

**PS-1200**  
**No. 45180**  
**PLANETARY**  
**[STEERING]**  
**AXLE**  
**ASSEMBLY**

*Maintenance*  
*&*  
*Service Parts*

**NAPCO**

**Napco**  
**Industries, Inc.**

**1600 SOUTH SECOND STREET**  
**HOPKINS, MINNESOTA 55343**



## INTRODUCTION

This illustrated parts list covers the Planetary (Steering) Driving Axle Unit; The Axle and its Associated parts. Use this for identifying and ordering service replacement parts.

When ordering parts, include the part name, the part number, and the serial number of the Axle.

Follow the above procedure for prompt parts service.

NOTE: The part names in the Parts List that are preceded by an asterisk (\*) means that the part is not shown in the illustration.

AR Signifies As Required.

L. H. -LEFT HAND

R. H. -RIGHT HAND



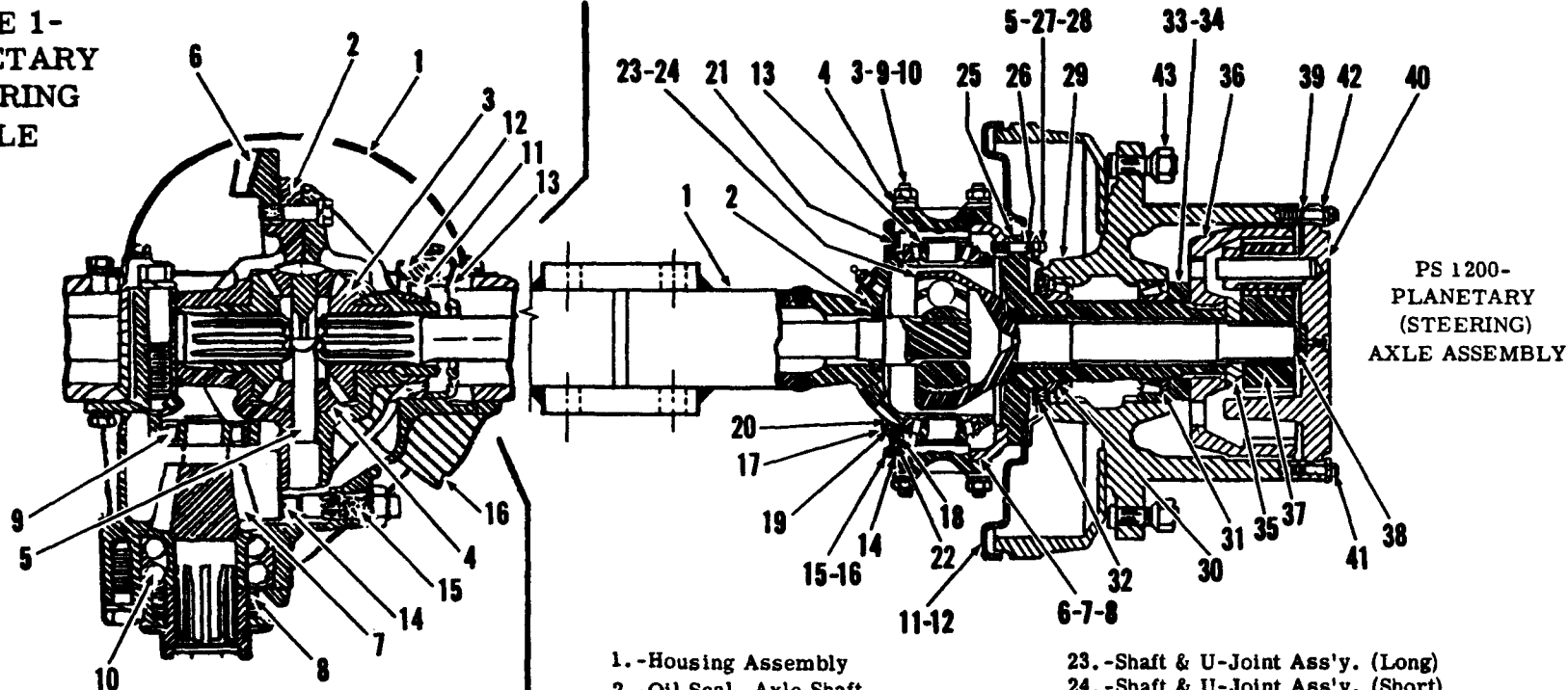
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**FIGURE 1-  
PLANETARY  
STEERING  
AXLE**



**DIFFERENTIAL ASSEMBLY**

1. Differential Cover
2. Differential Case
3. Differential Side Gear
4. Differential Pinion
5. Differential Spider
6. Drive Gear
7. Drive Pinion
8. Oil Seal
9. Rear Pinion Bearing
10. Front Pinion Bearing
11. Differential Side Bearing
12. Side Bearing Cap
13. Adjusting Nut
14. Thrust Pad
15. Thrust Pad Adjusting Bolt
16. Carrier Housing

1. -Housing Assembly
2. -Oil Seal, Axle Shaft
3. -Stud-Trunnion to Knuckle
4. -Trunnion
5. -Stud-Spindle to Knuckle
6. -Shim-Knuckle Bearing (.002)
7. -Shim-Knuckle Bearing (.005)
8. -Shim-Knuckle Bearing (.010)
9. -Lockwasher
10. -Nut
11. -Brake Assembly-L. H.
12. -Brake Assembly-R. H.
13. -Cone, Bearing
14. -Gasket-Knuckle
15. -Bolt-Retainer
16. -Lockwasher-Retainer
17. -Ring-Split Retainer
18. -Felt
19. -Spring
20. -Seal
21. -Flange
22. -Ring-Retainer Half

23. -Shaft & U-Joint Ass'y. (Long)
24. -Shaft & U-Joint Ass'y. (Short)
25. -Spindle Sub-Ass'y.
26. -Oil Deflector
27. -Lockwasher
28. -Nut
29. -Hub Sub-Assembly
30. -Inner Cone Bearing
31. -Outer Cone Bearing
32. -Oil Seal
33. -Nut-Bearing Lock
34. -Soc. Head Cap Screw
35. -Spacer Ring
36. -Ring Gear Assembly
37. -Sun Gear
38. -Retainer Ring
39. -Gasket
40. -Drive Flange & Planetary Ass'y.
41. -Locknut
42. -Dowel-Tapped
43. -Wheel Nut

PS 1200-  
PLANETARY  
(STEERING)  
AXLE ASSEMBLY

MAINTENANCE

PLANETARY AXLE

## PLANETARY AXLE

### A. Axle Removal

1. Disconnect propeller shaft.
2. Disconnect brake fluid line leading into tee at differential housing.
3. If axle is steering type, remove steering cylinders and drag links at axle steering arms.
4. Support vehicle under frame so tires are off floor. Remove wheels.
5. Place floor jack under axle differential housing and remove mounting nuts and u-bolts. Lower axle with floor jack and remove from under vehicle.

NOTE: With 4 cyl. steering remove oil line manifold from axle before removing steering cylinders.

### B. Axle Installation

1. Support axle with floor jack under differential housing.
2. Push axle into position under vehicle which must be supported under main frame.
3. Raise axle with floor jack until axle mounting pads are in contact with mounting pads on vehicle. Install U-Bolts from under side of axle and install nuts.
4. Mount wheels, raise jack until frame supports can be removed, then lower vehicle to floor.
5. Connect brake fluid line to tee at differential housing. Bleed brakes to remove air. Refill master cylinder.
6. Connect propeller shaft.
7. If axle is steering type, connect drag links and steering cylinders to axle steering arms.

NOTE: With 4 cyl. steering fasten oil line manifold to axle after steering cylinders are reconnected.

### C. Shaft Removal, Steering Axle (See Figure 1)

1. Remove planetary assembly as explained in Section G, Planetary disassembly.
2. Remove nuts and washers from spindle mounting studs.
3. Remove brake assembly and spindle.
4. Remove shaft and joint assembly from axle housing.

### D. Axle Shaft Disassembly, Rzeppa Joint

1. Clean excess lubricant from the axle shaft and joint.
2. Grasp axle shaft as shown in Fig. 3. Rap face of joint sharply against a protected vise or edge of bench. This will cause axle shaft and joint retaining snap ring to contract which then permits shaft and joint to separate.
3. Tilt ball race (3) and cage (2), then remove balls (4). (Fig. 4)
4. Align ball race (3) and cage (2), and remove from bell housing (1) (Fig. 4)
5. Disassemble ball cage (2) from race (3) (Fig. 4)
6. Inspect axle joint for seizure, broken or chipped balls, broken splines, or any other damage. Repair joint as required.

### E. Axle Shaft Assembly, Rzeppa Joint

1. Lubricate the housing (1), cage (2) race (3) and balls (4) with chassis lubricant.
2. Assemble the ball race and cage, then insert both parts in the joint housing. NOTE: The race has both a shallow and deep bevel. Be certain the deep bevel faces axles differential.

### F. Shaft Installation, Steering Axle

1. Slide shaft and joint assembly into axle housing. When shaft reaches differential side gear, rotate slightly to engage spline.
2. Assemble planetary as explained in Section H, Planetary Assembly.

### G. -Planetary Disassembly (See Figure 1.)

1. Remove drain plug from drive flange and drain planetary assembly. Remove nuts, dowels, drive flange and gasket.

Bronze axle shaft stop may be replaced if badly worn.

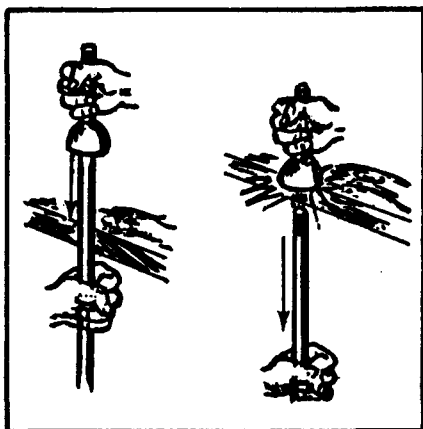


Fig. 3. Axle Shaft Disassembly

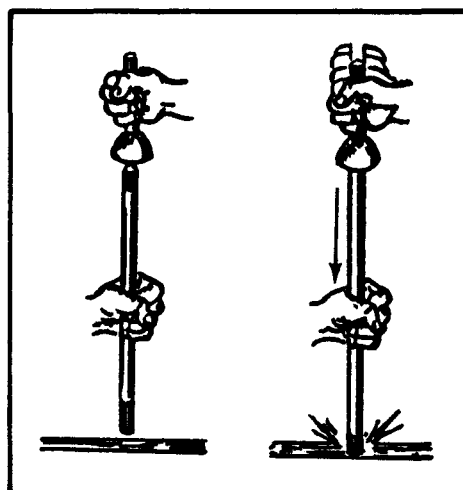


Fig. 6. Axle Shaft Assembly

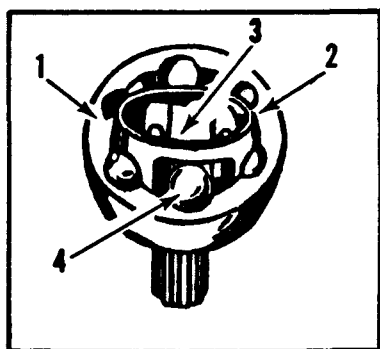


Fig. 4 Joint Assembly

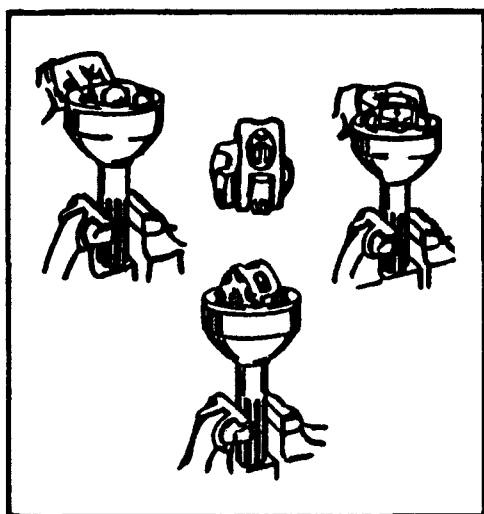


Fig. 5. Joint Disassembly

2. Disassemble drive flange by removing socket head cap screws, washers and planet pin key. Remove planet pin; hold planet gear as pin is removed and remove gear and thrust washers from drive flange. Remove needle bearings and inner retainer from gear. Inspect all parts for wear or galling. Inspect steel thrust washers for excessive wear. Inspect planet gear pin for wear or galling. The pin must be completely smooth since it serves as inner race for needle bearings.
3. Remove snap ring, sun gear, and spacer from end of axle shaft. Remove ring gear from spindle.
4. Loosen socket head cap screw and remove bearing locknut from spindle.
5. Remove hub and drum assembly from spindle; Inspect seal and bearings for wear.
6. Remove drum mounting bolts to remove brake drum. Inspect inside surface of drum for scratches, grooves, and out-of-roundness. Turn drum if necessary.
7. Remove nuts and lockwashers from spindle mounting studs.
8. Remove deflector, brake assembly and spindle from knuckle housing. Inspect seal and bronze bearing in bore of spindle.

#### H. -Planetary Assembly

1. Mount spindle, brake assembly and deflector on spindle mounting studs and install washers and nuts. Make certain all studs are firmly installed in knuckle housing before assembly.
2. Bolt brake drum to hub. Install inner wheel bearing assembly, oil seal, and outer wheel bearing cup in hub.

3. Slide hub into position on spindle. Press outer bearing cone into approximate position and install bearing locknut on spindle. Turn bearing locknut in tight to insure proper seating of wheel bearings. Back off 1/8 turn and check to make sure hub rotates freely. Tighten socket head cap screw. Place ring gear in position on spindle.
4. Install spacer on axle shaft. Slide sun gear onto end of axle shaft and install snap ring.
5. Assemble drive flange by installing needle bearings and inner retainer into planet gears. Place planet gears and thrust washers in drive flange and install planet gear pins. Place planet pin keys into correct position and fasten with internal shakeproof washers and socket head cap screw. Make sure that bronze axle shaft stop is firmly seated in drive flange.
6. Slide drive flange assembly into hub, rotating slightly to engage gear teeth. Fasten to hub studs with tapered dowels, and locknut.
7. Turn hub until arrow is pointing down and fill with lubricant until oil runs from check plug hole.

## I. Steering Knuckle Disassembly

1. Remove shaft and joint assembly as outlined previously.
2. Remove tie rod and steering linkage.
3. Remove seals and retainers from inner surface of steering knuckle.
4. Remove bearing caps, steering arm and shims and remove knuckle from ball end.
5. Clean ball end, inside and outside and polish seal surface of ball.
6. Inspect bearings for wear or discoloration and replace if necessary.

## J. Steering Knuckle Assembly

1. Lubricate trunnion bearings thoroughly.
2. Place knuckle in position over ball end and install bearing caps and steering arm using original shim packs.
3. Check adjustment of bearings by placing torque wrench on bearing cap or steering arm mounting nut and swinging knuckle. Torque should be 20 to 25 ft. lbs. To increase torque, remove shims from top or bottom bearing, to decrease torque, add shims.
4. Install seals and retainer on rear face of knuckle after replacing seal if worn.

5. Pack inside of ball end with lubricant.
6. Install shaft, spindle and hub. Connect the tie rod and steering linkage.

## K. Differential Carrier Removal and Disassembly

1. Drain lubricant from differential, remove housing cover and remove axle shafts.
2. Remove carrier-to-housing bolts and lockwasher and remove carrier from housing.
3. Loosen ring gear thrust pad lock nut and remove thrust pad.
4. Remove differential adjusting nut locks and bearing cap bolts and lockwashers. Remove bearing caps and adjusting nuts by tapping on caps until free from dowels.
5. Remove differential and ring gear assembly from carrier housing. Exercise care that differential side bearings are not dropped.
6. Check differential case to make sure the 2 halves are marked so they will be reassembled in same relation.
7. Remove bolts holding case and cover together.
8. Separate cover from case and remove differential side gears, pinion gears and differential spider.
9. Wash all parts in cleaning solvent.
10. Inspect ring gear for chipped or worn teeth.
11. Check radial clearance between differential side gears and differential case, also fit of differential pinions on spider.
12. Inspect spider arms for wear and distortion.
13. Inspect splines and teeth of differential side gears and pinions for chipping or excessive wear.
14. Inspect differential side bearings and cups for broken races, discoloration or roughness.
15. Remove ring gear from case by tapping back of gear with a soft hammer.
16. Inspect ring gear pilot case flange and back of ring gear for dirt or burrs.
17. If ring gear is to be replaced, install two guide pins to new gear diametrically opposite each other.
18. Start guide pins through case flange and tap ring gear onto case.

## L. Differential Assembly

1. Lubricate differential side gears and pinions.
2. Place differential pinions on spider.
3. Assemble side gears and pinions to left half of differential case.
4. Assemble right half of differential case to left half, being sure to line up marks on the two halves.
5. Install 10 differential-to-ring gear bolts and lockwashers and tighten evenly until ring gear is flush with case flange.
6. Remove 2 guide pins and install remaining 2 bolts. Tighten all bolts to 85-95 foot pounds.

## M. Pinion Disassembly

1. Remove bolts holding pinion bearing retainer to carrier. Remove pinion and bearing assembly from carrier.
2. Clamp pinion drive flange in vise, remove cotter pin, nut and washer from end of pinion shaft. Remove drive flange and bearing retainer assembly from shaft.
3. Drive oil seal and packing from retainer. Discard seal and packing as new parts should be used at assembly.
4. Remove rear pinion bearing snap ring and press pinion bearing from pinion.
5. Press off front double-row bearing assembly.
6. Wash all parts in cleaning solvent.
7. Inspect pinion for cracked, chipped or worn teeth. Inspect splines for excessive wear.
8. Inspect bearings for excessive wear or discoloration.

## N. Pinion Assembly

1. Install double row front pinion bearing assembly onto pinion shaft, using a piece of 2 inch pipe to press against inner row, until the collar on inner-race seats against the pinion head.
2. Press rear pinion bearing on the pinion shaft until chamfered side-of inner race seats against shoulder on pinion shaft.

3. Install rear pinion bearing and lock ring.

4. Soak a new oil seal and packing in engine oil. Install felt pack in bottom of pinion bearing retainer recess, then press oil seal into retainer with seal lip toward pinion bearing.

5. Slide oil seal retainer on pinion shaft, then tap drive flange onto pinion splines.

6. Clamp drive flange in bench vise and install washer and nut. Torque nut to 160 to 280 ft. -lbs. and install cotterpin.

7. Lubricate pinion bearings with engine oil.

## O. Differential Carrier Assembly

1. Mount carrier in bench vise.

2. Install pinion assembly in carrier using a new gasket under oil seal retainer. Torque bolts to 160 to 170 ft. -lbs.

3. Lower differential assembly into carrier and install side bearing cups and adjusting nuts.

4. Install differential bearing caps, making sure the marks on the caps line up with marks on the carrier.

5. Install bearing cap bolts and lockwashers and tighten until lockwashers just flatten out.

6. To adjust ring gear and pinion backlash, loosen differential bearing cap bolts enough to permit turning bearing adjusting nuts. Remove all lash between ring gear and pinion.

7. Back off left-hand adjusting nut one or two notches to a locking position.

8. Tighten right-hand adjusting nut firmly to force differential in solid contact with left-hand adjusting nut.

9. Back off right-hand adjusting nut until free of bearing, then retighten snugly against bearing.

10. Tighten right-hand nut from one to two additional notches to a locking position.

11. Mount a dial indicator on the carrier and check the backlash between ring gear and pinion. Backlash should be from .003" to .010. If backlash is more than .010", loosen right hand adjusting nut one notch and tighten left hand adjusting nut one notch. If backlash is less than .003", loosen left hand nut one notch and tighten right hand one notch.

12. Tighten bearing cap bolts to 190-220 ft. lbs. Recheck backlash and install both adjusting nut locks.
13. Inspect bronze tip of ring gear thrust pad and if worn, install a new one.
14. Install thrust pad and tighten screw until bronze tip engages back face of ring gear while rotating gear.
15. Back off screw 1/12 turn and tighten lock nut to 125-140 ft. lbs. Make sure screw does not turn during locking process. This adjustment provides .005" to .007" clearance between thrust pad and ring gear face.

## P. Differential Carrier Installation

1. Clean out axle housing and cover and place new gasket over axle housing.
2. Assemble differential carrier to axle housing, install lockwashers and bolts and tighten securely.
3. Replace axle housing inspection cover, using new gasket.
4. Make sure drain plug is tightly installed and fill with lubricant.

## Q. Service Diagnosis

1. Excessive oil deposits at the inside of the wheel indicates leakage past oil seal between hub and spindle or a leaking wheel cylinder. Check operation of pressure relief fitting (7 1/2-15 lb. Al-umite) to see that it is functioning properly. To check condition of oil seal, remove hub from spindle. Replace seal if necessary and polish seal surface on spindle. A leaking wheel cylinder should be repaired with a wheel cylinder kit.
2. A noisy or wobbly wheel might indicate worn or badly adjusted wheel bearings. Remove hub and inspect bearings. Turn in inner bearing nut until wrench tight, then back off 1/8 turn and check to make sure wheel turns free.
3. Another cause of noise in the wheel might be worn or broken gears in the planetary reduction. Disassemble and check all gears and inspect planet gear needle bearings, pins, and thrust washers. Check mounting of ring gear spider. Replace worn or broken parts.
4. Hard or erratic steering may be caused by worn or badly adjusted trunnion bearings. Remove tie rod and raise wheel from floor. Turn wheel by hand through full turning angle to determine whether knuckle is excessively tight or loose. Disassemble knuckle and inspect bearings, replace if necessary. After assembly check torque required to turn knuckle with hub installed but wheel removed and seal on inner face of knuckle loosened. Torque should be between 20 and 25 foot pounds with wrench placed on bearing cap or steering arm mounting nut.

5. Excessive noise originating at the axle differential area can be caused by any one of several parts being worn or badly adjusted. Remove inspection cover and check backlash between ring gear and pinion. Inspect differential bearings, pinion bearing and condition of all gears. Refer to Section K through Section P, Planetary Axle, for disassembly and adjustment instructions.
6. An obvious break in the power train between the axle pinion and the wheel can be traced by removing the differential inspection cover. Turn the wheels to determine on which side of the differential a shaft or planetary gear failure has occurred.

## CHECKING PINION DEPTH

1. Coat the ring gear teeth lightly with red lead or prussian blue. Then turn the pinion shaft several revolutions in both directions.
2. Examine the pattern on the ring gear teeth. If the pinion depth is correct, the tooth pattern will be centered on the pitch line and toward the toe of the ring gear.
3. If the pattern is below the pitch line on the ring gear teeth, the pinion is too deep and it will be necessary to remove the pinion assembly and increase the shim thickness between the pinion bearing and the carrier.
4. If the pattern is above the pitch line on the ring gear teeth, the pinion is too shallow and it will be necessary to remove the pinion assembly and decrease the shim thickness between the pinion bearing and the carrier.
5. Changing the pinion depth will make some change in the backlash; therefore, it will be necessary to readjust the backlash.

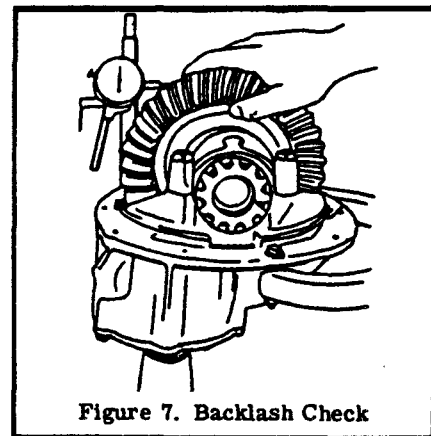


Figure 7. Backlash Check

## RING GEAR THRUST PAD ADJUSTMENT

1. Inspect bronze tip of thrust pad and, if worn, install a new one.
2. Install thrust pad and tighten screw until bronze tip engages back face of ring gear while rotating gear.
3. Back off screw one-twelfth (1/12), turn and tighten lock nut to 125 - 140 ft. lbs. Make sure screw does not turn during locking process. This adjustment provides .005" to .007" clearance between thrust pad and ring gear face.

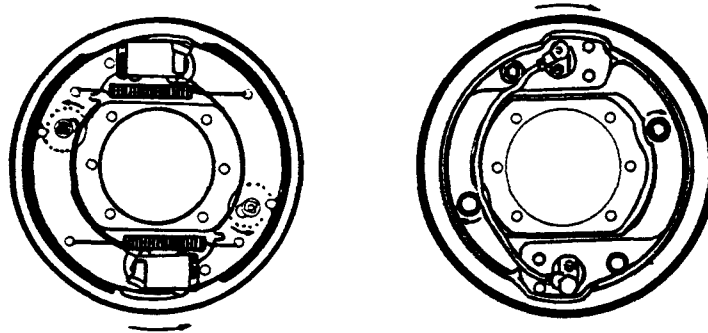
LUBRICATION CHART PLANETARY (STEERING) AXLE ASSEMBLY				
LUBRICATION POINT	INTERVAL	TYPE OF LUBRICATION	CAPACITY	REMARKS
HUB-PLANETARY AXLE	CHECK WEEKLY CHANGE EVERY 500 HRS.	OIL, SAE 90	2 1/2 Pints	FILL TO OIL LEVEL ON CAP-(2 1/2 PINTS)
DIFFERENTIAL	CHECK WEEKLY CHANGE EVERY 500 HRS.	OIL, SAE 90	11 PINTS	FILL TO OIL LEVEL HOLE (11 PINTS)
BALL END- STEERING AXLE	SERVICE WEEKLY	CHASSIS LUBRICANT	AS REQUIRED	REMOVE PLUG FROM BALL END FILL THRU FITTING UNTIL LUB- RICANT COMES OUT HOLE
STEERING CYLINDER BALL ENDS	SERVICE WEEKLY	CHASSIS LUBRICANT	AS REQUIRED	ONE FITTING ON EACH END
TIE ROD ENDS	SERVICE WEEKLY	CHASSIS LUBRICANT	AS REQUIRED	ONE FITTING ON EACH END
AIR VENTS-AXLE	CHECK WEEKLY			CLEAN IN SOLVENT
NOTE: THIS GUIDE IS FOR NORMAL OPERATING CONDITIONS - LUBRICATE MORE OFTEN UNDER SEVERE OPERATING CONDITIONS.				

MAINTENANCE INSTRUCTIONS  
#45212-L.H., #45213-R.H. BRAKE ASSEMBLY  
15" X 3"- STANDARD

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MAINTENANCE INSTRUCTIONS  
FOR

#45212-RIGHT HAND — [ BRAKE ASSEMBLY  
#45213-LEFT HAND — (15"x 3") (STANDARD)



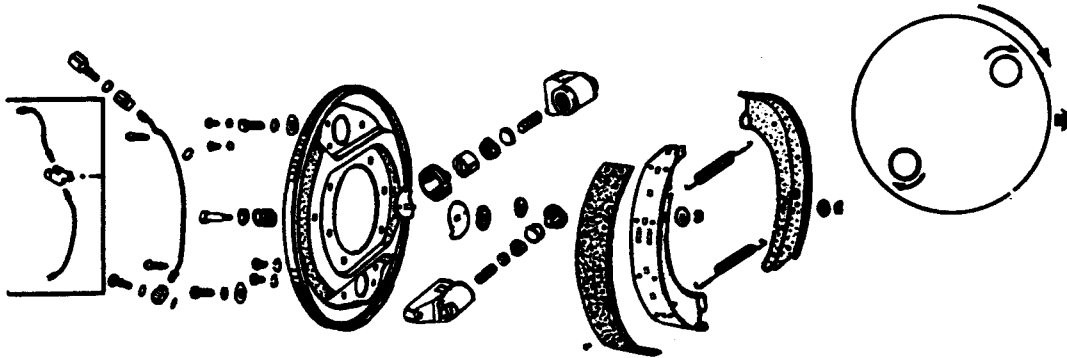
This Brake Assembly is equipped with two single-end wheel cylinders and self-centering shoes. The shoe heels and cylinders are diametrically opposite and the shoe anchor blocks are machined on the adjacent wheel-cylinder castings. Both shoes are de-energized by reverse drum rotation and energized by forward drum rotation, thus have wear patterns that are similar. Shoe adjusting cams maintain lining clearance, located near the toe of each shoe. Adjustment is maintained by means of a 5/8 inch hex-head stud, located on the back side of the backing plate, locked by means of a friction spring. Each shoe holddown consists of a pin extending from the shoe adjusting cam through a slot in shoe web. A spring clip ("C" washer) and plain washer hold the shoes in place.

DISASSEMBLY AND ASSEMBLY PROCEDURE

- (A.) Remove wheels and drums.
- (B.) Lift the shoes off the backing plate by removing "C" washers and retraction springs. Spring anti-rattle washers, located under each shoe web on the cam stud, can be lost when lifting the shoes off the backing plate and attention to this should be noted.
- (C.) By removing connector tube nuts, anchor bolts and mounting screws, wheel cylinders can be removed. To avoid errors at assembly, mark connector-tube ports on each wheel cylinder. Difficult bleeding may be expected if manifold tubing is installed incorrectly.
- (D.) Against the fresh drum surface, check fit of concentric-ground linings.
- (E.) Check backing plate and wheel cylinder bolts, making sure they are tight. While upper and lower wheel cylinders are the same, those for left-hand and right-hand brakes have opposite castings and must not be interchanged. The cylinder bore must face in the direction of forward rotation.
- (F.) Locate each retraction spring so that its long shank is connected into the heel of the shoe, when installing shoes.

**MAINTENANCE INSTRUCTIONS**  
**#45212-L.H., #45213-R.H. BRAKE ASSEMBLY**  
**15" X 3"- STANDARD**

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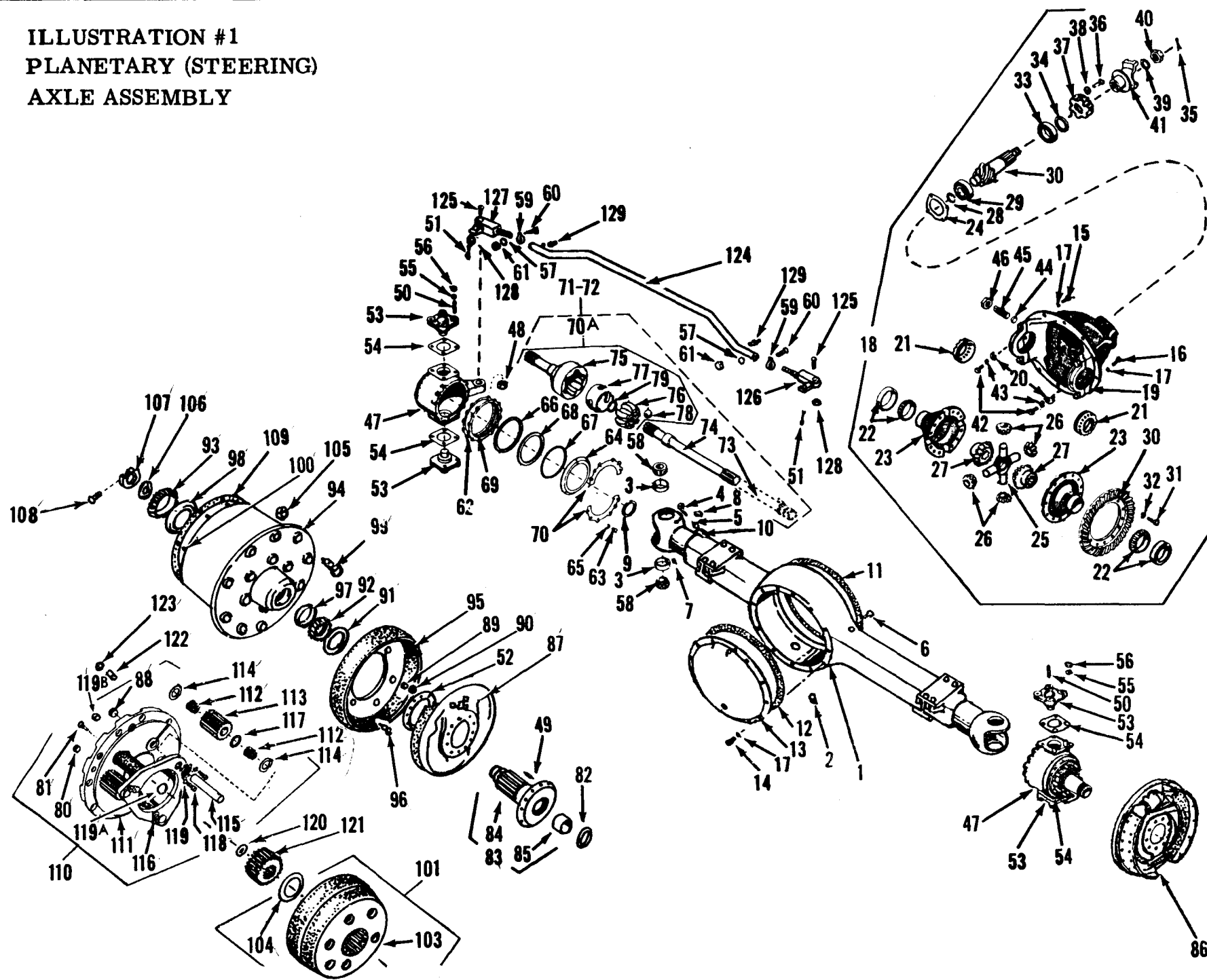


**LINING CLEARANCE ADJUSTMENT**

- (A.) To center the shoes, depress brake pedal several times.
- (B.) In direction of forward wheel rotation, rotate shoe-adjusting cam studs, one at a time, tightening until shoe drags on drum.
- (C.) While rotating the drum forward, back off slowly until drag is relieved. Then continue to back off approximately 1/8th turn for running clearance.
- (D.) Road test vehicle to check brake operation.

ILLUSTRATION #1  
PLANETARY (STEERING)  
AXLE ASSEMBLY

10



# PLANETARY (STEERING) AXLE ASSEMBLY-PS 1200

ITEM	DESCRIPTION	QUANTITY				PART NO.
		A	B	C	D	
	COMPLETE PLANETARY (STEERING) AXLE ASSEMBLY-PS 1200 (6.66 RATIO)	1				45180
1	Housing Assembly-Planetary Steering	1				45181
2	Plug-Magnetic Drain	1				501041
3	Cup-Bearing	4				10187
4	Bolt-Turning Stop	2				180147
5	Nut-Turning Stop	2				271501
6	Vent-Axle Air	1				10332
7	Plug-Ball End Grease	2				103885
8	Fitting-Lubrication	2				191758
9	Seal-Oil, Axle Shaft	2				125-39
10	Stop-Turning	2				130-179
11	Gasket-Differential Carrier	1				16-27
12	Gasket-Differential Cover	1				36379
13	Cover-Differential with Filler Plug	1				14-22
14	Bolt-Cover-7/16"-20 NF x 1" Hex Head	10				181666
15	Bolt-Carrier-7/16"-20 NF x 1 1/4" Hex Head	4				181668
16	Bolt-Carrier-7/16"-20 NF x 1 1/2" Hex Head	6				181670
17	Lockwasher-7/16" Heavy, Carrier and Cover Bolt	20				131100
18	Differential Assembly (6.66 RATIO)	1				45185
19	Carrier and Cap Assembly-Differential	1				37551-503
20	Lock-Differential Bearing Adjusting Nut	2				37570
21	Nut-Differential Side Bearing	2				37546
22	Bearing-Differential Side	2				10123
23	Differential Case and Cover Assembly	1				37547
24	Gasket-Pinion Oil Seal Bearing Retainer	1				37572
25	Spider-Differential Pinion	1				37574
26	Gear-Differential Pinion	4				26-116
27	Gear-Differential Side	2				26-115
28	Ring-Lock	1				37571
29	Bearing-Pinion Shaft Rear	1				10132
30	Ring Gear and Pinion Assembly (6.66 RATIO)	1				500996
31	Bolt-Differential Ring Gear	12				37573
32	Lockwasher-Ring Gear Bolt	12				131101
33	Bearing-Pinion Shaft Front	1				10134
34	Seal, Oil	1				502902

# PLANETARY (STEERING) AXLE ASSEMBLY-PS 1200

ITEM	DESCRIPTION	QUANTITY				PART NO.
		A	B	C	D	
35	Cotter Pin-Pinion Nut 1/8" x 1 3/4" Long	1				103388
36	Bolt-5/8"-11NC x 1 3/4" (Grade 8.)	6				223435
37	Retainer	1				37544
38	Lockwasher-5/8" Heavy	6				103331
39	Washer	1				14131
40	Nut-Pinion	1				14143
41	End Yoke	1				45200
42	Bolt-Bearing Adjusting Nut Lock	2				180075
43	Lockwasher-Lock Bolt, 5/16" Heavy	2				120638
44	Pad-Thrust	1				37543
45	Screw-Thrust Pad	1				37545
46	Nut-Thrust Pad Screw-7/8"-14 NF Jam	1				124954
47	Housing-Steering Knuckle (RH & LH)	2				76506
48	Bushing-Housing, Steering Knuckle	2				76585
49	Stud-Spindle to Knuckle	24				75474
50	Stud-Trunnion to Knuckle	16				14000
51	Cotter Pin-1/8" x 1 1/4" Long	2				103386
52	Deflector-Oil	2				75485
53	Trunnion	4				10159
54	Shim-Knuckle Bearing (.002)	AR				22-46A
	Shim-Knuckle Bearing (.005)	AR				22-46B
	Shim-Knuckle Bearing (.010)	AR				22-46C
55	Lockwasher-1/2" Heavy	16				131101
56	Nut-1/2"-20 NF Hex	16				120371
57	Lockwasher-5/8" Medium	2				103325
58	Cone-Bearing	4				10150
59	Clamp- Tie Rod	2				76795
60	Bolt-Hex Head, 5/8"-11NC x 2 3/4" Long	2				271565
61	Nut-Hex, 5/8"-11NC	2				102639
62	Gasket-Knuckle	2				10153
63	Bolt-Retainer, 5/16"-18 x 3/4" Long	24				122007
64	Ring-Split Retainer	2				10148
65	Lockwasher-Retainer, 5/16" Heavy	24				120638
66	Felt	2				10148
67	Spring	2				10144
68	Seal	2				10147
69	Flange	2				10149

# PLANETARY (STEERING) AXLE ASSEMBLY-PS 1200

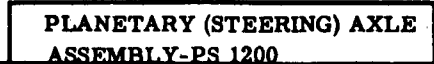
ITEM	DESCRIPTION	QUANTITY				PART NO.
		A	B	C	D	
70	Ring-Retainer Half	4				10145
70A	Joint Assembly (Includes Items #75 Through #79)	2				504673
71	Shaft and U-Joint Assembly (Long)(Includes Items #70A and #73)	1				45186
72	Shaft and U-Joint Assembly (Short) Includes Items #70A and #74)	1				45187
73	Shaft-Long	1				45188
74	Shaft-Short	1				45189
75	Bell-Outer Race	2				75414
76	Race-Inner	2				130-168
77	Cage	2				130-167
78	Ball	12				30-2
79	Ring-Snap	2				130-169
80	Plug-Pipe, 1/8 NPT	2				103883
81	Fitting-Vent, 1/8 NPT	2				502754
82	Seal-Oil, Axle Shaft	2				504384
83	Spindle Sub-Assembly (RH and LH) (Includes Items #82, #84, and #85)	2				78004
84	Spindle (RH and LH) (Not Serviceable Separately)	2				37917
85	Bushing-Spindle (RH & LH)	2				10170
86	Brake Assembly-(LH)-See Pages 16.17 For Parts Breakdown and Illustration.	1				45212
87	Brake Assembly-(RH)- See Pages 16.17 For Parts Breakdown and Illustration.	1				45213
88	Plug-Magnetic Drain, 1/2" NPT	2				501041
89	Nut-Spindle to Flange-7/16"-20 Hex, SAE Grade 8	24				456859
90	Lockwasher-Spindle to Flange-7/16" Medium, Cadum Plated	24				120383
91	Seal-Oil	2				500628
92	Cone-Bearing (Inner)	2				500626
93	Cone-Bearing (Outer)	2				501098
	Hub Sub-Assembly (Includes Items #94, #95, #96, #97, #98, #100 and #105.)	2				39527
94	Hub	2				37901
95	Drum-Brake	2				39521
96	Bolt-Nylok	12				500716
97	Cup-Bearing (Inner)	2				500624
98	Cup-Bearing (Outer)	2				181-41

# PLANETARY (STEERING) AXLE ASSEMBLY-PS 1200

PLANETARY (STEERING) AXLE  
ASSEMBLY-PS 1200

ITEM	DESCRIPTION	QUANTITY				PART NO.
		A	B	C	D	
99	Stud-Wheel, R. H.	20				34-108
100	Stud-Hub to Drive Flange-7/16"-1 3/4" Long	24				504438
101	Ring Gear Assembly (Includes Items #103 & #104)	2				39531
103	Gear-Ring	2				39511
104	Ring-Pilot	2				37915
105	Nut-Wheel	20				53-90
106	Spacer Ring	2				37922
107	Locknut-Bearing	2				37921
108	Capscrew-Soc. Head, 5/16"-24 NF x 2"	2				9421642
109	Gasket- 10 9/16" Dia. (.015) Thick	2				39534
110	Drive Flange and Planetary Gear Assembly	2				39525
111	Drive Flange	2				39508
112	Needle Bearing (Illustration Does Not Show Full Quantity. -50 Quantity Per Gear)	300				504658
113	Planet Gear	6				39520
114	Washer-Spacer	12				45178
115	Pin-Planet Gear	6				39518
116	Key-Planet Gear Pin	6				39517
117	Spacer-Planet Gear	6				45192
118	Soc. Head Cap Screw, 5/16"-18 x 5/8"	12				9421621
119	Int. Shakeproof Washer, 5/16"	12				115548
119A	Thrust Washer	2				37920
119B	Plug, Pipe-1/2"-14 NPT	2				444704
120	Gear-Sun	2				39519
121	Ring-Retainer	2				500632
122	Dowel-Tapered	24				504427
123	Locknut-7/16-20NF	24				272698
124	Tie Rod	1				45193
125	Bolt-Tie Rod	2				10199
126	Clevis-L. H.	1				45190
127	Clevis-R. H.	1				45191
128	Nut-Slotted Head, 5/8"-11 NC	2				109890
129	Fitting-Lubrication, 1/8" Straight	2				191758

1. *Journal of the American Medical Association*, 1997; 277: 1039-1043.

[illegible]

#45212-L. H. ; #45213-R. H. BRAKE ASS'Y. (15" x 3")

Complete #45212-L. H. ; #45213-R. H.  
Brake Assembly (15"x3")

ITEM	DESCRIPTION	QUANTITY				PART NO.
		A	B	C	D	
	COMPLETE BRAKE ASSEMBLY - L. H. (15"x3")					45212
	COMPLETE BRAKE ASSEMBLY - R. H. (15"x3")					45213
1	Plate Assembly-Brake Backing-R. H.	1				502766
	Plate Assembly-Brake Backing-L. H.	1				502767
2	Shoe And Lining Assembly (Includes Items #3, #4, #5)	2				502732
3	Shoe	2				502769
4	Lining	2				502770
5	Rivet	28				141-22
6	Shoe and Lining Assembly (Includes Items #7, #8, #9)	2				502732
7	Shoe	2				502769
8	Lining	2				502770
9	Rivet	28				141-22
10	Tube Assembly -Connecting	2				502771
11	Bolt-Fitting and Hose Connection	2				502772
12	Gasket	4				16-12
13	Fitting	4				141-122
14	Gasket	4				503241
15	Bolt	2				141-125
16	Spring Washer-Shoe Guide Lower	4				20-38
17	Cam-Shoe Adjusting	4				6-4
	Complete Wheel Cylinder Assembly-R. H.	2				502773
	Complete Wheel Cylinder Assembly-L. H.	2				502774
18	Wheel Cylinder Ass'y -Top L. H.	1				502733
	Wheel Cylinder Ass'y-Top R. H.	1				502734
18A	Wheel Cylinder Ass'y -Bottom L. H.	1				502735
	Wheel Cylinder Ass'y-Bottom R. H.	1				502736
19	Casting Assembly-Cylinder, L. H.	2				502776
	Casting Assembly-Cylinder, R. H.	2				502775
20	Screw-Bleeder, Cylinder	4				141-119
21	Boot	2				502777
22	Cup-Piston	2				166-26
23	Piston	2				141-26
24	Boot	2				502777
25	Cup-Piston	2				166-26

#45212-L. H.; #45213-R. H. BRAKE ASS'Y. (15" x 3")

Complete # 45212-L. H. # 45213- R. H  
Brake Assembly (15"x3")

ITEM	DESCRIPTION	QUANTITY				PART NO.
		A	B	C	D	
26	Piston	2				141-26
27	Spring-Cup	4				141-84
28	Filler Cap	4				502778
29	Spring-Adjusting Cam Stud	4				24-26
30	Stud-Adjusting Cam	4				502779
31	Washer-Adjusting Cam Stud	4				502780
32	Spring-Shoe Return	2				502781
33	Washer-Shoe Guide	4				20-39
34	"C" Washer-Shoe Guide	4				503242
35	Bolt- Cylinder Mounting-5/16"-18x 5/8" Hex Hd.	4				106324
36	Lockwasher-5/16" Medium	4				103320
37	Bolt-Cylinder Mounting 7/16"-20xl" Hex Hd.	2				100038
38	Lockwasher-7/16"	2				103322
*	Items Not Illustrated					
*	Wheel Cylinder Repair Kit (Contains 2 #502777 Boot and 2 #166-26 Cup.)	1				502782
*	Brake Lining Kit (Contains 4 #502770 Linings and 56 #141-22 Rivets)	1				502239

