring retainer (65) over the spring (43).

**Fig. 86**

Place the spider assembly (46) onto the clutch (54), ensuring that the gap in the holdout ring is aligned with the long tooth, or key, of the spider. Place the spider assembly over the spring (53).

**Fig. 89**

Install the side gear (66), with the flange firmly seated in the cupped portion of the spring retainer (65).

**Fig. 87**

Install the second spring (43), with the larger diameter against the clutch (44).

**Fig. 90**

Align the punch marks and place the right hand differential case (41) over the clutch and spider assembly.

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DIFFERENTIAL HEAD ASSEMBLY

Assembly and Adjustments (Continued)

Fig. 91



**WARNING**

**USE EXTREME CARE WHEN COMPRESSING THE DIFFERENTIAL CASE.**

Compress the differential case (41), engage the side gear and clutch splines and the spider trunnions. Install two bolts (68) opposite one another to secure the case.

Fig. 92

Gradually release the pressure and install the remaining bolts (68). Torque-tighten the bolts.

Fig. 93

Place the ring gear (17) onto the flange of the left hand differential case (16).

Fig. 94

Secure the gear (17) with the special bolts (48) and nuts (15). Turn the assembly over and torque-tighten the nuts.

Fig. 95

Coat the carrier assembly flange with gasket eliminator, Champion part number 25303 or 'Loctite' 515.

Fig. 96

Install the shims (23), ensuring that the lubrication hole is not obstructed.

**NOTE**

If the original gear set is used, install the original quantity and size of shims. When installing a new gear set, use a 16,205 mm (0.638 in.) thick shim pack.

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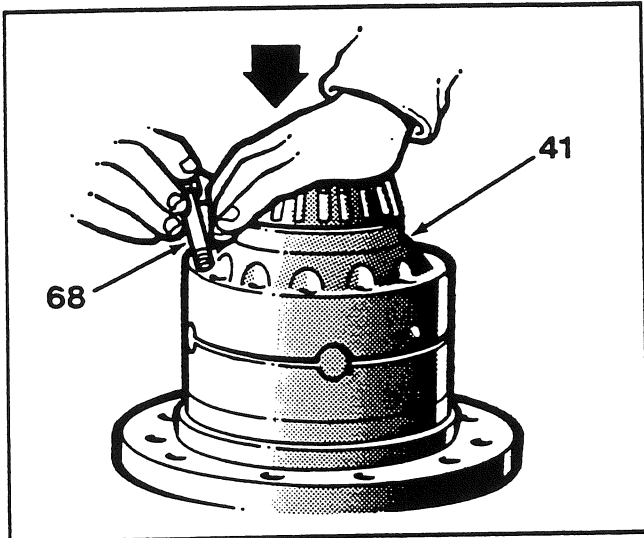


Fig. 91

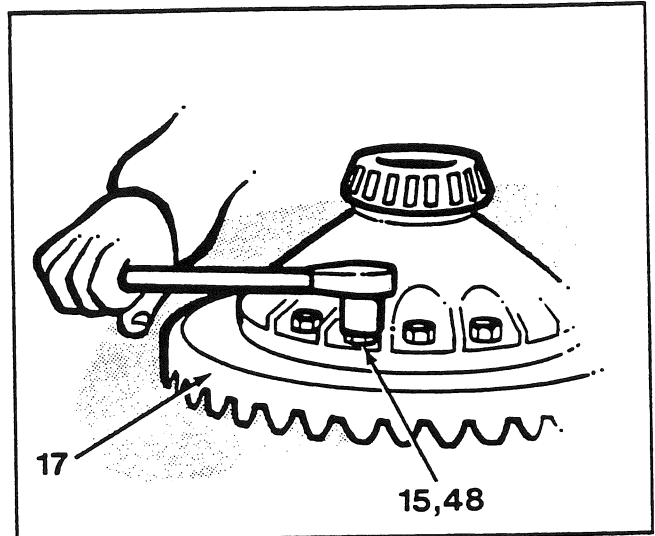


Fig. 94

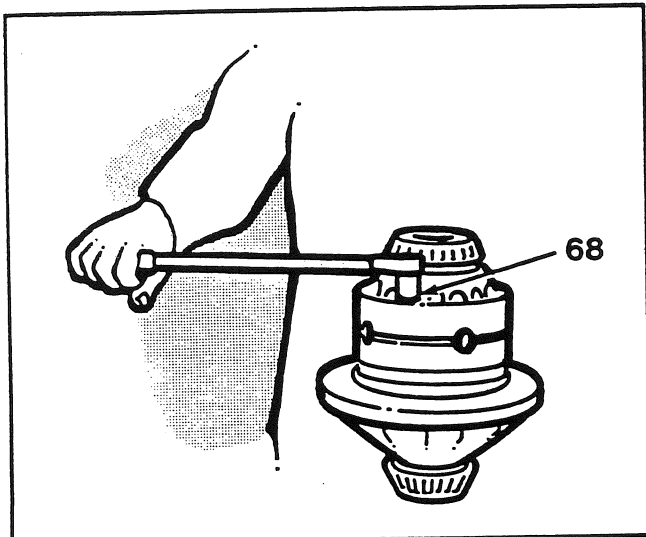


Fig. 92

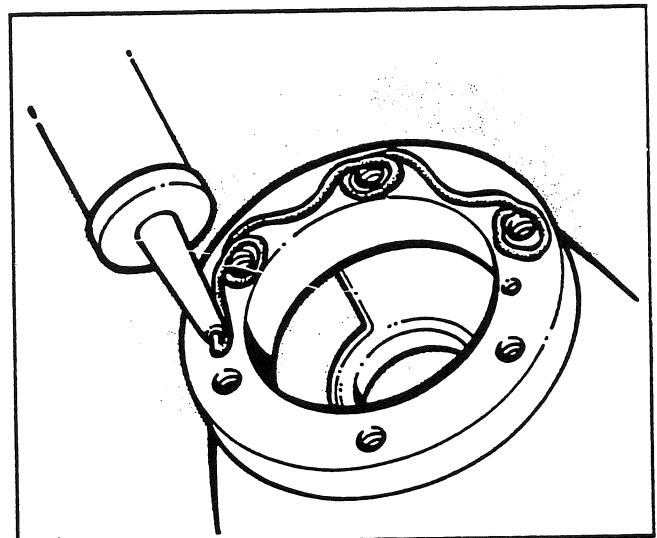


Fig. 95

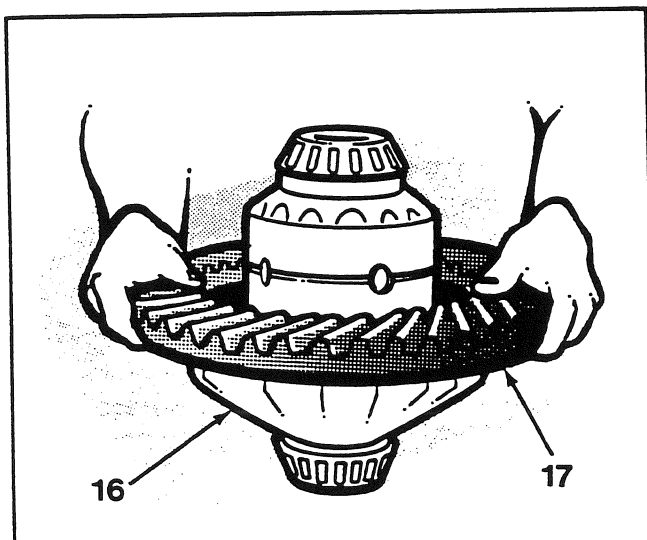


Fig. 93

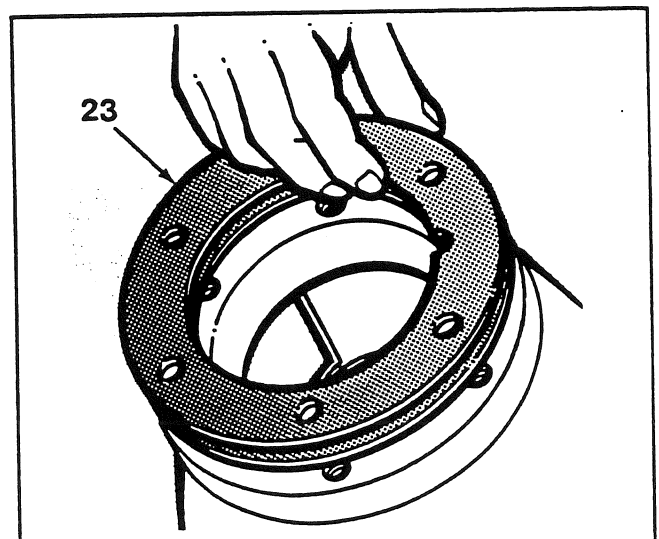


Fig. 96

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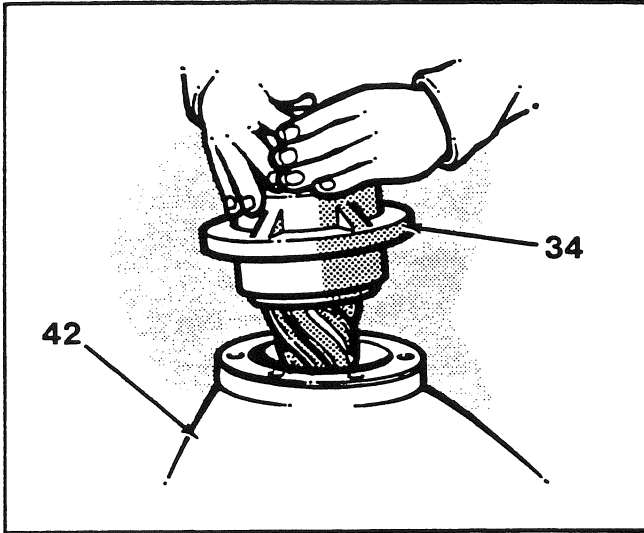


Fig. 97

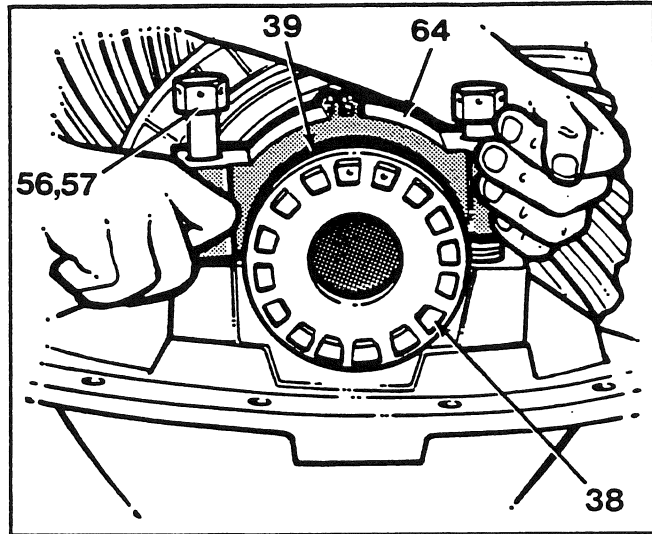


Fig. 100

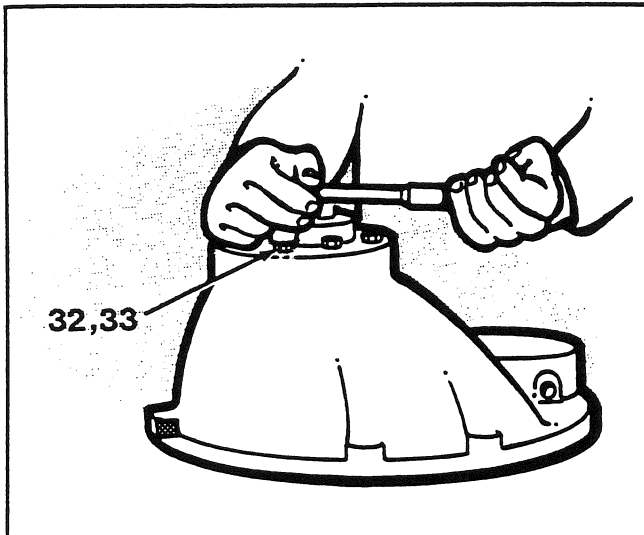


Fig. 98

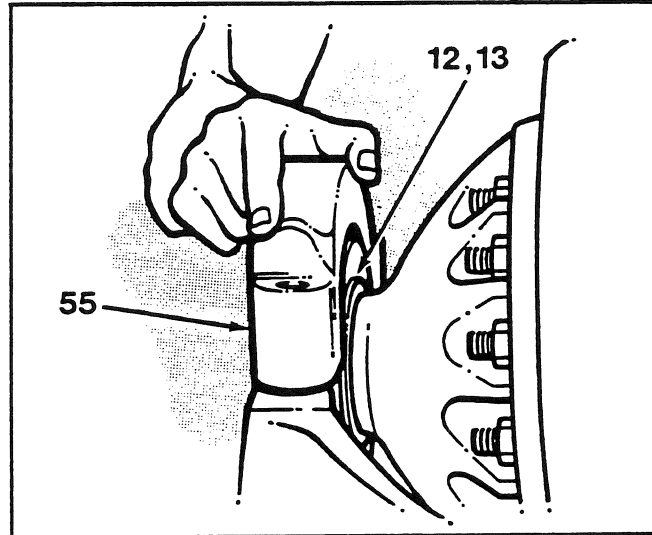


Fig. 101

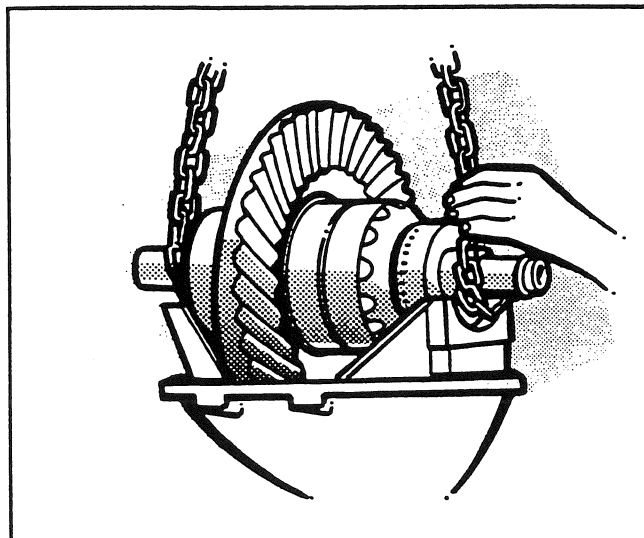


Fig. 99

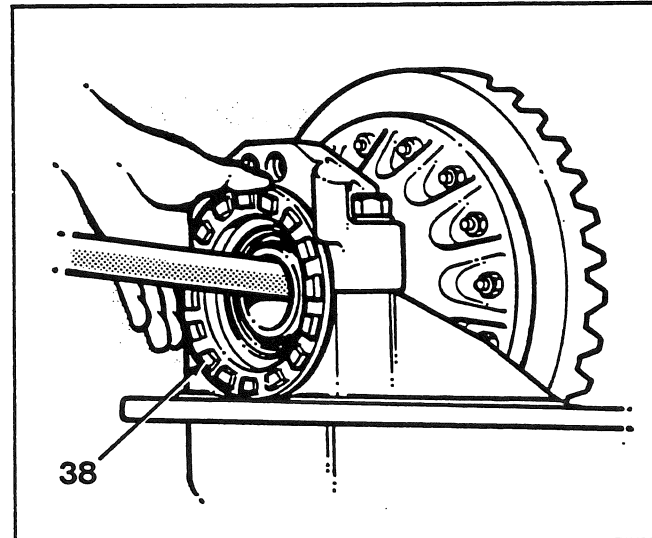


Fig. 102



**700 SERIES SHOP MANUAL**  
**SINGLE REDUCTION FINAL DRIVE**  
**DIFFERENTIAL HEAD ASSEMBLY**

**Assembly and Adjustments (Continued)**

**Fig. 97**

Install the pinion assembly onto the shims and carrier, ensuring that the lubrication holes in the carrier (42) and cage (34) are aligned.

**Fig. 98**

Coat the threads of the bolts (32) with 'Loctite' RC 60, or equivalent. Install the bolts and lockwashers (33). Torque-tighten the bolts.

**Fig. 99**

Support the carrier and pinion assembly with the open side at the top. Using a safe lifting device, lower the differential assembly and install into the carrier.

**Fig. 100**

Lubricate with final drive oil and install the right hand bearing cup (39), bearing adjuster (38) and bearing cap (64). Install the two bolts (57) and washers (56) retaining the bearing cap. Secure the bolts to finger-tightness only. Turn the adjuster until the first thread is exposed.

**Fig. 101**

Install the left hand bearing cup (13) into the bearing adjuster (12). Lubricate with final drive oil the bearing cup and adjuster threads. Install the bearing cap (55), bolts (57) and washers (56). Secure the bolts to finger-tightness only.

**Fig. 102**

Install a length of metal rod through the differential assembly bore. Place the bearing adjuster and cup assembly over the metal rod. Raise and lower the differential assembly while threading the adjuster (38) into position.

**NOTE**

**The carrier assembly is now ready for bearing preload, ring gear backlash and gear tooth contact adjustments.**

700 SERIES SHOP MANUAL  
SINGLE REDUCTION FINAL DRIVE

DIFFERENTIAL HEAD ASSEMBLY

Assembly and Adjustments (Continued)

Fig. 103

Check that the first thread of the right hand bearing adjuster is visible. Tighten the left hand bearing adjuster until there is no backlash between the pinion and ring gear.

Measure the ring gear backlash with a dial test indicator. If the original gear set is used, adjust to the backlash specification recorded before disassembly.

NOTE

To test absence of backlash, face in the direction of the ring gear teeth. Push on the gear while gently rocking the gear from side to side. There should be no free movement.

Loosen the left hand bearing adjuster by a distance of one notch.

Tighten the right hand bearing adjuster until it abuts against the bearing cup.

Tighten the right hand bearing adjuster until it abuts against the bearing cup. This is indicated by increased resistance to adjuster movement.

Rotate the ring gear and check for points where binding occurs. At these points, loosen and retighten the left hand bearing adjuster. Make all further adjustments from the point of tightest mesh.

Continue tightening the adjuster by a distance of two or three notches. Install the dial test indicator and check the backlash measurement.

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SINGLE REDUCTION FINAL DRIVE

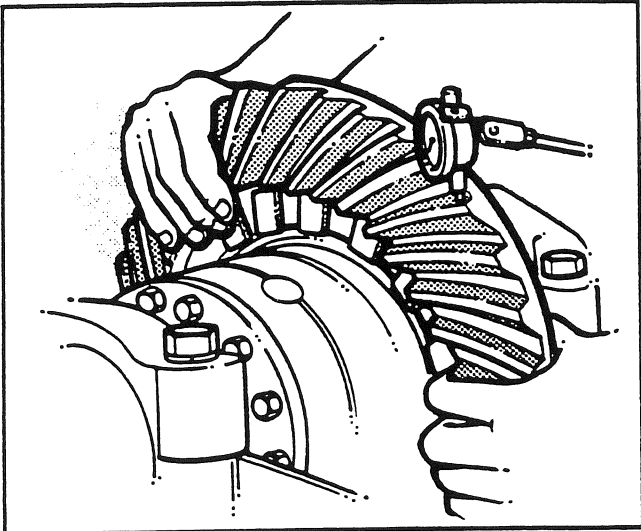


Fig. 103

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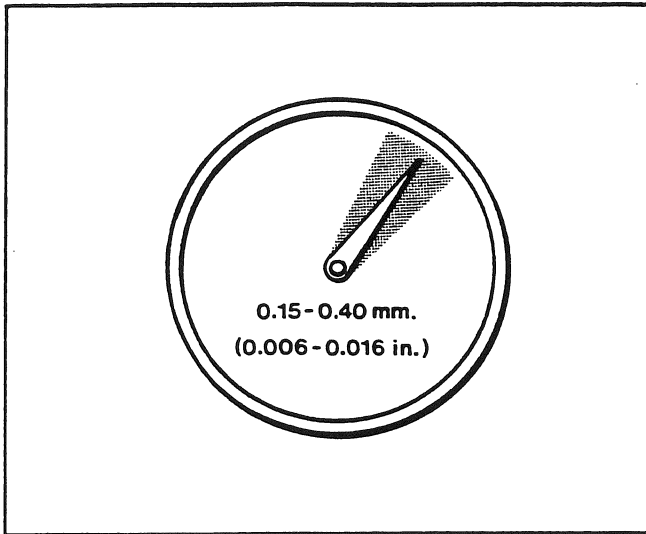


Fig. 104

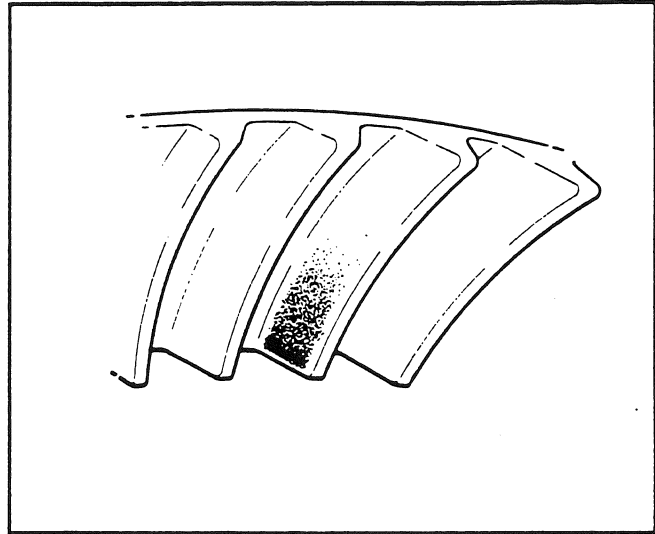


Fig. 105

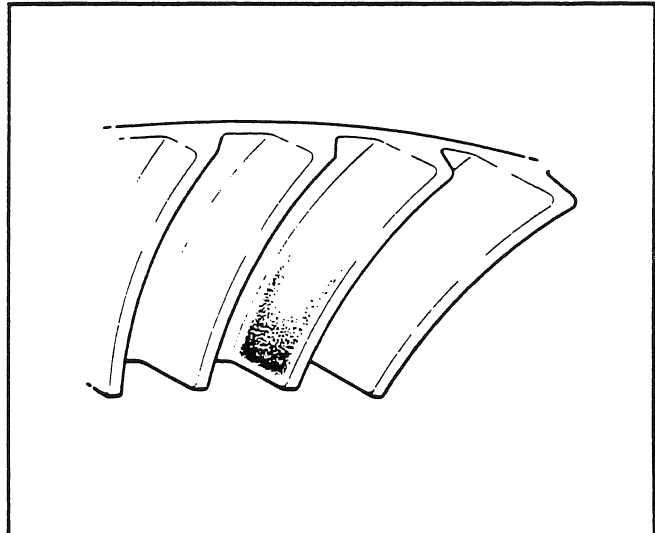


Fig. 106

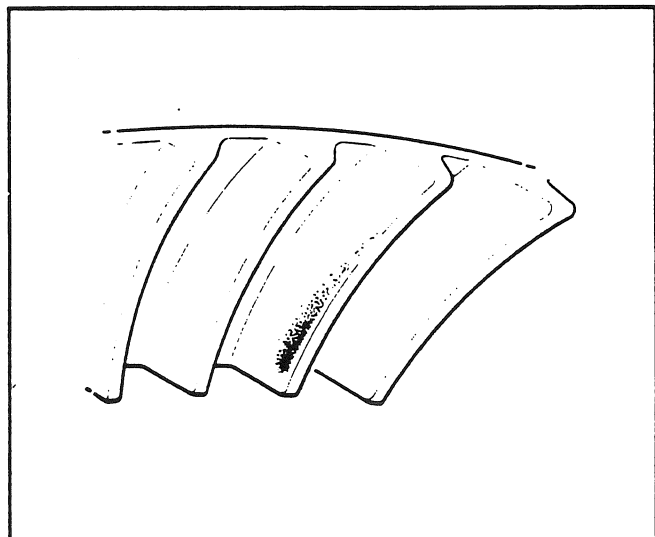


Fig. 107

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DIFFERENTIAL HEAD ASSEMBLY

**Assembly and Adjustments (Continued)**

**Fig. 104**

The backlash specification should be between 0,15 mm and 0,40 mm (0.006 in. and 0.016 in.). If necessary, adjust the backlash setting as follows before proceeding with any further adjustments.

**To increase backlash:** Loosen the left hand bearing adjuster one notch at a time. Tighten the right hand adjuster until it abuts against the bearing cup. Recheck the backlash.

**To reduce backlash:** Loosen the right hand bearing adjuster one notch at a time. Tighten the left hand adjuster until there is resistance. Continue tightening the adjuster by a distance of two or three notches. Recheck the backlash.

**Fig. 105**

Apply mechanic's blue compound onto the ring gear teeth and inspect the tooth contact pattern. This illustration shows a contact pattern for a new, correctly adjusted gear set.

**Fig. 106**

This illustration shows a contact pattern for an original, correctly adjusted gear set. If the pattern shows incorrect tooth depth contact, change the pinion position by altering the number of shims (23). An original gear set should show a proper contact pattern with the same shims removed at disassembly.

**Fig. 107**

If the pattern is similar to that illustrated, the pinion is not close enough to the ring gear. Remove shims to move the pinion inward. Re-adjust the backlash. Re-check the tooth contact pattern.

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DIFFERENTIAL HEAD ASSEMBLY

**Assembly and Adjustments (Continued)**

**Fig. 108**

If the pattern is similar to that illustrated, the pinion is close to the ring gear. Add shims to move the pinion outward. Re-adjust the backlash. Re-check the tooth contact pattern.

**Fig. 109**

If the pattern is similar to that illustrated, there is insufficient backlash. Loosen the left hand bearing adjuster one notch and tighten the right hand bearing adjuster one notch. Re-check the backlash. Repeat this procedure until the backlash is between 0,15 mm and 0,40 mm (0.006 in. and 0.016 in.).

**Fig. 110**

If the pattern is similar to that illustrated, there is excessive backlash. Loosen the right hand bearing adjuster one notch and tighten the left hand bearing adjuster one notch. Re-check the backlash. Repeat this procedure until the backlash is between 0,15 mm and 0,40 mm (0.006 in. and 0.016 in.).

**Fig. 111**

Following the gear set adjustment, align the bearing adjusters and adjuster locks. Torque-tighten the bearing cap bolts (57) and secure with lockwire.

**Fig. 112**

Install the left hand adjuster lock (51).

**Fig. 113**

Retain the adjuster lock with the bolts (50). Torque-tighten the bolts and secure with lockwire.

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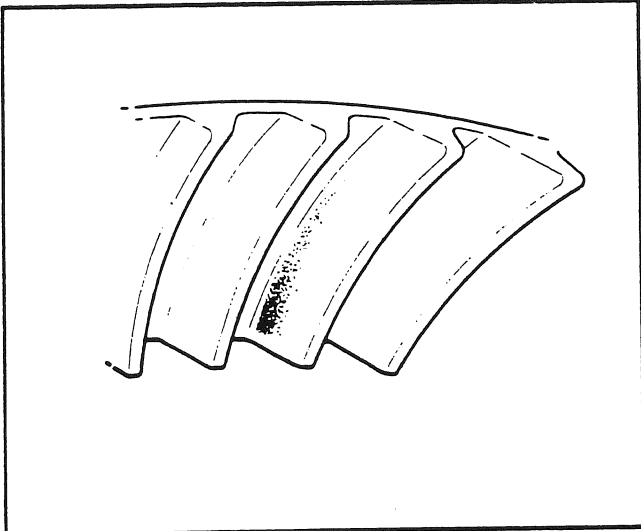


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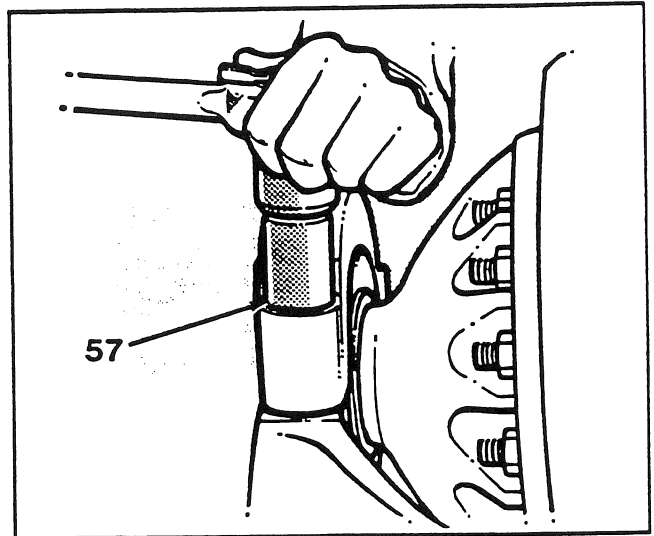


Fig. 111

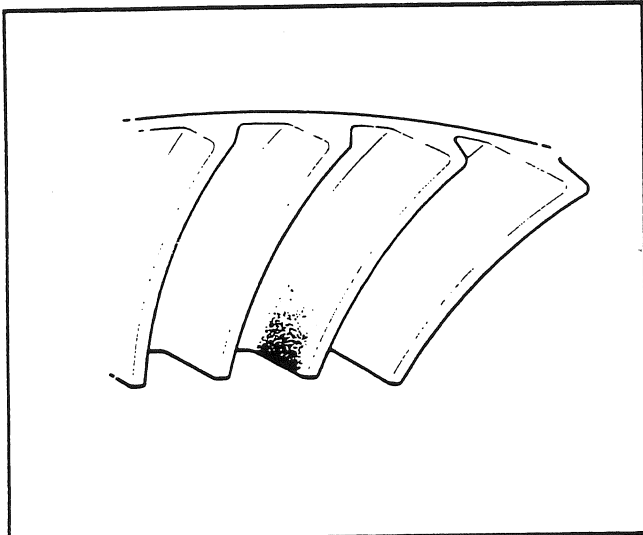


Fig. 109

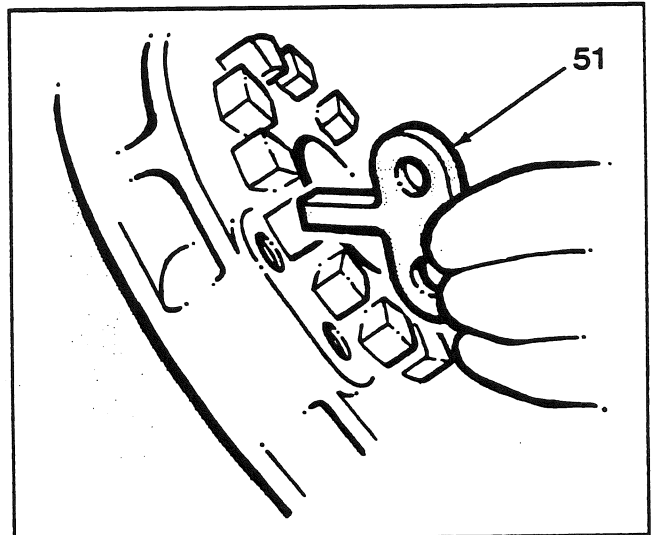


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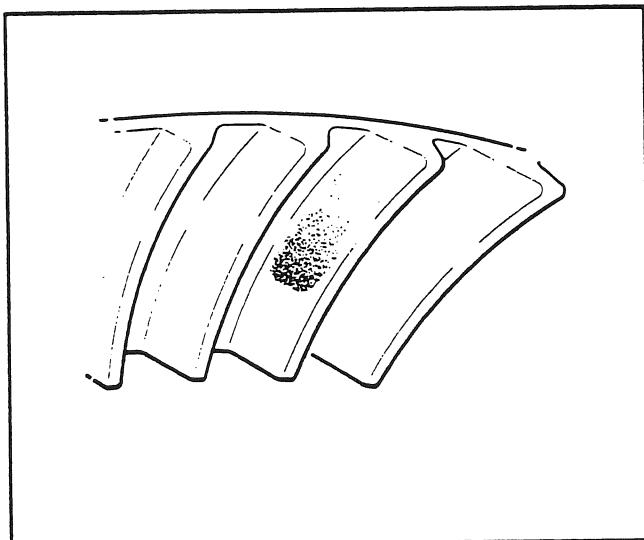


Fig. 110

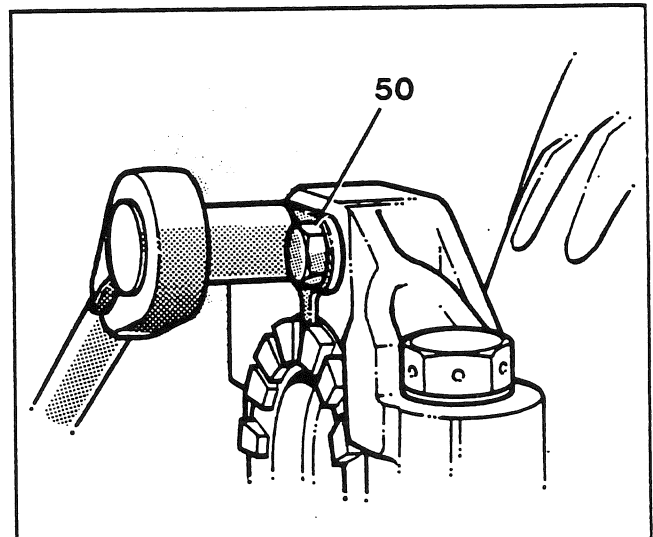


Fig. 113

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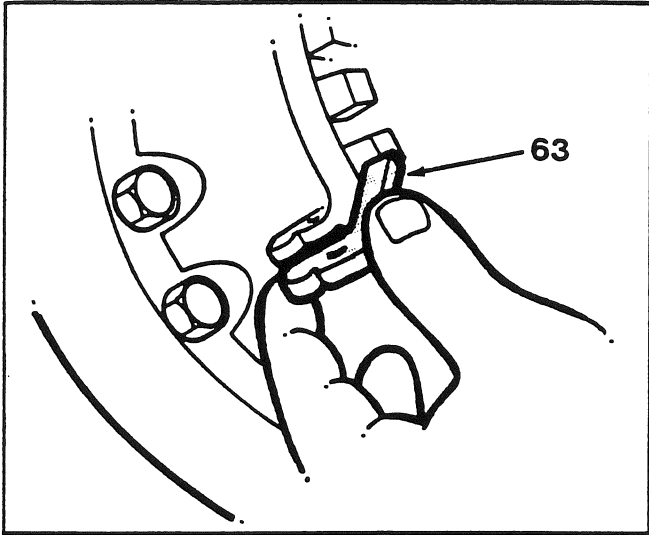


Fig. 114

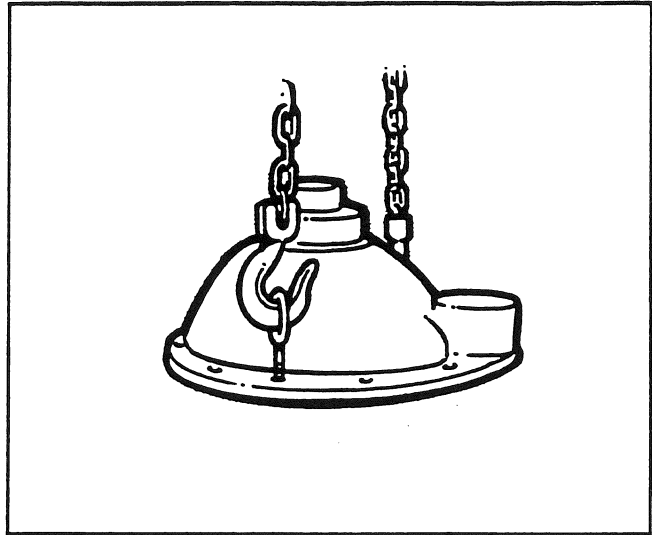


Fig. 116

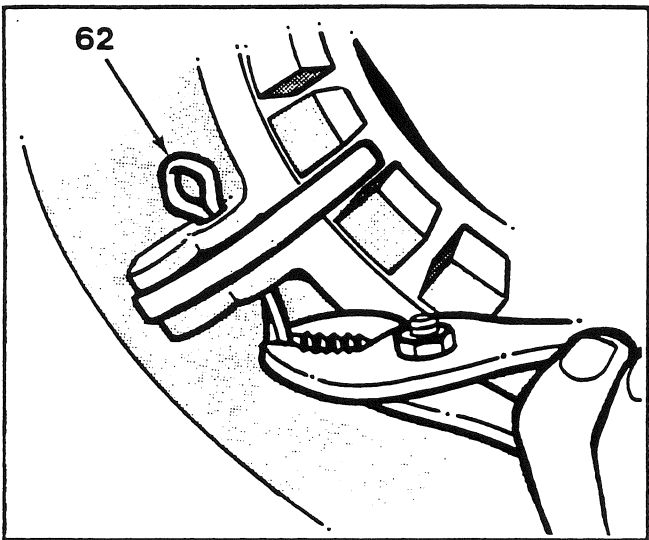


Fig. 115



**700 SERIES SHOP MANUAL**  
**SINGLE REDUCTION FINAL DRIVE**  
**DIFFERENTIAL HEAD ASSEMBLY**

**Assembly and Adjustments (Continued)**

**Fig. 114**

Install the right hand adjuster lock (63).

**Fig. 116**

The carrier assembly is now ready for installation to the axle housing. Install two lifting eyes into the yoke.

**Fig. 115**

Secure the adjuster lock with a new cotter pin (62).

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MAJOR COMPONENTS

Assembly and Installation

**Fig. 117**

Coat the axle housing opening with gasket eliminator, Champion part number 25303 or 'Loctite' 515.

**Fig. 118**

Using a safe lifting device, lower the carrier assembly onto the axle housing (11).

**Fig. 119**

Coat the threads of the nuts (20 and 22) with locking compound, Champion part number 40945 or 'Loctite' 242. Install the nuts, lockwashers (19 and 21) and conical washers (18); then torque-tighten.

**Fig. 120**

Coat the threads of the bolts (58) with locking compound, Champion part number 40945 or 'Loctite' 242. Install the bolts and lockwashers (59). Torque-tighten the bolts.

**Fig. 121**

Install the brake disc and input yoke assembly (28). Secure it with a new locknut. Torque tighten the locknut.

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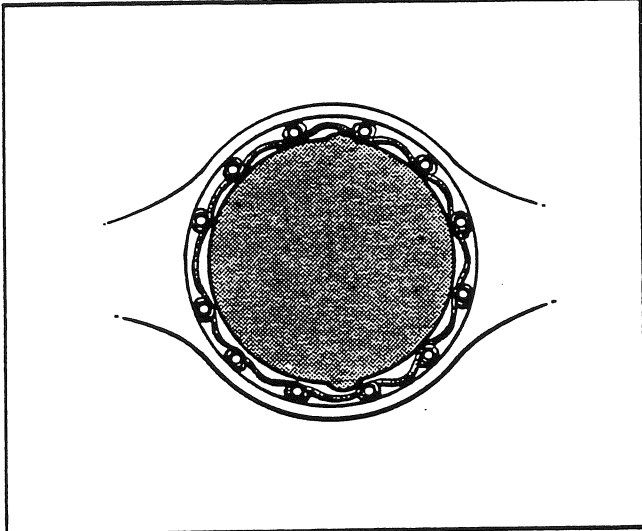


Fig. 117

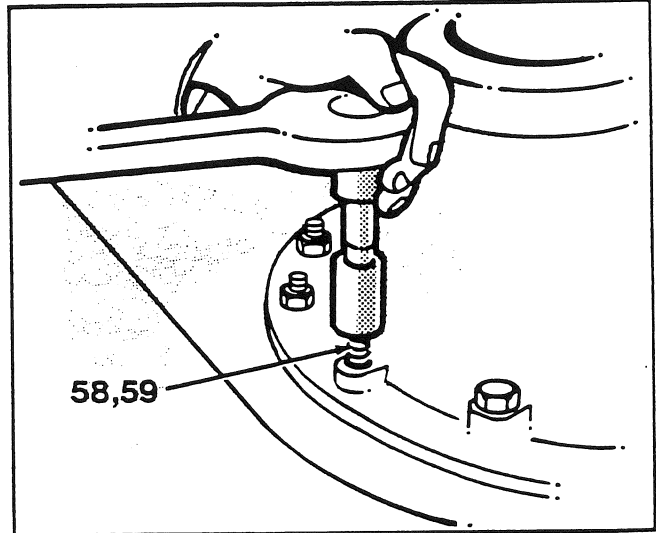


Fig. 120

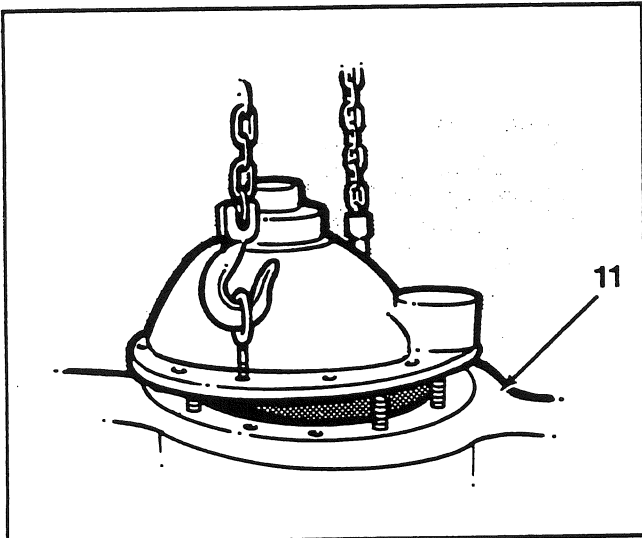


Fig. 118

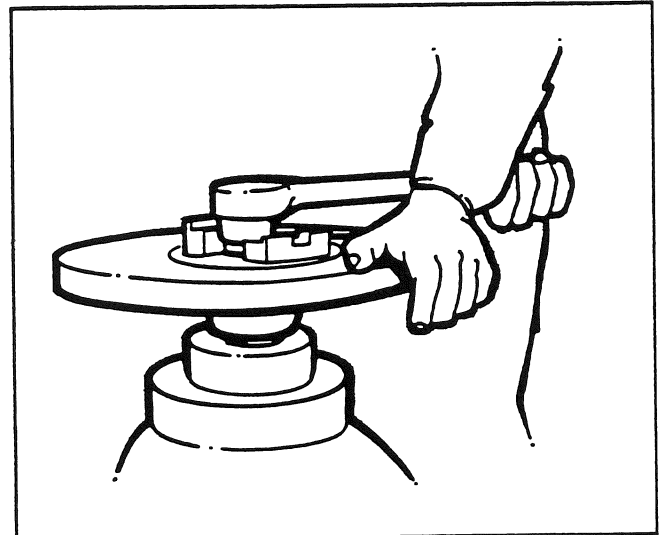


Fig. 121

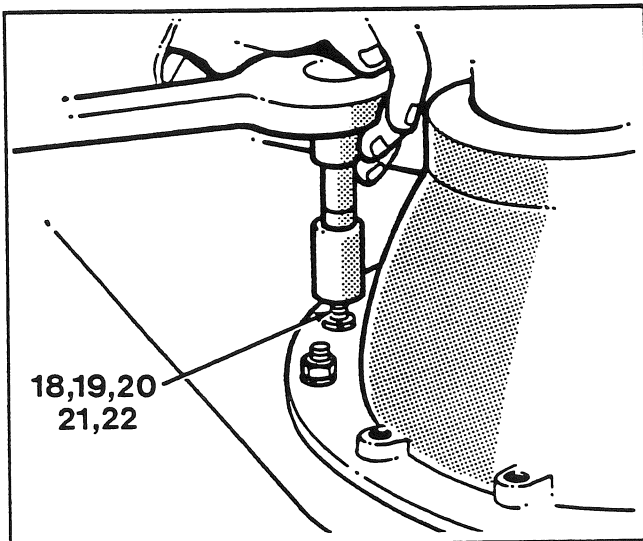


Fig. 119

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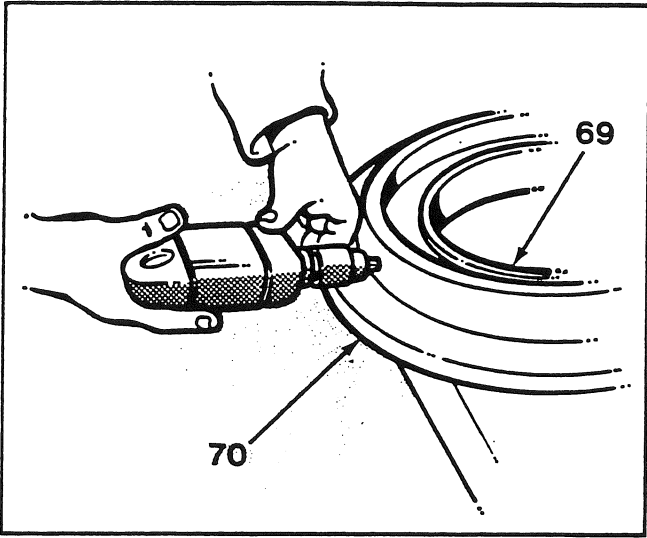


Fig. 122

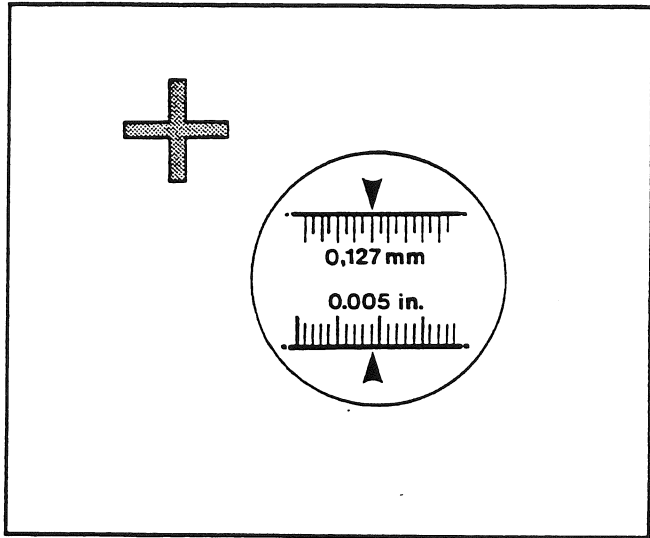


Fig. 125

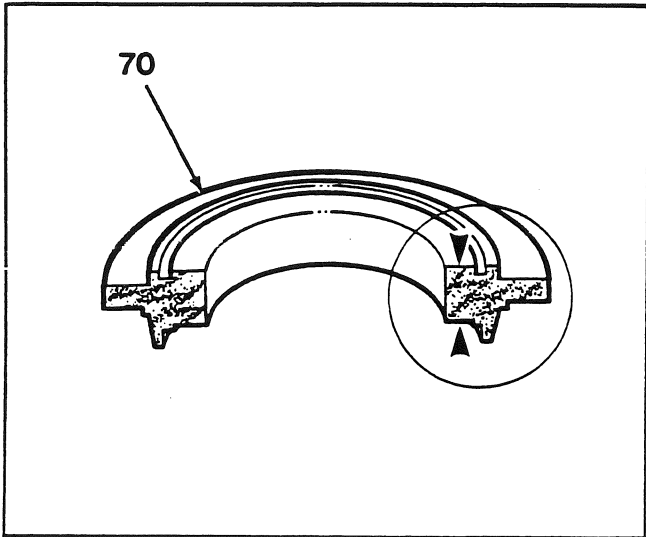


Fig. 123

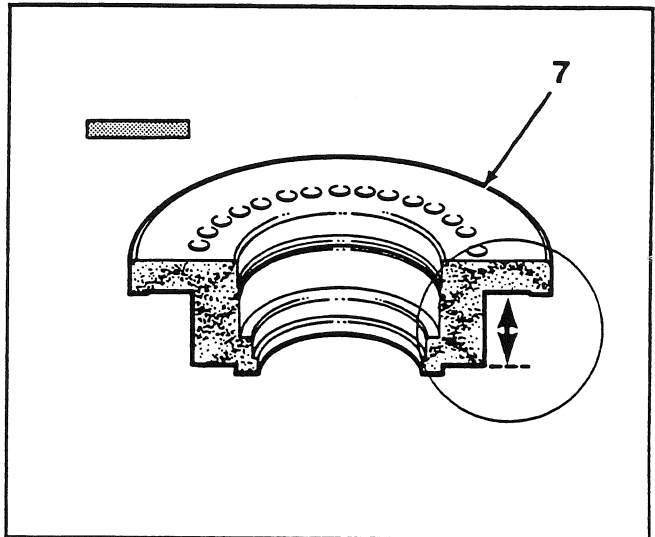


Fig. 126

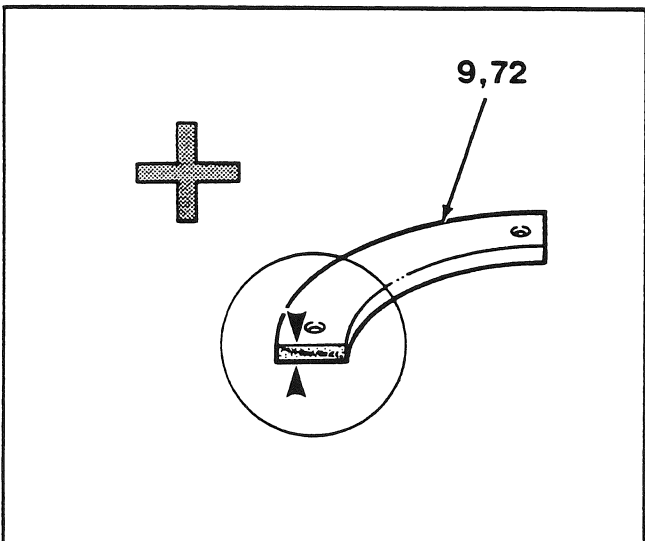


Fig. 124

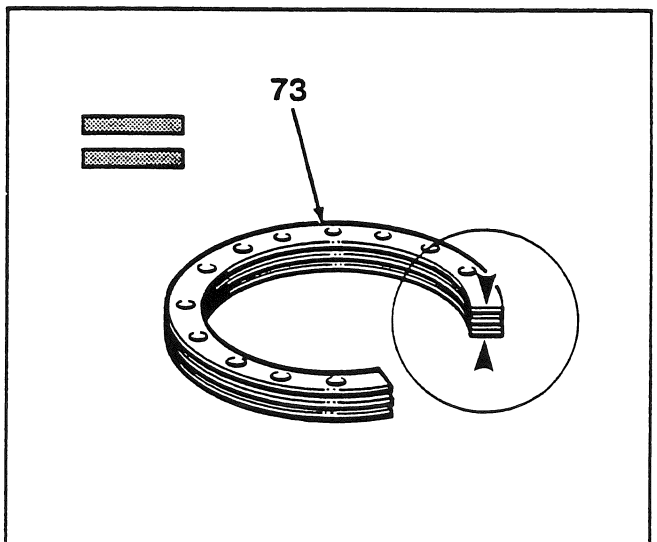


Fig. 127

**700 SERIES SHOP MANUAL**  
**SINGLE REDUCTION FINAL DRIVE**

**MAJOR COMPONENTS**

**Assembly and Installation (Continued)**

**Fig. 122**

If the bushing (69) has been removed from the pivot ring (70), use a press and sleeve to install a new bushing. Ensure that the edge of the bushing is flush with the surface of the pivot ring. Remove the grease fitting (71) from the pivot ring. Use the lubrication passage as a guide and drill a 4,8 mm (3/16 in.) hole through the bushing into the grease groove. Remove all burrs from the groove and hole using fine grade emery paper. Install the grease fitting. If new thrust plate segments (9 and 72) are installed, remove all burrs using a fine grinding stone.

**Fig. 123**

Before installing the complete pivot ring sub-assembly, use precision instruments to measure the thickness between the two machined surfaces of the pivot ring (70) in four places.

**Fig. 124**

Measure the thickness of both thrust plates (9 and 72).

**Fig. 125**

Add the dimensions; plus the constant clearance measurement of 0,127 mm (0.005 in.).

**Fig. 126**

Measure the depth from the machined flange to the shim bearing surface of the pivot ring retainer (7) in four places.

**Fig. 127**

Add a sufficient number of 0,127 mm (0.005 in.) shims (73) to exceed the final dimension in Fig. 124 by 0,025 mm to 0,152 mm (0.001 in. to 0.006 in.).

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SINGLE REDUCTION FINAL DRIVE**

**MAJOR COMPONENTS**

**Assembly and Installation (Continued)**

**Fig. 128**

Place the thrust plate segments (72) into position on the axle housing (11). Coat the threads of the bolts (10) with locking compound, Champion part number 40945 or 'Loctite' 242 and secure the thrust plate segments.

**Fig. 129**

Lubricate and install a new "Uniring" seal (74). Coat the "Uniring" seal and thrust plate segments with grease.

**Fig. 130**

**CAUTION**

**ENSURE THAT THE "UNIRING" SEAL IS NOT DAMAGED OR DISPLACED WHEN THE PIVOT RING AND PIVOT RING RETAINER ARE INSTALLED.**

Turn the axle housing over until the flange is pointing up. Coat the inside machined surface of the pivot ring assembly (69),(70) with grease. Install the pivot ring and place squarely over the "Uniring" seal (74).

**Fig. 131**

Ensure that the pivot ring grease fitting (71) is correctly positioned.

**Fig. 132**

Coat the pivot ring hub with grease. Lubricate and install a new O ring (8).

**Fig. 133**

Install the shims (73) previously calculated. Place the thrust plate segments (9) into position on the pivot ring retainer (7). Coat the threads of the bolts (10) with locking compound, Champion part number 40945 or 'Loctite' 242 and secure the thrust plate segments.

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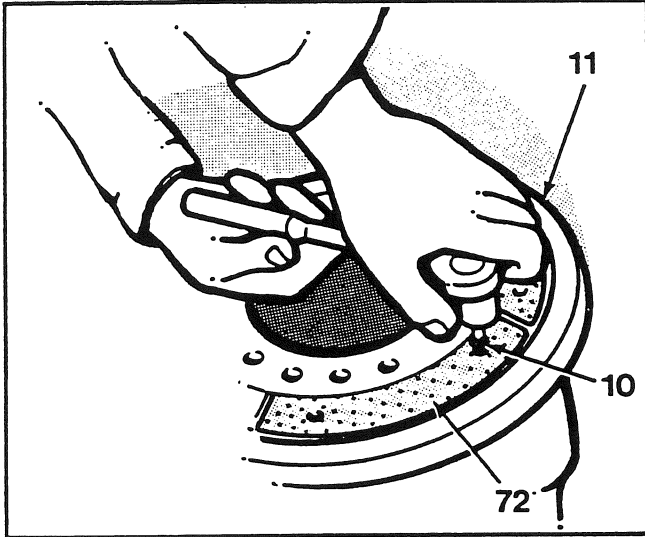


Fig. 128

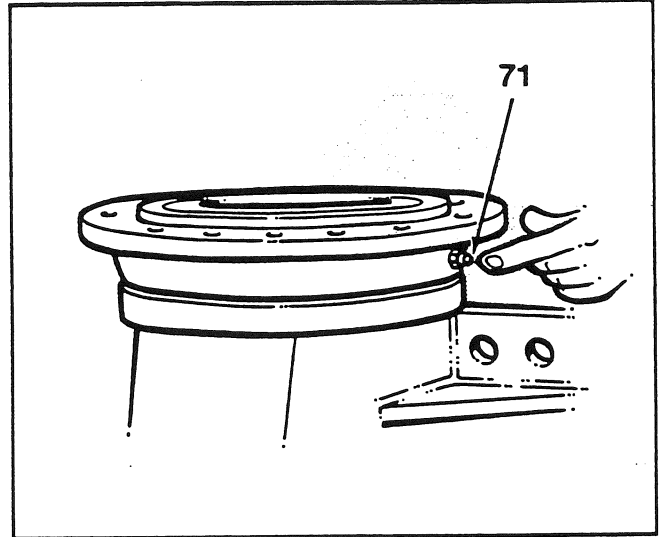


Fig. 131

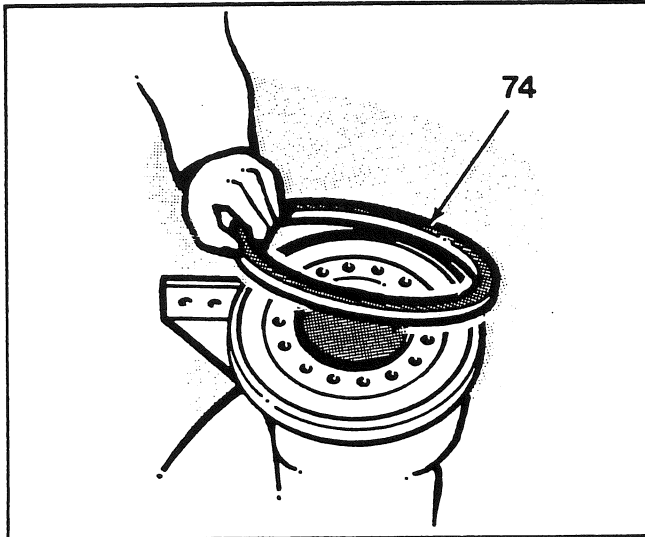


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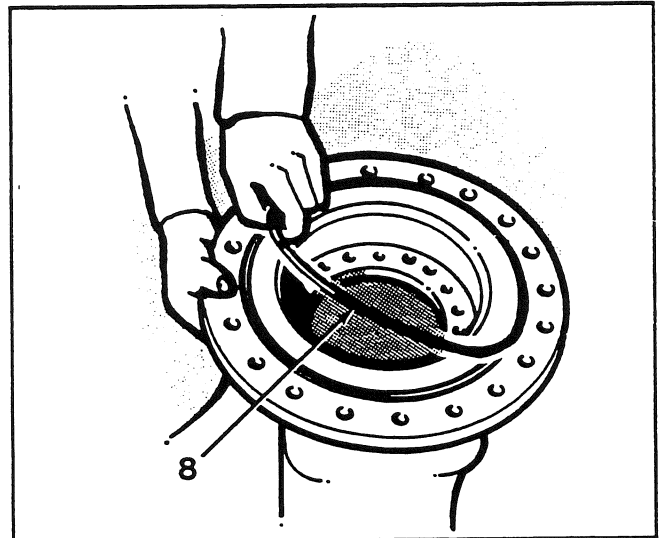


Fig. 132

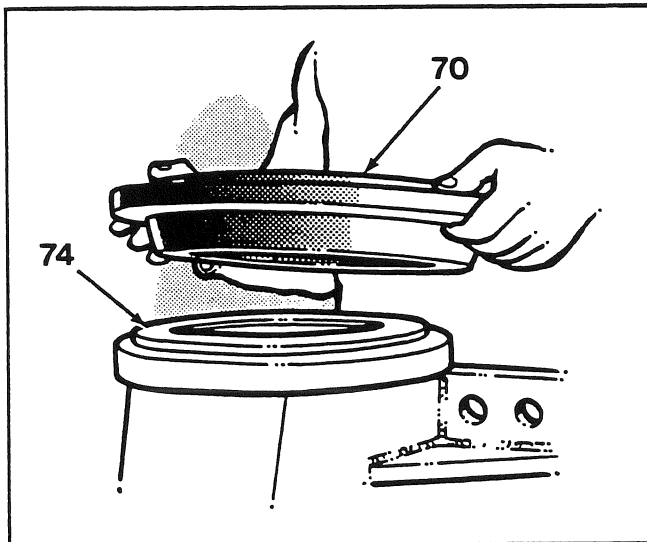


Fig. 130

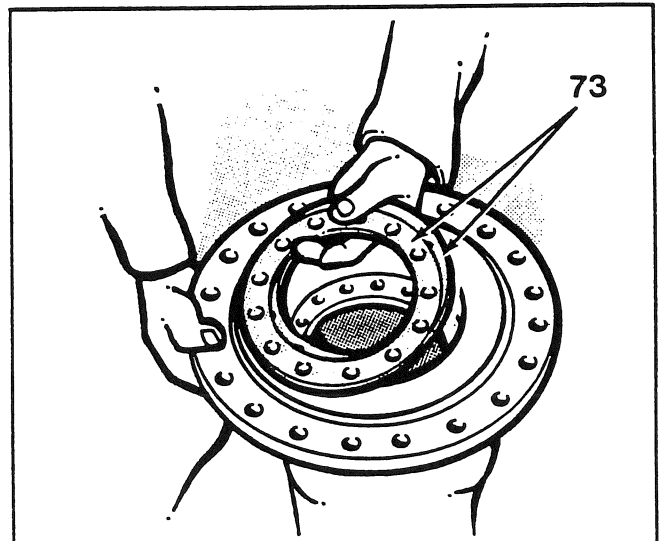


Fig. 133

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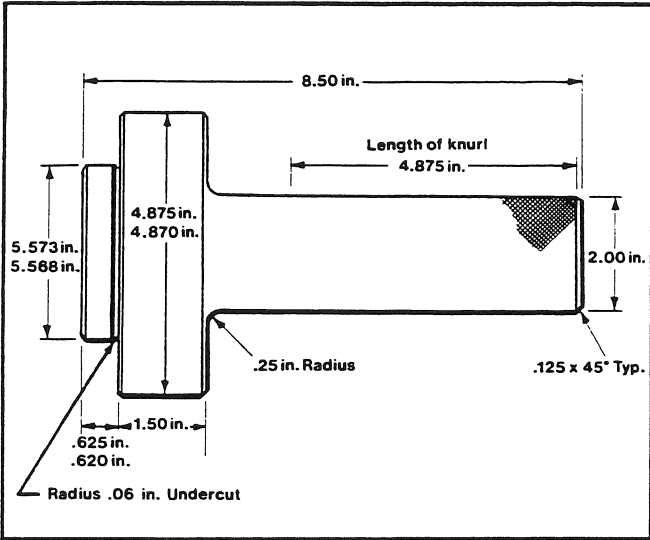


Fig. 134

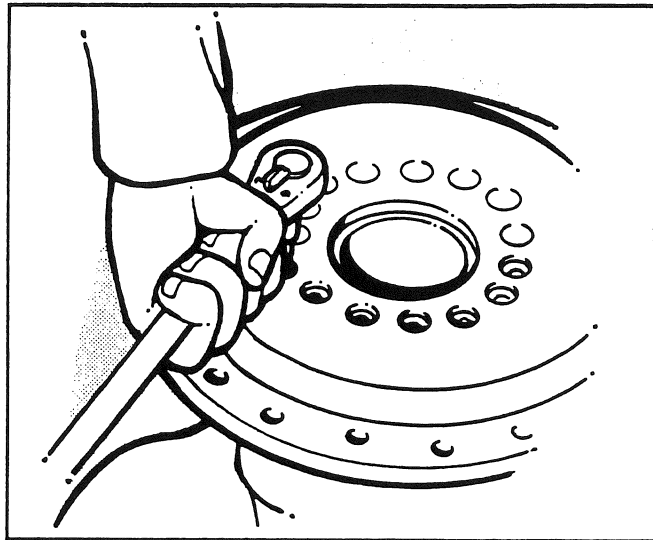


Fig. 137

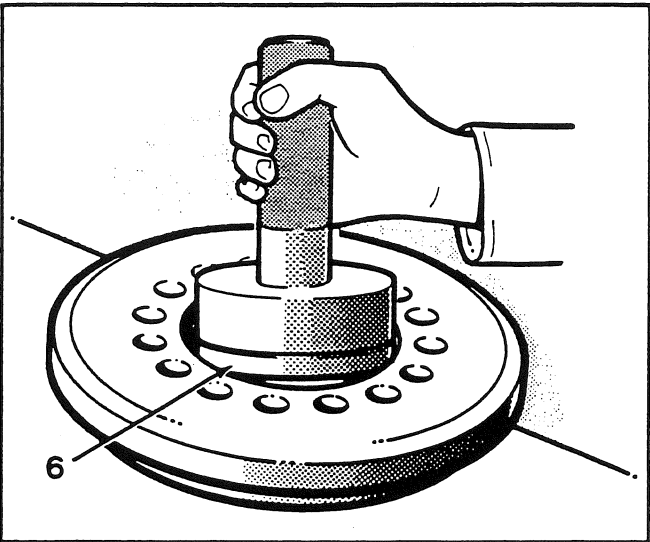


Fig. 135

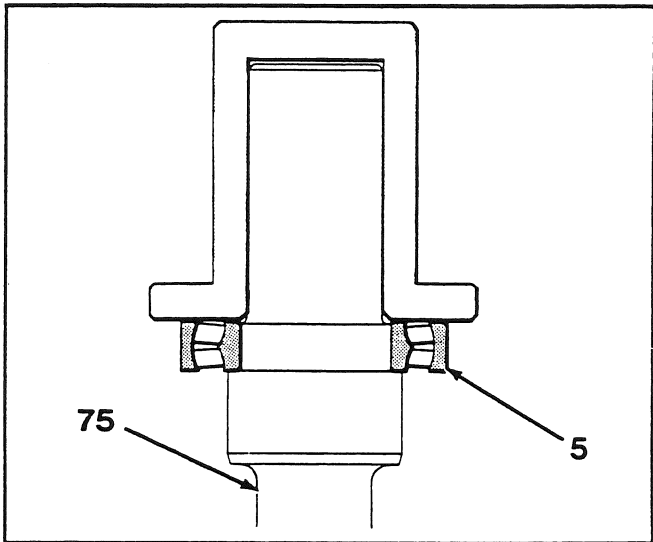


Fig. 138

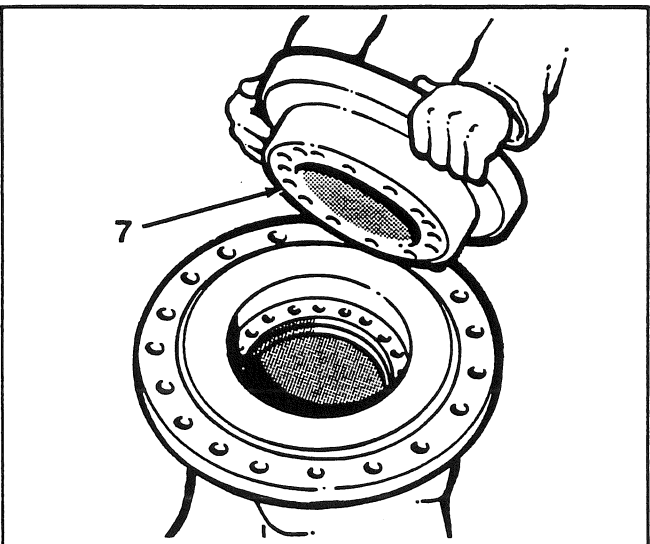


Fig. 136

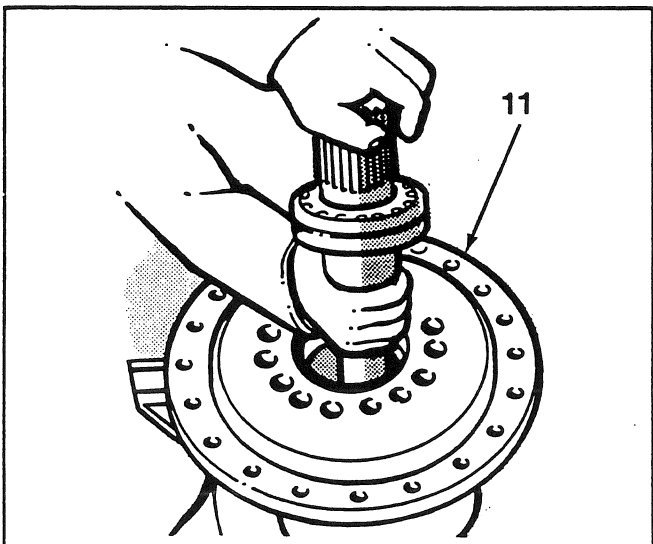


Fig. 139



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**SINGLE REDUCTION FINAL DRIVE**

**MAJOR COMPONENTS**

**Assembly and Installation (Continued)**

**Fig. 134**

If you do not already have one, make a tool according to the illustration.

**Fig. 135**

Coat the carrier of the inner oil seal (6) with 'Permatex No. 2', or equivalent. Lubricate the oil seal lips. Install the oil seal using the tool made from illustration Fig. 134.

**Fig. 136**

Coat the outside of the pivot ring retainer hub and thrust plates with grease. Carefully lower the pivot ring retainer (7) over the pivot ring. Ensure that the O ring is not displaced.

**Fig. 137**

Coat the threads of the bolts (4) with locking compound, Champion part number 40945 or 'Loctite' 242. Install six bolts in an even pattern. Tighten the bolts in a diagonal sequence to gradually compress the pivot ring over the "Uniring" seal. Torque-tighten the bolts. Install a threaded shackle into one of the pivot ring outside holes. Insert a 1 meter (3 ft) long metal bar into the eye of the shackle and check to see if the pivot ring assembly can be rotated. Rotation should just overcome any resistance.

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If the pivot ring assembly can not be rotated, disassemble and add a shim (73). Re-assemble and check the pivot ring assembly rotation. After checking the rotation, install the remaining bolts (4) and gradually tighten them in a diagonal sequence. Torque-tighten the bolts.

**Fig. 138**

Heat the bearing (5) evenly in an oven or oil bath type heater to 121°C (250°F) maximum. **DO NOT** use an induction heater. If the bearing must be pressed into place, use a tubular drift that contacts the full face of the bearing. Ensure the bearing is lubricated with final drive oil. Install the bearing onto the drive axle (75).

**Fig. 139**

**CAUTION**

**TAKE EXTRA CARE WHEN INSTALLING THE DRIVE AXLE AND BEARING ASSEMBLY. LUBRICATE THE AXLE SPLINES TO ENSURE POSITIVE ENGAGEMENT WITH THE DIFFERENTIAL SIDE GEAR SPLINES.**

Carefully place the drive axle and bearing assembly into the axle housing (11).

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**Assembly and Installation (Continued)**

**Fig. 140**

Cool the drive axle (75) in a freezer or with dry ice. If the axle must be pressed into place, use a soft metal drift. Install the drive axle.

**Fig. 141**

Retain the drive axle with a new snap ring (3).

**Fig. 142**

Coat the carrier of the outer oil seal (1) with 'Permatex No. 2', or equivalent. Lubricate the oil seal lips with tandem oil. Using a soft metal drift, install the oil seal.

**Fig. 143**

Lubricate and carefully install the spacer (2). Repeat the previous steps for the other pivot ring and drive axle sub-assembly.

**Fig. 144**

Coat around the tandem opening with gasket eliminator, Champion part number 25303 or 'Loctite' 515.

**Fig. 145**

Attach a safe lifting device to the final drive assembly. Maneuver the assembly to align the drive axle splines with the sprocket splines in the tandem.

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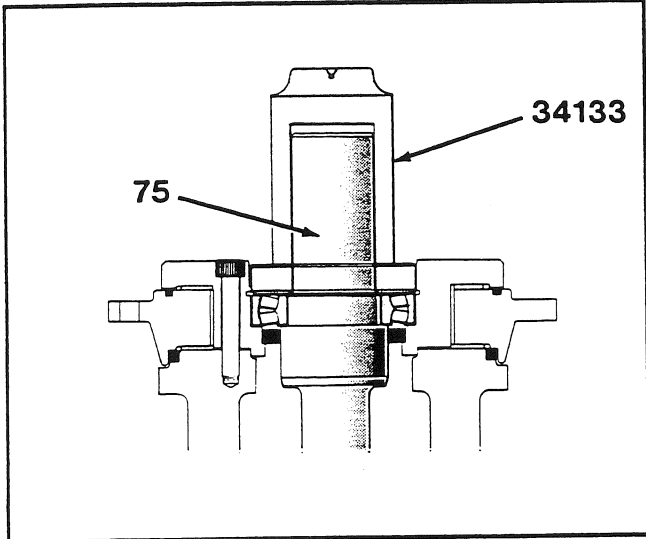


Fig. 140

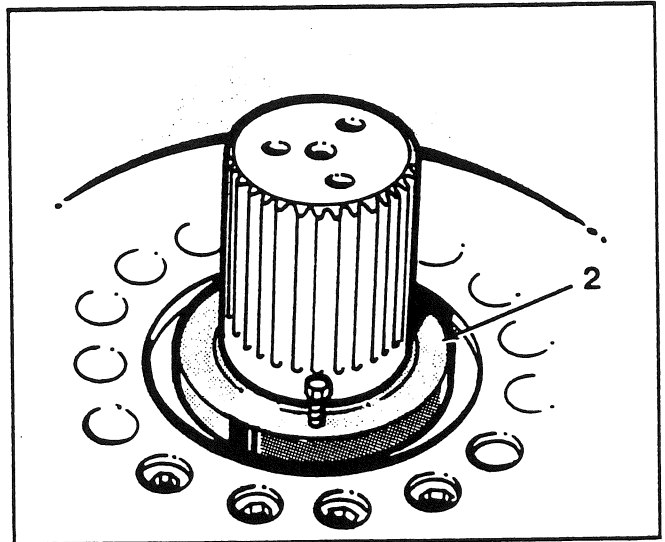


Fig. 143

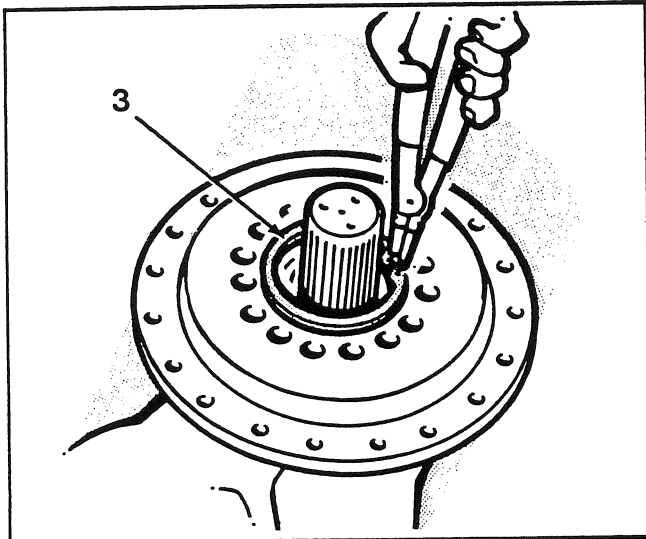


Fig. 141

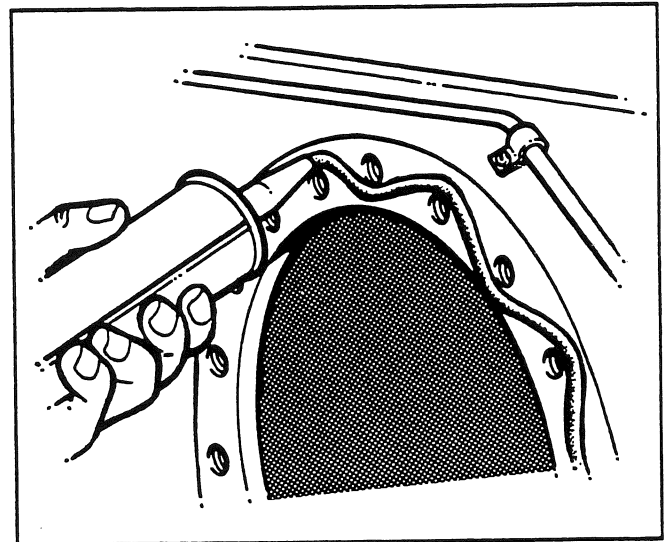


Fig. 144

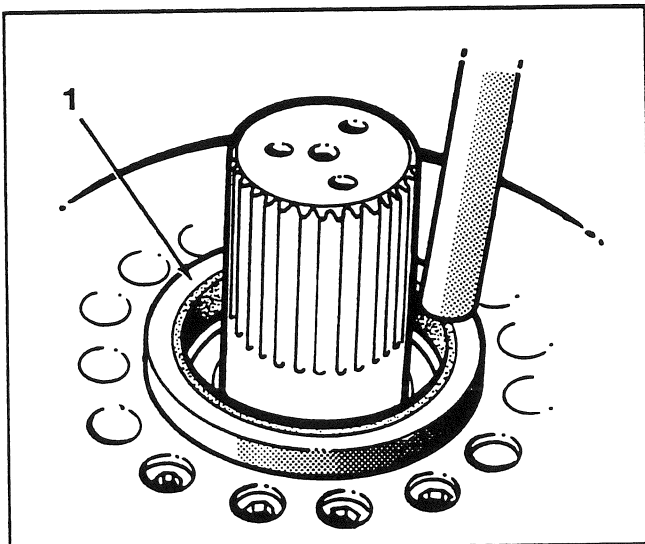


Fig. 142

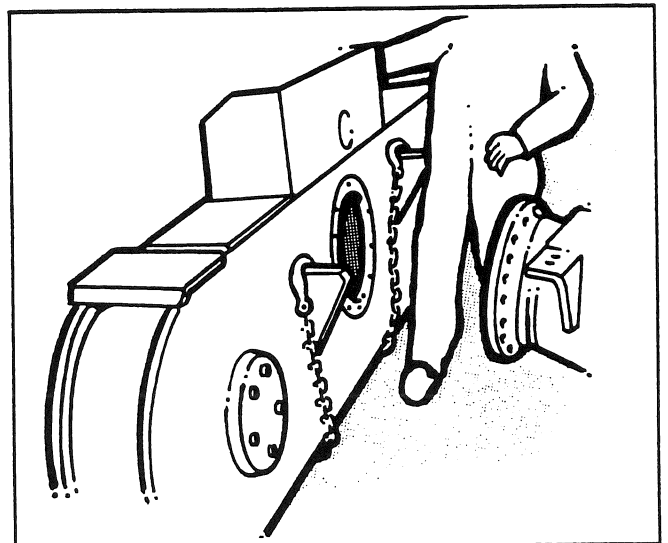


Fig. 145

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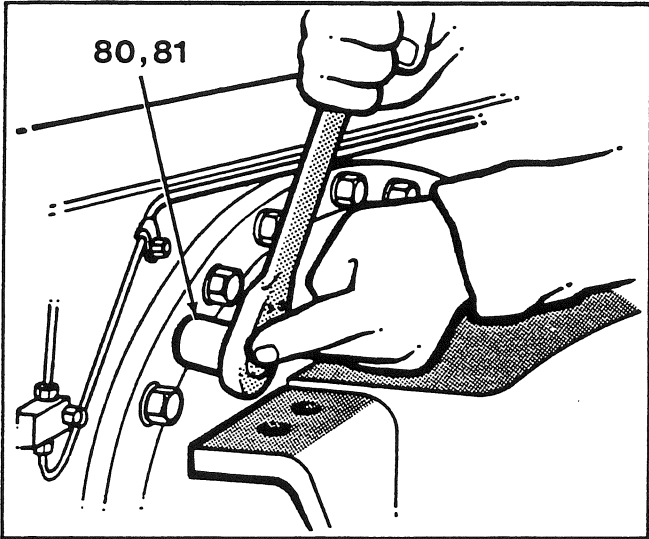


Fig. 146

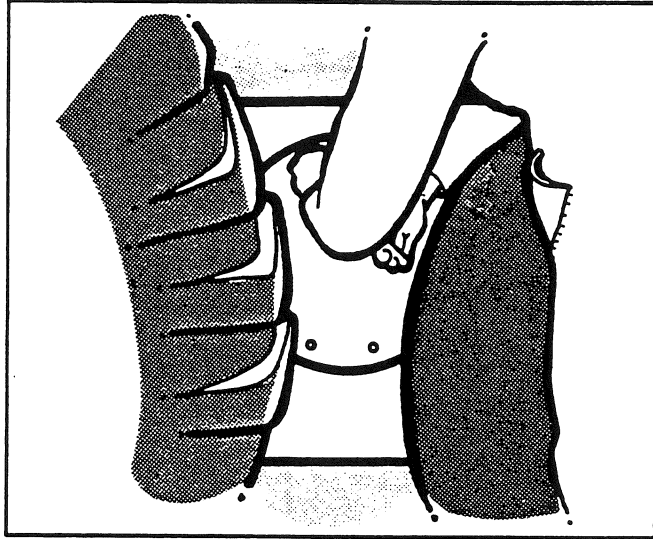


Fig. 149

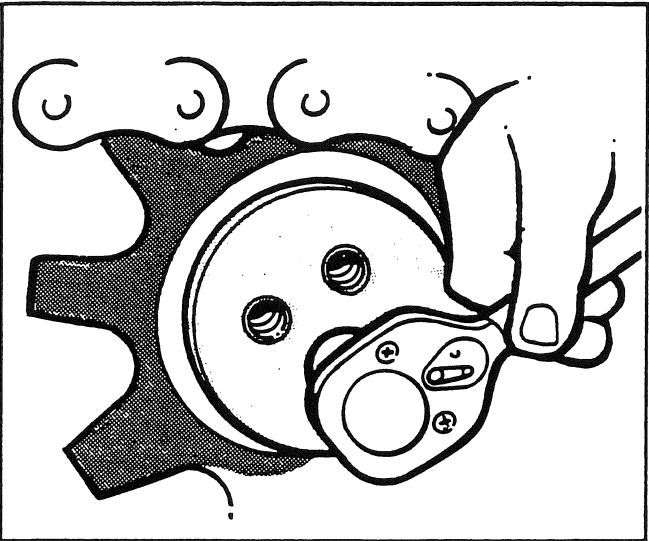


Fig. 147

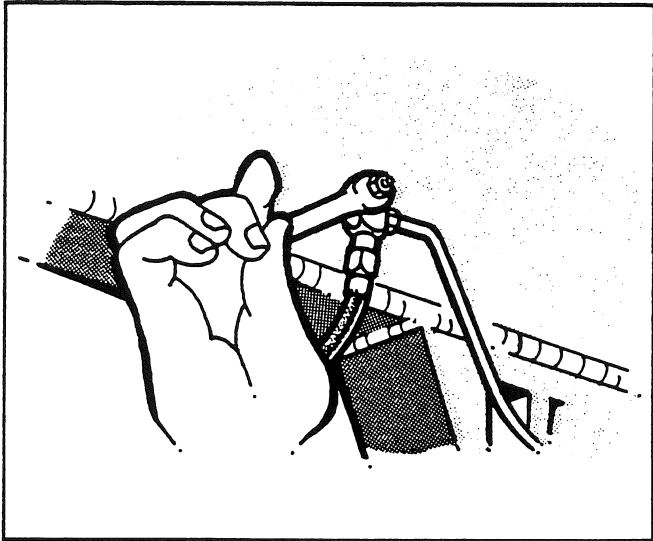


Fig. 150

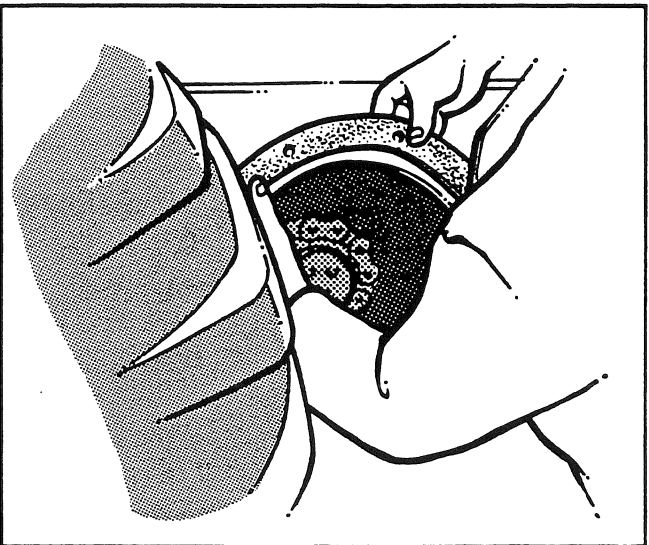


Fig. 148

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MAJOR COMPONENTS

**Assembly and Installation (Continued)**

**Fig. 146**

Coat the threads of the bolts (81) with locking compound, Champion part number 40945 or 'Loctite' 242, that retain the final drive to the tandem. Install the bolts and lockwashers (80). Torque-tighten the bolts.

**Fig. 147**

Install the end plate, bolts and lockwashers on the drive sprocket.

**Fig. 148**

Install a new cover plate gasket or use gasket eliminator, Champion part number 25303 or 'Loctite' 515.

**Fig. 149**

Install the cover plate and secure with the bolts. Repeat the previous steps for the opposite tandem.

**Fig. 150**

Install the transverse brake line. Wipe up any spilled fluid to avoid paint damage.

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SINGLE REDUCTION FINAL DRIVE ASSEMBLY

Installation to Grader

**Fig. 151**

Attach a safe lifting device to the rear of the grader frame. Raise the rear end of the grader and remove the stands. Roll the final drive and tandem assembly under the grader. Lower the grader until the frame brackets rest on the final drive mounting plates. Install the bolts (67) and new locknuts (76). Torque-tighten the bolts.

**Fig. 153**

Re-connect the emergency brake cable.

**Fig. 154**

Re-connect the tube from the master cylinder to the three-way connector on the inner right hand side of rear frame. Ensure all tube connections are clean and tight. Wipe up any spilled brake fluid to prevent paint damage.

**Fig. 152**

Remove and discard the lockwire securing the two halves of the lower driveshaft slip yoke. Re-connect the lower driveshaft. Place the brake disc fender and two spacers into position. Retain with the bolts and lockwashers.

**NOTE**

**Add brake fluid as required. Bleed the brake system of air before driving the grader (See section on brakes).**

**CAUTION**

**THE EMERGENCY BRAKE CALIPER ASSEMBLY IS EXTREMELY HEAVY.**

Place the emergency brake caliper assembly into position and retain with the bolts, lockwashers and flatwashers.

**Fig. 155**

Pass the battery cables through the grommet, install one battery and re-connect the cables. Close and secure the battery box(es).

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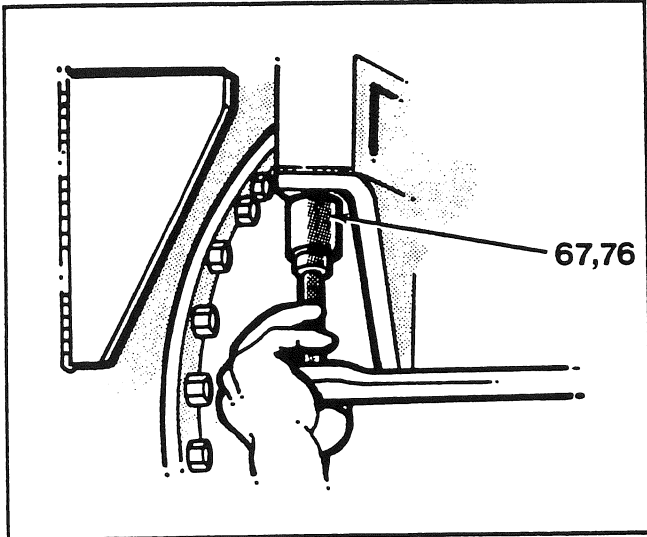


Fig. 151

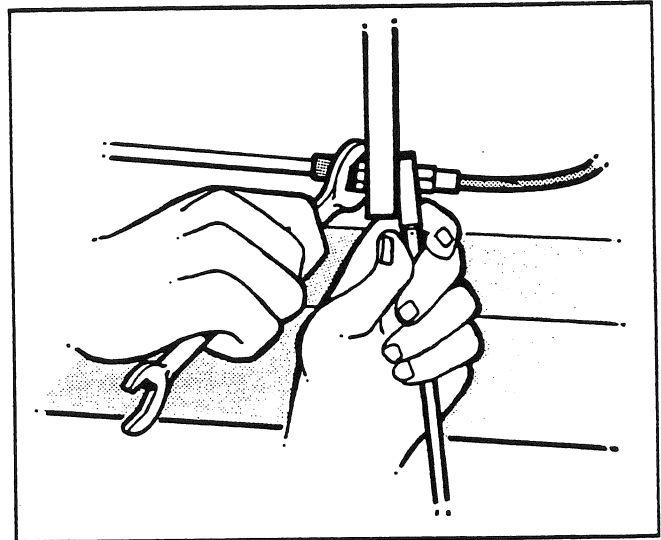


Fig. 153

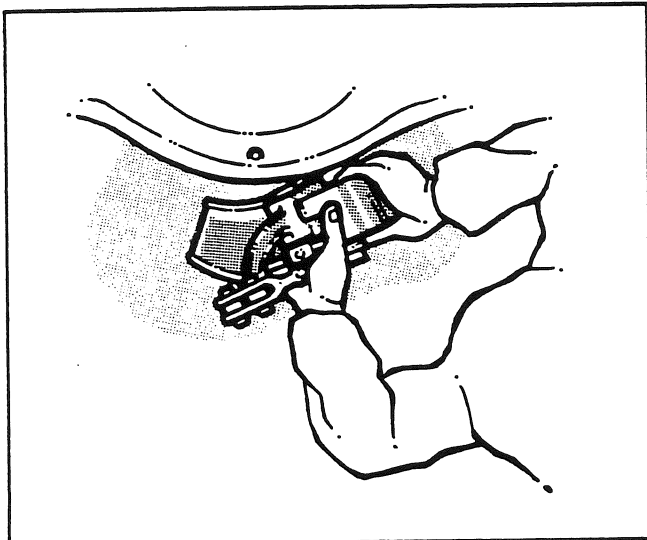


Fig. 152

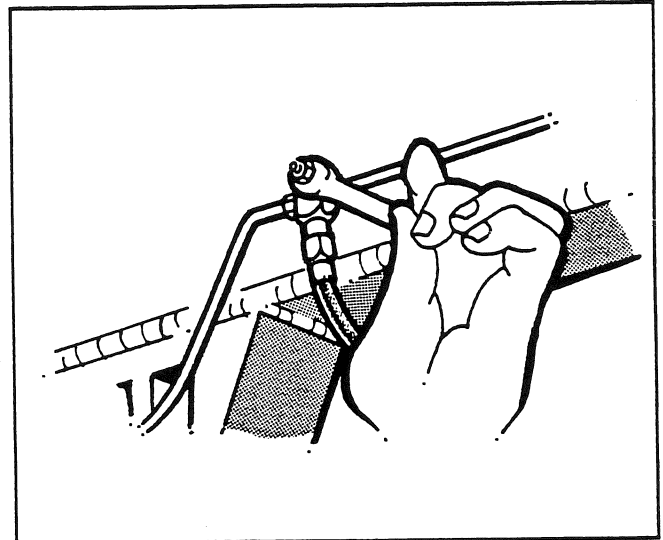


Fig. 154

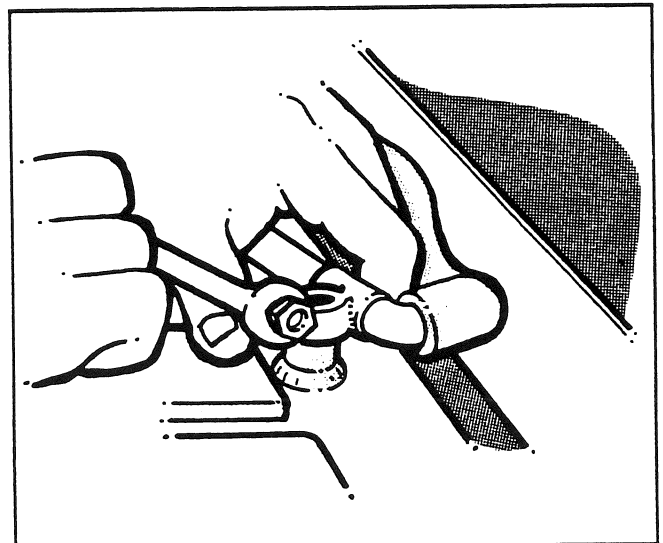


Fig. 155

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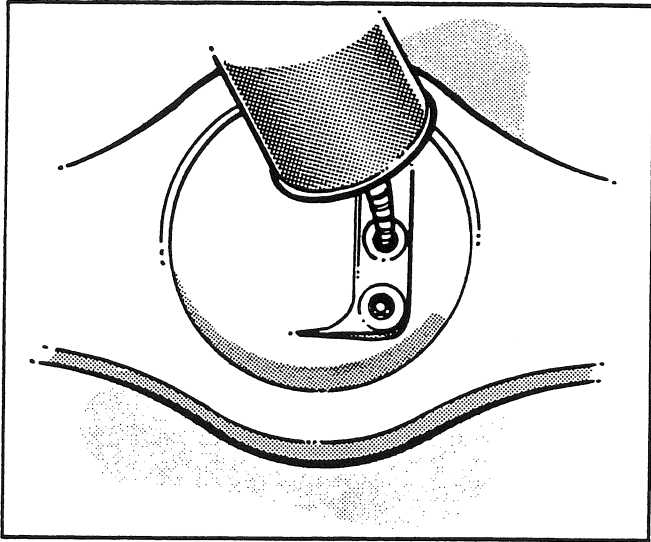


Fig. 156

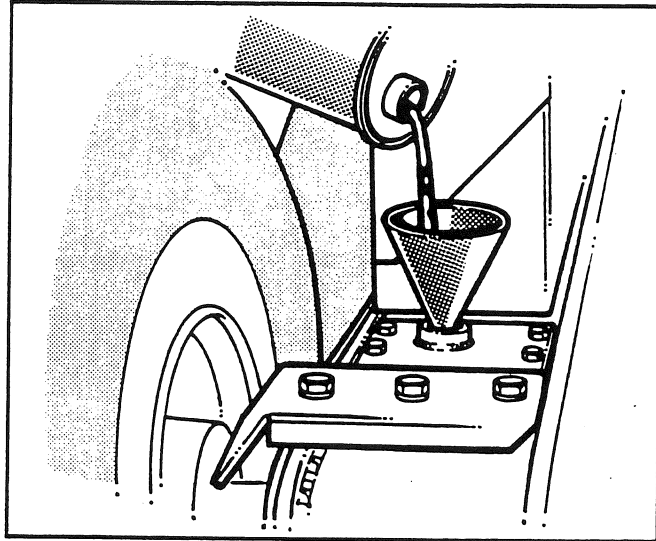


Fig. 157



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SINGLE REDUCTION FINAL DRIVE ASSEMBLY

Installation to Grader (Continued)

**Fig. 156**

Refer to Lubrication Specifications detailed in the front of this manual for the recommended tandem and final drive lubricating oils. Remove the upper pipe plug (83) from the axle housing. Refill the final drive to the bottom of the plug hole. Clean and install the plug.

**NOTE**

The final drive oil capacity is 19 litres (4.2 Imp. gal, 5.0 U.S gal).

**Fig. 157**

Remove and clean the tandem filler plugs and level check plugs. Refill both tandems to the bottom of the check plug hole. Install the filler and level check plugs.

**NOTE**

The tandem oil capacity is 30 litres (6.6 Imp. gal, 7.9 U.S gal). Oil disc brake tandem capacity is 100 litres (22 Imp. gal, 26.5 U.S gal).

Select the isolation switch to the "ON" position and start the engine. Raise the moldboard to lower the front wheels. Road test the grader to check for leaks.

