

SERVICE MANUAL

**DATSUN  
PICK-UP**

MODEL 520 SERIES



NISSAN MOTOR CO., LTD.

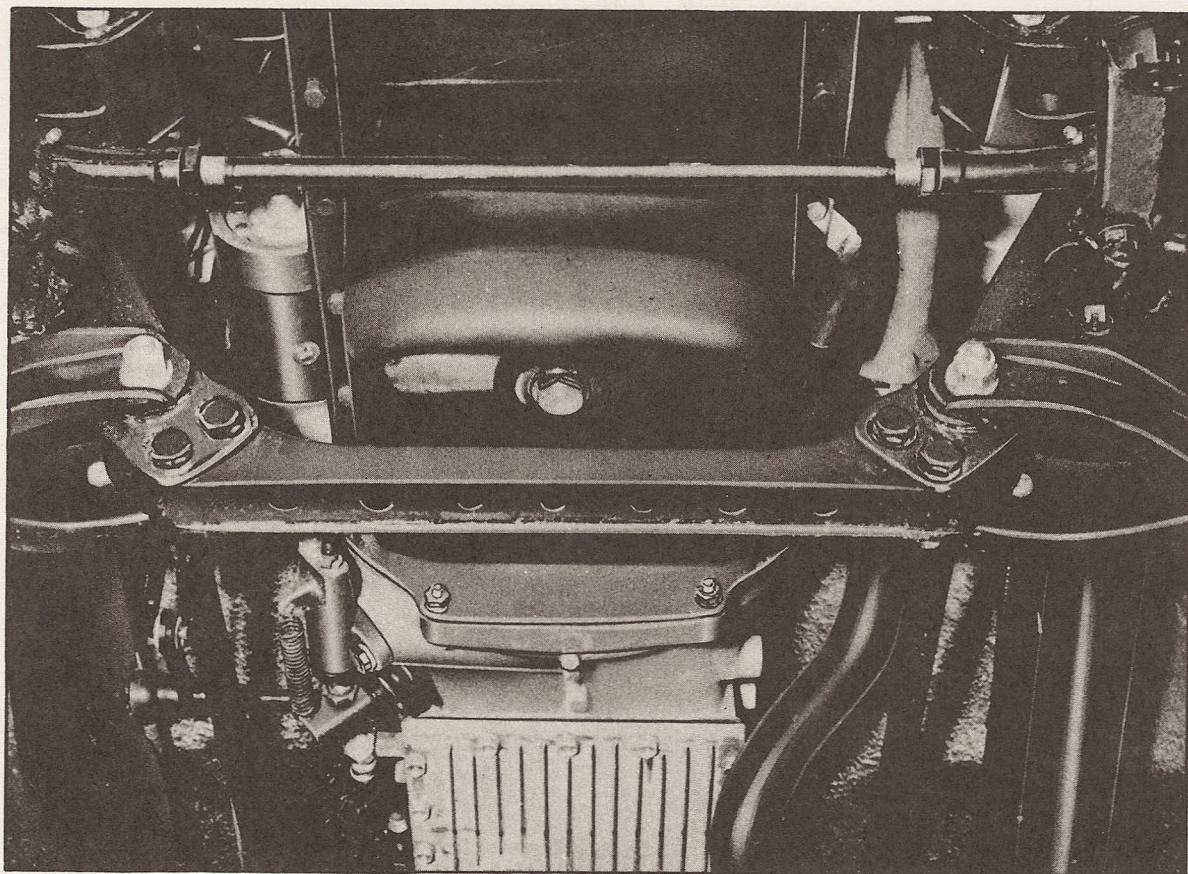
**CHASSIS**

**NISSAN MOTOR CO., LTD.**

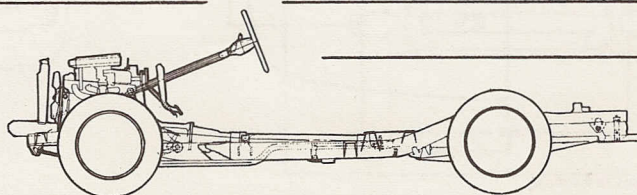


# CHASSIS

## CHASSIS



*CONSTRUCTION OF CHASSIS*

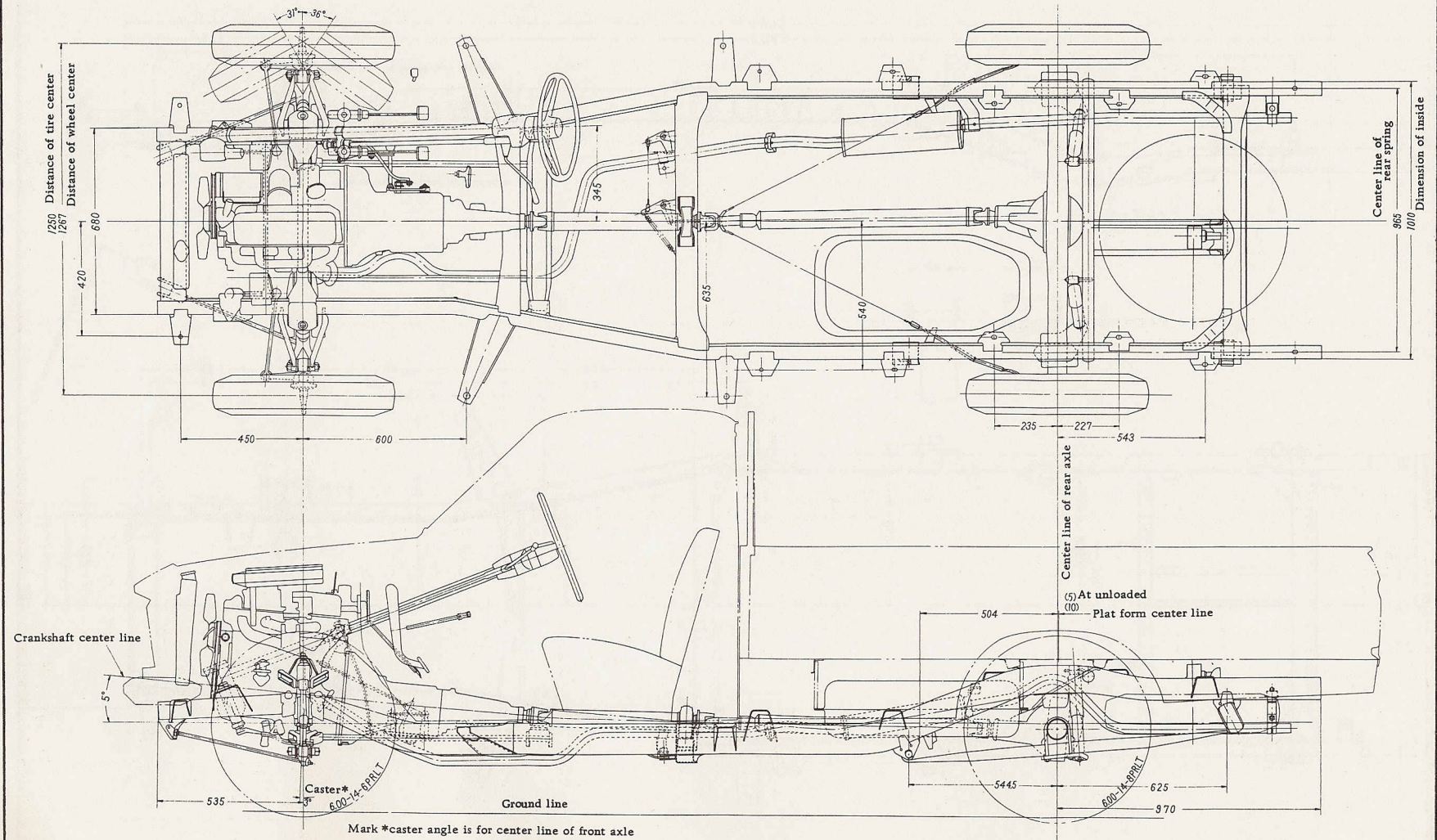








# CHASSIS (for Long Boby)





## FRAME (for Long Body)





## STEERING

## STEERING GEAR

Type	Semi-external mesh worm and roller
Gear ratio	17.3 : 1

## WORM GEAR

Thickness of adjusting shim for housing end play	
Shim for adjusting front end play	0.762 mm (0.030 in.)
"	0.254 mm (0.010 in.)
"	0.127 mm (0.005 in.)
"	0.075 mm (0.003 in.)
"	0.050 mm (0.002 in.)
Shim for adjusting rear end play	0.254 mm (0.010 in.)
"	0.127 mm (0.005 in.)
"	0.075 mm (0.003 in.)
"	0.050 mm (0.002 in.)
Center distance	52 mm
Locking angle	$\pm 40^\circ$
Starting torque for revolving worm shaft	0.08-0.15 kg
Backlash between worm & roller	0-0.2 mm (at top center of gear arm)
Tightening torque for cover nut	2.5 kg-m
Roller shaft nut	14 kg-m
Gear box fix bolts	4.5 kg-m

The type of steering gear is worm and roller and has the drum type of worm gear at the lowest end of main steering shaft.

The main steering shaft is incased in the jacket tube, and the steering wheel is fixed with at the top end of it.

The worm gear inter locks with the roller which is fixed on the roller shaft and works

upon it to turn and through which turns the steering arm around the axle of shaft at the operation of steering wheel.

The motion of the steering arm is that of back and forth in front of drag link and turns the spindle around the king pin with the connecting knuckle arm, through which changes the bushings of front wheels.

The roller shaft itself is supported by the two bearings both sides in the gear housing.

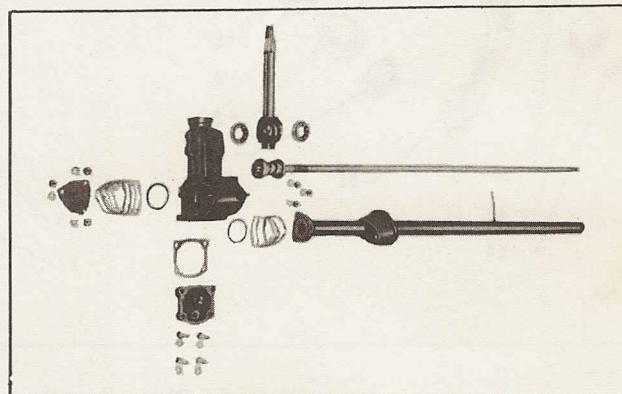
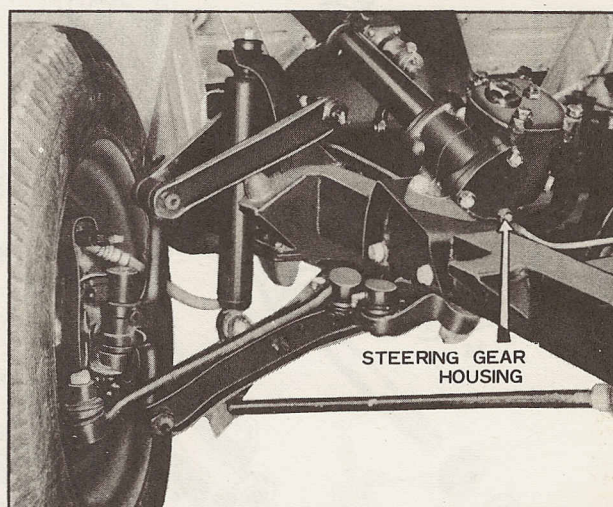


Fig. 1



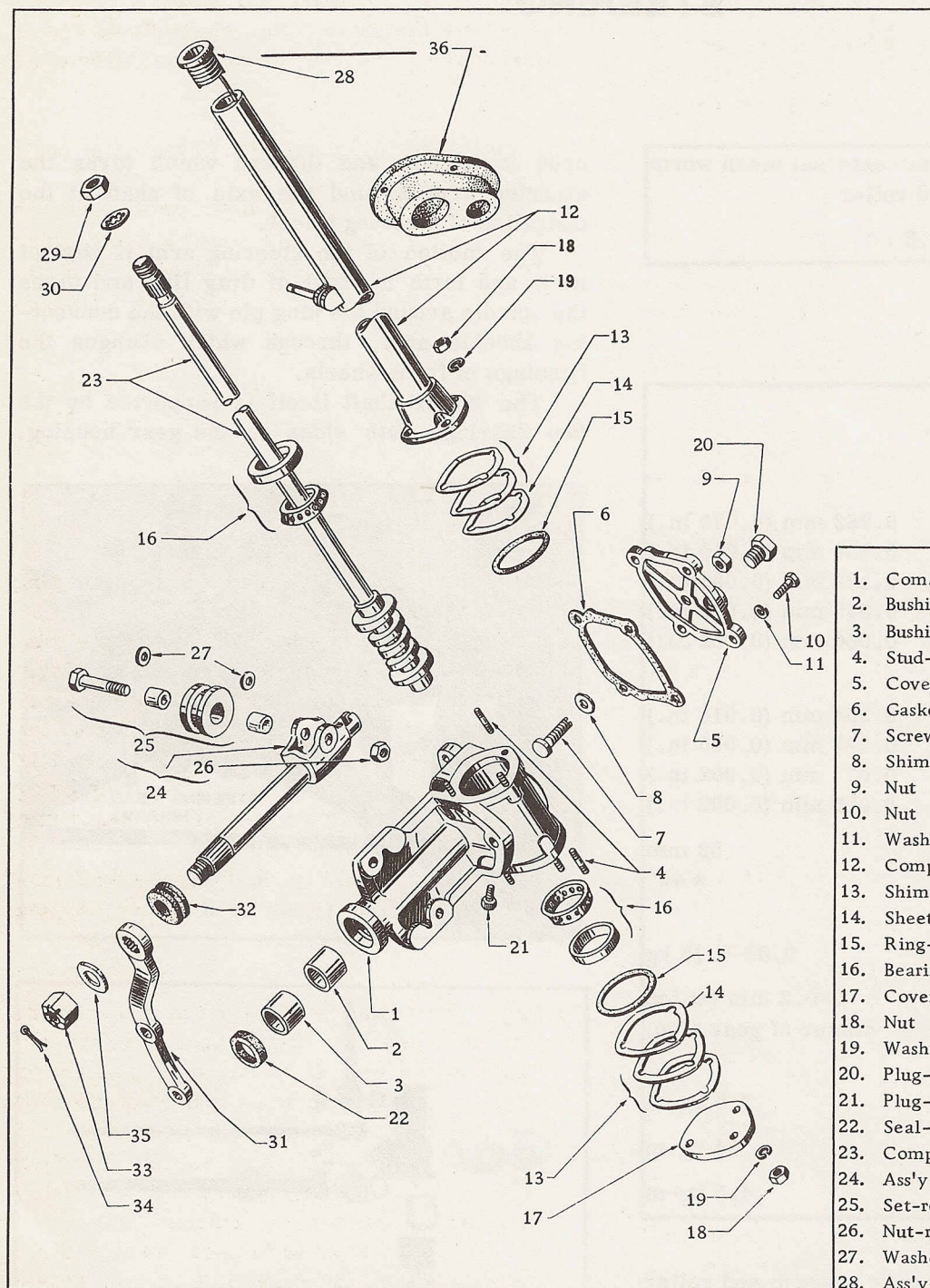


Fig. 2 Steering Gear

1. Com. -housing, steering gear
2. Bushing-steering housing, upper
3. Bushing-steering housing, lower
4. Stud-housing, front
5. Cover-roller shaft cover
6. Gasket-roller shaft cover
7. Screw-adjusting, roller shaft
8. Shim-adjusting, roller shaft
9. Nut
10. Nut
11. Washer-lock
12. Comp. -jacket, column
13. Shim-worm gear
14. Sheet-"O" ring
15. Ring-"O", housing cover
16. Bearing-steering worm
17. Cover-gear housing, front
18. Nut
19. Washer-lock
20. Plug-filler
21. Plug-drain
22. Seal-oil
23. Comp. -column, steering
24. Ass'y-shaft, roller, steering
25. Set-roller & pin, roller shaft
26. Nut-roller pin
27. Washer-thrust, steering roller
28. Ass'y-bushing, column jacket
29. Nut-steering wheel
30. Washer-lock
31. Arm-steering gear
32. Seal-dust, rocker shaft
33. Nut
34. Pin-cotter
35. Washer-plain
36. Grommet-steering column



## Assembling and Inspection

In case the replacement of parts is required due to the defacements and damages of steering gear and housing bush, disassemble and adjust in the following order.

## Dismounting of the Steering

- 1) Take off the steering wheel.  
Pull out the three screws of the back side of steering wheel boss, then take off the horn button retainer as well as horn button.  
After unscrewing and taking off the wheel nut, pull out the steering wheel with the steering wheel puller.
- 2) Disconnect the clamp on and under the remote control rod which is fixed on the jacket tube after unscrewing the steering jacket clamp bolt under the instrument panel, and disconnect the horn cord.
- 3) Disconnect the steering gear arm with the drag link, unscrewing the end plug at the side of steering gear arm of drag link, thus is taken off from the gear arm.
- 4) Take off the fixing bolt of steering gear box which is fixed with the side member of frame.
- 5) Pull out the steering assembly to the downward direction.

## Disassembling and Inspection of the Steering Gear

After the steering assembly is dismantled and the gear oil is completely drained, the steering gear box should be fixed on the vice setting the steering tube on level.

- 1) Taking off the steering gear arm.  
Take off the nut of gear arm and roller shaft cover and strike out lightly the bolt, then pull the gear arm out of roller shaft.
- 2) Dismounting the housing cover and roller shaft assembly.  
In dismantling the cover, the column jacket and roller shaft assembly after unscrewing the three nuts, the adjusting shim of the housing gear must be handled with care not loose them.

- 3) Taking off the housing end plate.  
Unscrew the three nuts, at the front end of the housing and they should also be handled carefully not to loose them.
- 4) Dismounting and inspection of the worm shaft and bearing.  
The main shaft could be dismantled together with the roller bearing assembly and upper bearing cone by fixing the wheel nut on the tip of main shaft and striking out lightly, without damage.
- 5) Take the column jacket out of the gear housing, thus the outer race of upper bearing can easily be dismantled. The adjust shim must be carefully handled not to loose them in taking off the housing gear.
- 6) Inspection and adjustment of gear housing column jacket and front cover.  
Adjust the steering gear by changing the total thickness of the adjust shims of the worm bearing so that the starting torque for revolving worm shaft is 0.08-0.15 kg at the circumference of steering wheel. In this case, tighten it with the end cover by applying the "O" ring. Use the said ring 0.3-1.1 mm thicker than the used shims.  
And further adjust by changing the thickness of the worm bearing adjust shims exchanging the rear and front shims.
- 7) Inspection and adjustment of the roller shaft.  
The shaft itself should be checked and replaced with new one when it is worn out. The roller shaft assembly should be replaced in a unit in case the roller pin becomes loose and damages or defacement of surface of roller is found. The replacement can be limited to the worn out parts after disassembling.  
Fit the roller shaft to the gear housing after inserting the adjust shims to the adjust screw and adjusting said screw so as the end clearance along the roller shaft is to be 0.01-0.03 mm with the shims.  
The backlash at the top of gear arm is to be 0-0.2 mm in the vertical rolling center of the roller shaft and lock the nut up after confirming that the roller is smoothly rolling over the worm gear.



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- 8) Assemble and disassemble of the linkage. The joint parts of the linkage are constructed with the spring sheet, spring, plug, and so forth, and this order must be conformed with in assembling the unit.



Fig. 3

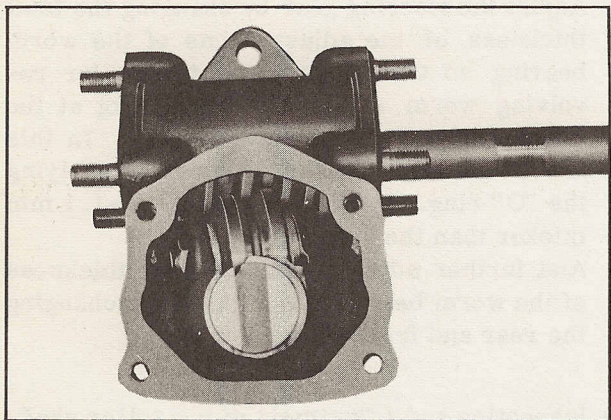


Fig. 4

Otherwise, the spring would not action besides giving a shock to the every part of the unit, wearing out both the steering gear arm and linkage of the steering, which furtherly will be easily pulled off endangering the operation.

It is, therefore, important to check and to set aside the parts in assembling when disassembled.

### Inspection and Adjustment After Assembling

It is important that the center of interlocking roller is located in the center of worm gear.

The inspection for this should be made in a

way as to make sure of the equal conditions of backlash at the position of steering wheel when turned fully to left and right. In case the backlash differs, greatly, the interlocking position of worm gear must be adjusted again.

The correct backlash at the both ends of worm gear should be made sure of, after putting the more shim in the side of larger backlash at the gear arm and for equalizing, pull out the shim on the opposite side and tighten up the bolt again, adjusting with the shim in front of and the shim behind the gear housing.

The backlash at the center locking should also be checked and adjusted, if necessary.

### Installation of Steering Wheel

Inspection by steering wheel.

The steering wheel is relation-locked with the shaft and it may as be fixed to the forwarding direction, tightened may as well be fixed to the forwarding direction, tightened with nuts. The standard revolving weight gravity of the wheel on the wheel rim circle, as for as it is rightly assembled, is 500-700 gr., measured by the spring scale.

The play allowed on the circle of wheel is 40-50 mm.

Installation and adjustment of horn button.

The horn button should be installed in a reverse order of dismounting.

### Inspection and Adjustment of Steering Fixed on Car

The inspection and adjustment of the steering system installed in the car should be made in following order.

- 1) Set the car on the levelling place with the front wheels fixed to the forwarding direction. Take measure of the position of lower part of wheel and tube with the finger of one hand, spin the wheel to left and right to the extent of wheel's play by another hand. When the wheel moves up and down, there should be found a play in the worm bearing to the direction of axle.

In this case, the fixing bolts in front and rear (upper or lower) of gear housing are loose on the bearing is worn out.

The shim should be pull off in a way as explained in the item of worm bearing and the



adjustment should be made as explained in the item of inspection and adjustment after assembling.

- 2) In case the roller shaft moves to the direction of axle shaft, as the wheel spined hardly to left and right, the roller shaft adjusting screw is loose. The adjustment should be carried in a way as explained in adjustment of the position of steering roller.
- 3) In case the roller shaft shakes to left and right, the roller shaft or the bush is worn out, therefore, they should be replaced with new one and adjusted.
- 4) In this case the fixing bolt for gear housing front and rear (upper or lower) is loose or the bearing is worn out, for which the shim should be pulled out in a way as mentioned in the item of worm bearing and the adjustment should be made as inspection and adjustment after assembling.
- 5) In case the roller shaft moves to the axle shaft, by returning the wheel to left and right, the roller shaft adjusting screw is loose, for which the adjustment should be made in a way as explained in adjustment of the position of steering roller.
- 6) In case the roller shaft trembles to left and right, the roller shaft or the bush is worn out and they should be replaced with new one and adjusted.
- 7) Take off the drag link at the end of steering gear arm. In case the play should be found by holding the arm and move it strongly back and forth, the backlash of roller and worm gear is too large. The adjustment for this should be done in a way as explained in the above section setting the steering wheel at the center of turning to left and right.
- 8) In case the operation of steering wheel felt heavy and becomes light when the front axle is jacked up, the trouble is with the front axle system.  
In case the wheel is still felt heavy even when the front axle is jacked up, the trouble is connected with the front axle.

9) When the front axle is jacked up, the inspection of contacting and tightening parts of tie-rod socket, knuckle arm, drag link and the steering arm should be possible.

- 10) Hold both the top and down end of front wheel and move it strongly, and the pin would rattle if any, as well as the looseness of the wheel should be found.

## Adjustment of Idler

After tightening the idler shaft nut under the torque of 14 kg-m, adjust the idler so as the dimension from the idler body frame fitting plane to the idler arm lower end is to be 157 mm by turning the idler shaft.

## The Cause of Trouble

The cause of the trouble caused in regards with the steering in operation, is closely connected with those of the front axle, therefore it is hard to judge then separately.

The following are main troubles caused in steering.

## Heavy and Difficult Operation of Handle

- 1) The oil in gear box.
- 2) Adjustment of worm and roller is poor.
- 3) Damage on corn of worm bearing.
- 4) Hard locking of column jacket bush.
- 5) Steering shaft or tube is bended.

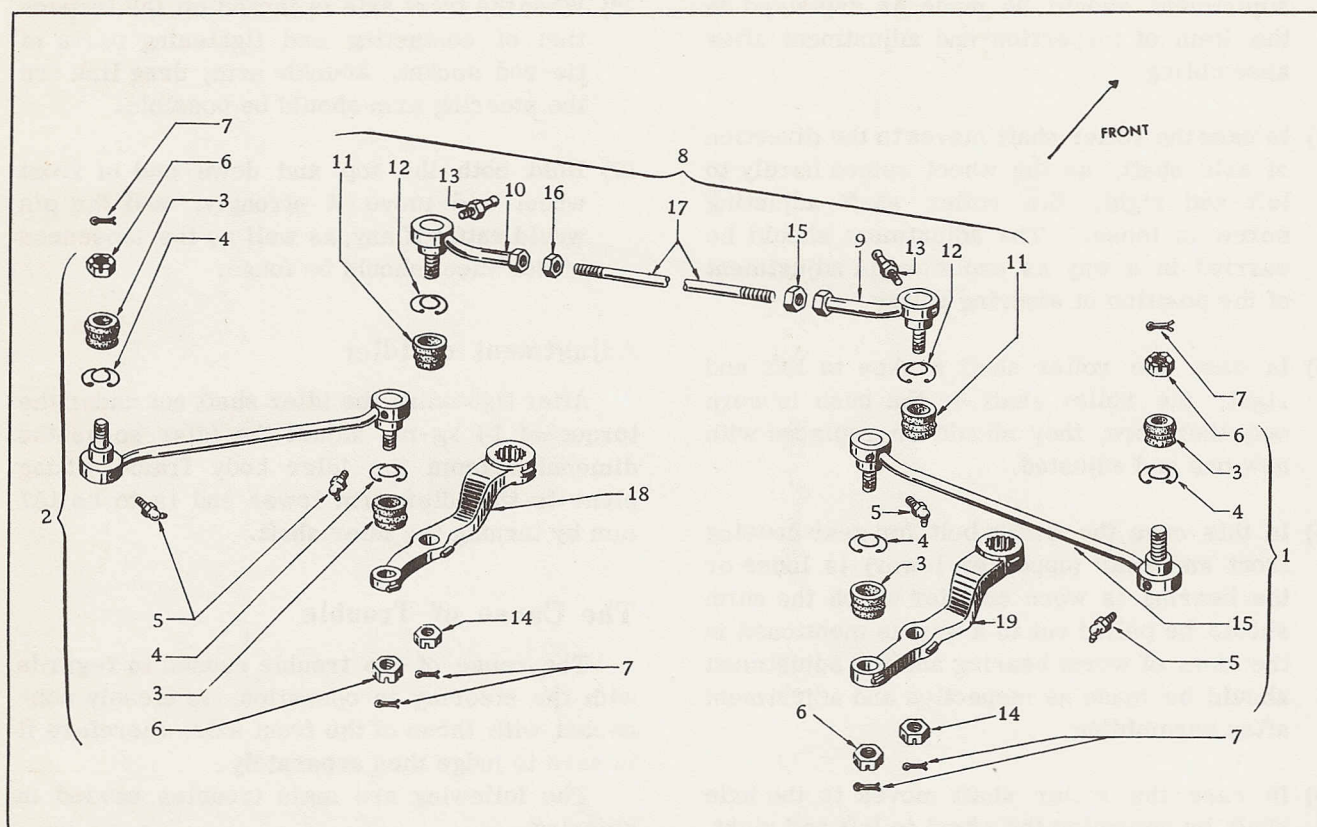
## Insufficient Amount of Turning

- 1) Adjustment of worm and roller is poor.
- 2) Fixing port of gear housing with frame is loose.
- 3) Locking position of roller shaft and steering arm is bad.

## Unsteady or Trembling Handle in Motion

- 1) Too much backlash of worm and roller (wheel play is too large).
- 2) Worm bearing and roller shaft bush is worn out.
- 3) Looseness of each bolts on gear housing.
- 4) Looseness of fixing bolts for frame.





1. Ass'y-rod, side (R.H.)	10. Ass'y-socket, cross rod (L.H.)
2. Ass'y-rod, side (L.H.)	11. Seal-dust, ball socket
3. Seal-dust	12. Clip-dust seal
4. Clip-dust seal	13. Nipple-grease
5. Nipple-grease	14. Nut
6. Nut	15. Nut
7. Pin-cotter	16. Nut
8. Ass'y-rod, cross	17. Bar-cross rod
9. Ass'y-socket, cross rod (R.H.)	18. Arm-idler
	19. Arm-steering gear

Fig. 5 Steering Linkage



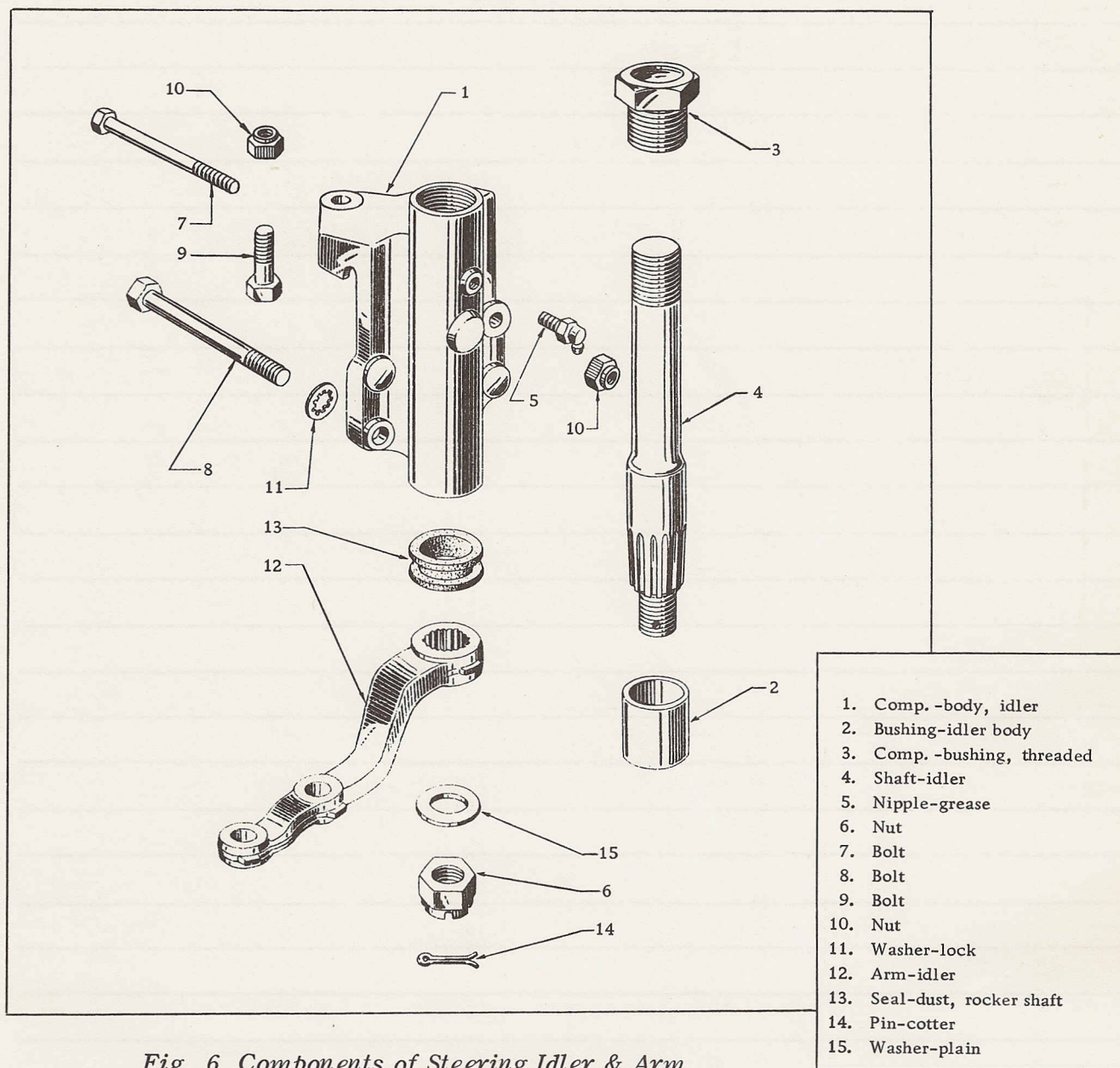
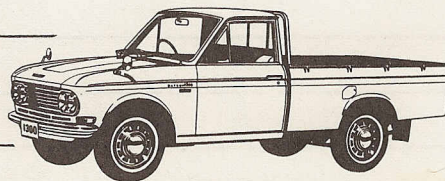


Fig. 6 Components of Steering Idler & Arm



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## FRONT AXLE

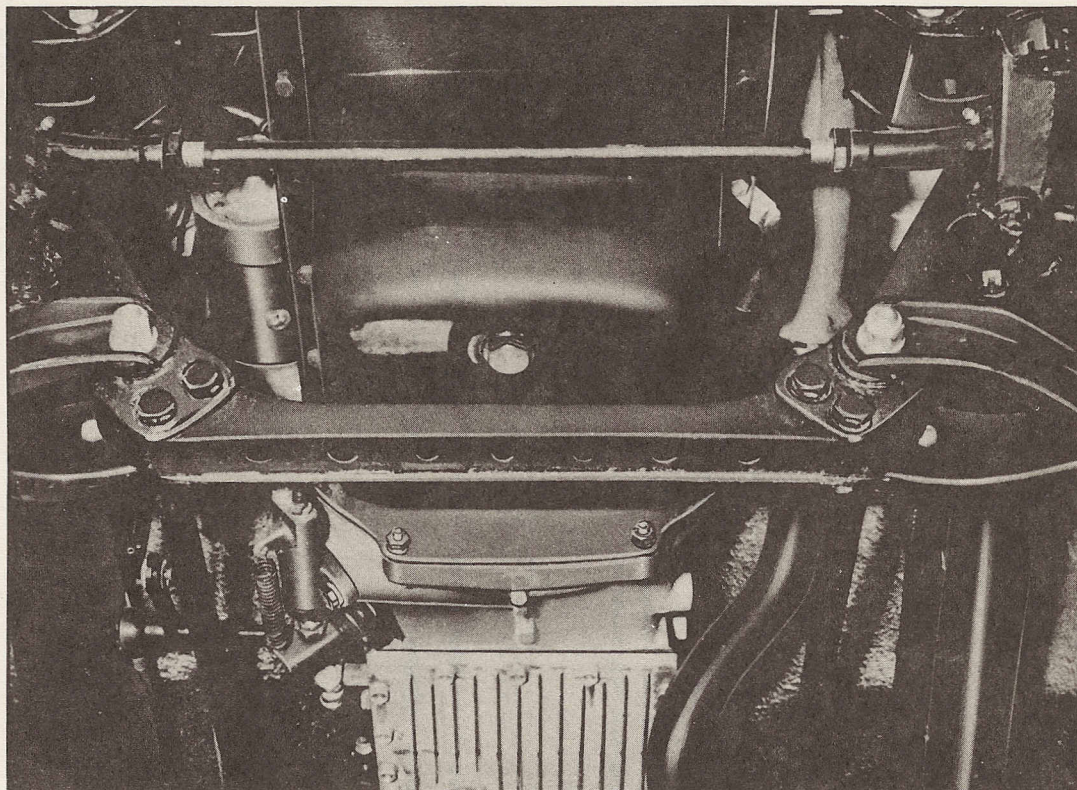


Fig. 1

**Disassembling of Front Axle**

Disassembling and dismounting of the front axle should be carried out in the following order if required in case that it is bended by the violent shock or with any other reason.

- 1) Unscrew the connector of the brake hose for the front wheel on left and right at the side of frame.

- 2) The front axle unit can be disassembled further as follows:

Taking off the cover, loosen the spindle nut after the hub cap is taken off. It can be easily removed first by tapping lightly around the cap and pry with the screw driver.

Take off the front brake disc ass'y.

Pull out first the machine screws and after taking off the oil catcher with the parking, remove the four cap screws which fixed the disc to the spindle.

Thus, the disc ass'y can be dismounted.

Dismounting of the tie rods.

The tie rod ass'y can be dismounted by disconnecting the stud nut of the rod socket on the both end of side rod.

Taking out the spindle of the axle.

The king pin must be pulled out first. Pull out the king pin lock bolt and take off the spindle plug on the spindle by a graver.

Strike downwards the king pin by the drift and take off the plug at the bottom.

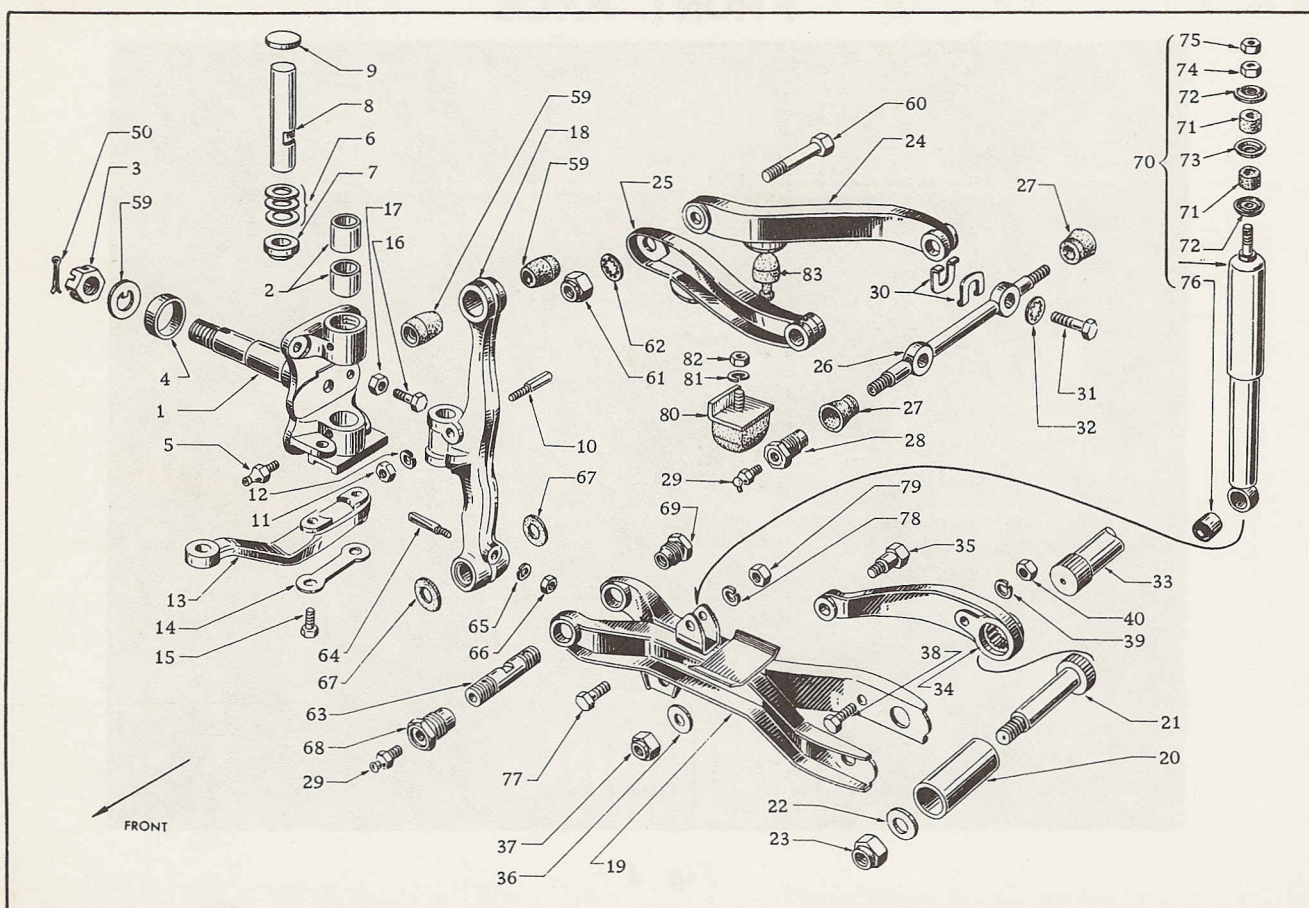
The pin, thus, can easily be removed. The spindle can be dismounted with the spindle shim and thrust washer assembly.

**Inspection & Adjustment After Disassembling**

Every parts must be cleaned with the cleaning oil. Any parts of damage or defect should be replaced and adjusted.



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1. Ass'y-spindle, knuckle, with nut	22. Washer-special lower link	61. Nut-self locking
2. Bushing-front spindle	23. Nut-self lock	62. Washer-lock
3. Nut-knuckle spindle	24. Ass'y-link, upper, front suspension, A (restr)	63. Pin-fulcrum, lower, link, front suspension
4. Collar-front spindle	25. Ass'y-link, upper, front suspension, B (front)	64. Pin-cotter, fulcrum pin
5. Nipple-grease	26. Spindle-upper link front suspension	65. Washer-lock
6. Shim-front spindle	27. Seal-dust upper link bush	66. Nut
7. Ass'y-washer, thrust, front spindle	28. Ass'y-bush, upper link front suspension	67. Ring-fulcrum pin, lower link
8. Pin-king	29. Nipple-grease type B	68. Ass'y-bush, lower link, front suspension, front
9. Plug-front spindle	30. Shim-camber A	69. Ass'y-bush, lower link, front suspension, rear
10. Bolt	31. Bolt-spindle upper link	70. Kit-shock absorber, front
11. Nut	32. Washer-lock	71. Bush-rubber, shock absorber
12. Washer-lock	33. Spring-front	72. Washer-special, shock absorber
13. Arm-knuckle	34. Arm-torque, front spring	73. Washer-special
14. Plate-lock	35. Bolt-torque arm, front suspension	74. Nut
15. Bolt-knuckle arm	36. Washer-plain	75. Nut-lock
16. Bolt	37. Nut-self locking	76. Ass'y-bushing, front shock absorber
17. Nut	38. Bolt	77. Bolt-clamp, shock absorber front
18. Support-knuckle spindle	39. Washer-lock	78. Washer-lock
19. Ass'y-link, lower, front suspension for stabilizer	40. Nut	79. Nut
20. Ass'y-bush, lower link, front suspension	59. Ass'y-bush, upper link	80. Ass'y-bumper, bound, front suspension
21. Spindle-lower link, front suspension	60. Bolt-fulcrum, upper link	81. Washer-lock
		82. Nut
		83. Bumper-rebound, front suspension

Fig. 2 Structures of Swivel Axle & Front Suspension



## Adjustment of Spindle

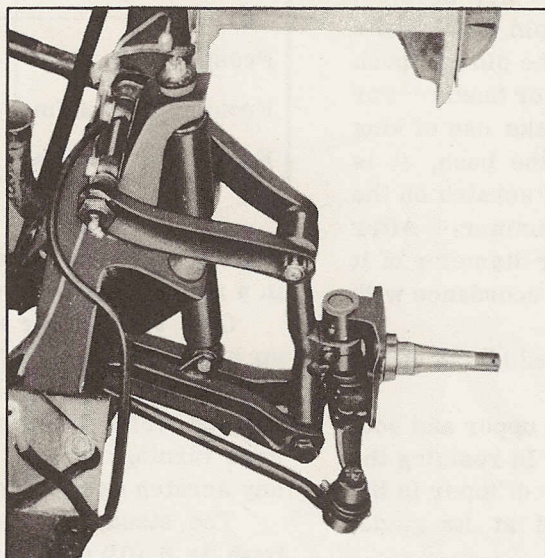
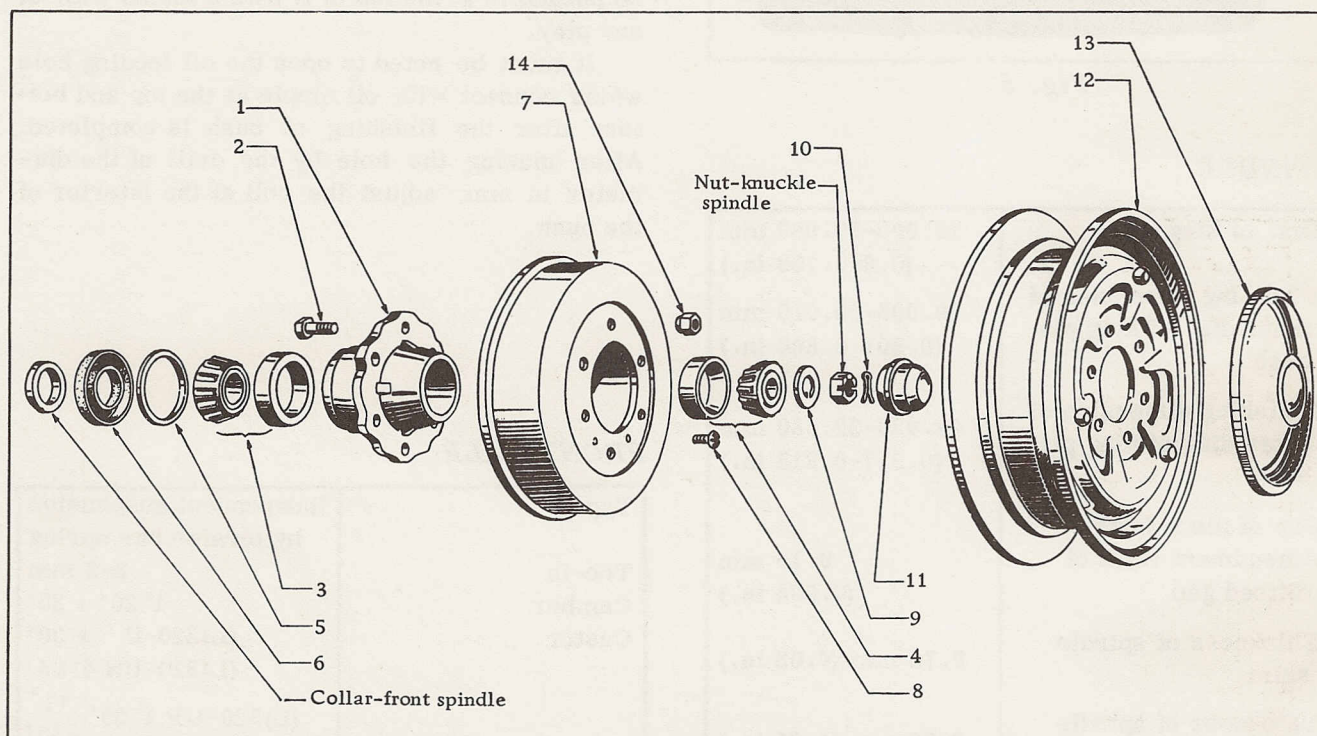


Fig. 3



1. Ass'y-hub, road wheel, front	6. Seal-grease, front hub	11. Cap-hub, front wheel
2. Bolt-hub, road wheel	7. Drum-brake	12. Ass'y-wheel, road
3. Bearing-wheel, inner	8. Screw	13. Cap-road wheel
4. Bearing-wheel, outer	9. Washer-front wheel bearing	14. Nut-road wheel
5. Spacer-grease seal, front hub	10. Pin-cotter	

Fig. 4 Components of Front Hub &amp; Drum



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The inspection should be made specially in regard with the crack and any other scratch. Check the defacement of king pin and spindle bush. If the clearance between the pin and bush is over 0.10 mm replace the pin or bush. For replacement of spindle bush, make use of king pin bush driver and can insert the bush, it is easily removed without giving any scratch on the surface of it tapping with the hammer. After the bush is replaced, the interior diameter of it should be finished up exactly in accordance with the standard measurement.

The king pin bush reamer should be employed in this case.

It can ream the holes at the upper and bottom in exactly a straight line. In reaming the upper hole, insert the adaptor of taper in the bottom hole from up side, and at its guide, scrape the upper side.

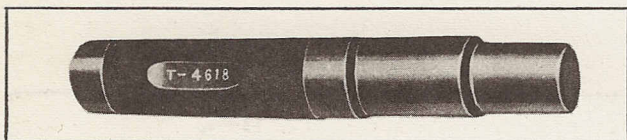


Fig. 5

### SPINDLE

Dia. of king pin	20.000-19.980 mm (0.8-0.799 in.)
Finishing dimension of inner dia. of king pin bush	20.035-20.010 mm (0.801-0.800 in.)
Finishing dimension of outer dia. of king pin bush	22.930-22.880 mm (0.917-0.915 in.)
Gap of pin & bush	
Amendment limit of dittoed gap	0.10 mm (0.004 in.)
Thickness of spindle shim	0.75 mm (0.03 in.)
Thickness of spindle shim	0.25 mm (0.01 in.)
Thickness of spindle shim	0.075 mm (0.003 in.)
Vertical gap of spindle	0.08-0.13 mm (0.0032 in.)
Tightening of wheel bearing nut	Tighten it at 30 ft-lb. and turn it 1/8 revolution back.

Name of Parts	Number of Parts	Thickness
Front spindle shim	40032 25660	0.075 mm
Front spindle shim	40033 25660	0.250 mm
Front spindle shim	40034 25660	0.750 mm

The bottom hole can be made and finished up in a reverse way as well.

Give the reamer an average force and finish up by turning to right so as the scraping face should be made smoothly. At the time of pulling out the reamer it must be handled with much care turning to right direction to avoid giving any scratch on the surface.

The standard fitting of the king pin with the bush is 0.010 mm-0.055 mm. Clean the both of them well, smear with new oil. They should be in a condition that can be turned lightly and be pushed in at the top of it with a thumb without any play.

It must be noted to open the oil feeding hole which connect with oil nipple at the top and bottom after the finishing of bush is completed. After making the hole by the drill of the diameter in mm, adjust the roll at the interior of the bush.

### FRONT AXLE

Type	Independent suspension by torsion bar spring
Toe-in	2-3 mm
Camber	1° 20' ± 30'
Caster	(L)320-U ± 30' (L)320-UN 4° 05' (L)320-UP 1° 30' +1° -30' U(L)320-U 3° 50' V(L)320-U 3° 25'
Angle of inclination of king pin	6°
Tread	1,170 mm
Turning angle of front wheel (inside)	34°
(outside)	29° 30'
Min. turning radius	5° 20' metres



### Assembling & Adjustment

The assembling is made in a reverse order of disassembling with care to the following points.

- 1) Inspect the locking part of the king pin and bush. The inspection must be made whether there is the oil hole or not after the bush is replaced.
- 2) At the time of fixing the spindle with the axle, the thrust washer should be replaced in an ass'y, because it consists of the armed bronze washer with the oil groove, clipping two carburized rapping steel washer of upper and bottom, and two covering covers.
- 3) Use standard clearance (the play to the direction of the axle) between the upper end of king pin boss of the axle and the spindle is 0.08 - 0.13 mm. In case of exceeding the standard clearance, adjust it by inserting the front spindle shim.
- 4) After the king pin is fixed, strike the expansion plug both on upper & bottom. The plug should be new one.
- 5) The outer lace drift should be used to press in or strike in at the time of mounting the inner bearing, outer bearing and oil seal on the front wheel hub.  
The oil seal should be replace with a new one.
- 6) Smear well the oil on the bearing at the time of mounting the front wheel hub, on the other

hand, the grease housing should be fitted out only for 50% of the space. In tightening up the spindle nut, settle down the bearing by turning and clamping up the wheel hub turn back for about 1/8 and lock with the cotter pin.

This is important to decide the play at the wheel bearing to the direction of the axle. There should not be any rattle and it should be turned lightly.

- 7) If the front axle ass'y mounted on the chassis, feed oil to the king pin. After this, as mentioned later, inspect the alignment of the front wheel. Inspect the turning angle at the same time and then adjust the stopper.

### Front Axle and Suspension

As showing above Fig. 1 is adopted an independent suspension and is directly connected to the upper link bracket. The front suspension is provided with the lower link spindle and the torsion bar.

The tension rod are fitted to restrict the back and forth movement of the lower links.

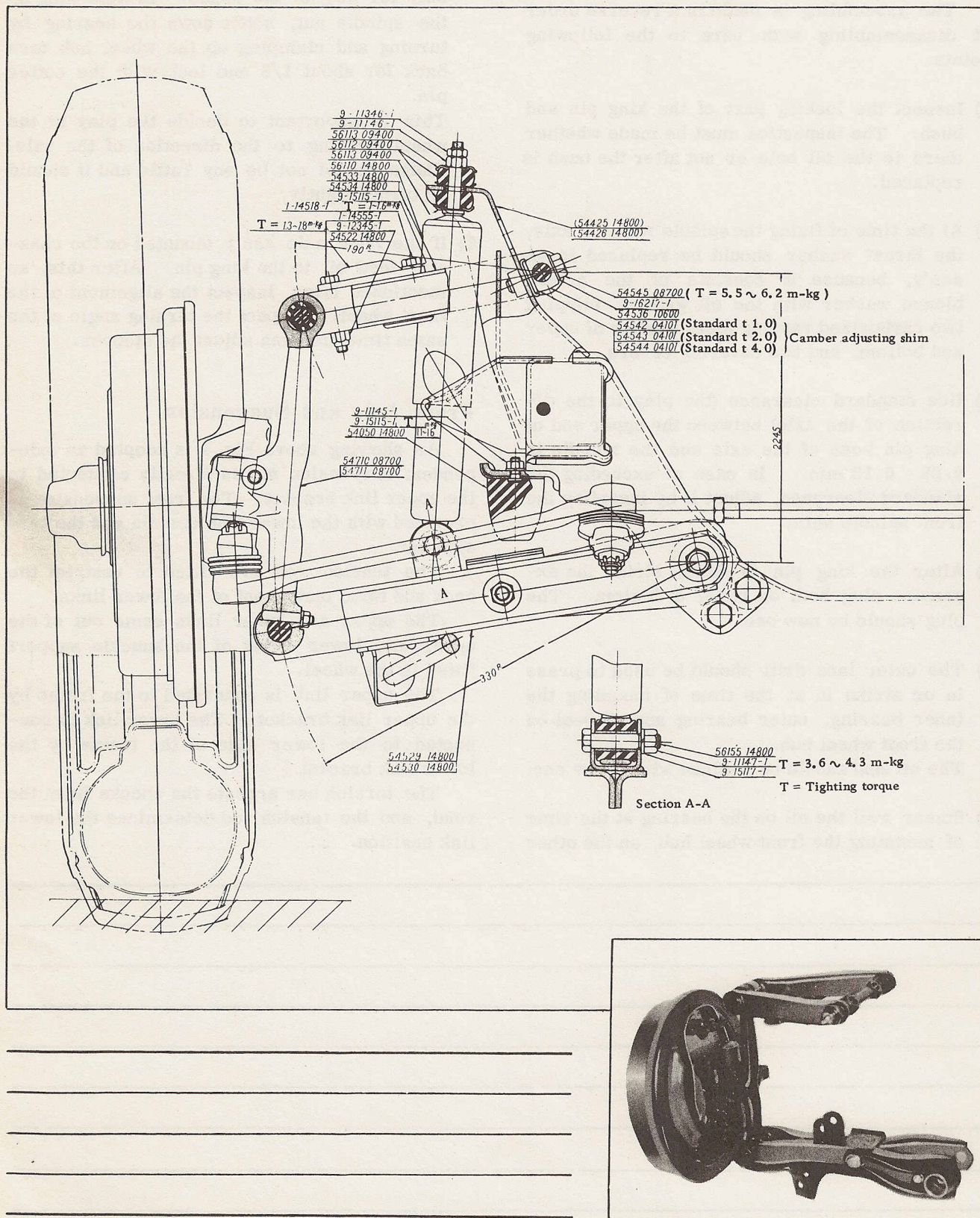
The upper and lower links come out of the upper and lower sides of the knuckle support fitted to the wheel.

The upper link is connected to the frame by the upper link bracket. The lower link is connected to the lower side of the frame by the lower link bracket.

The torsion bar arrests the shocks from the road, and the tension rod determines the lower link position.

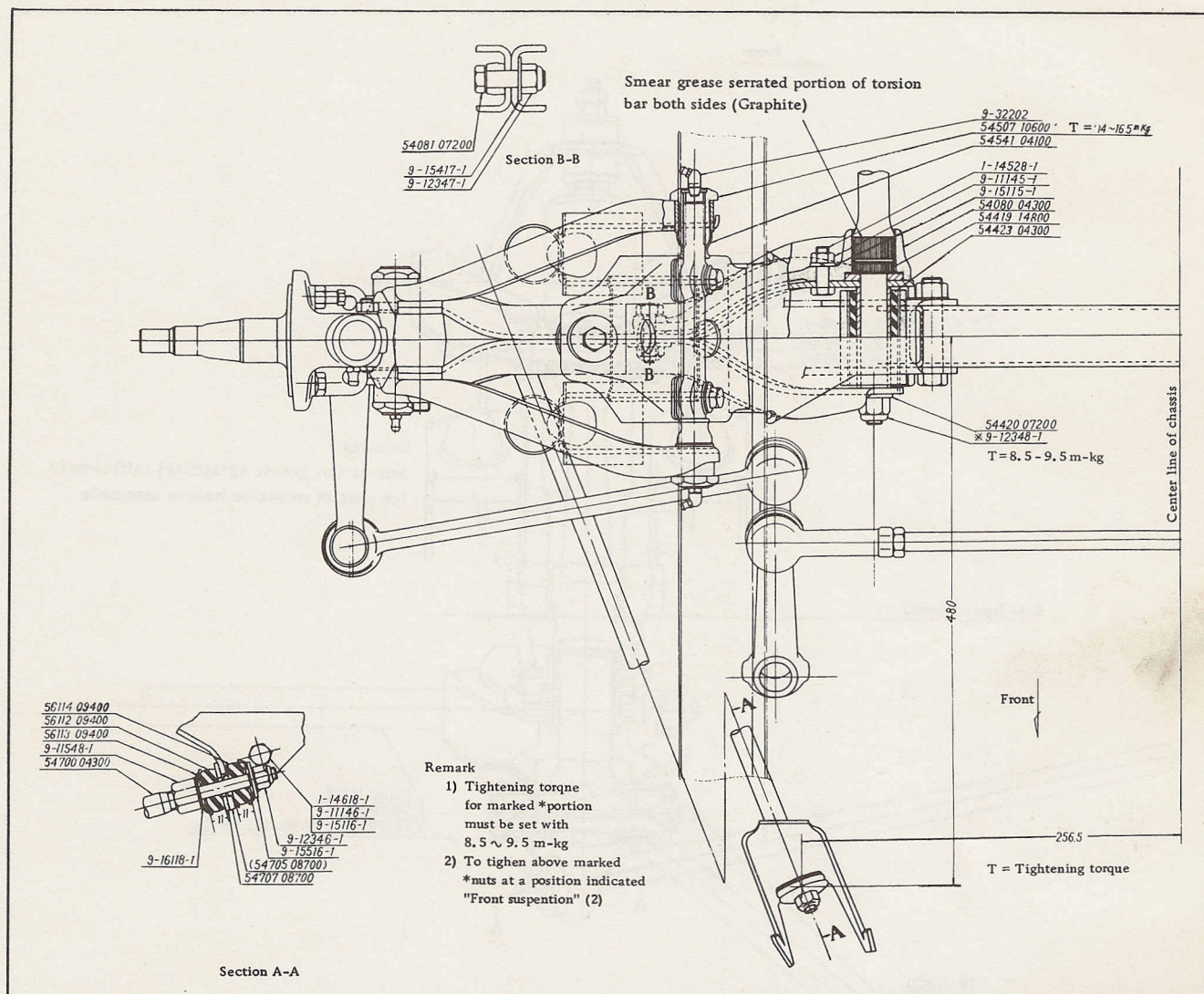


## FRONT SUSPENSION (NO. 1)





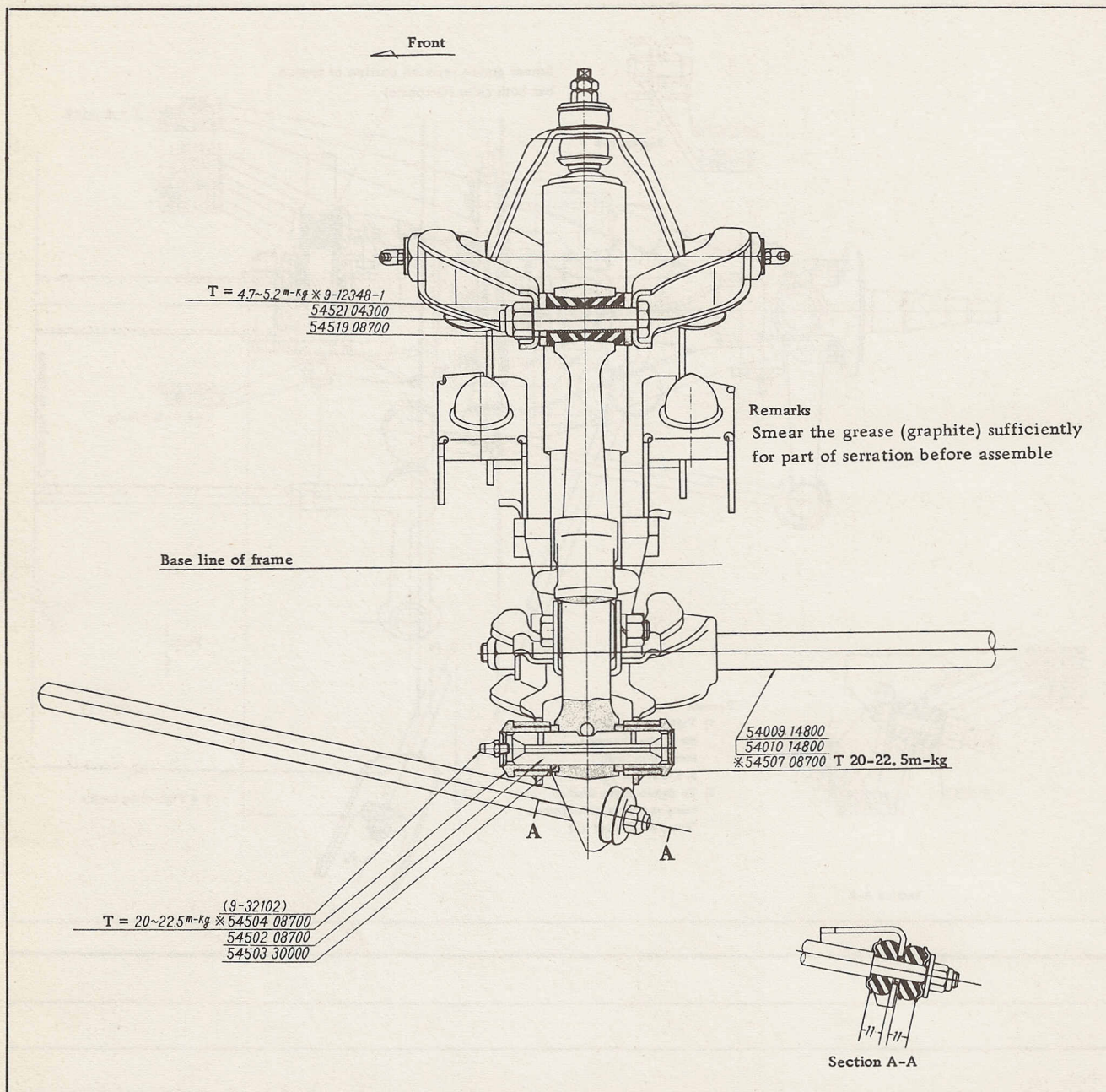
## FRONT SUSPENSION (NO. 2)





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## FRONT SUSPENSION (NO. 3)





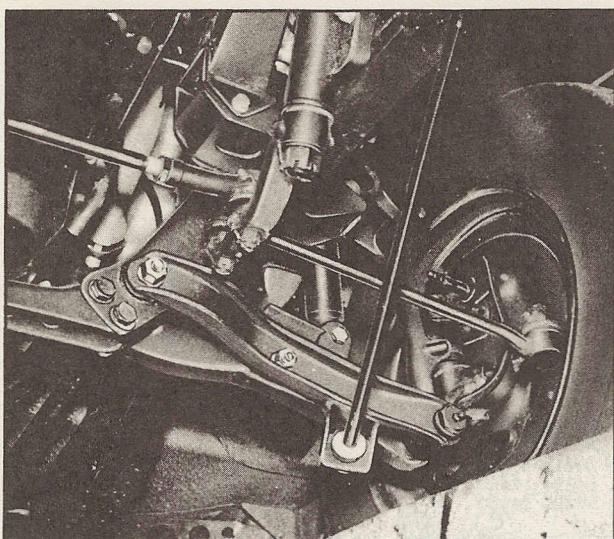


Fig. 6

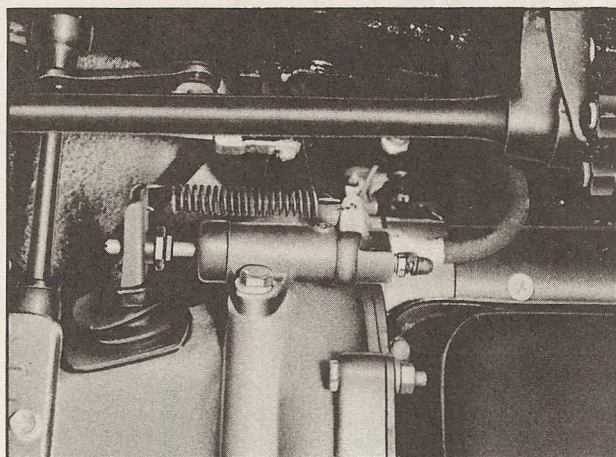


Fig. 7

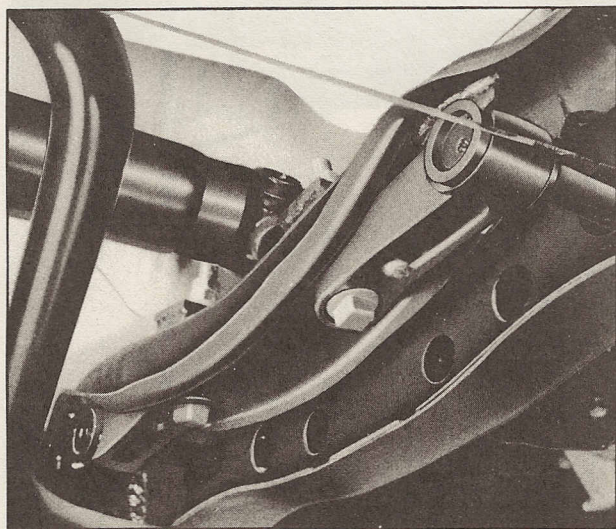


Fig. 8

## TIGHTENING TORQUE

Part Name	Tightening torque (kgm.)
Nut-fulcrum upper link bolt	4.7 - 5.2
Nut-lower link spindle bolt	8.5 - 9.5
Nut-upper spindle fixing bolt	5.5 - 6.2
Nut-cross member front susp. fixing bolt	8 - 9
Threading bush-lower link	20 - 22.5
Threading bush-upper link spindle	14 - 16.5

## Fitting Upper Link

Apply the rubber bush to joint of the upper link and the knuckle support and tighten with the bolt.

Fit the torque arm on the side of lower link.

Temporarily insert and tighten the tension rod. Fit the lower link to the frame with the lower link spindle, but tighten temporarily the lower link spindle nut.

Insert one end of the torsion bar to the torque arm.

In this case, be attentive to the symbols "R" and "L" marked on the right and left sides of the bar.

Insert the anchor to the other end of the torsion bar and fit it to the second cross member.

After adjusting the vehicle carriage.

Tighten the lower link spindle nut under the torque of 8.5-9.5 kgm.

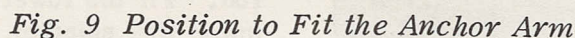
The torsion bar spring is a serration fit at both ends, but it is easy to set in or remove.

Apply ample chassis grease before hand to the serrated position.

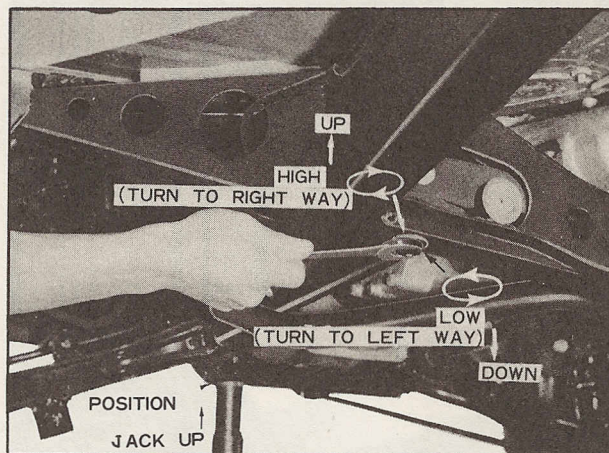
Apply a few drops of motor oil to the anchor adjust bolt.



## To Assemble the Anchor Arm of Front Suspension



Insert and tighten firmly the anchor bolt with lock nut.



Tighten these nuts alternately and gradually until the dimension of rubber become 11 mm.

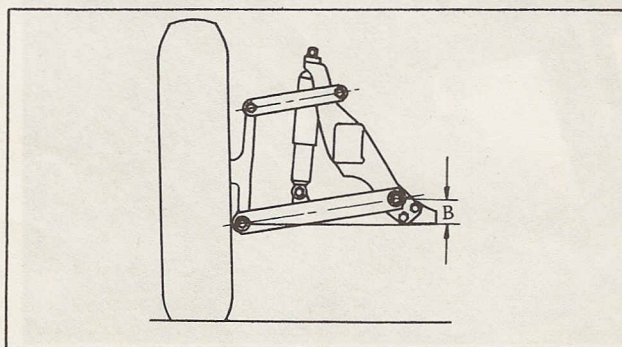


Fig. 10

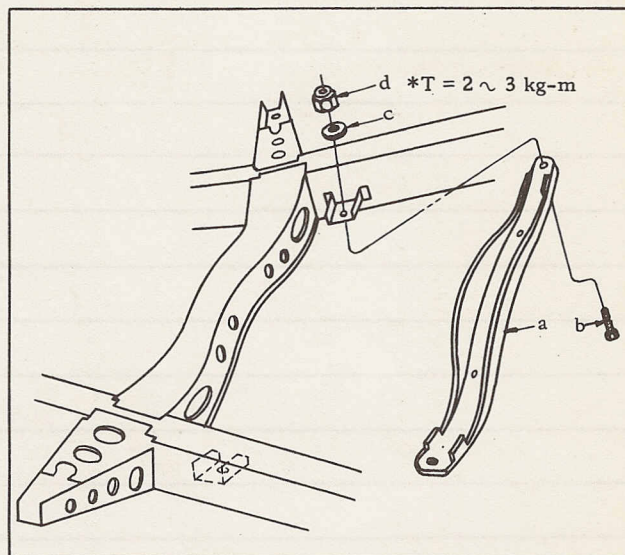


Jack up the vehicle at the position as shown and after reducing the twisting torque loading, upon the torsion bar to the minimum turn the anchor adjust bolt to right or left so as the dimension (as shown) is to be the following valve. Turning the bolt to right makes the carriage higher and to left makes it lower.

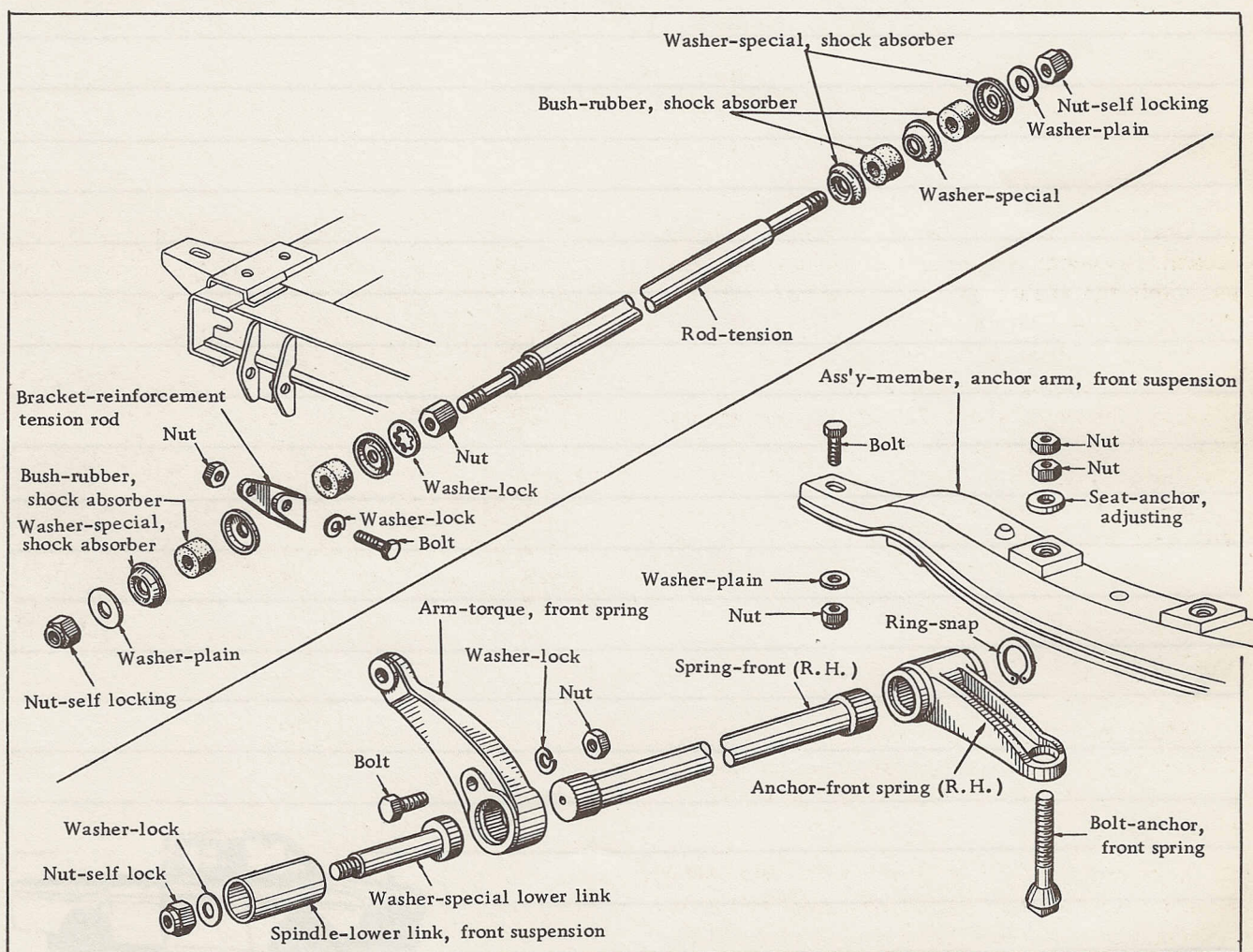
Dimension B	$78 + \frac{5}{0}$ mm
(when unloaded)	$56 + \frac{5}{0}$ mm

## How to Attach the Anchor Member

At first, place the anchor member "a" on the bracket of flame, next, insert the bolt "b" into the bracket through "c" and tighten the nut with tightening torque 2~3 kg-m.



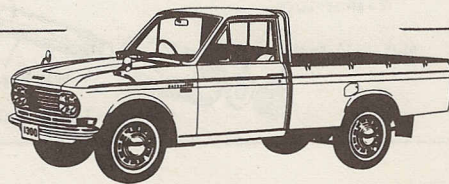
*Fig. 11*



*Fig. 12*



## DATSUN PICK-UP





## REAR AXLE

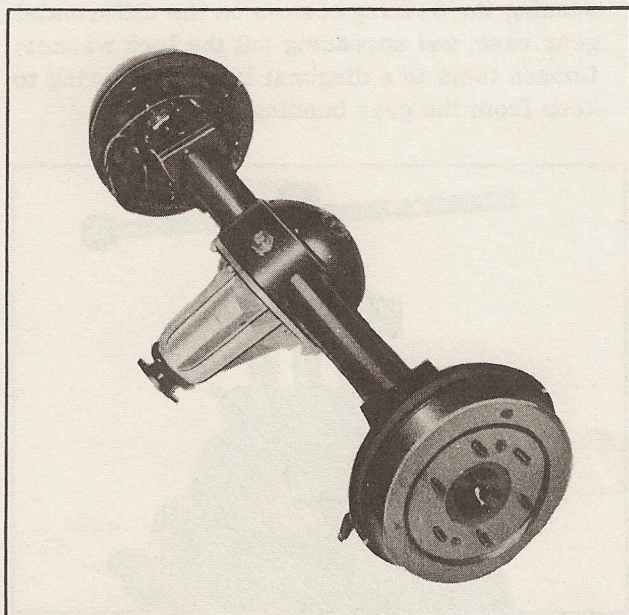
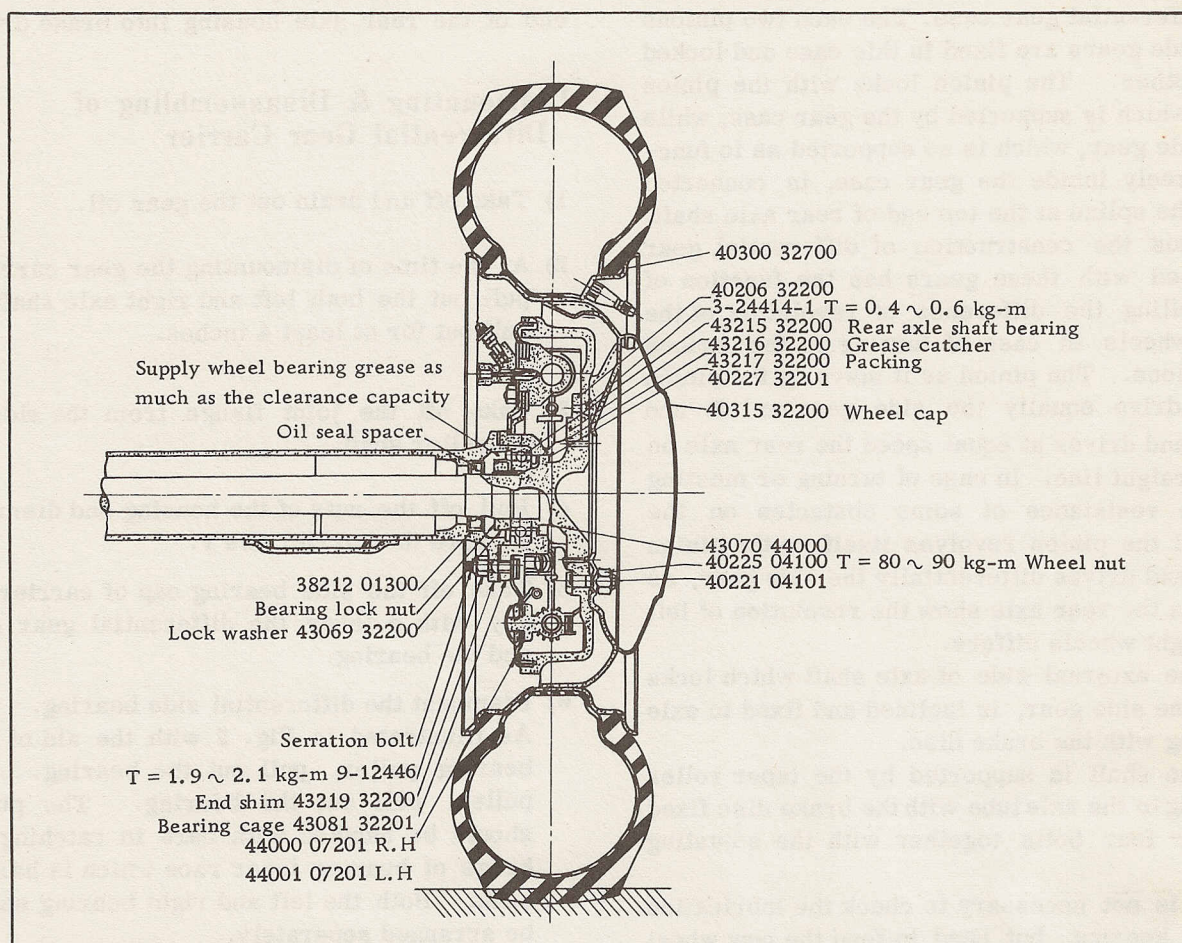


Fig. 1

## The Construction &amp; Handling

The rear axle is semi-floating and the hypoid bevel gear is used for slowing down the speed. The engine power is transmitted through the transmission to the propeller shaft, then to the drive pinion and finally drives the left and right rear axle with the differential gear which is housed in the axle housing. The axle housing is made out of the pressed steel plate in the form of Banjo and is constructionally strong enough against the torsion or the bending for its light weight with its rear cover being welded.

The gear carrier is made out of light and strong alloy of aluminum and the differential gear ass'y is so constructed as to make easy dismounting and the adjustment of each gear carrier. The rear axle shaft is materially made out of molybdenum chrome steel of highly strength, and the spline is of the involute gear type.



Inside the housing, the drive pinion drives the bevel gear which is closely connected with the differential gear case. The each two pinions and side gears are fixed in this case and locked each other. The pinion locks with the pinion shaft which is supported by the gear case, while the side gear, which is so supported as to function freely inside the gear case, is connected with the spline at the top end of rear axle shaft.

Thus the construction of differential gear combined with these gears has the function of controlling the difference of revolution of the rear wheels in case of turning to the various directions. The pinion as it stays on the pinion shaft drive equally the side gear on left and right and drives at equal speed the rear axle on the straight line. In case of turning or meeting at the resistance of some obstacles on the ground the pinion revolves itself on the pinion shaft and drives differentially the side gear, as well as the rear axle show the revolution of left and right wheels differs.

The external side of axle shaft which locks with the side gear, is inclined and fixed to axle housing with the brake disc.

The shaft is supported by the taper roller bearing to the axletube with the brake disc fixed by the four bolts together with the adjusting shim.

It is not necessary to check the lubrication to the bearing, but need to feed the new wheel bearing grease in proper quantity when disassembled. The proper lubrication to the gear housing is also necessary, otherwise it would shorten the durability of the gear to cause the trouble.

The following points must be taken into consideration.

- I. Nominated Hypoid gear oil No. MP90 must be used. (Temperature over 32°C SAE. MP140)
- II. It is prohibited to use any other kinds of gear oil or any oil of different viscosity. The same brand must always be selected.

The standard capacity of oil is about 0.9. The method of feeding oil should be done by taking off the feeler plug at the rear cover of the housing and fill in full up to the feeding hole.

The brake system would not work if over-feed the oil by causing it to flow out of the bath end of the rear axle housing into brake drum.

### Dismounting & Disassembling of Differential Gear Carrier

- 1) Take off and drain out the gear oil.
- 2) At the time of dismounting the gear carrier, pull out the both left and right axle shaft or pull out for at least 4 inches.
- 3) Take off the joint flange from the side of propeller shaft.
- 4) Pull off the nuts of the housing and dismount forward the carrier ass'y.
- 5) Take off the side bearing cap of carrier and pry with a lever the differential gear case and the bearing.
- 6) Dismount the differential side bearing.  
As illustrated in Fig. 2 with the aid of side bearing puller, pull out the bearing. The puller, pull out the bearing. The puller should be handled with care in catching the hedge of bearing inner race which is hard to hook. Both the left and right bearing should be arranged separately.
- 7) Dismount the differential drive gear, by loosening the 8 vixing screws on the differential gear case, and spreading out the lock washer. Loosen them in a diagonal line considering to keep from the gear bending.

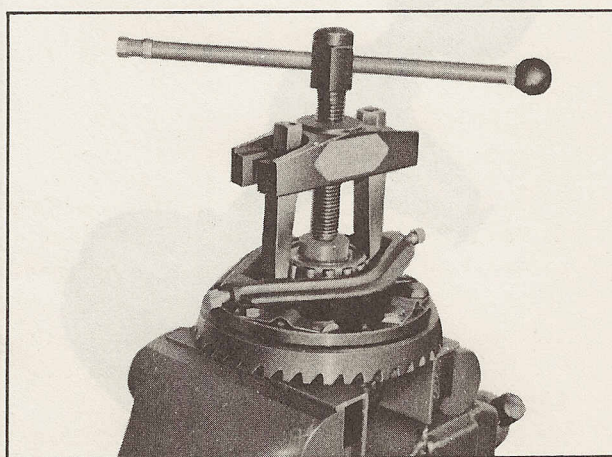


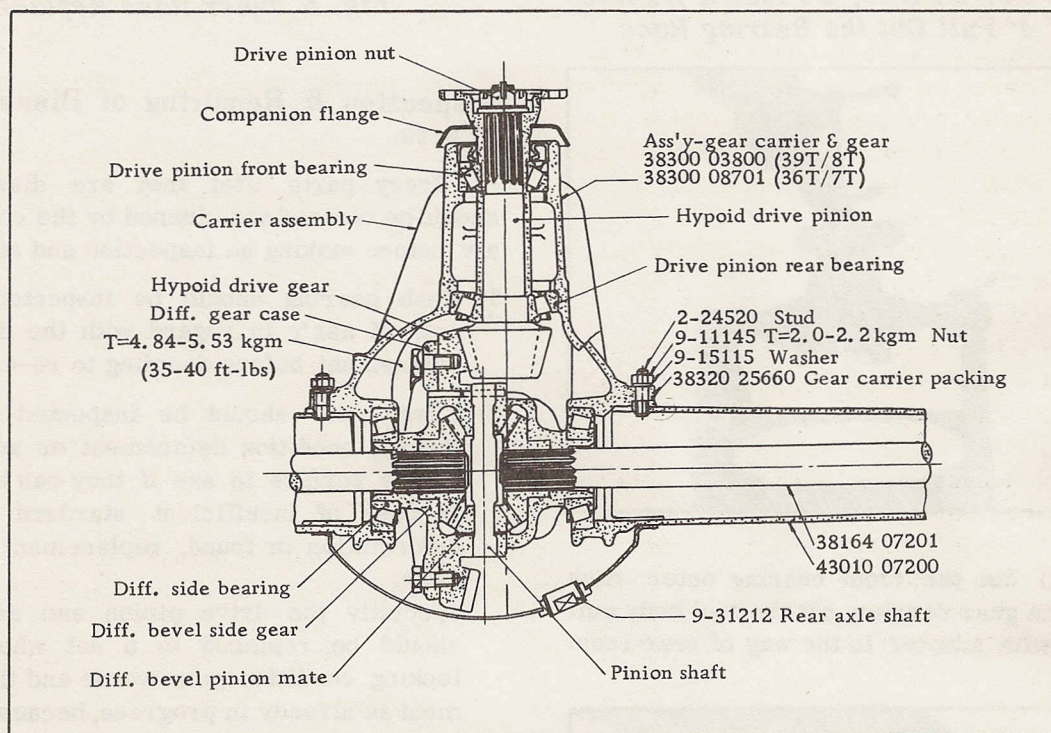
Fig. 2 Using of Side Bearing Puller



- 8) Take out the differential pinion as well as the side gear. The pinion mate shaft should first be pulled out by striking out the pinion mate shaft locking pin which is fixed on the differential case from left side (from the side of ring gear fixed) to the right before pulling out the pinion, side gear and the thrust washer. The gear as well as the thrust washer should be arranged separately as left and right, front and rear.
- 9) After taking the nut of the carrier, pull out the companion flange. The drive pinion flange wrench should be employed, setting

its four points in the holes of flange to keep it from moving, take off the nuts with the box wrench.

- 10) Take out the drive pinion of gear carrier by striking out lightly to the backwards the front end (at the side of companion flange) of drive pinion with the drift of soft metal. Thus, the pinion would be taken out together with the inner race of rear bearing and roller, distance piece, and the adjusting shim and the oil seal, outer race and pinion of front and rear bearing as well as the pinion adjusting shim left in the carroer.



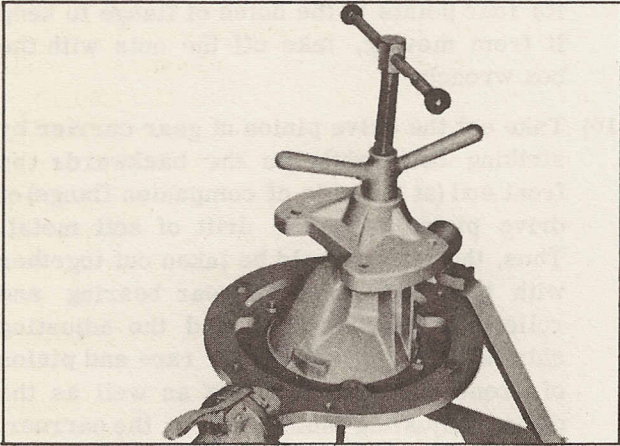
*Fig. 3 Differential Gear Carrier*

- 11) Pull out the rear bearing inner race of the drive pinion. The drive pinion rear bearing inner race replacer and the adaptor should be employed in this case. The adaptor in the round from is for fixing and the other for taking off. It is easy to handle with the vice fixing one end of replacer.
- 12) Taking out the rear bearing outer race of gear carrier.

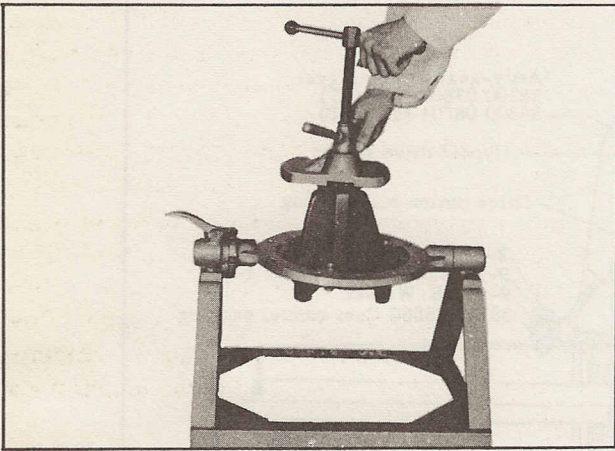
The drive pinion bearing outer race replacer should be employed in this case. In other upon the stud so as to make the screw at the center of carrier, and set the adaptor at the lower trim of the race.

Supporting the tommy bar and screw up till the corn closely touches the adaptor, then screw the wing nut to take out the rear outer race.





Tool No. DT4782, DT4631 & DT4689  
Fig. 4 Pull Out the Bearing Race



- 13) To pull out the front bearing outer race from the gear carrier, set the tool body pull it out with adaptor in the way of rear race.

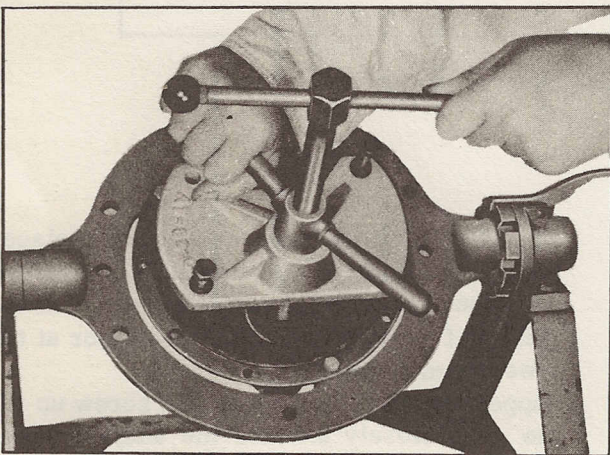


Fig. 5 Drive Pinion Front and Rear Bearing Outer Race Replace

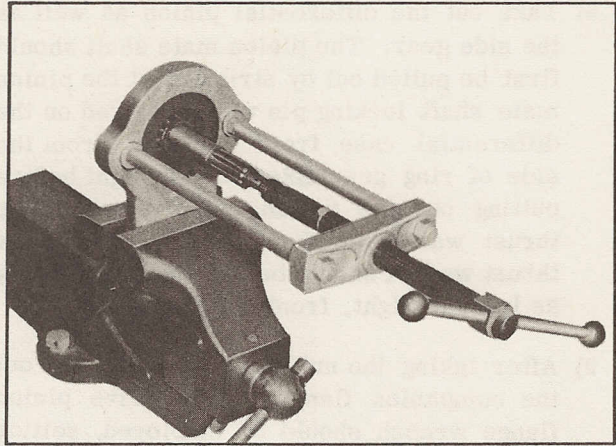


Fig. 6 Inner Race Replacer

## Inspection & Repairing of Disassembled Parts

Every parts after they are disassembled should be cleaned and cleaned by the compressed air before making an inspection and adjustment.

- 1) Each bearing should be inspected in every unit of ass'y in regard with the defect and defacement before deciding to re-used them.
- 2) Every gear should be inspected as to the locking condition defacement or any defects on the surface to see if they can be reused. In case of insufficient standard backlash, deformation or found, replacement is necessary.

Specially the drive pinion and drive gear should be replaced in a set whenever the locking condition gets worse and the defacement is already in progress, because it would cause the noise in later operation and be difficult to adjust even with proper adjustment is made.

The perfect driving condition at the surface of drive pinion gear should be about from  $\frac{2}{3}$  mm to  $\frac{3}{4}$  mm in unloaded driving while the gear surface should start to touch from tip to full surface in an ordinary loaded driving.

The inspection of this condition can be made as it is.

If it is hard to inspect them as it is, do otherwise by cleaning the both with the rugs before disassembling and paint thinly and evenly with the mixed with thin oil on the gear surface (drive side) then turn the pinion with hand to



print the trace of it on the gear. Which shows the situations of considerably worn out gear.

In case of unloaded test, it is perfect that the gears contact for about three quarter at the center of 1/4 of whole gear length from tooth (interior tip end of the gear) on the pitch line.

- 3) Lock the side gear with pinion together with respective thrust in the gear case.

In case of the backlash over 0.2 mm and the clearance between the side gear and thrust washer exceeds 0.5 mm, replace the thrust washer.

The else worn out parts should also be replaced.

The contact when ring gear is too close to pinion center in case of backlash should be adjusted closely or it gives much noise.

- 4) Put the drive gear (ring gear) on the buoy block as it is fixed in the differential gear case, and measure with the dial indicator. Revolve the drive gear to turn around the differential gear case as the bearing do not move on the buoy block.

Measure the shake at the rear side of gear by the scale and the shake should be within 0.5 mm. In mounting the gear, clean well the fitting face and rear face (measured face) of it and fix correctly, then there should not be any shaking.

## ASSEMBLING, ADJUSTMENT

### Assembling Differential Gear

- 1) Assemble the pinion and side gear in the differential case. Every parts should be cleaned and oiled with new gear oil, then the pinion mate side gear and the thrust washer should be assembled by the mentioned inspection and selection before pushing in the

pinion mate to shaft. Inspection should be made again in the clearance of between the washer or the backlash. Adjustment must be made in case any abnormal, is found.

Strike in the pinion shaft locking pin from the right side of the case (opposite side of drive gear) and must be fixed by setting well the striking hole of it after putting it to the required piston so as the pin should not loosen.

- 2) Fix the drive gear (ring gear) with the differential case.

The drive gear as well as the drive pinion should be well inspected or they must be replaced as a set whenever the replacement is required. Otherwise, they would not properly lock after assembling is completed. In mounting in the case, the fitting surface must specially be cleaned and fixed with 8 Nos. screws as well as lock washer. Bend the washer with sureness after the drive gear shake is adjusted. In tightening up the screw, it should be set and supported by vice or any other setting tools so as not to damage it and screw up in a diagonal line with a wrench fit correctly with the head of the screws. The standard screwing torque for this is 35 ft/lbs. to 40 ft/lbs. Screw in for sure, striking lightly the head of screw by one quarter and pund hammer.

- 3) Mount the side bearing in the differential case.

Press in the both side of the bearing by using the drift.

It is important in this case to assemble by putting the side bearing adjusting shim to give the bearing a proper preload in fixing with the carrier.

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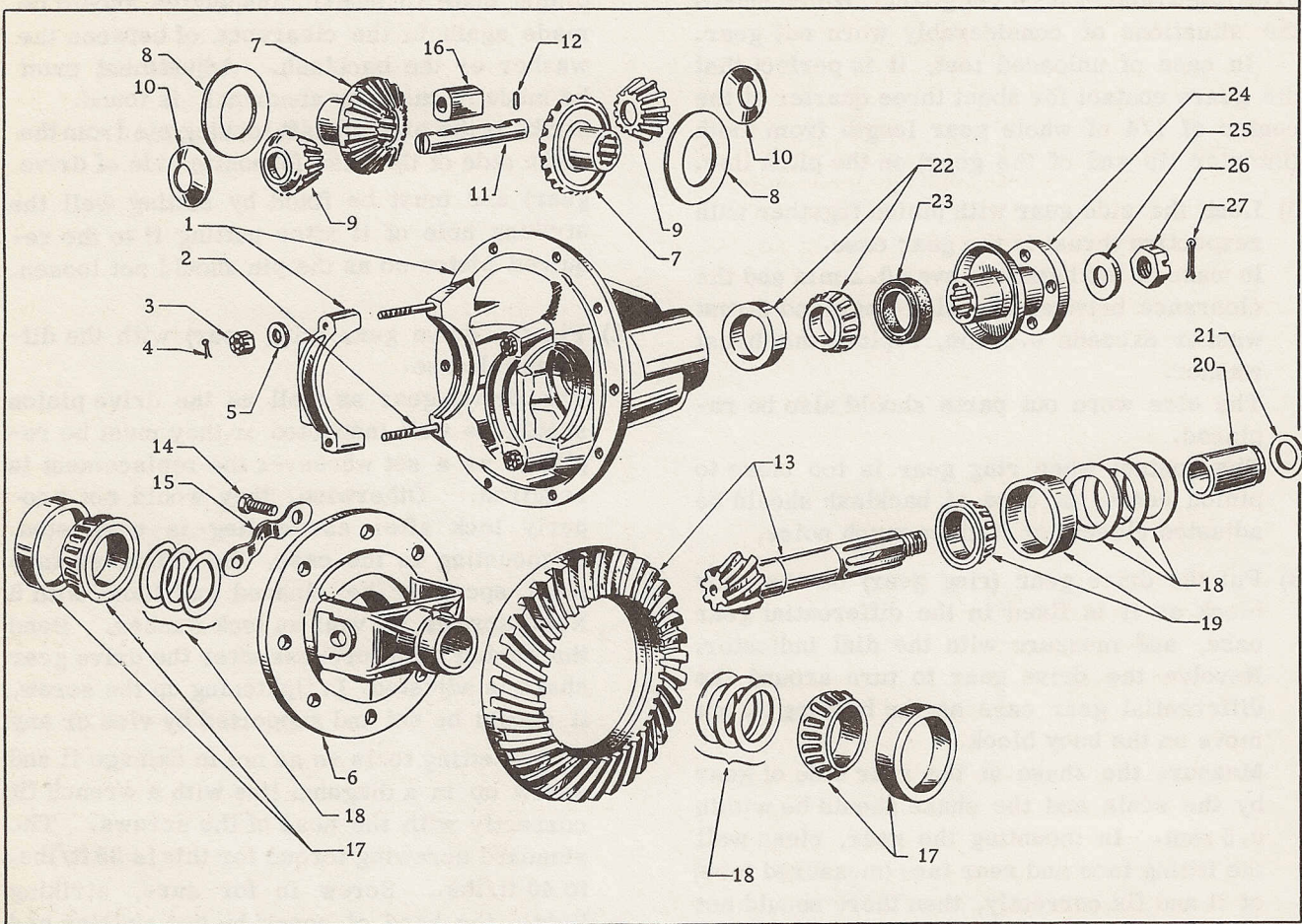
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1. Ass'y-carrier, gear	10. Washer-thrust, pinion mate	19. Ass'y-bearing, drive pinion, rear
2. Stud-differential	11. Shaft-pinion mate	20. Spacer-drive pinion bearing
3. Nut	12. Pin-lock, pinion shaft	21. Washer-adjusting, drive
4. Nut	13. Set-gear, hypoid	22. Ass'y-flange, companion
5. Washer-plain	14. Bolt-drive gear	23. Seal-oil, drive pinion
6. Case-differential gear	15. Strap-lock, bolt	24. Ass'y-flange, companion
7. Gear-side	16. Block-thrust	25. Washer-plain
8. Washer-thrust, side gear	17. Ass'y-bearing, side	26. Nut-drive pinion
9. Mate-pinion	18. Shim-adjusting, drive gear	

Fig. 7 Carrier & Gear



## Assembling & Adjustment by Gear Carrier Ass'y

It is to decide the assembling & adjustment of gear which is most important in an rear axle ass'y and should be carried in accordance with the exact sample shown by the manufacture. The construction and mechanism must well be comprehended referring to Fig.10 & 12 and the adjustment & repairing exactly according to the condition of practical use based on the adjustment by exact calculation.

### (A) The Preparation for Mounting the Drive Pinion in the Gear Carrier

- (1) If the drive gear, drive pinion, and bearing are to be reused they are as a result of disassembling and inspection, they should be assembled in order of disassembling at the previous condition of adjusting shim.

In case any item should be replaced or required to reuse even if any item is worn out prepare the various shims as mentioned later because the position of drive pinion to be fixed with carrier must be adjusted by the adjusting shim between the carrier and pinion rear bearing outer race.

- (2) There are few numbers with 0 & + or - besides set number marked by an electric pen on the tip head surface of drive pinion.

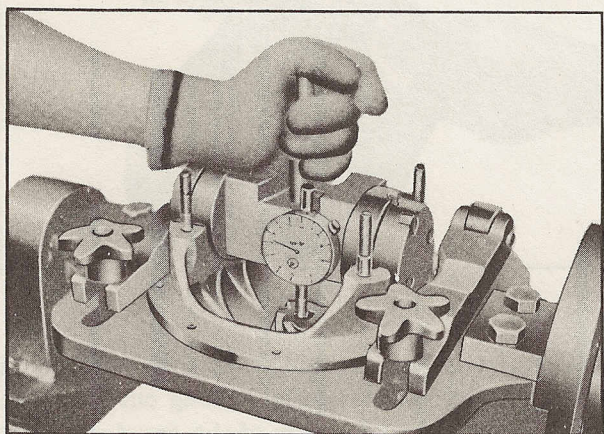


Fig. 8 Adjustment of Pinion Height

They show the manufacturing error in a figure at the unit of 0.001 in. (0.025 mm)

to decide the thickness of adjusting shim for adjustment of standard position (The standard pinion height is 61.0 mm from axle center as shown in Fig. 11). If the figure is difficult to discriminate due to the corrosion, scrape off the oxidized substance on the surface by a somewhat narrow grind stone with care not to scrape off even the mark.

Adjust to the direction of an arrow in accordance with the pinion mark.

- (3) The thickness of drive pinion adjusting shim are arranged as following.

	Part No.	Thickness	Standard Leaf Nos.	Part No.
Drive pinion adjusting shim	38153 25660	0.75 mm (0.030 in.)	1	38127 04100
	38154 35660	0.25 mm (0.010 in.)	2	38128 04100
	38155 25660	0.125 mm (0.005 in.)	2	38129 04100
	38156 25660	0.075 mm (0.003 in.)	2	38130 04100

The use of the adjusting shim will be explained in the following paragraph of adjustment. Supposing the drive gear and the drive pinion were replaced as a new set and the height of drive pinion previously used was right, prepare the shim of thickness which equals to the difference of figures on the new and this pinion. Deduct the previously used shim in case it is plus, increase in case of minus and have the general idea of required thickness of the shim for assembling to prepare.

It is convenient to inspect the condition before disassembling in a way as mentioned later in the measurement of pinion height. Beside the condition of defacement on the carrier, the pinion bearing must be taken into consideration though it will be explained in detail later.

### (B) Fixing and Adjustment of Drive Pinion

- (1) Drive pinion rear bearing outer race should be mounted in the carrier.



In this case, after inserting the properly selected adjusting shim as previously mentioned between the carrier and bearing race, mount the outer lace by the special tool of drive pinion front, rear bearing outer race replacer. For adjustment of previously mentioned pinion height, the shim at the rear side of this outer race is increased or decreased, and the race also must be taken off in each time for this adjustment, therefore the tools must be handled properly to avoid such a situation as to make the bearing hole of carrier in an oval. Referring to handling method of tool, set the adaptor ring on the corn to guide the body of tool at the small hole of carrier put the rear outer lace on the corn as bearing surface faces inside at the tip end of screw and put the split adaptor inside race. At the same time, supporting it by the bar, twist up the corn till the adaptor and lace come to the setted position then screw up the wing nut so as the race be housed properly at the setted position.

- (2) Mount the front bearing outer lace in the carrier.

For mounting the front outer lace, take off at first the adaptor from the front end of the carrier and fix the tool at the side of stud in opposite side, tighten the screw as to be the center of carrier then mount it by using adaptor as in a way of mounting the rear outer race.

The race is scarcely necessary to be taken off unless damaged.

- (3) Mount the rear bearing inner race and roller to the drive pinion. By using the round adaptor attached to the drive pinion rear bearing inner race replacer which was employed at disassembling, press in the drive pinion. This might as well be done in pressing in by the use of a certain drift.

- (4) Mount the drive pinion in the carrier and adjust by measuring the position.

The pinion height must be adjusted as mentioned in the previous paragraph, by mounting temporarily the pinion in the carrier and the bearing be given a

regular pre-load. On the other hand, the bearing of drive pinion should be newly oiled after the pinion is inspected from the inside of the carrier, the inserted end of pinion should be locked with front bearing corn and tightened up by the pinion nut fixing with the companion flange till the regular revolving torque is required. As this is not yet at the final assembling, the bearing spacer (distance piece), bearing adjusting shim and oil seal are not mounted.

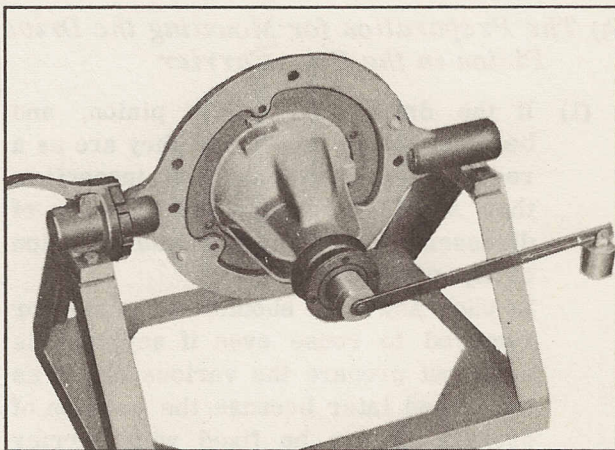


Fig. 9

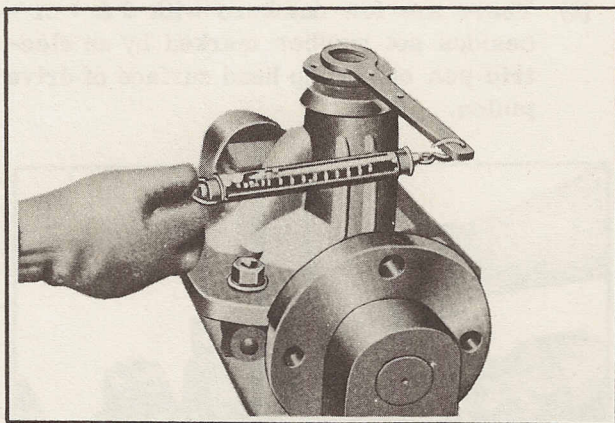
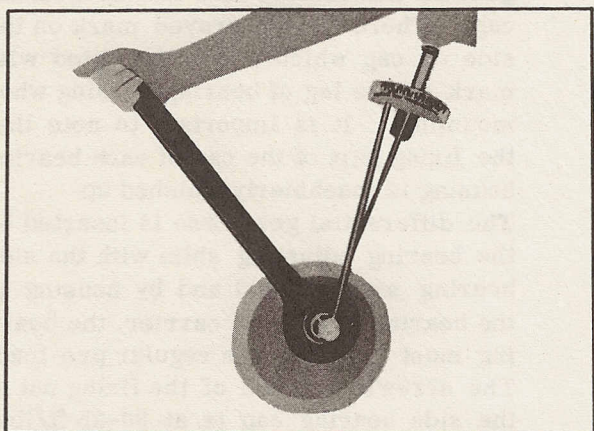


Fig. 10

At the time of inserting the front bearing, as pushing in the inner race by pulling out the drive pinion from the rear side of the carrier. Put the rear side of the carrier downward and set the tool under it, then supporting the end surface of drive pinion, press in the bearing by using the drift.



The operation would be easier by using the drive pinion front bearing inner lace inserter as shown.



*Fig. 11 Use of Drive Pinion Bearing Pre-load Gauge*

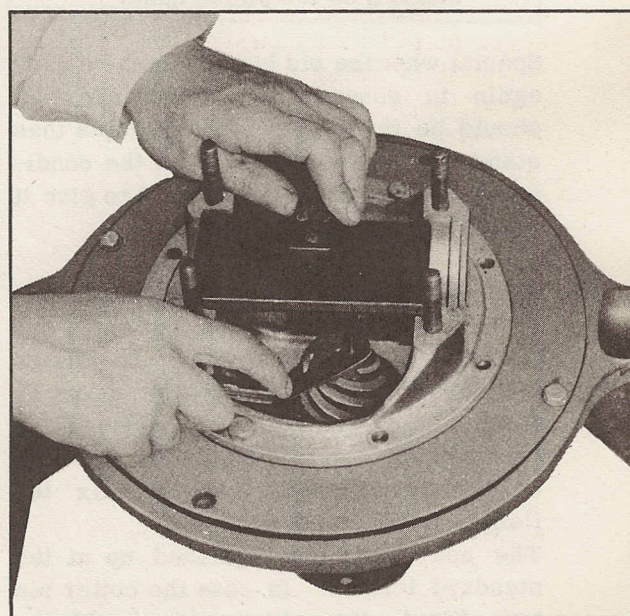
Tighten up the pinion nut by turning it slowly with hands with the use of pre-load gauge as Fig. 11 to the degree that support the bearing pre-load at 7-10 kg/cm.

When the drive pinion is mounted in the previously mentioned condition, it is necessary to measure the height of rear surface of the pinion whether it is higher or lower than the standard. Make use of the special drive pinion arrangement gauge. The standard height of the pinion is 21 mm from the bottom of the side bearing fixed with the carrier. The fixing position can be measured by setting an arc of circle on both sides of arrangement gauge at the position of side bearing and insert the thickness gauge in the clearance between the tip of gauge bar and the pinion such as to push in by scraping of the carrier in diagonal, otherwise pre-load and the pinion height of the bearing would come out of order and tend to cause an unexpected trouble in future.

- (5) The formal adjustment of the drive pinion, bearing and pre-load. After the fixing position of drive pinion is decided as mentioned in the previous paragraph, take off the pinion nut & companion flange to mount again the drive pinion bearing spacer (distance piece) and nut. Tighten up the nut as Fig. 11 by using the torque wrench at the regular torque of 100-120 ft/lbs (1400-1680 kg-cm).

The pre-load supportedly the bearing in this case is different according to the condition of the bearing adjusting shim inserted. The more of the shim inserted, much the play of pinion to the direction of axle is increased.

The less of the shims inserted, the more the bearing tightened by the previously mentioned nuts and cause it to be burned if left and turned as it is. Therefore, for readjustment of the bearing pre-load in this case, it must be adjusted by increasing or decreasing the number of four kinds of adjusting shim as shown in the following list and measuring with the use of the drive pinion bearing pre-load gauge as Fig. 4 so as to make the revolving torque of pinion at 7-10 kg/cm if there should not be any error in the pinion with the head mark at 0 and the clearance should be sealed at 0.2 mm (0.008 in.) by the feeler gauge, thus pinion is regarded as at the correct position because the height of the gauge is made shorter for 0.2 mm than the standard size (21.0 mm). If it is necessary to adjust the pinion height, take off the drive pinion as well as pinion rear bearing outer lace from the carrier to adjust by increasing or decreasing the number of the adjusting shim.



*Fig. 12*



In other words, read the mark on the head of the drive pinion, before adjusting by increasing or decreasing the number of device pinion adjusting shim to insert the feeler gauge which is deducted for the number of mark from 0.008 in. in case of minus side added for the number of mark to 0.008 in. in case of plus.

For instance, the mark shows 2, adjust the position of drive pinion by deducting the number of shim so as to make the clearance at 0.008 in., 0.002 in., 0.010 in. It is necessary to give the bearing a right pre-load. At the time of pushing the outer lace into the carrier, it must be done in a right way, otherwise.

**Remarks:** When measuring the height of the pinion head, set the semicircular side portions of the gauge on the side bearing seats; insert a feeler gauge into the clearance between the tip of the gauge center rod and the pinion head, and adjust the pinion.

The gauge rod is made 0.2 mm (8/1000 in.) shorter than the standard measurement (21 mm).

Therefore, adjustment is made by selecting a feeler gauge in accordance with the plus or minus valve marked on the pinion head.

Special when the old bearing is to be used again in assembling, the adjustment should be made at the lower torque than standard in accordanced with the conditions of practical use so as not to give it an over pre-load.

- (6) When the former adjustment of pre-load of the bearing is completed as in the previous paragraph, inspect the pinion height again. Unless any thing wrong is found, loosen the pinion nut, take off the flange, insert the new oil seat in the rear of the carrier and formerly fix the flange, washer and pinion nut.

The nut should be tightened up at the standard torque. In case the cotter pin hole fitted, the adjustment should be made not by tightening the nut, but by filling the washer.

### (C) Mounting the Differential Gear Ass'y in the Carrier

- (1) Mount the complete unit of differential gear in the carrier and fix the bearing cap. There is a engraved mark on the side of cap which should be fitted with mark on the leg of bearing housing when mounting. It is important to note that the fixing part of the cap of each bearing housing is machinerly finished up.

The differential gear case is inserted by the bearing adjusting shim with the side bearing as explained and by housing in the bearing housing of carrier, the bearing must be given the regular pre-load. The screwing torque of the fixing nut of the side bearing cap is at 30-35 ft/lbs. (420-490 kg-cm) and should be equally locked with fixing cotter pin.

So far, only the differential unit is mounted and the drive gear is locked with the drive pinion, therefore, the following adjustment must be made to acquire the regular side bearing pre-load & the gear backlash.

- (2) Adjustment of side bearing pre-load & backlash.

To give the right pre-load on the side bearing of differential gear case and in pressing the bearing in the differential case adjust by inserting inside the bearing adjusting shim of thickness calculated in accordance with the following method of computation.

There is a marked numeral of adjusting basis on the bearing housing of the gear carrier and differential case. The numeral is the manufacturing error in a unit of 1/1000 in. against each standard measurement of A. B. C. D. in Fig. 12. To measure the width of the side bearing on left and right, use the standard gauge (20.0 mm thickness) and dial gauge on a flat board. In this case, place the load on the bearing with the aid of weight block for about 2.5 kg to acquire the steady figures.

Calculate the error on minus side against the each standard measurement of 20.0 mm on the unit basis of 1/1000 and assume each of them as E & F.



Take the left side bearing, for example. When the measured width is 19.8 mm, it is -0.2 mm (-0.008 in.) against the standard measurement and the E is, by excluding the minus sign, 0.008 in.

The thickness of the shim is acquired by applying the numerals to the following method of computation.

It may as well be assembled by using the shim of thickness which is in accordance with above method of computation. The left and right bearing must be well pressed in, otherwise the pre-load changes. Measure the backlash of the drive pinion & ring gear as Fig. 15 by using the dial indicator to make sure that it is within 0.1 mm-0.2 mm (0.004"-0.008"). If it is much, move to left by taking off the right shim, and a vice versa for adjustment.

The numeral marked by the electric pen on the side of the drive gear shows that of the recommended backlash besides the set number. For example, 6-6 means the backlash of 0.006 in.

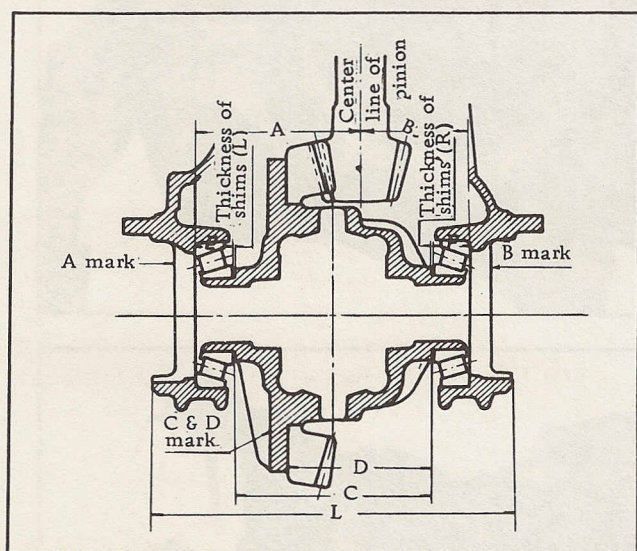


Fig. 13

Thickness of shim on left side

$$\text{Left Side } T_1 = A + D - C + 0.007 \text{ in.} + E$$

Example of calculation:

$$\begin{array}{ll} \text{Left} & A = +1 \\ & D = +2 \\ & C = +2 \end{array}$$

$$E = +0.2 \text{ mm (0.008 in.)}$$

$$T_1 = A + D - C + 0.007''E = 0.001'' + 0.002'' - 0.002'' + 0.007'' + 0.008'' = 0.016''$$

Thickness of shim on right side

$$\text{Right Side } T_2 = B - D + 0.006 \text{ in.} + F$$

Example of calculation:

$$\begin{array}{ll} \text{Right} & B = +2 \\ & D = +3 \text{ there fore.} \\ & F = +0.25 \text{ mm (0.010 in.)} \end{array}$$

$$T_2 = B - D + 0.006''F = 0.002'' - 0.003'' + 0.006'' + 0.010'' = 0.015''$$

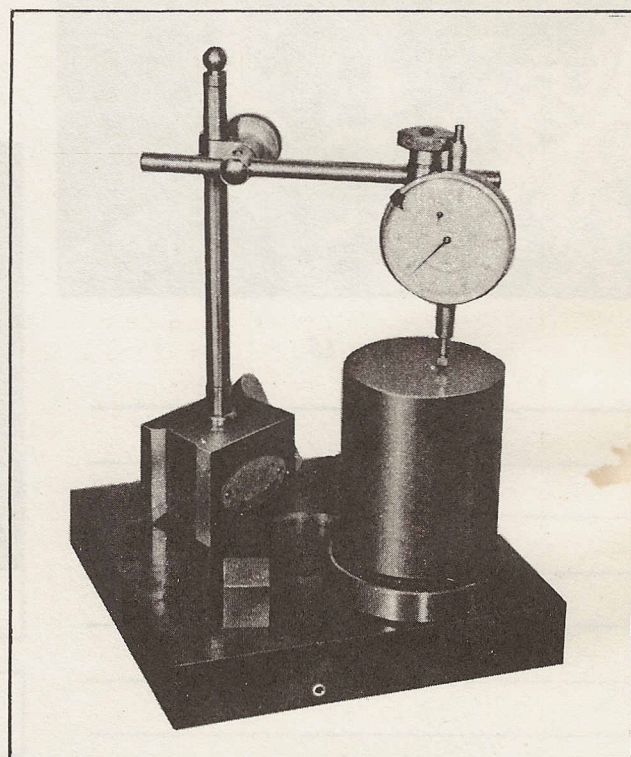


Fig. 14

### After the Operation

If it is necessary to use the bearing again at the time of repairing, the thickness of each shim of left & right must be reduced for 0.001"-0.003" on the basis of 80% or 60% against standard pre-load in accordance with the practical condition of use, because over pre-load is given to the bearing with the shim of thickness calculated from above method of computation.



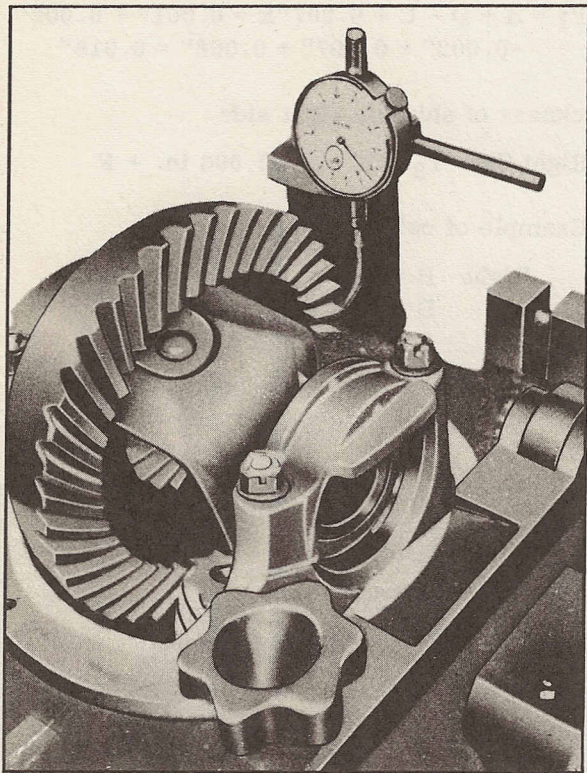


Fig. 15

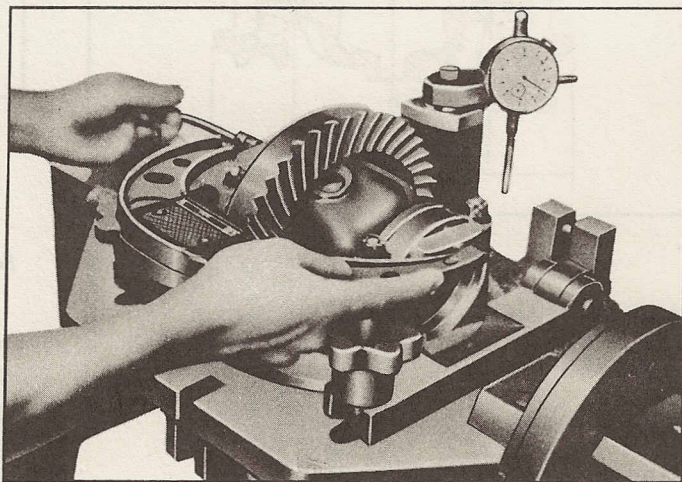
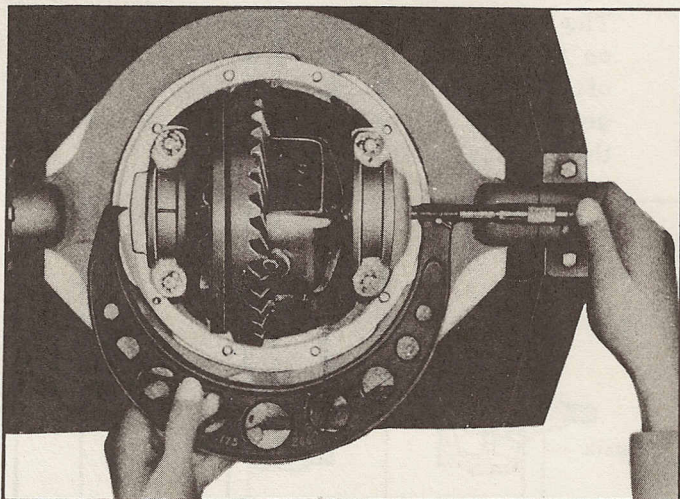


Fig. 16 Using the Differential Side Bearing Cap Gauge



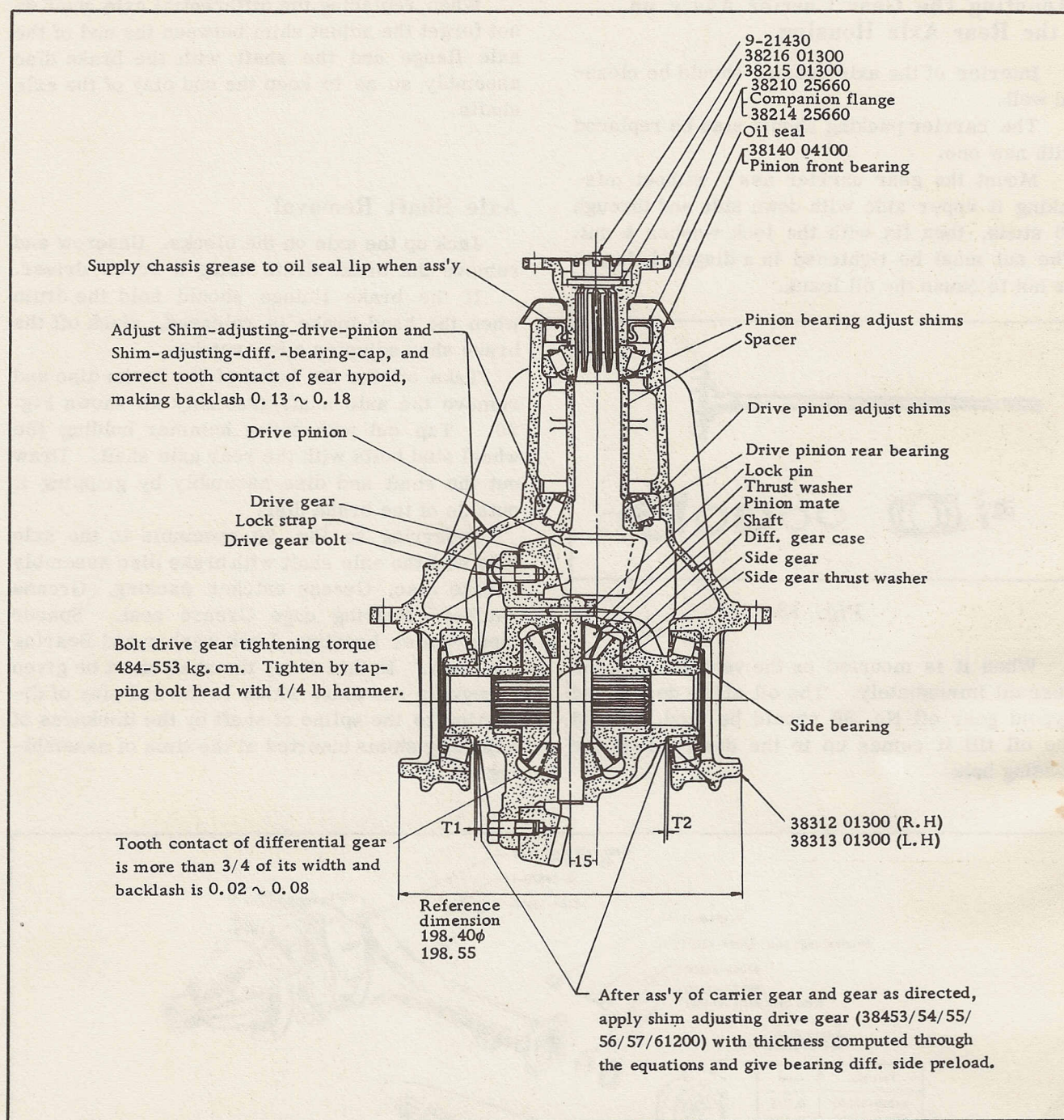


Fig. 17 Differential Gear Carrier Section

Thus the adjustment is completed. By way of precaution, measure the L measurement which is within 198.40-198.55 mm as Fig. 10. If it is insufficient, and an additional shim of 0.002 in. (0.05 mm) in left and right. In this case, the large size of micrometer, as Fig. 10

or special gauge should be employed for scaling.

The shake of the back of drive gear which has been fixed with the carrier should be measured by dial indicator to confirm that it is within 0.1-0.2 mm.



# DATSUN PICK-UP

## Mounting the Gear Carrier Ass'y on the Rear Axle Housing

Interior of the axle housing should be cleaned well.

The carrier packing should also be replaced with new one.

Mount the gear carrier ass'y without mistaking it upper side with down side and through 10 studs, then fix with the lock washer & nut. The nut must be tightened in a diagonal line so as not to cause the oil leaks.

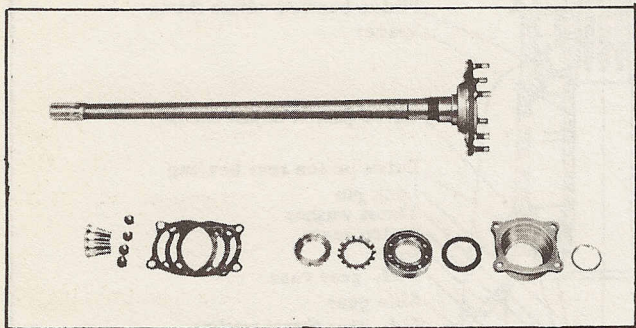


Fig. 18

When it is mounted on the vehicle, feed the gear oil immediately. The oil of the designated hypoid gear oil No. 90 should be feed. Feed the oil till it comes up to the down side of the feeding hole.

When replacing the differential axle shart do not forget the adjust shim between the end of the axle flange and the shaft with the brake disc assembly so as to keep the end play of the axle shafts.

## Axle Shaft Removal

Jack up the axle on the blocks. Unscrew and remove the brake drum using a screw driver.

If the brake linings should hold the drum when the hand brake is released, slack off the brake shoe adjuster a few notches.

Take off the fix bolts of the brake disc and remove the axle shaft assembly as shown Fig. 20. Tap out with swing hammer holding the wheel stud bolts with the rear axle shaft. Draw out the shaft and disc assembly by gripping it outside of the brake disc.

Referring to Fig. 20 assemble to the axle tube with the axle shaft with brake disc assembly (Brake disc, Grease catcher packing, Grease catcher, Bearing cage Grease seal, Spacer taper roller bearing, Lock washer and Bearing lock nut). In this case, the shaft must be given a regular end play, which is the end play of direction to the spline of shaft by the thickness of adjusting shims inserted at the time of assembling.

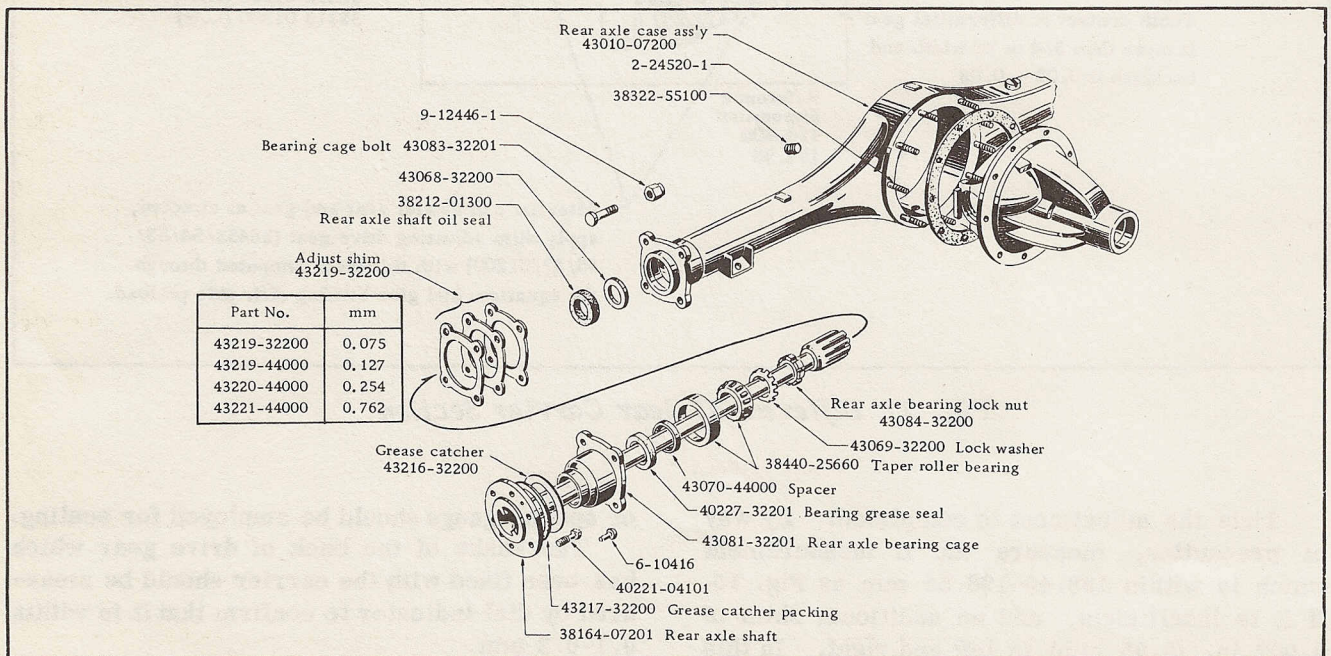


Fig. 19



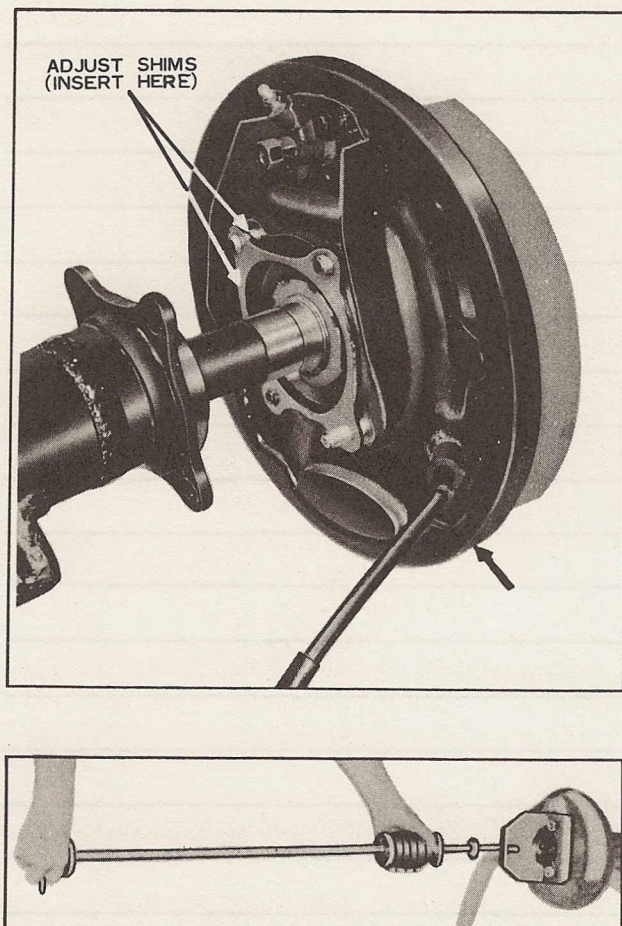


Fig. 20

In adjustment for this end play, select the adjusting shims for one side (Left or Right) at the first.

Insert selected shims (standard 1.5 mm) between the axle tube and the shaft assembly fit the end play of axle shaft 0.85-1.10 mm.

Secondary, attach the other side of axle shaft assembly and adjust end play 0.05-0.10 mm by selecting adjust shims.

### The Inspection When the Car Stops

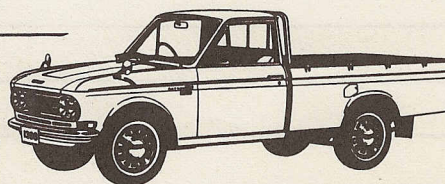
- (1) Operating the side brake, and setting the revolving of axle shaft, the gear backlash and the defacement of the spline in the housing can be found by inspecting the motion of the propeller shaft as moving it to left and right. Specially in case of the drive pinion comes out and in, the pinion bearing is worn out or the adjustment is necessary.
- (2) Another inspection should be carried in a way by tacking up one of the wheels and spin it back and froth.
- (3) Holding the tire of the wheels jacked up and spin and move to every direction. When the shock is felt, inspect the degree of tightness and adjust it.
- (4) Inspect and confirm the voume and quality of the oil in the housing.

### Inspection in Motion

- (1) In case of giving the high metallic noise when speeding up, the backlash is at the least or too much at the drive gear and the drive pinion.
- (2) Giving any abnormal noise in speeding up or slowing down, the drive pinion bearing is worn out or damaged.
- (3) It is the bearing that gives the constant humming noise at high speed and the gear that makes a periodic noise at low speed. In case there is any damage of the gear, it must be immediately disassembled and repaired because if it is used as it is, the broken gear cause to break the other gear and another and so forth, finally to the big accident.



## DATSUN PICK-UP





## BRAKE

## GENERAL DATA

Type	Operated by foot	Four wheel braking by oil pressure
	Operated by hand	Mechanical braking for rear wheels
Inner dia. of master cylinder		19.05 mm (0.77 in.)
Inner dia. of wheel cylinder	Front wheel	Rear wheel
	19.05 mm	19.05 mm
Residual pressure of brake oil		0.5-0.8 kg/sq. cm

## BRAKE DRUM

Inner dia. of drum (both front & rear)	254 mm (10 in.)
Degree of real circle of drum	Less than 0.05 mm (0.002 in.)
Amendment limit of dittoed degree	0.20 mm (0.008 in.)
Allowable limit of inner dia. of drum	0.80 × 2 mm (0.032 in. × 2)

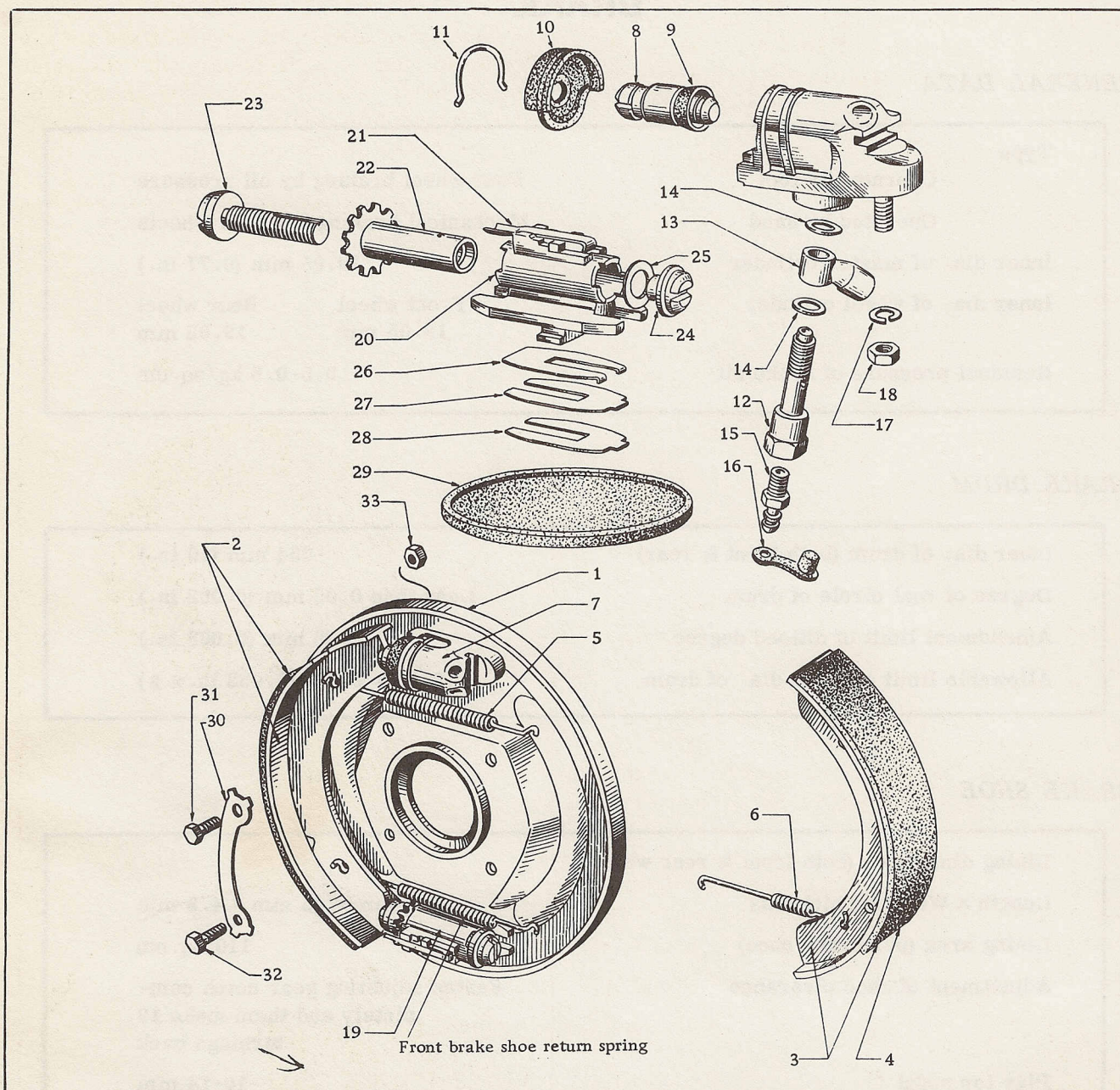
## BRAKE SHOE

Lining dimension (both front & rear wheel)	
Length × Width × Thickness	244 mm × 45 mm × 4.5 mm
Lining area (per brake shoe)	110 sq. cm
Adjustment of shoe clearance	Fasten adjusting gear notch completely and then make 12 turnings back
Play for pedal	10-14 mm

The brakes on all four wheels are hydraulically operated by foot pedal application, directly coupled to a master cylinder in which the hydraulic pressure of the brake operating fluid is originated. A supply tank cast integrally with

the master cylinder provides a reservoir by which the fluid is replenished, and a pipe line consisting of tube, flexible hose and union, interconnected the master cylinder and the wheel cylinders.





1. Ass'y-disc, front brake (L.H.)	12. Bolt-connector, front wheel cylinder	23. Screw-adjuster (L.H.)
2. Ass'y-shoe, front brake, fore	13. Connector-front wheel cylinder	24. Ass'y-head, adjuster
3. Ass'y-shoe, front brake, after	14. Washer-front wheel cylinder	25. Shim-adjuster head
4. Lining-front brake	15. Screw-bleeder	26. Spring-retaining, adjuster
5. Spring-return, after shoe	16. Cap-bleeder screw	27. Plate-lock, retaining spring
6. Spring-return, after shoe	17. Washer-lock	28. Shim-adjusting, retaining spring
7. Ass'y-cylinder, front wheel	18. Nut	29. Boot-rubber
8. Piston-front wheel cylinder	19. Ass'y-adjuster	30. Plate-lock, brake disc, front
9. Cup-piston, wheel cylinder	20. Ass'y-housing, adjuster	31. Bolt
10. Cover-dust shield	21. Spring-lock, adjuster wheel	32. Bolt
11. Retainer-dust shield cover	22. Wheel-adjuster (L.H.)	33. Nut

Fig. 1 Components of Front Brake



The pressure generated in the master cylinder by application with the foot pedal is transmitted with equal and undiminished force to all wheel cylinders simultaneously. This moves the pistons outwards, which in turn expand the brake shoe thus producing automatic equalisation, and efficiency in direct proportion to the effort supplied at the pedal. When the pedal is released the brake shoe springs return the shoes which then return the wheel cylinder pistons, and therefore the fluid back into the pipe lines and master cylinder.

An independent mechanical linkage actuated by a hand brake, mounted drivers seat side (left or right side), operates the rear wheels by mechanical expanders attached to the rear wheel cylinder bodies.

## Front Brakes

The front brakes are operated by each one wheel cylinder.

Each wheel cylinder consists of a body containing, spring, spring seats, pistons, piston cups, cylinder cover lock wheel cylinder cover and adjust screw.

The shoes are allowed to slide and centralise during the actual braking operation which distributes the braking force equally over the lining area ensuring high efficiency and even lining wear.

The brake shoes rest on the dimples formed in the back plate and are held in position by one return spring which connecting with the hole of shoes.

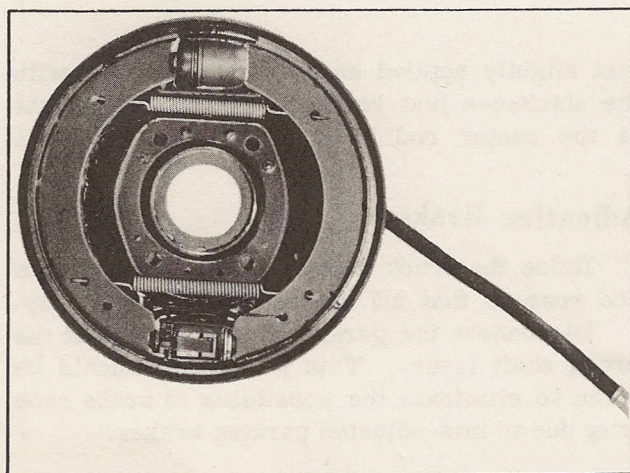


Fig. 2

## Rear Brakes

The rear brake shoes are not fixed but are allowed to slide and centralise with the same effect as in the front brakes. They are hydraulically operated by wheel cylinder and independent hand brake mechanism.

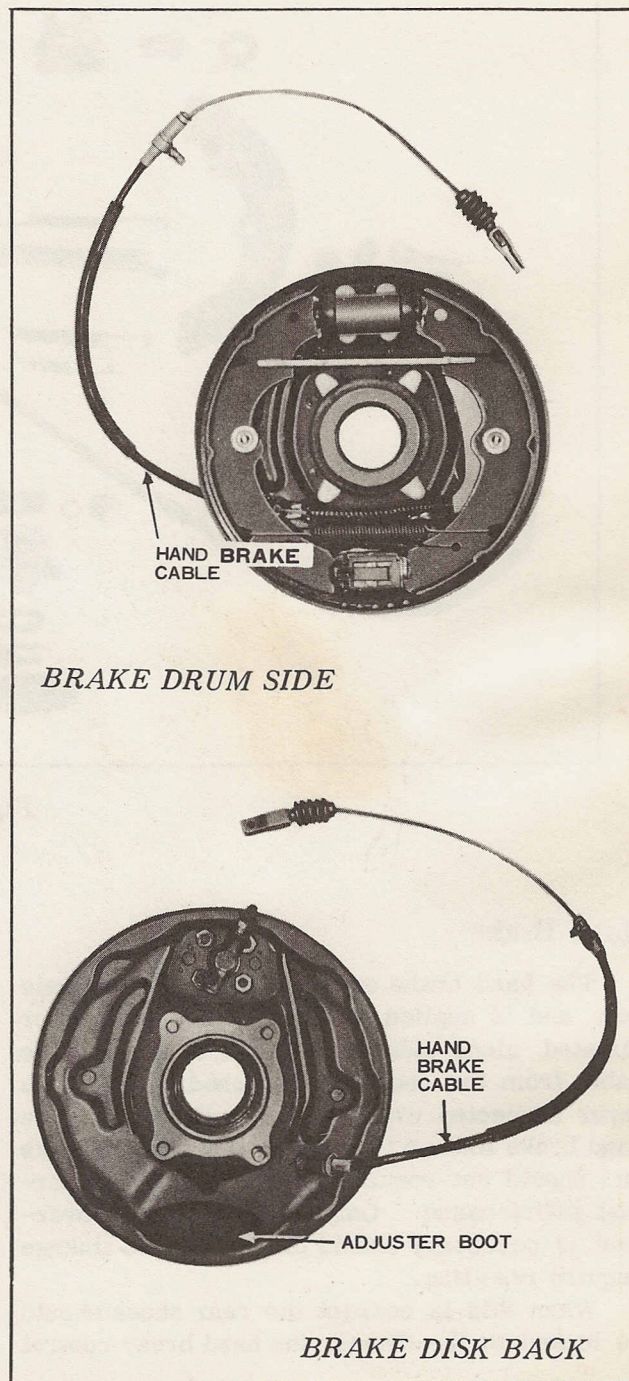


Fig. 3 Rear Brake



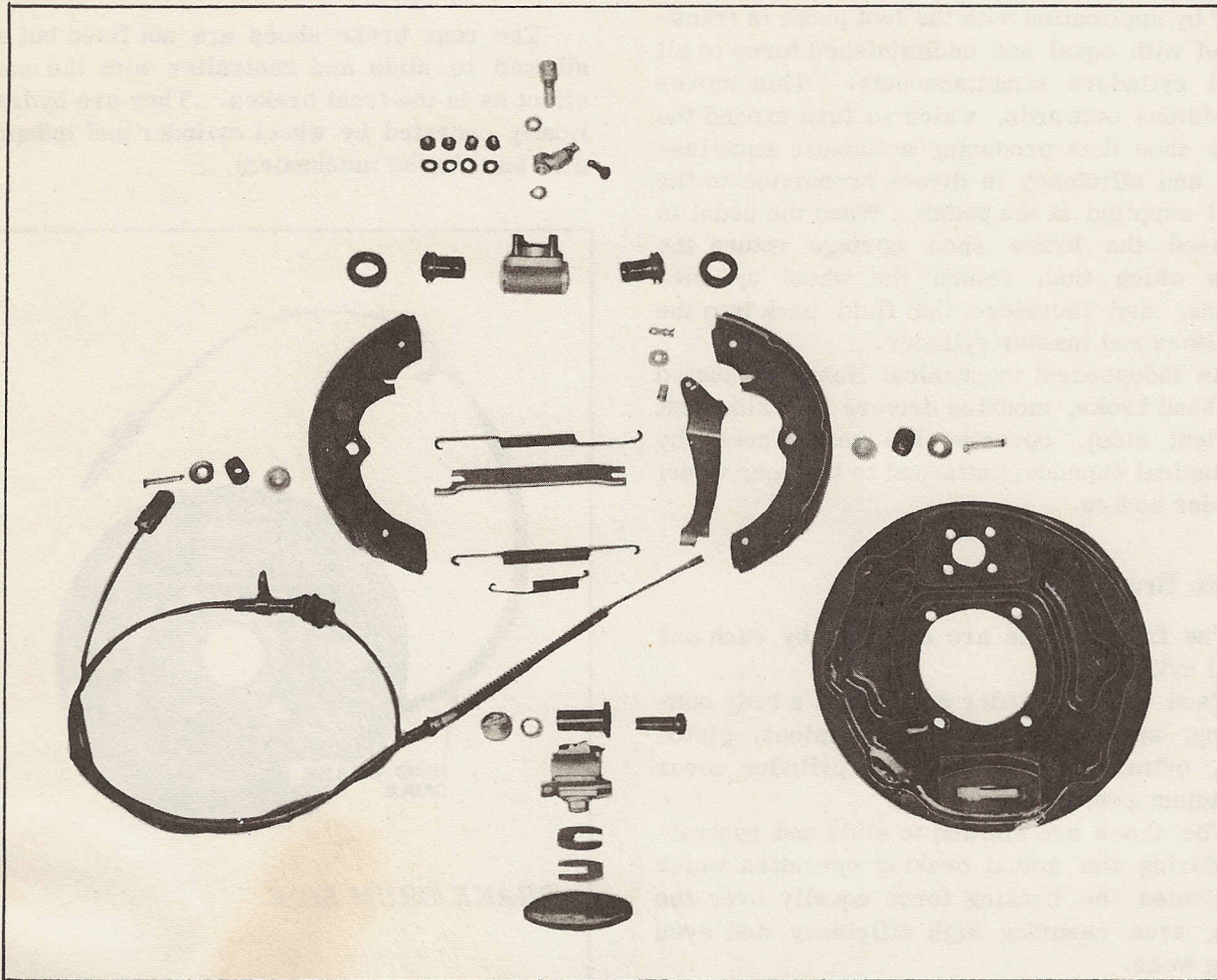


Fig. 4

### Hand Brake

The hand brake operates on the rear wheels only and is applied by a pull-up type of lever situated along-side the driver's seat. The cable from the control is attached to the toggle lever connected with the rear brake disc. The hand brake linkage is set when leaving the works and should not require any attention under normal maintenance. Only when a complete overhaul is necessary should the hand brake linkage require resetting.

When this is correct the rear shoes should be locked to the drums, the hand brake control

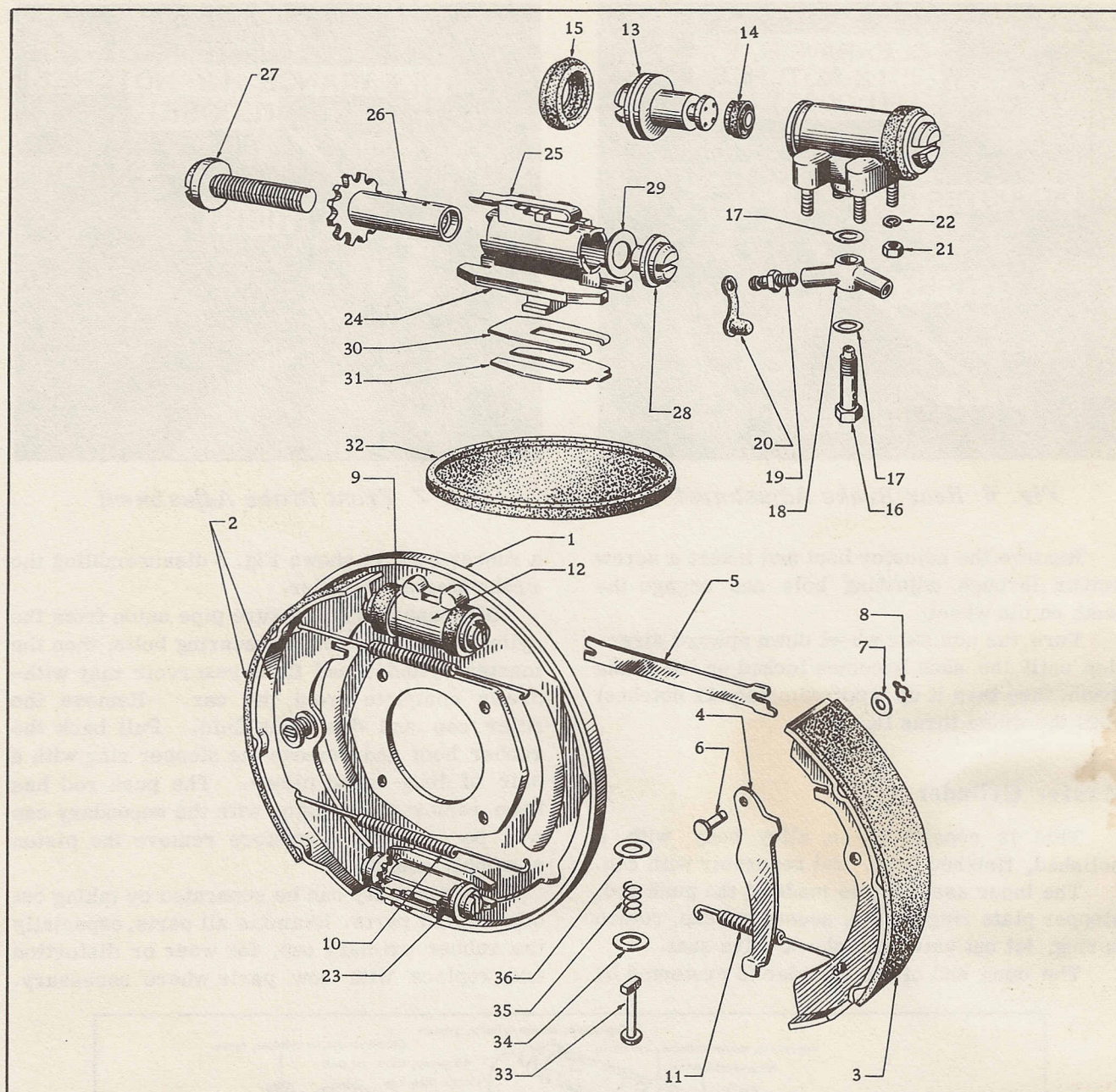
just slightly applied and the wire rope set with the slackness just removed, by means of a nut at the center rod of the equalizer drag link.

### Adjusting Brakes

Raise the truck and place stand jacks front and rear so that all four wheels rotate freely.

Disconnect the parking brake cables at the cross shaft lever. This precaution should be taken to eliminate the possibility of brake shoe drag due to mis-adjusted parking brakes.





1. Ass'y-disc, rear brake (L.H.)	13. Piston-rear wheel cylinder	25. Spring-lock, adjuster wheel
2. Ass'y-shoe, rear brake	14. Cup-piston, rear wheel cylinder	26. Wheel-adjuster (L.H.)
3. Ling-brake	15. Cover-dust shield	27. Screw-adjuster (L.H.)
4. Link-extension, hand brake	16. Bolt-connection	28. Ass'y-head, adjuster
5. Lever-toggle (L.H.)	17. Washer-front wheel cylinder	29. Shim-adjuster head
6. Pin-toggle lever	18. Connector-rear wheel cylinder	30. Spring-retaining, adjuster
7. Washer-plain, toggle pin	19. ScrewObleeder	31. Plate-lock, retaining
8. Spring-lock, clevis pin	20. Cap-bleeder screw	32. Boot-rubber
9. Spring-return, rear brake, upper	21. Nut	33. Pin-anti-rattle
10. Spring-return, rear brake, lower	22. Washer-lock	34. Seat-spring, anti-rattle
11. Spring-return, after shoe	23. Ass'y-adjuster	35. Spring-anti-rattle
12. Ass'y-cylinder, rear wheel	24. Ass'y-housing, adjuster	36. Retainer-anti-rattle

Fig. 5 Components of Rear Brake



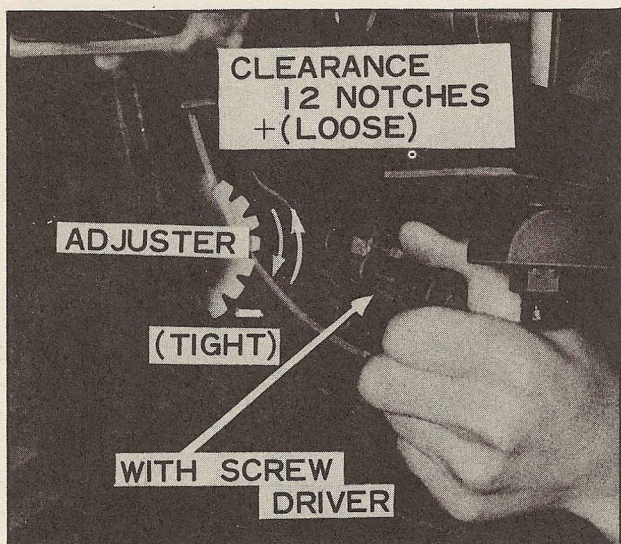


Fig. 6 Rear Brake Adjustment



Fig. 7 Front Brake Adjustment

Remove the adjuster boot and insert a screw driver through adjusting hole and engage the teeth on the wheel.

Turn the adjuster wheel down upward direction until the shoe becomes locked on the brake drum, then turn it up (approximately 12 notches) until the wheel turns lightly.

## Master Cylinder

This consists of an alloy body with a polished, finished bore, and reservoir with cap.

The inner assembly is made of the push rod, stopper plate ring, piston, secondary cap, return spring, let out valve and check valve seat.

The open end of the cylinder is protected by

a rubber boot as shown Fig. 8 disassembling the Brake Master Cylinder.

Disconnect the pressure pipe union from the cylinder and remove the securing bolts, then the master cylinder and fluid reservoir may be withdrawn complete from the car. Remove the filler cap and drain out fluid. Pull back the rubber boot and remove the stopper ring with a pair of long-nosed pliers. The push rod has been removed the piston with the secondary cap will be exposed, therefore remove the piston assembly complete.

The assembly can be separated by taking out other small parts. Examine all parts, especially the rubber primary cap, for wear or distortion and replace with new parts where necessary.

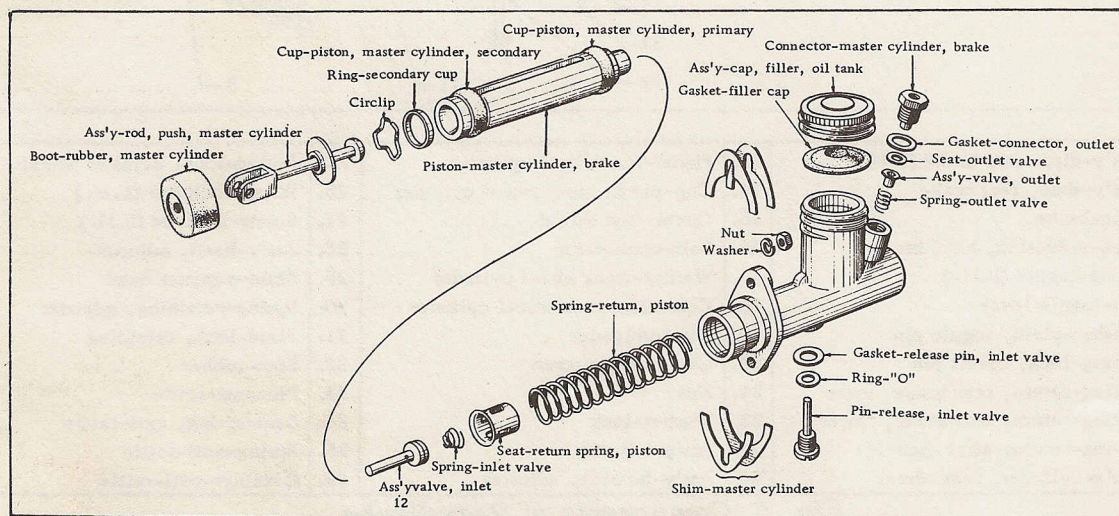


Fig. 8 Components of Brake Master Cylinder



## Bleeding the Hydraulic System

Bleeding is necessary any time a portion of the hydraulic system has been disconnected or if the level of the brake fluid has been allowed to fall so low that air has entered the master cylinder. With all the hydraulic connections secure and the supply tank topped up with the fluid, remove the cap from the bleed valve and fit the bleed tube over the bleed valve, immersing the free end of the tube in a clean jar containing a little brake fluid.

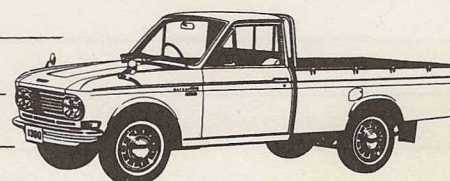
Unscrew the bleed valve cap about three-quarters of a turn and then operate the brake pedal with a slow full stroke until the fluid entering the jar is completely free of air bubbles. Then, during a downstroke of the brake pedal, tighten the bleed screw cap sufficiently to seat, remove bleed tube.

This process must now be repeated for each of the other wheel cylinder.

Always keep a careful check on the supply tank during bleeding since it is most important that a full level is maintained.

Should air reach the master cylinder from the supply tank, the whole of the bleeding operation must be repeated.

After bleeding, top up the supply tank to its correct level of approximately three-quarters full. Never use fluid that has been bleed from a brake system for topping up the supply tank, as this brake fluid may be to some extent treated. Such fluid must be allowed to stand for at least one day before it is used again. This will allow the air bubbles in the fluid time to disperse. Great cleanliness is essential when dealing with any part of the hydraulic system, and especially so where the brake fluid is concerned. Dirty fluid must never be added to the system.





## DATSUN PICK-UP

