HUDSON-ESSEX
SERVICE MANUAL

1926

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1926 Hudson-Essex Service Manual

I N D E X

HUDSON

SERVICE - REPAIRS

INDEX

Front Axle Group

Rear Axle Group

Spring Group

Steering Gear Group

Drag Link Group

Clutch Group

Transmission Group

INDEX—(Continued)

Pedal Control Group

Hand Control Group

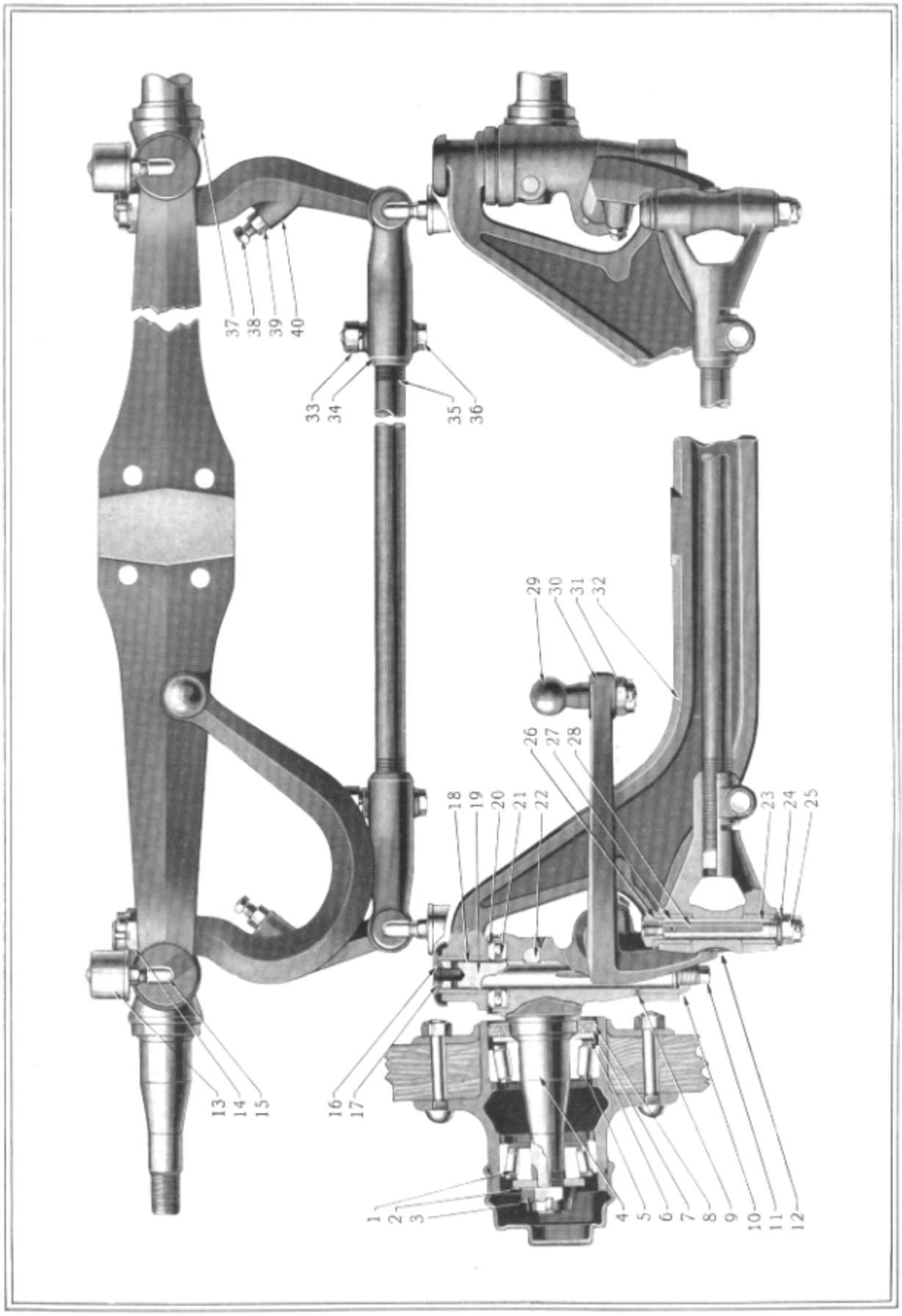
Universal Joint and Propeller Shaft Group

Carburetor Group

Motor Group

Hudson
Front Axle

Front Axle Group



Hudson Front Axle

Ref. No.	Name of Part
1.	Front wheel outer bearing
2.	Spindle washer
3.	Spindle nut
4.	Spindle-left hand
5.	Front wheel inner bearing
6.	Front wheel dust washer retainer-outer
7.	Front wheel dust washer
8.	Front wheel dust washer retainer-inner
9.	Spindle shim
10.	Spindle pivot pin lower bushing
11.	Lower bushing pipe plug
12.	Tie rod pivot pin lock
13.	Spindle pivot pin oiler
14.	Steering arm nut
15.	Pivot pin oiler elbow
16.	Pivot pin dust shield
17.	Pivot pin dust washer
18.	Spindle pivot pin upper bushing
19.	Spindle pivot pin
20.	Thrust bearing shield
21.	Thrust bearing
22.	Spindle pivot pin lock
23.	Tie rod pivot pin lower bushing
24.	Tie rod pivot pin washer
25.	Tie rod pivot pin nut
26.	Tie rod pivot pin shield
27.	Tie rod pivot pin upper bushing
28.	Tie rod pivot pin
29.	Steering arm ball
30.	Steering arm-left hand
31.	Steering arm ball nut
32.	Axle center
33.	Tie rod yoke clamp bolt nut
34.	Tie rod yoke
35.	Tie rod
36.	Tie rod clamp bolt
37.	Spindle-right hand
38.	Steering arm stop screw
39.	Steering arm stop screw nut
40.	Steering arm-right hand

(A) Renew Spindle Pivot Pin Bushings and Pins

1. Jack up or block up front end of car.

2. Remove front hub caps and spindle nuts (3); take off wheels.

3. Remove drag link front end boot, cotter pin and front end adjusting plug, then disconnect drag link from steering arm ball (29).

4. Remove cotter pins, nuts (25) and washers from bottom of tie rod pivot pins (28).

5. Drive out flat side lock pins (12) from steering arms, remove tie rod pivot pins and tie rod assembly.

6. Remove oil cup elbows (15), dust caps (16), and dust washers (17) from top of spindle pivot pins and pipe plugs (11) from lower bushings.

7. Drive out flat side lock pins (22) from spindles and drive out spindle pivot pins (19) with drift inserted through pipe plug holes in lower bushings, allowing spindles (4), thrust bearings (21), and shims (9) to be removed. Note: If spindle pivot pins are rusted or frozen in spindle, it will be necessary to force them out with the spindle pivot pin remover shown on page 32, service tool section.

8. Remove old bushings (10, 18) and insert new ones, using pivot pin bushing press shown on page 3, service tool section, which will prevent damage to the parts and insure proper alignment of the bushings so that the pivot pins will operate freely.

9. To reassemble, reverse above operations, making sure that pivot pins turn freely, without shake, and that the proper number of shims are inserted between bottom of spindle and top of lower bushing to eliminate up and down play.

(B) Renew Tie Rod Pivot Pin Bushings and Pins

1. Remove cotter pins, nuts (25) and washers from bottom of tie rod pivot pins (28).

2. Drive out tie rod pivot pin locks (12) from steering arms; take out pivot pins (2 8) and remove, tie rod assembly.

3. Remove old bushings (23, 27) from tie rod yokes and press in new ones, using bushing press shown on page 12, service tool section.

4. Reassemble parts to axle, by reversing the above operations.

(C) Straighten* or Replace Front Axle Center

*This procedure we do not recommend unless the axle center is only slightly bent and the proper equipment available to straighten it cold. Heating the axle to straighten it should be avoided, as this destroys the original heat treatment, with the result that the part is weakened and a satisfactory or lasting job is seldom obtained.

1. Raise front end of car with chain hoist or by jacks or blocking under frame side members, directly back of front springs.

2. Remove front hub caps, cotter pins and spindle nuts (3); take off front wheels.

3. Remove drag link front end boot, cotter pin and front end adjusting plug, then disconnect drag link from steering arm ball (29)..

4. Remove cotter pins, nuts (25) and washers from bottom of tie rod pivot pins (28).

5. Drive out tie rod pivot pin locks (12); take out pivot pins and tie rod assembly.

6. Remove oil cup elbows (15), dust caps (16), and dust washers (17), from top of spindle pivot pins, also pipe plugs (11) from bottom of lower bushings.

7. Drive out flat sided lock pins (22) from spindles and drive out spindle pivot pins (19) with drift inserted through pipe plug holes in lower bushings, allowing spindles, thrust bearings (21) and shims (9) to be removed. If the spindle pivot pin is rusted or frozen in the spindle, it should be removed with the spindle pivot pin remover shown on page 32, service tool section.

8. Remove front spring clip nuts, clips and rubber bumpers. This will release the front axle center (32), which may be removed and straightened or replaced with a new part. (See note above.) If the axle center is straightened, care must be exercised to have the pivot pins parallel to each other in all directions and perpendicular to the spring seats. It is very important that these points be observed, as they materially affect the steering of the car and tire wear.

9. To reassemble axle, reverse the above operations.

(D) Renew Front Wheel Bearings, Washers, or Retainers

1. Remove front hub caps, cotter pins and spindle nuts (3); take off front wheels.

2. Remove inner bearing cone and rolls from spindle, using bearing cone and roll puller shown on page 26 service tool section, if necessary; this will allow the removal of the felt washer retainers (6) and felt washers (7).

3. The bearing cups are best removed from the wheel hubs by the use of the bearing outer cup puller shown on page 14, service tool section, inserting the lugs of the puller through the openings in the inside flanges of the hubs, against which the cups seat. They may, however, be removed by inserting a drift through these openings and tapping on opposite sides lightly with a hammer. The new bearing cups should be fitted into position with the puller or by means of a soft hammer.

4. The parts may be reassembled by reversing the above operations, using care to make sure that the bearings are properly adjusted as outlined in Article "E."

(E) Adjust Front Wheel Bearings

1. Jack up car under front axle.

2. Remove front hub caps, and spindle nut cotter pins.

3. Adjust spindle nuts (3), so that when the wheel is grasped at the top and bottom, all perceptible play or looseness will be taken up. If the wheels do not turn freely after the cotter pins have been replaced, the spindle nuts should be backed off and the cotter pins inserted in the next notch, otherwise destruction of the bearings may result.

4. Add grease if necessary, and replace hub caps.

(F) Align Front Wheels

One of the most important factors governing the life of the front tires and ease of steering, is the alignment of the front wheels. In view of this, it is advisable to check the alignment of the wheels after front axle repairs have been made, or whenever there is a possibility of the parts having been damaged by skidding or accident.

The operation of checking wheel alignment is greatly simplified and the time reduced by the use of a wheel aligning gauge, similar to that shown in the equipment section. This instrument is used by telescoping it and inserting it between the tires, ahead of the front axle, so that the ends of the chains just touch the floor. The pointer should then be set to zero, and the car moved forward until the gauge is to the rear of the front axle, with the ends of the chains just touching the floor. The difference between the measurements taken between the inside of the tires ahead of and behind the axle, or the amount of toe-in, will then be immediately apparent by merely reading the scale on the gauge.

The distance between the inside of the tires at the rear, should be the same as the distance at the front, or range between that and 1/8” greater than the measurement at the front. If the toe-in or variation exceeds this amount or if the distance between the tires at the front is greater than the distance at the rear, the tie rod should be adjusted as follows:

1. Remove cotter pin, nut (25) and washer from tie rod pivot pin (28).

2. Drive out pivot pin lock (12), remove pivot pin and disconnect tie rod.

3. Loosen tie rod yoke clamp bolt (36), turn yoke (34) one complete turn to right if toe-in is too great, or to left if insufficient; drop tie rod pivot pin in place and check alignment. Repeated trials should be made if necessary, until the proper adjustment is obtained.

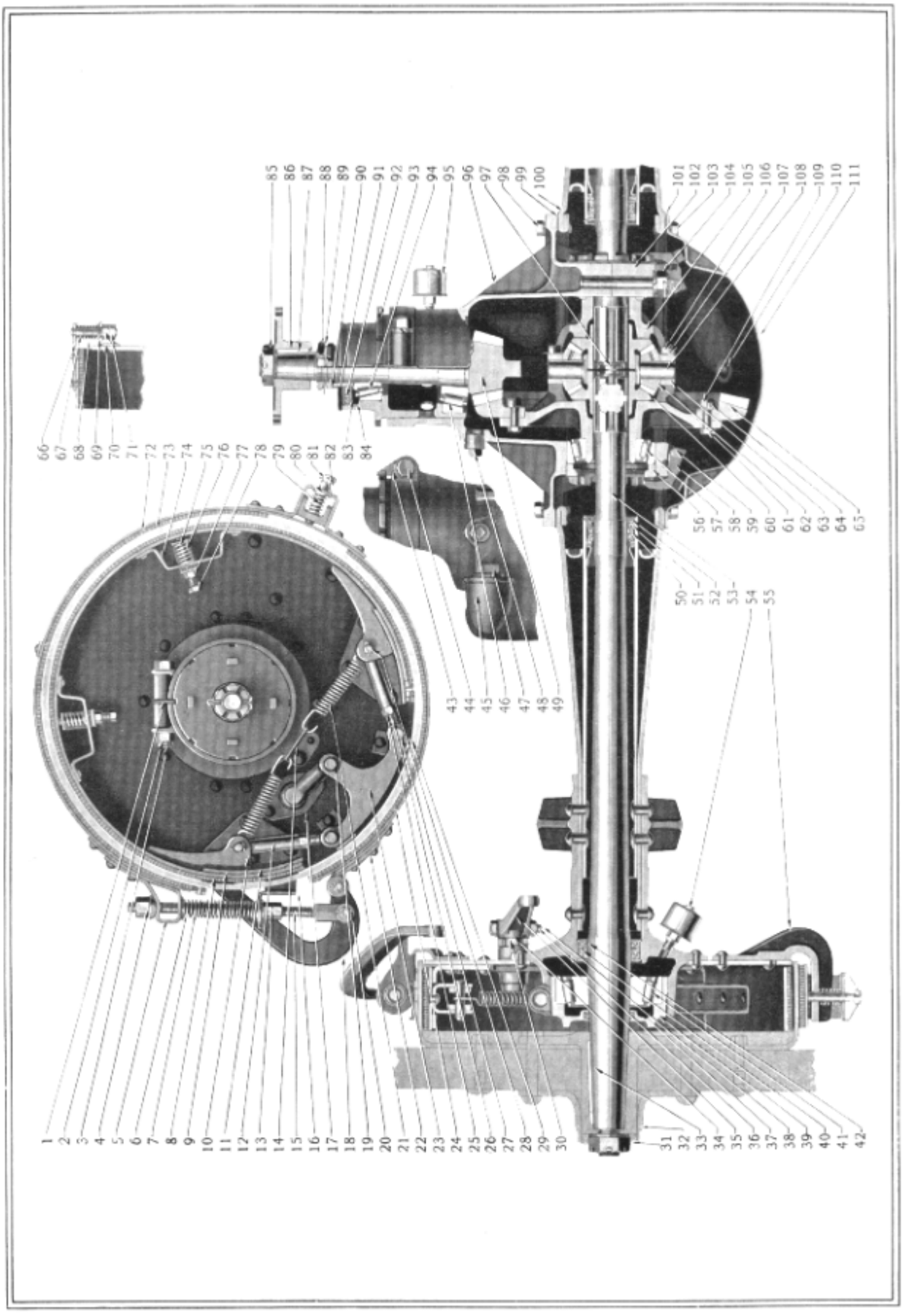
4. Replace tie rod, pivot pin, lock, washer, nut and cotter pin; tighten clamp bolt securely.

Hudson
Rear Axle

Springs

(See page 18)

Rear Axle Group



Hudson Rear Axle

Ref. No. Name of Part

1. Rear wheel bearing adjusting nut lock
2. Adjusting nut clamp bolt nut
3. Adjusting nut clamp bolt
4. Tension rod adjusting nut
5. External brake band upper bracket
6. Tension rod washer
7. Tension rod spring
8. Internal brake lining
9. Internal brake band
10. Internal brake band end bracket
11. Internal brake anchor bracket
12. Internal brake link
13. Tension rod nut
14. Internal brake spring clip
15. Tension rod
16. External brake bracket
17. Internal brake shaft bracket
18. External brake operating lever
19. Internal brake link clevis pin
20. Tension rod clevis pin
21. Internal brake main spring
22. External brake band lower bracket
23. Internal brake tie bar
24. External brake band
25. Internal brake adjusting link nut
26. Internal brake adjusting link
27. Internal brake adjusting link clevis pin
28. Internal brake band bracket clevis pin
29. Internal brake stop bracket
30. Internal brake shaft
31. Axle shaft nut
32. Rear wheel hub
33. Axle shaft key
34. Internal brake shaft bracket bushing
35. Internal brake operating lever
36. Operating lever clamp bolt nut
37. Wheel bearing adjusting nut felt washer
38. Internal brake operating lever clamp bolt
39. Rear wheel bearing adjusting nut
40. Axle drive shaft felt washer
41. Rear wheel bearing
42. Axle shaft felt washer
43. Pinion shaft bearing cage lock
44. Pinion shaft bearing cage clamp bolt
45. Oil filler elbow
46. Pinion shaft rear bearing
47. Oil filler elbow plug
48. Drive gear inspection plug
49. Drive pinion
50. Axle housing inner felt washer-small
51. Axle housing inner felt washer-large
52. Axle housing inner felt washer retainer
53. Axle shaft
54. Rear wheel bearing oiler
55. External brake anchor bracket
56. Differential bearing adjusting nut

Ref. No. Name of Part

57. Differential bearing
58. Differential bearing nut lock
59. Adjusting nut lock clevis pin
60. Differential gear
61. Drive gear bolt
62. Differential pinion
63. Differential case left hand
64. Drive gear bolt nut lock
65. Drive gear
66. External brake band spacer bar
67. Spacer stud
68. Spacer stud spring
69. Spacer stud washer
70. Spacer stud bracket
71. Spacer stud nut
72. Lining rivet
73. External brake lining
74. Internal brake spacer clip
75. Internal brake spacer bracket
76. Internal brake spacer spring
77. Internal brake spacer screw nut
78. Internal brake spacer screw
79. External brake anchor bracket spring
80. External brake band bracket-center
81. External brake anchor bracket screw
82. Anchor bracket screw lock
83. Pinion shaft felt washer retainer-front
84. Pinion shaft felt washer retainer-rear
85. Pinion shaft nut
86. Universal joint flange
87. Pinion shaft key
88. Pinion shaft adjusting sleeve lock nut
89. Pinion shaft adjusting sleeve nut lock
90. Pinion shaft adjusting sleeve
91. Pinion shaft dust collar
92. Pinion shaft felt washer
93. Pinion bearing cage
94. Pinion shaft front bearing
95. Pinion bearing oiler
96. Differential carrier
97. Axle shaft thrust plug
98. Differential carrier bolt
99. Differential carrier gasket
100. Rear axle housing
101. Housing cover gasket
102. Differential carrier cap
103. Housing cover screw
104. Differential carrier cap bolt
105. Differential case right hand
106. Differential case screw
107. Differential case screw lock
108. Differential spider
109. Drive gear bolt nut
110. Housing cover plug
111. Housing cover

(A) Repair or Renew Axle Housing

1. Jack up or block up car under rear springs ahead of rear axle, or raise rear end of car with chain hoist until car weight is off the rear springs.

2. Place receptacle under housing to catch lubricant, remove housing cover cap screws (103) and housing cover.

3. Remove rear hub caps, cotter pins and axle shaft nuts (31), pull rear wheels off axle shafts, using wheel puller shown on page 22, service tool section. Note: Be sure hand brakes are fully released before attempting to pull off wheels.

4. Remove clamp bolts (3) and bearing adjusting nut locks (1), unscrew bearing adjusting nuts (39), using bearing adjusting nut wrench shown on page 6, service tool section, pull out axle shafts and wheel bearings.

5. Remove clevis pins from internal and external brake operating levers (35, 18) and disconnect brake pull rods.

6. Remove flange bolts at rear universal joint and disconnect propeller shaft.

7. Place blocking or jacks under axle housing; takeoff rear spring clip nuts and plates, which will allow the lowering and removal of the axle from under car.

8. The axle may now be placed on a bench or axle stand, and the differential carrier and gear set assembly removed by taking off the cap screws (98), which secure it to the housing.

9. Remove external brake anchor bracket adjusting screw locks (82), adjusting screws (81) and springs (79).

10. Remove tension rod adjusting nuts (4), springs (7), and clevis pins (20).

11. Remove spacer stud nuts (71) and springs (68); this will permit the removal of the external brake bands.

12. Remove clamp bolts (38), take off internal brake operating levers (35).

13. Remove spacer bracket screws (78), springs (76), main springs (21) and adjusting link clevis pins (27); this will allow the removal of the internal brake bands and operating shafts (34).

14. Any necessary welding or riveting operations may, now be performed or new housing assembly installed and the axle reassembled, reversing the above operations, and making sure that the wheel bearings are properly adjusted as outlined in Article "N."

(B) Renew Carrier and Gear Set Assembly

1. Jack up or block up rear end of car.

2. Remove rear hub caps, cotter pins and axle shaft nuts (31), pull wheels off axle shafts, using wheel puller shown on page 22, service tool section. Note: Be sure hand brakes are fully released before attempting to pull off wheels.

3. Remove clamp bolts (3), bearing adjusting nut locks (1) and unscrew adjusting nuts (39), using bearing adjusting nut wrench shown on page 6, service tool section; pull out axle shafts and bearings.

4. Place receptacle under axle housing to catch lubricant, and remove lower carrier to housing cap screw (98).

5. Remove flange bolts at rear universal joint and disconnect propeller shaft.

6. Take off remaining screws holding carrier to axle housing and remove carrier and gear set assembly.

7. Install new carrier and gear set assembly and reassemble axle, reversing the above operations, and making sure that the wheel bearings are properly adjusted as detailed in Article "N."

(C) Renew Axle Drive Shaft

1. Jack up or block up car under rear axle.

2. Remove rear hubcap, cotter pin and axle shaft nut (31); pull wheel off axle shaft, using wheel puller shown on page 22, service tool section. Note: Be sure hand brakes are fully released before attempting to pull off wheels.

3. Remove clamp bolts (3), bearing adjusting nut locks (1), and unscrew bearing adjusting nuts (39), using bearing adjusting nut wrench shown on page 6, service tool section; pull out axle shafts and wheel bearings. Note: It is occasionally necessary, in the case of a broken axle shaft, to remove the shaft on the opposite side as well, so that a rod may be inserted to push out the inner part of the broken shaft.

4. Press bearing cone and rolls off axle shaft and install on new shaft, using arbor press, or bearing cone and roll puller shown on page 6, service tool section. If these are not available, this may be done by holding the shaft in a vertical position with the tapered end downward, and tapping upper side of cone with hammer and brass rod.

5. Install new shaft and reassemble axle, reversing above operations.

(D) Renew Differential Carrier

1. Jack up or block up car under rear axle.

2. Remove rear hub caps, cotter pins and axle shaft nuts (31); pull rear wheels off axle shafts, using puller shown on page 22, service tool section. Note: Be sure hand brakes are fully released before attempting to pull off wheels.

3. Remove clamp bolts (3) and bearing adjusting nut locks (1), unscrew bearing adjusting nuts (39), using bearing adjusting nut wrench shown on page 6, service tool section; pull out axle shafts and bearings.

4. Remove lower carrier to housing cap screw (98) and drain lubricant.

5. Remove flange bolts at rear universal joint and disconnect propeller shaft.

6. Take off remaining screws holding carrier to axle housing, remove carrier and gear set assembly and place on bench or stand.

7. Remove carrier cap bolts (104), and caps (102); take out differential and drive gear assembly.

8. Remove pinion bearing cage clamp bolt (44) and lock (43) from front of carrier, unscrew drive pinion cage (93), using spanner wrench shown on page 22, service tool section.

9. Fit new carrier and reassemble axle by reversing the above operations. Make sure that the pinion shaft, differential and wheel bearings, also drive gear and pinion are properly adjusted and lubricant added, as covered in Articles "L," "M" and "N."

(E) Renew Wheel Bearing

1. Jack up or block up car under rear axle.

2. Remove rear hub cap, cotter pin and axle shaft nut (31); pull rear wheel off axle shaft, using wheel puller shown on page 22, service tool section. Note: Be sure hand brakes are fully released before attempting to pull off wheel.

3. Remove clamp bolt (3) and bearing adjusting nut lock (1), unscrew bearing adjusting nut (39), using bearing adjusting nut wrench shown on page 6, service tool section; pull out axle shaft and bearing.

4. Press bearing cone and rolls off axle shaft, using arbor press or bearing cone and rod puller shown on page 6, service tool section. If these are not available, this may be done by holding the shaft in a vertical position with the tapered end downward, and tapping upper side of cone with hammer and brass rod.

5. Fit new bearing cone to axle shaft taper, first making sure that cone and shaft are clean and free from burrs which might prevent the bearing from seating properly.

6. Remove bearing outer cup from adjusting nut, by screwing adjusting nut back into axle housing, and tapping cup loose by means of a punch or short piece of 7/32" rod, inserted through opposite holes drilled near edge of nut. When doing this, care should be taken to tap the bearing cup alternately through each hole, to insure its coming out straight.

7. Clean thoroughly inside of adjusting nut and new outer cup. The pressing in place of the cup is best done in an arbor press; however, if care is used a satisfactory job can be done with the aid of a large vise or soft hammer. In performing this operation, it is very essential that the inner side of the cup, when pressed in place, is parallel with the inside of the adjusting nut; otherwise, the binding which will take place when assembled in the axle may cause the destruction of the bearing.

8. The parts may now be reassembled by reversing operations 1, 2, and 3. The rear wheel bearings should be adjusted to allow an end play in the axle shafts of approximately .005" to .010". In addition, it is necessary that the adjusting nuts be screwed into the axle the same distance on each side to guard against interference between the brake drums and support brackets.

(F) Renew Drive Gear and Pinion, Differential Bearings or Pinion Shaft Bearings

1. Jack up or block up car under rear axle.

2. Remove hub caps, cotter pins and axle shaft nuts (3 1), pull wheels off axle shafts, using wheel puller shown on page 22, service tool section. Note-Be sure hand brakes are fully released before attempting to pull off wheels.

3. Remove clamp bolts (3) and bearing adjusting nut lock (1), unscrew bearing adjusting nuts (39), using bearing adjusting nut wrench shown on page 6, service tool section; pull out axle shafts and bearings.

4. Remove lower carrier to housing cap screw (98) and drain lubricant.

5. Remove flange bolts at rear universal joint and disconnect propeller shaft.

6. Take off remaining screws holding carrier to axle housing; remove carrier and gear set assembly and place on bench or stand.

7. Take off cap bolts (104) and caps (102); remove differential and drive gear assembly.

8. If new differential bearings are to be fitted, remove cone and rolls from differential case hubs and install new ones, using bearing cone and roll puller shown on page 5, service tool section.

9. Bend over ears on drive gear bolt nut locks (64), remove nuts (109) and bolts (61); take off drive gear.

10. Thoroughly clean differential case flange, also flange of new drive gear of chips and foreign matter; place gear in position and insert bolts. Fit new nut locks if necessary, draw up bolts securely and bend over nut lock ears.

11. Remove pinion bearing cage clamp bolt (44) and lock (43) from front end of carrier and unscrew pinion bearing cage (93), using spanner wrench shown on page 22, service tool section.

12. Remove cotter pin and nut (85) from front end of pinion shaft and pull off universal joint flange (86), using universal joint flange puller shown on page 6, service tool section.

13. Bend over lugs on pinion shaft nut lock (89), remove lock nut (88), nut lock (89), adjusting nut (90), drive pinion and bearings.

14. Remove bearing cone and rolls from pinion shaft, using puller shown on page 5, service tool section, and press onto new drive pinion, or fit new bearing cone and rolls on old pinion if bearings are to be renewed.

15. Remove old bearing outer cups from pinion cage (93) using bearing race puller shown on page 5, service tool section, or by holding cage in upright position, and driving out cups by means of a long drift or piece of steel, inserted through opposite slots in inside flanges against which bearing cups seat.

16. Clean thoroughly inside of bearing cage and new outer cups. An arbor press or bearing race puller should be used when pressing the new cups into position; however, a soft hammer may be used to drive them in place, provided care is taken to start them straight, and tap evenly all around the edges of the cups.

17. The axle may now be reassembled by reversing operations 1 to 13, making sure that parts are properly lubricated and the pinion shaft, differential and wheel bearings, also drive gear and pinion, are properly adjusted as outlined in Articles "L," "M" and “N”.

(G) Renew Pinion Shaft Felt Washer

1. Remove flange bolts at rear universal joint and disconnect propeller shaft.

2. Remove cotter pin and nut (85) from pinion shaft and pull off universal joint flange (86) using universal joint flange puller shown on page 6, service tool section.

3. Straighten lugs on pinion shaft nut lock (89) remove lock nut (88) and adjusting nut (90)

4. Remove felt washer retainer (83) using felt washer retainer puller. If no puller is available, insert hooked tool or offset screwdriver behind retainer, removing same by prying evenly around inside edge.

5. Remove felt washer (92) and replace with new part; straighten or replace retainer if damaged in removing, and tap in position.

6. To reassemble parts, reverse operations 1, 2 and 3, making sure that the drive gear and pinion, also pinion shaft bearings, are properly adjusted as outlined in Articles "L" and "M."

(H) Renew Axle Shaft Felt Washers

1. Jack up or block up car under rear axle.

2. Remove rear hub caps, cotter pins and axle shaft nuts (31), pull wheels off axle shafts, using wheel puller shown on page 22, service tool section. Note: Be sure hand brakes are fully released before attempting to pull off wheels.

3. Remove clamp bolts (3) and bearing adjusting nut locks (1), unscrew bearing adjusting nuts (39), using bearing adjusting nut wrench shown on page 6, service tool section; pull out axle shafts and bearings.

4. Remove felt washer (42, 37) from axle and bearing adjusting nuts and replace with new parts.

5. To reassemble parts to axle, reverse the above operations, making sure that the wheel bearings are properly adjusted as outlined in Article "N."

(I) Renew Differential Case Gears, Pinions or Spider

1. Jack up or block up car under rear axle.

2. Remove rear hub caps, cotter pins and axle shaft nuts (31), pull wheels off axle shafts, using wheel puller shown on page 22, service tool section. Note: Be sure hand brakes are fully released before attempting to pull off wheels.

3. Remove clamp bolts (3) and bearing adjusting nut locks (1); unscrew bearing adjusting nuts (39), pull out axle shafts and wheel bearings.

4. Place receptacle under housing to catch lubricant, remove housing cover screws (103) and take off cover.

5. Remove carrier cap bolts (104), caps (102) and adjusting nuts (56); take out differential and drive gear assembly.

6. Place differential assembly on bench; bend back lugs on bolt locks (107), remove screws (106) and take apart case.

7. Replace case or any other differential parts which require renewal.

8. To reassemble parts to axle, reverse the above operations, using care to see that the drive gear and pinion, differential bearings and wheel bearings are properly adjusted as outlined in Articles "M" and "N."

(J) Reline Internal Brakes

1. Jack up or block up car under rear axle.

2. Remove rear hub caps, cotter pins and axle shaft nuts (31); pull wheels off axle shafts, using wheel puller shown on page 22, service tool section. Note: Be sure hand brakes are fully released before attempting to pull off wheels.

3. Remove clevis pins from external brake operating levers (18) and disconnect brake pull rods.

4. Remove clevis pins (20) and adjusting nuts (4) from tension rods; take off tension rods (15) and springs (7).

5. Remove lock wires (82), adjusting screws (81) and springs (79) from anchor brackets.

6. Remove nuts (71) and springs (68) from spacer studs (67); this will release external brake bands, which may now be removed.

7. Remove internal brake main springs (21).

8. Remove clevis pins (27) from adjustable links (26).

9. Remove internal brake spacer clip adjusting screws (78) and springs (76); take off internal brake bands.

10. Drive out lining rivets and remove old lining; fit new lining, making sure that it conforms to the curvature of the brake bands and that the rivet holes are countersunk sufficiently to allow the rivet heads to set well beneath the surface.

11. To reassemble parts to axle, reverse the above operations. Make sure that the brakes are properly adjusted as detailed in Articles "O" and "P."

(K) Reline External Brakes

1. Jack up or block up car under rear axle.

2. Remove rear hub caps, cotter pins and axle shaft nuts (31); pull wheels off axle shafts, using wheel puller shown on page 22, service tool section. Note: Be sure hand brakes are fully released before attempting to pull off wheels.

3. Remove clevis pins from external brake operating levers (18) and disconnect pull rods.

4. Remove clevis pins (20) and adjusting nuts (4) from tension rods, take off tension rods (15) and springs (7).

5. Remove lock wires (82), adjusting screws (81) and springs (79) from anchor brackets.

6. Remove nuts (71) and springs (68) from spacer studs (67); this will release external brake bands, which now may be removed.

7. Drive out lining rivets and remove old lining; fit new lining, making sure that it conforms to the curvature of the brake bands, and that the rivet holes are countersunk sufficiently to allow the rivet heads to set well beneath the surface.

8. To reassemble parts to axle, reverse the above operations. Make sure that the brakes are Proverlv adiusted as outlined in Articles "O" and "P."

(L) Adjust Drive Pinion Bearings

1. Straighten lugs on nut lock (89) and loosen lock nut (88).

2. Turn adjusting nut (90) until all perceptible play or looseness in the bearings is taken up, using care to see that they are not adjusted too tightly.

3. Tighten lock nut (88), then test bearing adjusting to make sure it has not been disturbed.

4. Bend over lugs on nut lock (89), locking adjusting and lock nuts in position.

(M) Adjust Drive Gear and Pinion and Differential Bearings

1. Make sure drive pinion bearings are properly adjusted as outlined in Article

2. Remove inspection plug (48) in side of carrier and examine position of drive gear and pinion.

3. Remove clamp bolt (44) and pinion bearing cage lock (43), from front of carrier.

4. Engage spanner wrench shown on page 22, service tool section, with slots in flange of pinion bearing cage (93); turn cage in housing until back face of drive pinion teeth is flush with outside face of drive gear teeth.

When in this position, the backlash or play between the drive gear and pinion teeth should be approximately .006” to .008”. If the backlash is greater or less than this amount, it will be necessary to adjust the differential and drive gear, which is accomplished as follows:

5. Place receptacle under housing to catch lubricant, remove housing cover cap screws (103) and cover.

6. Disengage adjusting nut locks (58) from slots in adjusting nuts, and loosen cap bolts (104) very slightly.

7. Back off adjusting nut (56) (R. H. if backlash is excessive, L. H. if insufficient) by turning to left or anti-clockwise.

8. Turn adjusting nut (L. H. if backlash is excessive, R. H. if insufficient) to right or clockwise, until required amount of play is present between drive gear and pinion teeth.

9. Turn adjusting nut (R. H. if backlash is excessive, L. H. if insufficient) to right or clockwise, until all perceptible looseness in differential bearings is taken up, using care to see that they are not adjusted too tightly.

10. Tighten cap bolts and wire heads, place nut locks in position; then inspect gear and bearing adjustments to see that they have not been disturbed.

11. Replace pinion bearing cage lock and clamp bolt at front of carrier.

12. Replace inspection plug in side of carrier.

13. Replace housing cover and fill housing with lubricant to level of pipe plug opening in cover.

14. The car should now be driven and results noted. If the axle is still noisy, it will be necessary to remove clamp bolt (44) and pinion bearing cage locks (43). Turn pinion bearing cage until next notch is in position, by means of spanner wrench, then replace lock and bolt. Repeated trials should be made if necessary, moving the bearing cage adjustment a notch at a time in either direction, until satisfactory results are obtained.

(N) Adjust Rear Wheel Bearings

1. Jack up or block up car under rear axle.

2. Remove rear hub caps, cotter pins and axle shaft nuts (31); pull wheels off axle shafts, using wheel puller shown on page 22, service tool section. Note: Be sure hand brakes are fully released before attempting to pull off wheels.

3. Remove clamp bolts (3) and bearing adjusting nut locks (1).

4. Adjust wheel bearings, turning adjusting nuts (39) to right or clockwise to tighten or to left or anti-clockwise to loosen, using wheel bearing adjusting nut wrench shown on page 22, service tool section. In making this adjustment it is important that an end play of from .005” to .010” remain in the axle shafts and that the adjusting nuts be screwed into the housing approximately the same distance on each side, to prevent interference between the brake drums and support brackets.

5. Reassemble, reversing operations 1, 2 and 3.

(O) Adjust Foot Brakes

1. Make sure external brake operating levers (18) rest against support brackets (16) when brakes are fully released.
With the operating levers in this position, the cross shaft levers should point to the ear at an angle of about 30º from the vertical. If they do not, it will be necessary to adjust as follows:

2. Disconnect cross shaft to rear axle pull rods by removing clevis pins from yokes at rear end.

3. Adjust stop screw at lower part of brake pedal so there will be approximately 1/4” clearance between pedal and toe board in fully released position.

4. Lengthen or shorten rod connecting brake pedal to equalizer bar, by loosening lock nuts and turning adjusting turnbuckle to right or left until cross shaft levers are in the position indicated in operation 1.

5. Lengthen or shorten rods connecting cross shaft to rear axle brake operating levers, by turning adjusting yokes to right or left until rods are correct length; then tighten lock nuts and replace clevis and cotter pins.

6. Remove lock wires (82) from anchor bracket screw heads.

7. Adjust anchor bracket screws (81) so that external brake bands just clear the brake drums at these points and replace lock wires.

8. Loosen lock nuts and turn tension rod nuts (13) down until lower halves of brake bands are raised sufficiently to just clear brake drums, then tighten lock nuts.

9. Turn tension rod adjusting nuts (4) down until the upper halves of the brake bands also just clear the brake drums.

10. Inspect adjustment of external brake spacer studs (67), and if necessary, loosen lock nuts (71) and adjust, so that with brakes fully released, the brake bands will be raised clear of the drums.

11. Test adjustments, by turning wheels by hand to make sure there is no tendency for the brakes to drag.

(P) Adjust Hand Brakes

1. Jack up or block up car under rear axle.

2. Remove rear hub caps, cotter pins and axle shaft nuts (3 1), pull wheels off axle shafts, using wheel puller shown on page 22, service tool section. Note: Be sure hand brakes are fully released before attempting to pull off wheels.

3. Make sure internal brake tie bars (23), rest against stop brackets (29), when the hand brake lever is fully released. With the tie bars and hand brake lever in this position, the internal brake cross shaft levers should point to the rear, at an angle of about 30º from the vertical. If they do not, it will be necessary to adjust, as follows:

4. Loosen lock nuts on pull rod connecting cross shaft to hand brake lever, turn turnbuckle to right or left as necessary until cross shaft levers are at proper angle, then tighten lock nuts.

5. Lengthen or shorten pull rods connecting cross shaft levers with rear axle internal brake shaft levers, by turning adjusting yokes to right or left until brake tie bars are in the position indicated in operation No. 3.

6. Place in position on axle shaft, brake band aligning fixture shown on page 22, service tool section.

7. Loosen spacer clip adjusting screw nuts (77) and turn adjusting screws (78) until brake bands just clear the drums at these points, then tighten nuts.

8. Remove clevis pins (27) from adjusting links (26).

9. Loosen link nuts (25) and expand brake bands until they just clear the brake drums, by turning adjusting links (26) to left or anti-clockwise.

10. Tighten lock nuts, replace clevis and cotter pins, then remove aligning fixture after turning same by hand to make sure the brake bands do not drag.

11. Place rear wheels in position, but do not draw them up tight on axle shaft taper. Pull up hand brake lever a notch at a time, grasping the rear wheels, and noting whether or not the braking effort is equal on both sides. If one wheel offers less resistance to turning than the other, it should be taken off and the brake bands expanded further, as outlined in operations 8, 9 and 10.

12. After the brakes have been properly adjusted and equalized, the parts may be reassembled by reversing operations No. 1 and 2.

Springs

(A) Renew Front Spring Assembly

1. Raise front end of car with chain hoist or by jacks or blocking under frame side members directly back of front springs, until weight of car is off springs.

2. Remove nuts from front spring clips and take off clips.

3. Remove cotter pins and nuts from front end and shackle bolts, take out bolts and shims; this will allow the removal of the front spring assembly.

4. Install new spring assembly, reversing operations 1, 2 and 3, making sure that the spring clip nuts are securely tightened. It is essential, when reassembling front end and shackle bolts, to draw the nuts up tight and then back them off 1/6th of a turn before inserting cotter pins to take up side play and insure freedom of spring action.

(B) Renew Front Spring Bushings

1. Raise up front end of car with hoist or by jacks or blocking under frame side members, directly back of front springs so that weight of car is off springs.

2. Remove nuts from bottom of clips holding spring to front axle and take off front spring clips.

3. Remove cotter pins and nuts from front end and shackle bolts, take out bolts and front end shims; this will allow the removal of the spring assembly.

4. Press out old bushings and insert new ones, using spring bushing remover shown on page 12, service tool section. If necessary, use 11/16” expansion reamer to bring bushings to size after pressing in place. When pressing rear bushings in position, be sure oil holes in bushings line up with holes in spring leaves.

5. Install springs on car, reversing operations 1, 2, and 3, making sure that spring clip nuts are securely tightened. When tightening front spring front end bolts, it is essential that the nuts be drawn up tight and then backed off 1/6th of a turn before inserting cotter pin, so that side play will be eliminated without interfering with the spring action. The rear end or shackle bolts should be backed off 1/6th of a turn after tightly screwing them into shackles; then tighten lock nut securely.

(C) Renew Rear Springs or Rear Spring Bushings

1. Raise rear end of car with hoist, or by jacks or blocking under frame ahead of rear springs, so that weight of car is just off springs.

2. Remove nuts and lock nuts from bottom of clips holding spring to rear axle and take off spring clip plate.

3. Remove cotter pin and nut from rear spring front end bolt, take out bolt and shims.

4. Remove nut and lock washer from rear end or shackle bolt and unscrew bolt out of shackle; this will allow the removal of the rear spring, which may be renewed or rebushed as necessary.

5. If spring is to be rebushed, press out old bushings and insert new ones, using spring bushing remover shown on page 12, service tool section. If necessary to bring bushings to size after pressing them in place, use 3/4” expansion reamer on front end bushing and 11/16” reamer on rear end bushing.

6. Install spring on car, reversing operations 1 to 4 inclusive, making sure that rear spring clip nuts and lock nuts are drawn up tightly. When assembling front end bolt,

care must be taken to back off the nut 1/6th of a turn after tightening, before inserting cotter pin, to insure free spring action. In like manner, the rear or shackle bolt should be backed off slightly after being tightly screwed into the shackle and before tightening lock nut.

(D) Remove Side Play from Front or Rear Springs

1. Remove cotter pins from ends of front and rear spring front end bolts.

2. Draw up front and rear spring front end bolt nuts tightly, then back them off 1/6th of a turn so that all side play will be eliminated without any tendency for the springs to bind.

3. Replace and spread cotter pins.

4. Loosen lock nuts on shackle bolts at rear ends of front and rear springs.

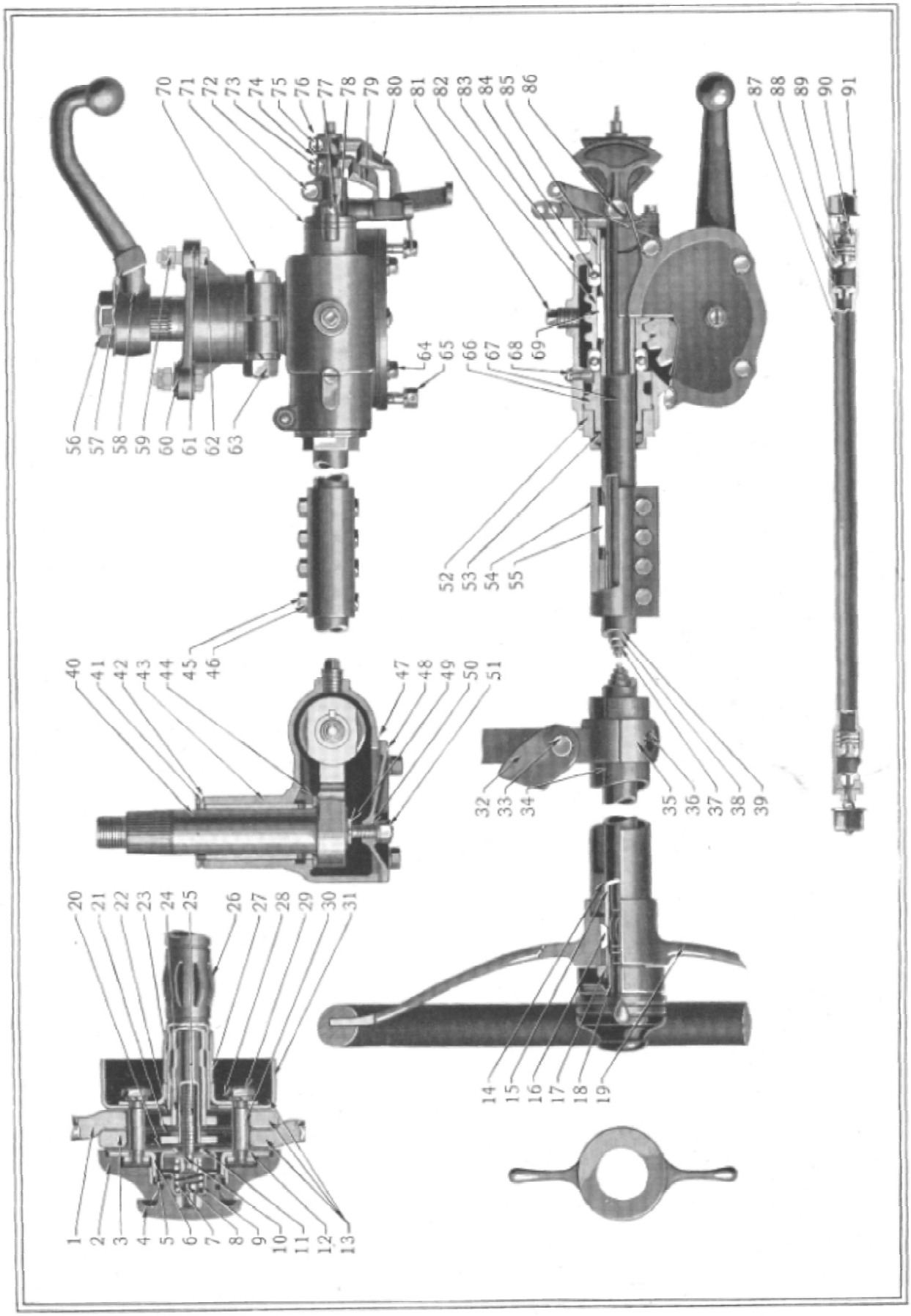
5. Screw shackle bolts tightly into shackles, then back them off slightly and tighten lock nuts securely. After tightening lock nuts, test spring action to make sure there is no tendency to bind.

Hudson
Steering Gear

Drag Link

(See page 28)

Steering Gear Group



Steering Gear

Ref. No.	Name of Part
I .	Throttle control hand lever
2.	Control cover
3.	Spark hand lever
4.	Horn button
5.	Horn button lock ring
6.	Control cover plate
7.	Horn button spring
8.	Horn button screw
9.	Horn button spring retainer
10.	Horn wire terminal
11.	Horn button contact cup
12.	Stud nut-upper
13.	Friction washer
14.	Jacket tube bushing
15.	Main tube-upper
16.	Steering wheel key
17.	Main tube nut
18.	Sector tube plate
19.	Steering wheel
20.	Spark tube plate
21.	Compression washer
22.	Throttle tube plate
23.	Throttle tube
24.	Spark tube
25.	Horn wire
26.	Sector tube silencer
27.	Sector tube bushing
28.	Stud nut washer
29.	Stud nut-lower
30.	Stud
31.	Control base
32.	Jacket tube cowl bracket
33.	Cowl bracket bolt
34.	Jacket tube
35.	Jacket tube bracket
36.	Jacket tube bracket screw
37.	Spark tube
38.	Throttle tube
39.	Sector tube
40.	Worm wheel and shaft
41.	Worm wheel bushing lock pin
42.	Lock pin retaining wire
43.	Worm wheel bushing
44.	Worm wheel thrust washer-large
45.	Main tube coupling bolt
46.	Coupling bolt nut
47.	Case cover gasket
48.	Case cover
49.	Worm wheel thrust washer-small
50.	Thrust washer adjusting screw
51.	Adjusting screw lock nut
52.	Thrust bearing adjusting nut
53.	Adjusting nut felt washer
54.	Main tube coupling
55.	Coupling key
56.	Worm wheel shaft nut
57.	Nut lock
58.	Steering gear lever
59.	Steering gear frame bolt nut
60.	Steering gear bracket spacer
61.	Steering gear frame bracket
62.	Frame bracket bolt
63.	Frame bracket clamp bolt nut
64.	Case cover bolt-short
65.	Case cover bolt-long
66.	Steering case upper bushing
67.	Main tube lower
68.	Upper bushing dowel screw
69.	Main tube lower key
70.	Frame bracket clamp bolt
71.	Sector tube clamp bracket gasket
72.	Sector tube clamp bracket bolt
73.	Throttle tube pinion screw
74.	Throttle tube pinion
75.	Spark tube pinion screw
76.	Spark tube pinion
77.	Sector tube clamp bracket screw
78.	Sector tube clamp bracket
79.	Throttle control sector
80.	Spark control sector
81.	Steering gear case plug
82.	Steering worm
83.	Steering gear case
84.	Thrust bearing
85.	Steering case lower bushing
86.	Control sector shoulder bolt
87.	Drag link
88.	Drag link ball seat
89.	Drag link spring
90.	Drag link plug
91.	Drag link oiler

(A) Renew Case and Gear Complete

1. Loosen clamp screws (75, 73) in spark and throttle control pinions and remove pinions (76, 74).

2. Loosen sector tube bracket clamp bolt (72).

3. Disconnect at horn terminal, wire (25) leading from steering gear horn button to horn.

4. Remove screws (36) and cap from jacket tube bracket (35).

5. Loosen main tube coupling bolts (45).

6. Disconnect upper and lower main tubes (15, 67) by grasping steering wheel and pulling column assembly upward, until spark tube is clear of lower main tube.

7. Remove bolts (65) from case cover (48), takeoff bracket supporting spark, throttle and oil control rods and levers.

8. Straighten lugs on nut lock (57) and remove nut (56) from worm wheel shaft.

9. Pull steering gear lever (58) off taper on worm wheel shaft, using puller shown on page 18, service tool section.

10. Remove nuts (59) and bolts (62) holding steering gear frame bracket (61) to frame; this will allow the removal of the lower case and gear assembly.

11. Install new case and gear assembly and reassemble, reversing the above operations.

(B) Renew Upper and Lower Case and Worm Wheel Bushings, Worm Wheel or Thrust Washers

1 . Loosen clamp screws (75, 73) in spark and throttle control pinions and remove pinions (76, 74).

2. Loosen sector tube bracket clamp bolt (72).

3. Disconnect at horn terminal, wire (25) leading from steering gear horn button to horn.

4. Remove screws (36) and cap from jacket tube bracket (35).

5. Loosen main tube coupling bolts (45).

6. Disconnect upper and lower main tubes (15, 67), by grasping steering wheel and pulling column assembly upward, until spark tube is clear of lower main tube.

7. Remove bolts (65) from case cover (48), take off bracket supporting spark, throttle and oil control rods and levers.

8. Straighten lugs on nut lock (57) and remove nut (56) from worm wheel shaft.

9. Pull steering gear lever (58) off taper on worm wheel shaft, using puller shown on page 18, service tool section.

10. Loosen frame bracket clamp bolt (70); this will release steering gear lower case and gear assembly, which may now be removed from the car.

11. Loosen adjusting nut clamp bolt at top of case, unscrew adjusting nut (52) and remove upper bushing lock screw (68); this will allow the removal of the upper bushing (66), lower main tube (67), thrust bearings (84) and worm (82).

12. Remove sector tube bracket screws (77) and take off sector tube bracket (78) and gasket (71).

13. Remove case cover screws (64), take off case cover (48) and gasket (47); this will allow the removal of the worm wheel and shaft (40) and thrust washer (44).

14. Remove worm wheel bushing lock pin retainer (42) and lock pin (41); take out worm wheel bushing (43) and replace with new part.

15. Press out lower case bushing (85) and replace with new part, using arbor press or bushing drift shown on page 19, service tool section.

16. Fit new worm wheel or thrust washers if necessary and reassemble, reversing operations 1 to 13 inclusive, making sure parts are properly adjusted as detailed in articles “H”, “I” and “J.”

(C) Renew Jacket Tube Bushings

1. Loosen clamp screw (73, 75) in spark and throttle control pinions and remove pinions (76, 74).

2. Loosen sector bracket clamp bolt (72).

3. Disconnect at horn terminal, wire (2 5) leading from steering gear horn button to horn.

4. Loosen clamp bolt (70) in steering gear frame bracket (61).

5. Remove jacket tube bracket screws (36) and cap from bracket (35).

6. Grasp spark and throttle control mounting and pull spark, throttle, and sector tubes and horn wire out of steering gear main tube.

7. Remove nut (17) from top of steering gear upper main tube.

8. Pull steering wheel off upper main tube, using steering wheel puller shown on page 18, service tool section.

9. Slide jacket tube (34) off steering gear main tube; press out or drive out bushings (14) and replace with new parts.

10. Reassemble parts, reversing above operations.

(D) Renew Steering Gear Lever

1. Remove drag link rear end boot, remove cotter pin and takeout rear end adjusting plug; disconnect drag link from steering gear lever (58).

2. Straighten lugs on worm wheel nut lock (57), remove worm wheel nut (56) and nut lock.

3. Pull steering gear lever (58) off taper on worm wheel shaft, using steering gear lever puller shown on page 18, service tool section.

4. Install new steering lever and reassemble parts, reversing above operations.

(E) Renew Lower Tube, Worm or Thrust Bearings

1. Loosen spark and throttle control pinion clamp screws (75, 73) and remove pinions (76, 74).

2. Loosen sector tube bracket clamp bolt (72.)

3. Loosen clamp bolt (70) in steering gear frame bracket (61).

4. Disconnect at horn terminal, wire (2 5) leading from steering gear horn button to horn.

5. Remove screws (36) and cap from jacket tube bracket (35).

6. Loosen main tube coupling bolts (45).

7. Disconnect upper and lower main tubes (15, 6 7) by grasping steering wheel and pulling column assembly upward, until spark tube is clear of lower main tube.

8. Loosen adjusting nut clamp bolt at top of case, unscrew adjusting nut (52) and remove upper bushing lock screw (68).

9. The upper main tube, worm, thrust bearings and upper bushing may be removed and replaced with the new parts where necessary, and steering gear reassembled, reversing above operations.

(F) Renew Spark or Throttle Levers, Spark, Throttle or Sector Tubes, Friction Washers, or Column Silencers

1. Loosen spark and throttle control pinion clamp screws (75, 73) and remove pinions (76, 74).

2. Loosen sector tube bracket clamp bolt (72).