

Subaru 360

Truck & Van

Body Section Manual

Fuji Heavy Industries, Ltd.

FOREWORD

This service manual has been prepared as reference for effective service and maintenance of the body for Subaru 360 Truck and Subaru 360 Van.

Please utilize this manual fully to ensure complete maintenance work for satisfying our customers by keeping their vehicles in the best condition.

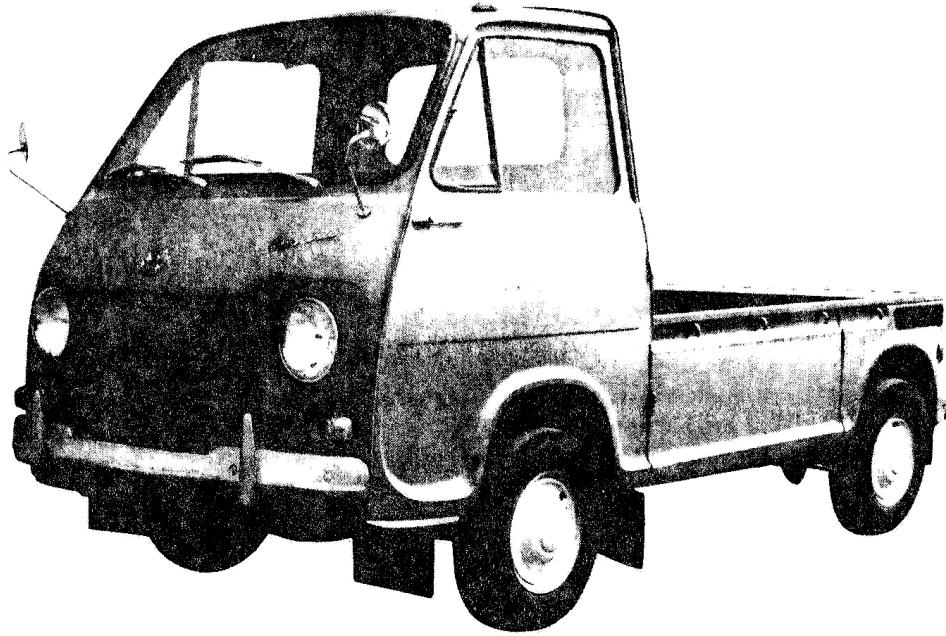
(For information on the engine, please refer to the "Service Manual - Engine Section".)

When it is necessary to replace parts during maintenance, be sure to use genuine Subaru parts.

FUJI HEAVY INDUSTRIES LTD.

EXTERIOR PHOTOGRAPHS

SUBARU 360 TRUCK



SUBARU 360 VAN

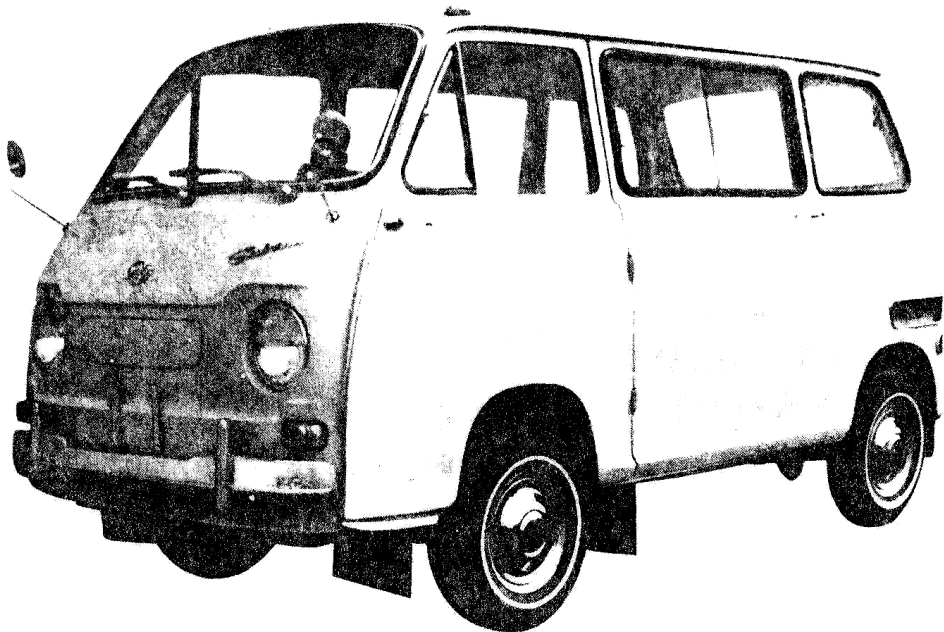


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1. MAIN SPECIFICATIONS

	Truck	Van	
MODEL	K153L	K163L	
DIMENSIONS AND WEIGHTS			
Overall length	2,995 mm (117.9 in)	"	
Overall width	1,295 mm (51.0 in)	"	
Overall height	1,545 mm (60.8 in)	1,535 mm (60.4 in)	
Cargo bed length	1,785 mm (70.3 in)	1,515 mm (59.6 in)	
Cargo bed width	1,185 mm (46.7 in)	1,110 mm (43.7 in)	
Cargo bed depth	365 mm (14.4 in)	1,170 mm (46.1 in)	
Cargo bed ground height	355 mm (14.0 in)	355 mm (14.0 in)	
Ground clearance	185 mm (7.3 in)	"	
Wheelbase	1,750 mm (68.9 in)	"	
Tread			
Front	1,120 mm (44.1 in)	"	
Rear	1,080 mm (42.5 in)	"	
Vehicle weight	470 kg (1,035 lb)	550 kg (1,210 lb)	
Load distribution (empty)			
Front	235 kg (507.5 lb)	255 kg (560 lb)	
Rear	235 kg (507.5 lb)	295 kg (650 lb)	
Height of center of gravity	505 mm (19.9 in)	590 mm (23.2 in)	
Maximum tipping angle			
Right side	47°	42°	
Left side	48°	44°	
Number of passengers	2	2	4
Maximum loading capacity	350 kg (770 lb)	300 kg (660 lb)	200 kg (440 lb)
PERFORMANCE			
Maximum speed	95 km/h (60 mph)	"	

	Truck	Van
Minimum fuel consumption (paved level load)	24 km/ℓ (57 mi/USgal)	25 km/ℓ (59 mi/USgal)
Average practical fuel consumption	17 km/ℓ (40 mi/USgal)	18 km/ℓ (42 mi/USgal)
Climbing power	15°	13°
Minimum turning circle	8 m (26.2 ft)	
Braking distance	14.5 m/50 km/h (15.9 yd/31 mph)	
ENGINE		
Model	EK 32	
Type	Forced air-cooled, 2-cylinder, 2-stroke gasoline engine	
Cylinder arrangement	in line	
Combustion chamber	Hemisphere type	
Bore x stroke	61.5 mm x 60 mm (2.42 in x 2.36 in)	
Displacement	356 cc (21.7 cc. in)	
Compression ratio	6.7	
Compression pressure	9.1 kg/cm ² (129.4 lb/in ²) at 300 rpm	
Maximum explosion pressure	25.0 kg/cm ² (355.6 lb/in ²) at 1500 rpm	
Maximum mean effective pressure	6.2 kg/cm ² (88.2 lb/in ²) at 4500 rpm	
Maximum horsepower	25 HP at 5500 rpm	
Maximum torque	3.5 kg-m at 4500 rpm (25.3 lb-ft)	
Minimum fuel consumption with full load	300 gr/HP-hr at 5200 rpm	
Dimensions: Length x Weight x Height	634 x 618 x 476 mm (25.0 x 24.3 x 18.7 in)	
Weight	78.8 kg (173.4 lb)	
Location	Rear	

	Truck	Van
Piston material	High silicon aluminum alloy casting	
Number of piston rings	3 (Pressure Ring)	
Port timing		
Intake port: Open	53° BTDC	
Closed	53° ATDC	
Exhaust port: Open	68° BBDC	
Closed	68° ABDC	
Starting	Starter Motor	
IGNITION SYSTEM		
Ignition timing	13° BTDC at 2,000 rpm	
Firing order	1 - 2	
Ignition coil	HITACHI 51504-1100	
Distributor	HITACHI D-203	
Ignition advance control	Automatic centrifugal	
Spark plug	NGK B7H	
Spark plug size	14 mm	
Spark plug gap	0.7 mm (0.0276 in)	
FUEL SYSTEM		
Carburetor		
Type & quantity	HITACHI SOLEX (Side Draft) HAB28, 1 ea	
Air cleaner		
Type & quantity	Oil wet type paper filter, 1 ea	
Fuel pump	Diaphragm Type	
Fuel tank capacity	30ℓ (8.0 USgal)	
LUBRICATION SYSTEM		
Type	Separate-force-feeding type	
Oil pump	Plunger type	
Oil tank capacity	2.5ℓ (2.6 USqt)	

	Truck	Van
BATTERY		
Model & quantity	YUASA 12N24-3	
Voltage & capacity	12 V, 26 AH	
GENERATOR		
Model	NIPPON DENSO 27000-116	
Performance	12 V, 200 W	
Voltage regulator	NIPPON DENSO 26000-108	
STARTER MOTOR		
Model	HITACHI S108	
Performance	12 V, 0.8 HP	
TRANSMISSION SYSTEM		
Clutch	Dry single plate type	
Primary reduction gear	Helical gear	
Primary reduction gear ratio	1.605	
Transmission	3-speed forward with 2nd, 3rd and 4th in synchromesh; 1-speed reverse	
Transmission gear ratio	Low : 3.130 2nd : 1.601 3rd : 1.000 4th : 0.806 Reverse : 4.248	
Amount of transmission oil	1.6ℓ (3.4 USpt)	
Final reduction gear	Helical gear	
Final reduction gear ratio	4.188	3.882
Differential case	Separate type	
Differential gear	Bevel gear	

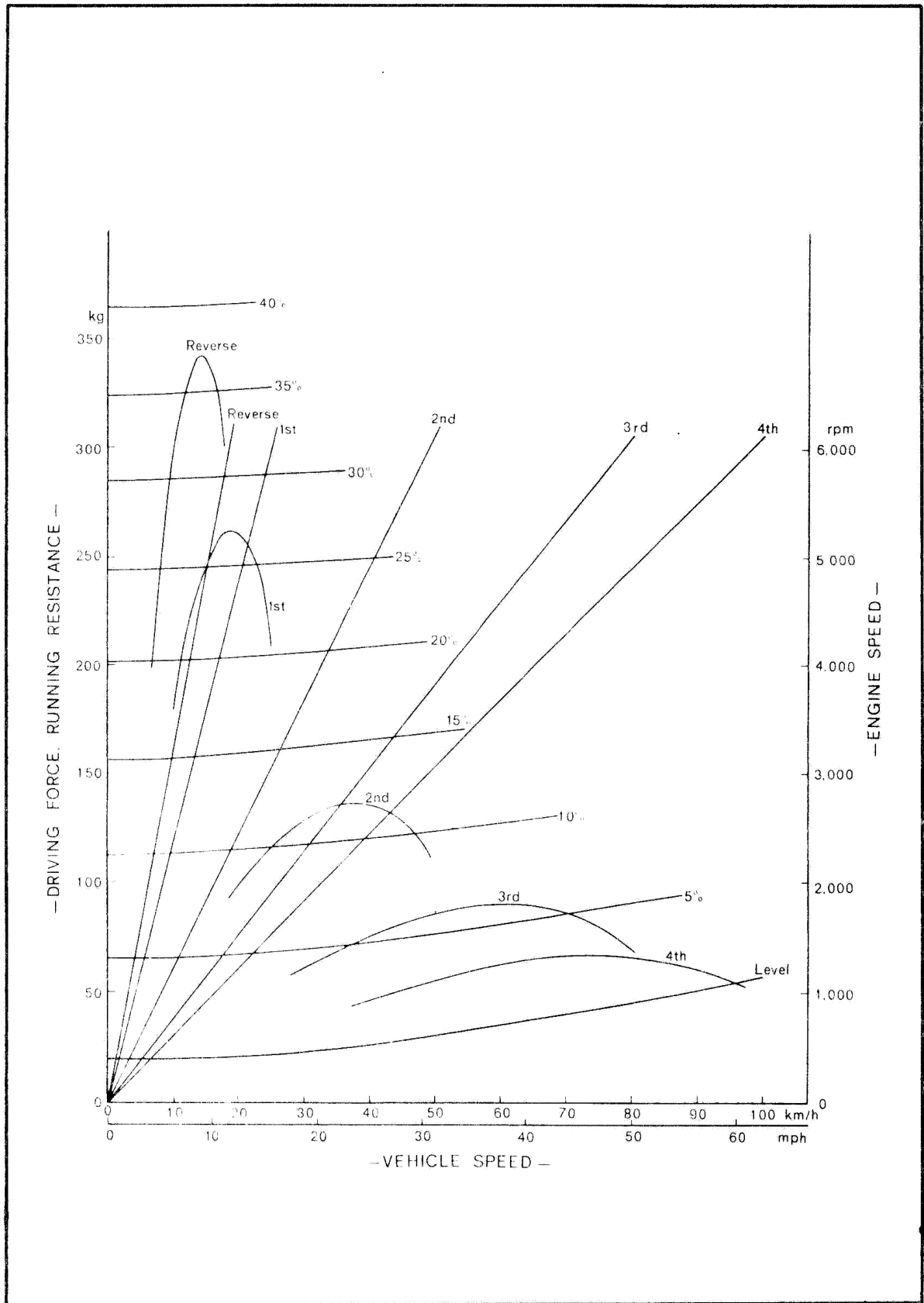
	Truck	Van
STEERING SYSTEM		
Steering gear type	Rack and pinion type	
Steering gear ratio	22.5	
Steering angle : Inner	29° - 33°	
: Outer	27° - 31°	
Steering wheel diameter	380 mm (15 in)	
WHEEL & WHEEL AXLE		
Wheels	2 each in front and rear	
Front wheel axle	Trailing arm type	
Toe-in	12 - 17 mm (0.47 - 0.67 in)	
Camber	1°30' - 2°30'	
Caster	13°10'	
Trail	100 mm (3.94 in)	
Kingpin angle	7°	
Rear wheel axle	Swing axle type	
Tire (front & rear)	4.50-10-4PR	
Tire pressure:		
Front & rear	1.9 - 2.0 gk/cm ² (27.0 - 28.4 lb/in ²)	
Spare	2.0 kg/cm ² (28.4 lb/in ²)	
BRAKE SYSTEM		
Service brake	Hydraulic on all four wheels	
Type : Front	Two-leading type	
: Rear	Leading and trailing type	
Brake lining area: Front	218 cm ² (33.8 in ²)	
: Rear	216 cm ² (33.5 in ²)	
Brake drum diameter:		
Front	170 mm (6.69 in)	
Rear	170 mm (6.69 in)	
Master cylinder inner diameter	19.05 mm (3/4 in)	

	Truck	Van
Wheel cylinder inner diameter: Front Rear	23.81 mm (15/16 in) 15.87 mm (5/8 in)	
Maximum hydraulic pressure	100 kg/cm ² (1422 lb/in ²)	
Hand brake	Mechanical on rear wheels	
SUSPENSION		
Front suspension	Independent suspension	
Front spring	Torsion bar with hydraulic shock absorber	
Front torsion bar (dia x length)	19.5 mm x 500 mm (0.77 in x 19.69 in)	
Rear suspension	Independent suspension	
Rear spring	Torsion bar with hydraulic shock absorber	
Rear torsion bar (dia x length)	20.5 mm x 435 mm (0.81 in x 17.12 in)	
Shock absorber (front & rear)	Hydraulic double action	
FRAME		
Type	Ladder type	
LIGHTING EQUIPMENT		
Headlamp	12 V - 50/40 W x 2 ea	
Front turn signal & clearance lamp	12 V - 23/7 W x 2 ea	
Front side marker lamp	12 V - 3 W x 2 ea	
Rear turn signal, tail & stop lamp	12 V - 23/7 W x 2 ea	
License plate lamp	12 V - 8 W x 1 ea	
Compartment lamp	12 V - 5 W x 1 ea	

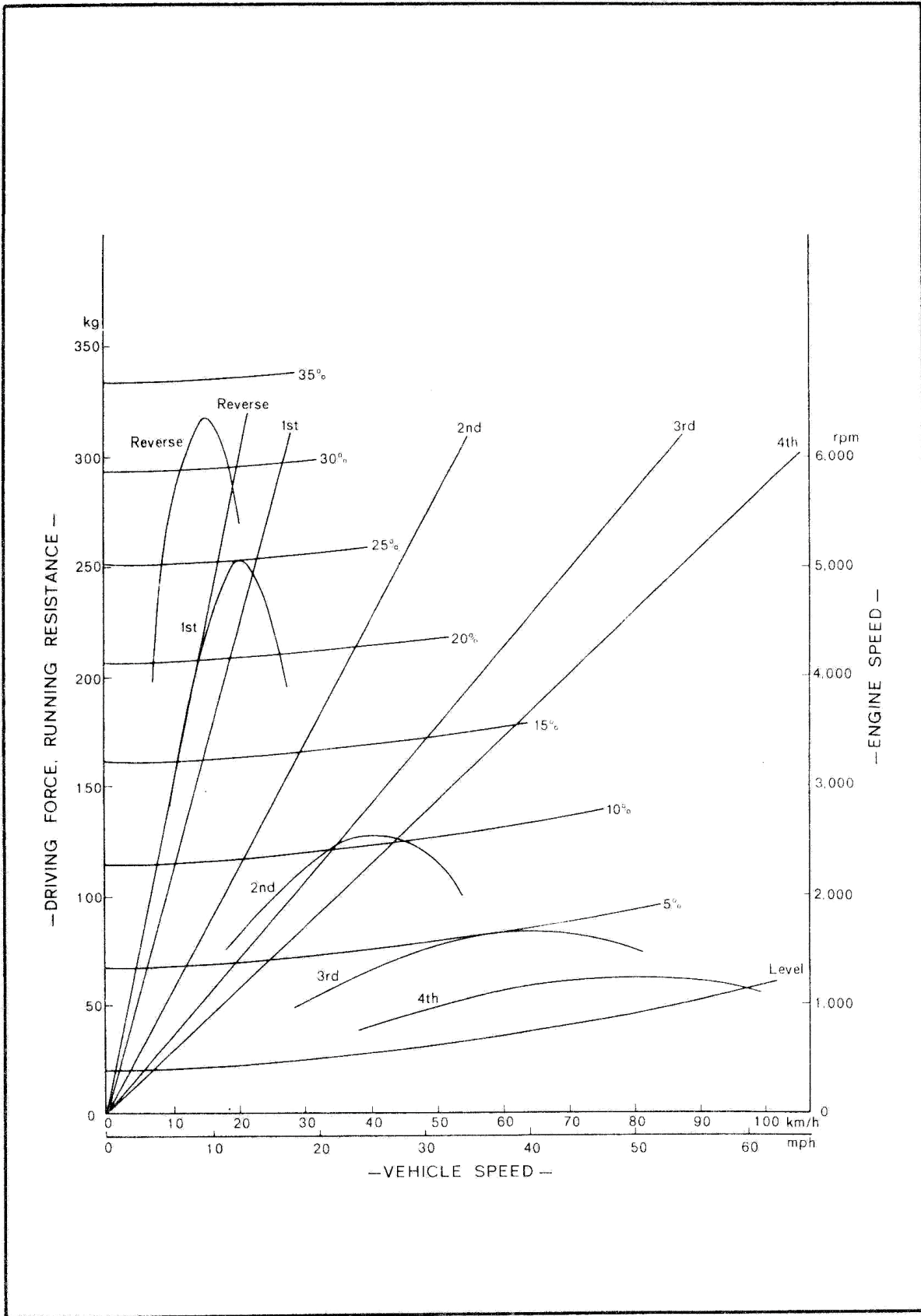
	Truck	Van
MISCELLANEOUS		
Horn	Miniature turbine type	
Rear view mirror	Round type x 2 ea	
Windshield wiper	2-speed	
Speedometer	Magnet type	
Fuel gauge	Bi-metal type	

2. PERFORMANCE CURVES

(A) SUBARU 360 TRUCK



(B) SUBARU 360 VAN



CHAPTER 2: FRONT END

2

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1. SPECIFICATIONS AND ADJUSTMENT STANDARDS OF
THE FRONT END
(FRONT)

Suspension system	Independent suspension
Tread	1120 mm (44.1 in)
Toe-in	12 - 17 mm (0.47 - 0.67 in)
Camber angle	1°30' ~ 2°30'
Caster angle	13°10'
Kingpin angle	7°
Trail (by caster angle)	100 mm (3.94 in)
Trail (by kingpin and camber angles) .	3 mm (0.12 in)
Kingpin outside diameter	17 mm (0.67 in)
Correcting limit of kingpin and bushing clearance	0.1 - 0.15 mm (0.0039 - 0.0059 in)
Adjustment of kingpin thrust washer	Adjust so that kingpin turns lightly without play.
Front tires	4.50-10-4PR
Front tire air pressure	1.9 - 2.0 kg/cm ² (27.0 - 28.4lb/in ²)
Tightening of front hub bearing	After fully tightening the nut, loosen it for approximately 1/8 - 1/10 rotation and lock it with lock washer. In this case, the suitable starting torque after tightening is 0.07 - 0.10 kg-m (0.5 - 0.7 lb-ft)
Load distribution when unloaded	Truck: 235 kg (507.5 lb) Van: 255 kg (560 lb)

OUTLINE

The front wheels of the Subaru Sambar use a unique independent suspension system in which the torsion bars, trailing arms, bump stoppers and shock absorbers are coupled ingeniously.

For riding comfort, regardless of whether the vehicle is loaded or not, the front wheels adopt nonlinear factors.

Also, except the toe-in, no adjustment is required for the wheel alignment. The design is such that when each section is assembled using correct parts, the proper angle for each section can be obtained as long as there is no heavy damage to any of the parts.

2. SPECIFICATIONS AND ADJUSTMENT STANDARDS OF THE FRONT SUSPENSION

Front torsion bar

Effective length	500 mm	(19.69 in)
Diameter	19.5 mm	(0.77 in)

Front torsion bar end specifications

Hexagonal, diagonal distance .. (both ends of the same shape)	23 mm	(0.91 in)
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Bump Stopper free length	55.2 mm	(2.17 in)
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Oil damper damping factor

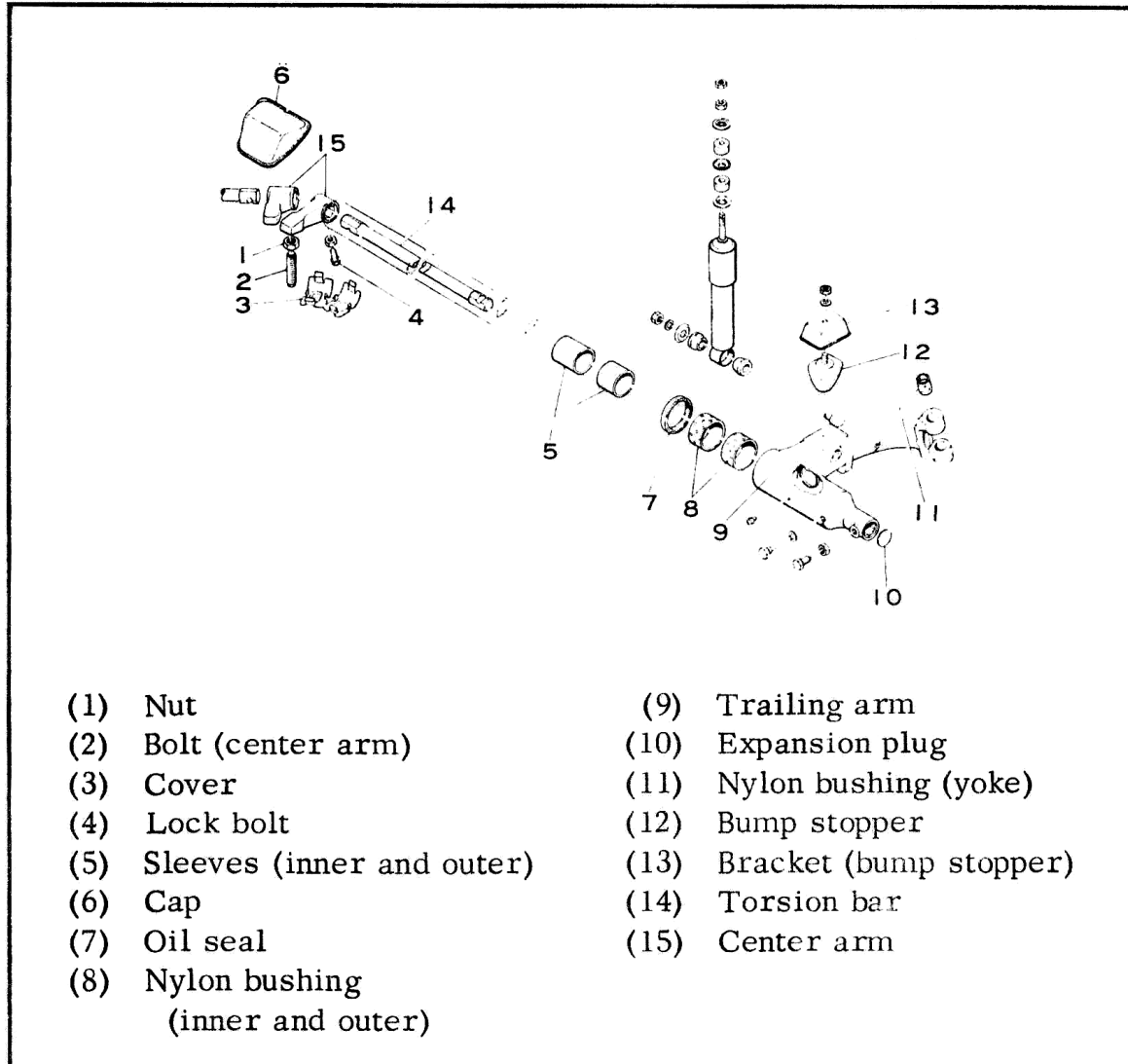
Extention stroke	80 [±] 12 kg/0.3 m/sec	(150 ~ 200 lb/1ft/sec)
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Compression stroke	55 [±] 11 kg/0.3 m/sec	(97 ~ 145 lb/1ft/sec)
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Rim size	3.00 D x 10
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Rim deflection	1 mm (0.04 in) in left and right directions
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3. COMPOSITION OF THE FRONT SUSPENSION

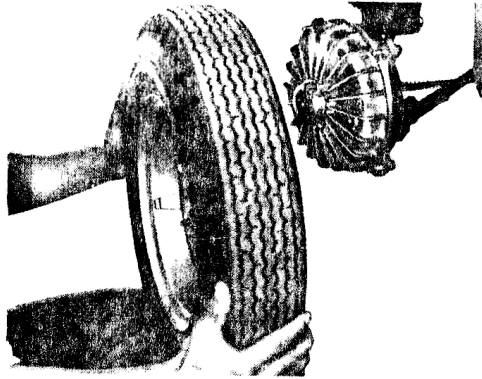


4. REMOVAL AND INSTALLATION OF THE FRONT SUSPENSION

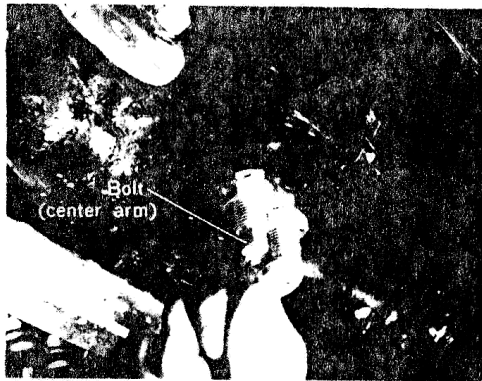
A: REMOVING THE FRONT SUSPENSION

SPECIAL TOOL	921240000
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- (1) Place the car over a greasing pit or on a rack and jack up the body so that the front wheels can be turned freely.



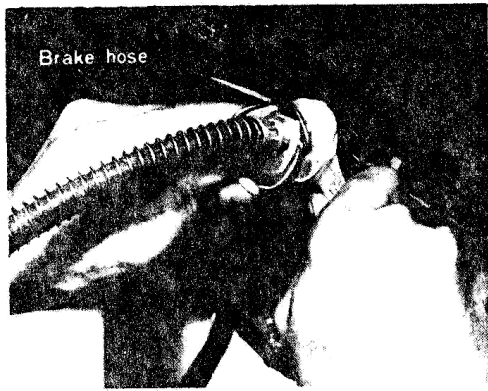
- (2) Loosen the four 10 mm nuts fixing the rims to the brake drums. Pull the tires in the axial direction and remove the wheels.



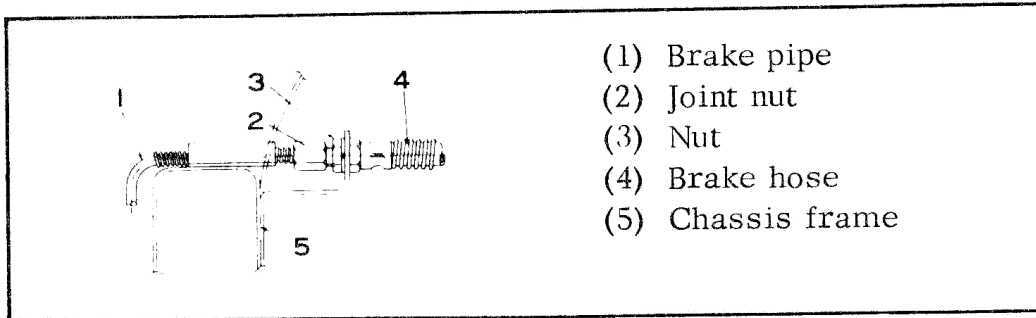
- (3) Fully loosen the bolt (center arm) to decrease the torsion of the torsion bars.



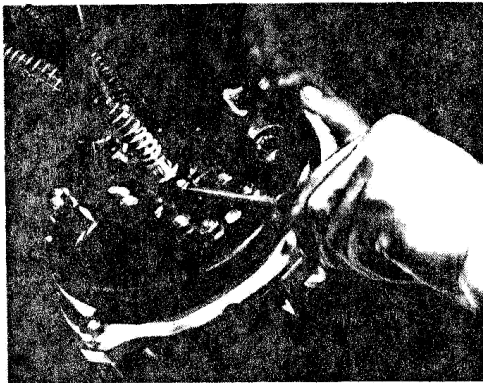
- (4) Disconnect the coupling of the upper end bracket of the shock absorber.



- (5) Since the left and right brake hoses are connected as shown in the drawing, hook a wrench on the hexagonal section of the brake hose side and remove the 3/8 inch joint nut by turning it with another wrench. Next, loosen the 3/8-inch nut which holds the brake hose with a wrench and pull out the brake hose.

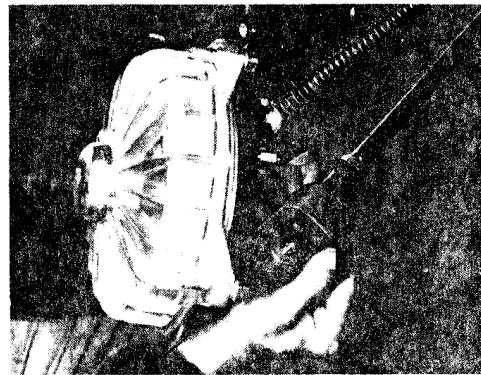


- (1) Brake pipe
 (2) Joint nut
 (3) Nut
 (4) Brake hose
 (5) Chassis frame



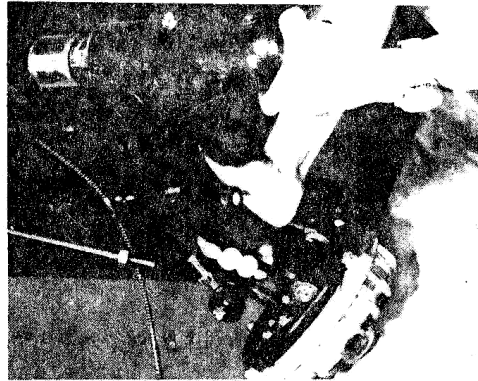
- (6) Remove the speedometer cable end fitting from the knuckle of the left side wheel.

- (7) Remove the 10 mm castle nut of the connecting section of the tie rod and knuckle arm and pull out the tie rod end with the special tool 921240000.





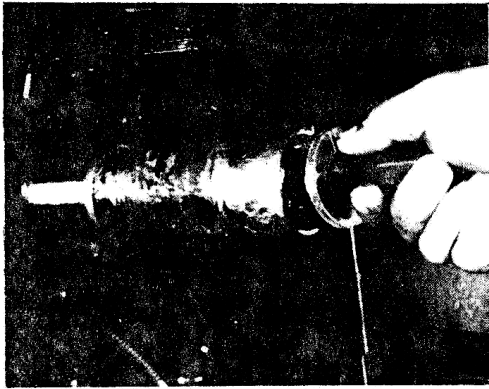
- (8) Remove the lock bolt, lock nut and bolt of the trailing arm.



- (9) Pull the trailing arm outward by hand.

- (10) When the cover of the center arm bracket is removed, the lock bolt and lock nut which couple the torsion bars to the center arms will be found. Remove these with the box wrench. The lock bolt and lock nut are the same as those of the trailing arm side.

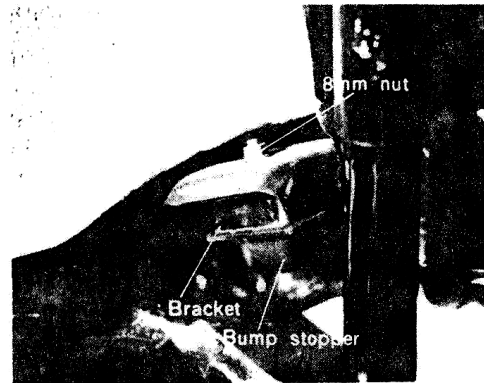
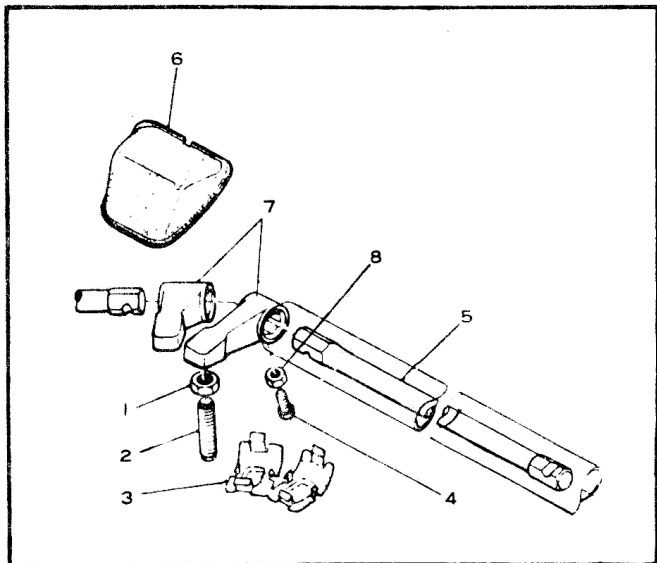




(11) Take hold of the outside ends of the torsion bars and pull outward. The torsion bars will come out.

(12) Raise the clip; remove the cap (bracket center arm) and pull out the center arm.

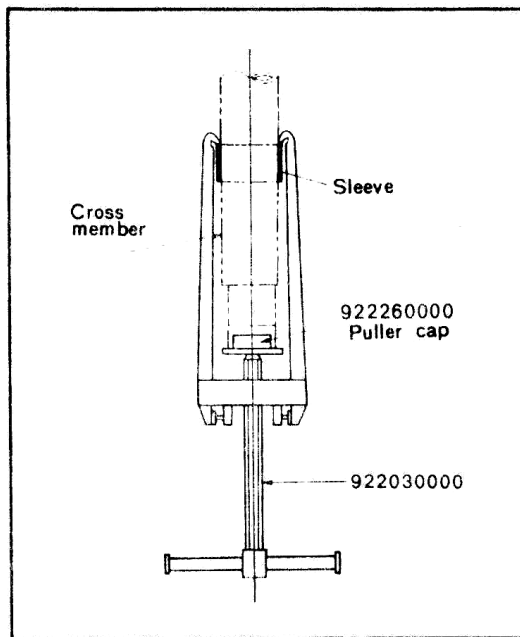
(13) The bump stopper can be removed together with the bracket by removing the 8 mm nut.



- | | |
|-----------------------|-----------------|
| (1) Nut | (5) Torsion bar |
| (2) Bolt (center arm) | (6) Cap |
| (3) Cover | (7) Center arm |
| (4) Lock bolt | (8) Lock nut |

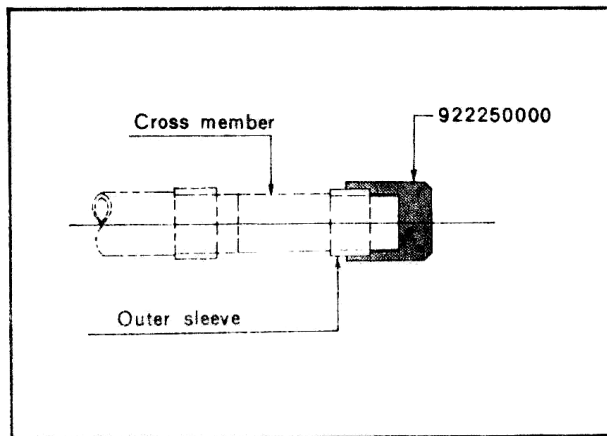
B: Pulling-out and pressing-in of the sleeves (inner and outer) of the front cross member

SPECIAL TOOL	922030000, 922240000 922250000, 922260000
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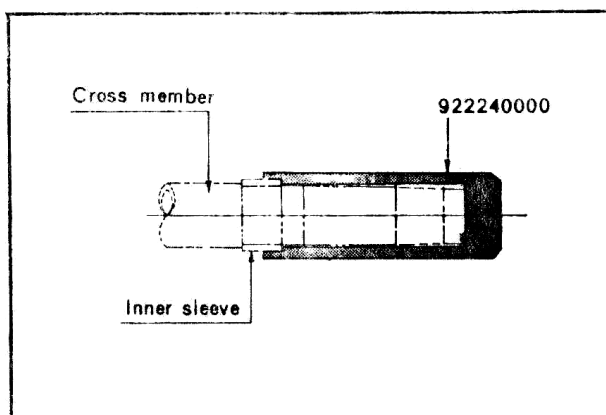
- (1) Pulling out the sleeves (inner and outer)

Fit the puller cap (922260000) on the inside diameter of the cross member; hook the claws of the special tool (922030000) on the sleeve. Contact the tip of the handle screw on the puller cap and pull out the sleeve by operating the handle.



- (2) Pressing-in of the sleeve (inner)

Insert the sleeve (inner) in the special tool (922250000); match it to the cross member outside diameter and press it in until it contacts the cross member end face by striking the tool with a wooden hammer.



- (3) Pressing-in of the sleeve (outer)

Insert the sleeve (outer) in the special tool (922240000); match it to the cross member outside diameter and strike the tool with a wooden hammer until it contacts the cross member end face.

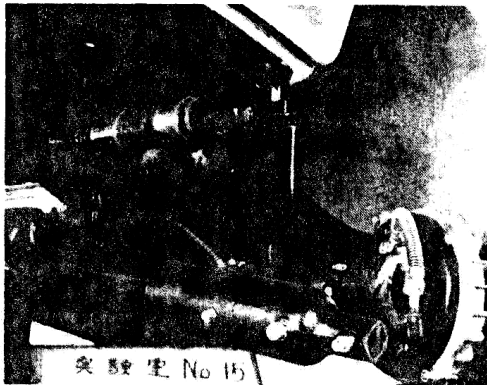
(CAUTION)

Be careful not to press in the sleeve (outer) before the sleeve (inner).

C: INSTALLING THE FRONT SUSPENSION

Prior to installation, carefully check the following:

- (a) Check the torsion bars and bump stoppers for damage and check all surfaces to make sure no coating has peeled off.
 - (b) Check the nylon bushing pressure-fitted in the trailing arm for damage and wear.
 - (c) Check the sleeves pressure-fitted in the cross member for damage and wear.
 - (d) Check the threaded parts and hexagonal parts of the torsion bars to ascertain that they are coated with sufficient amount of grease.
- (1) Insert the center arm into the bracket and insert the torsion bars into the center arm. At this time, match the threaded hole of the center arm to the V-shaped groove of the torsion bar and tighten the lock bolt and lock nut. (See the drawing on page 2-7)



- (2) Apply sufficient amount of grease to the cross member and then insert the trailing arm. At this time, insert the shock absorber in the damper pin of the trailing arm and secure it temporarily.

- (3) Match the V-shaped groove of the torsion bar and threaded hole of the trailing arm; tighten the lock bolt and lock it with the lock nut. Then, match the bolt to the groove of the cross member and tighten.

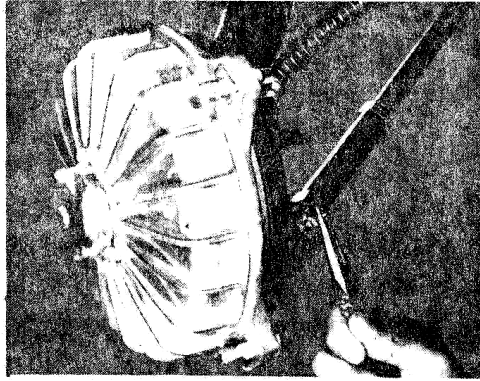
LOCK NUT TIGHTENING TORQUE	3.0 - 4.5 kg-m (22 ~ 32 lb-ft)
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(CAUTION)

On the torsion bars are the letters "R" and "L" etched in relief. For the right side, install the torsion bar with marking of "R" and for the left side, install the torsion bar with marking of "L". If these torsion bars are installed in reverse, early

breakage may result. Be careful and install them correctly.
 Moreover, install the torsion bars with their ends which have the letter etched in relief toward the center arm side.

- (4) Attach the shock absorber upper mounting section.
- (5) Attach the brake hose.

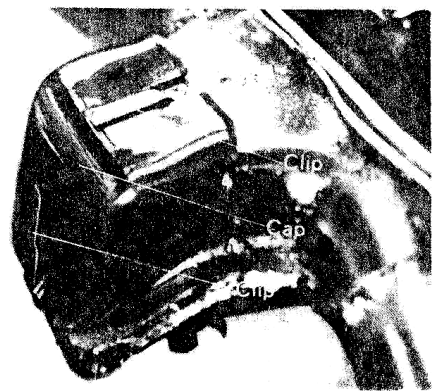
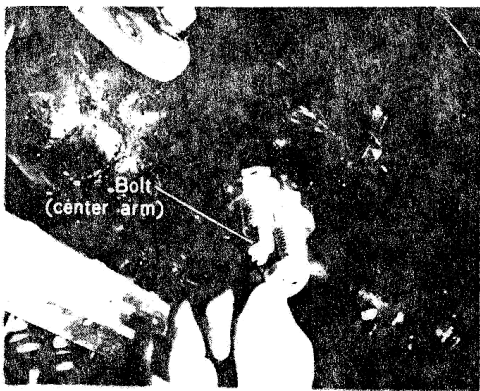


- (6) Attach the tie-rod end of the knuckle arm. Fit the tie-rod end on the knuckle arm; tighten with a 10 mm castle nut and insert a cotter pin to stop the nut from turning.

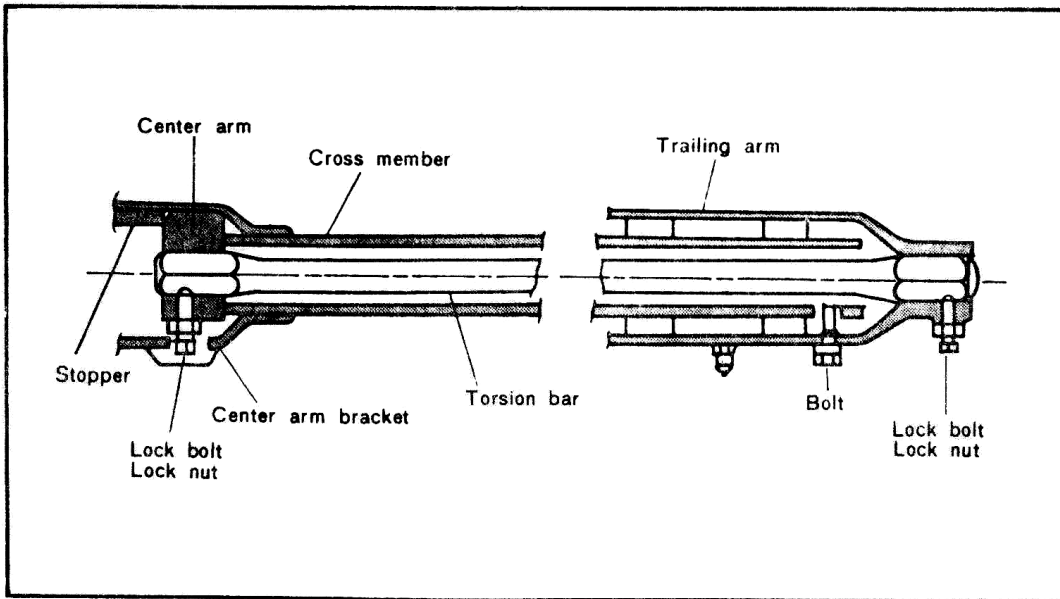
CASTLE NUT TIGHTENING TORQUE
3.0 - 5.5 kg-m (22 ~ 39 lb-ft)

- (7) In the case of the left side wheel, insert the end of the speedometer cable into the knuckle and secure with a 6 mm holding screw.
- (8) Attach the wheels and tighten it with the four 10 mm nuts.

TIGHTENING TORQUE	3.6 - 5.5 kg-m (26 ~ 39 lb-ft)
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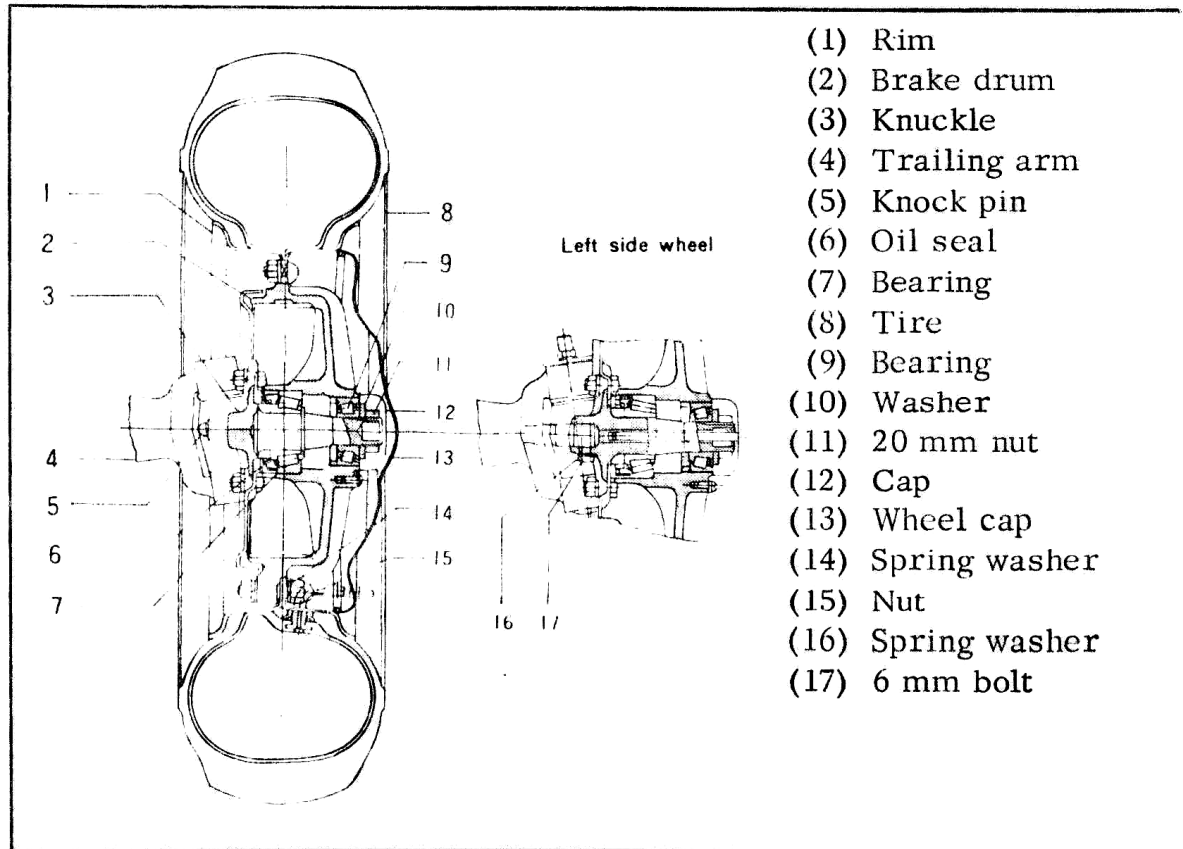
- (9) Pull the trailing arm as much as possible toward outside and screw in the bolt (center arm) to a suitable position. Then, attach the cap and plug. Since the cap and plug are for water-proofing, tighten them firmly.



As shown in the above figure, the center arm is held between the stopper and the cross member. When no torsional force acts on the torsion bars, the center arm is dropped in a lowered position. For this reason, maintain the center arm at the specified position by pulling the trailing arm and then screw in the bolt (center arm) so that the torsional force is imparted to the torsion bars and lock the bolt.

- (10) Lubricate through the grease nipple of the trailing arm.

5. REMOVAL AND INSTALLATION OF THE FRONT AXLE

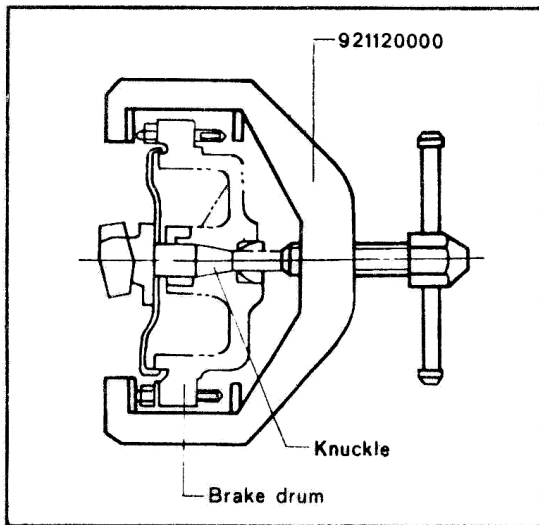


5-1: REMOVAL AND INSTALLATION OF THE BRAKE DRUM

A: REMOVAL OF THE BRAKE DRUM

SPECIAL TOOL	921120000
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- (1) Jack up the front section of the car and take off the wheels.
- (2) Loosen the three 5 mm screws fixing the cap to the brake drum and remove the cap.
(In this operation, pay attention as a pin which connects to the speedometer cable is welded on the cap of the left side wheel).
- (3) Straighten the bent lock washer and remove the 20 mm nut, lock washer and washer successively in this order.

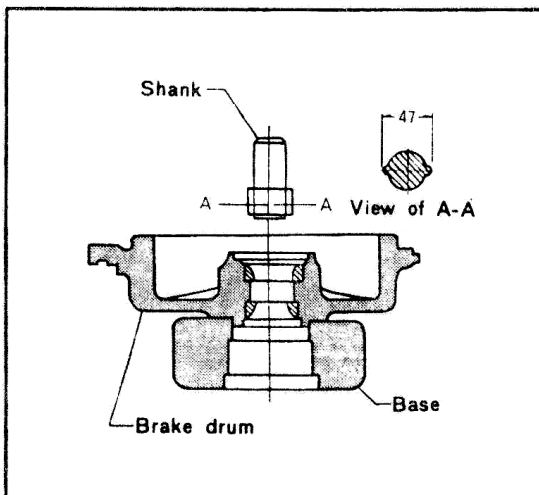


- (4) Hook the claws of the special tool 921120000 on four projections of the brake drum; place the threaded tip of the tool against the center hole of the knuckle and operate the handle of the tool. Then, the drum will come off leaving the spacer in place.

B: REMOVAL OF THE BEARINGS AND OIL SEAL

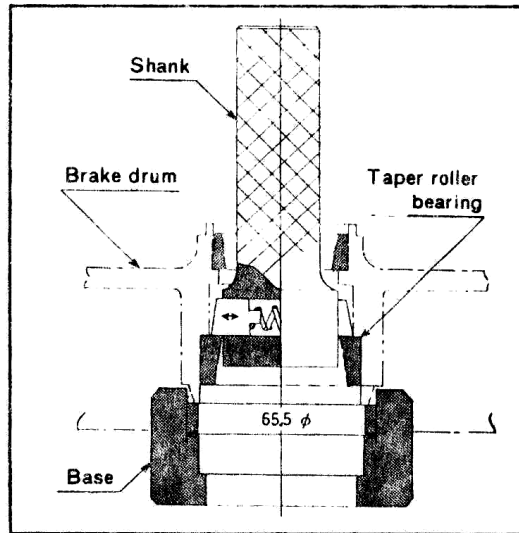
SPECIAL TOOL	922100000
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(1) Removal of the small diameter bearing



- (a) Remove the oil seal and inner race of the large diameter bearing.
- (b) Place the brake drum on a base; match the shank and the extraction groove of the brake drum. Strike the shank with a hammer and remove the outer race.

(2) Removal of the large diameter bearing.



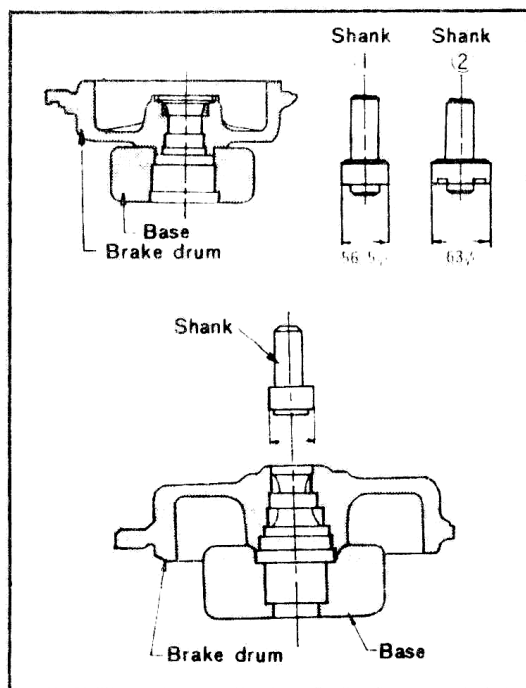
After removing the small diameter bearing, turn the base over; place the drum as shown in the figure. Match the shank and extraction groove; remove the outer race by striking the shank with a hammer.

C: INSTALLATION OF THE BEARINGS AND OIL SEAL

SPECIAL TOOL

922110000

The proper amount of grease is 18 ~ 20 g (0.6 ~ 0.7oz). Regarding the wheel bearing, check the tightness and the damage of the race surface contacting with the rollers. The insufficient tightness or damage will cause excessive wear. In this case, replace the bearing with new one.



(1) Installation of the large diameter bearing and oil seal.

- (a) Place the drum on the base as shown in the figure and press the bearing into the drum by striking the shank with a hammer.
- (b) After insert the oil seal into the shank (2) and match the center to the hole of the drum, press it in by striking the shank with a hammer.

- (2) Installation of the small diameter bearing.

Place the drum on the base and press in the bearing by striking the shank with a hammer.

D: INSTALLATION OF THE BRAKE DRUM

- (1) Insert the drum into the knuckle and tighten it with 20 mm nut through the washer and lock washer.
After tightening the nut, bend the lock washer to the nut to prevent the nut from getting loose.

(CAUTION)

If the nut is tightened fully, the rotation of the wheel may become sluggish. Loosen the nut for 1/8 - 1/10 turn from its fully tightened position so that the wheel can turn freely. (Refer to Table of Servicing Standards.)

- (2) Attach the cap through a packing with three 5mm screws.
- (3) Adjust the gap between the brake lining and the drum.

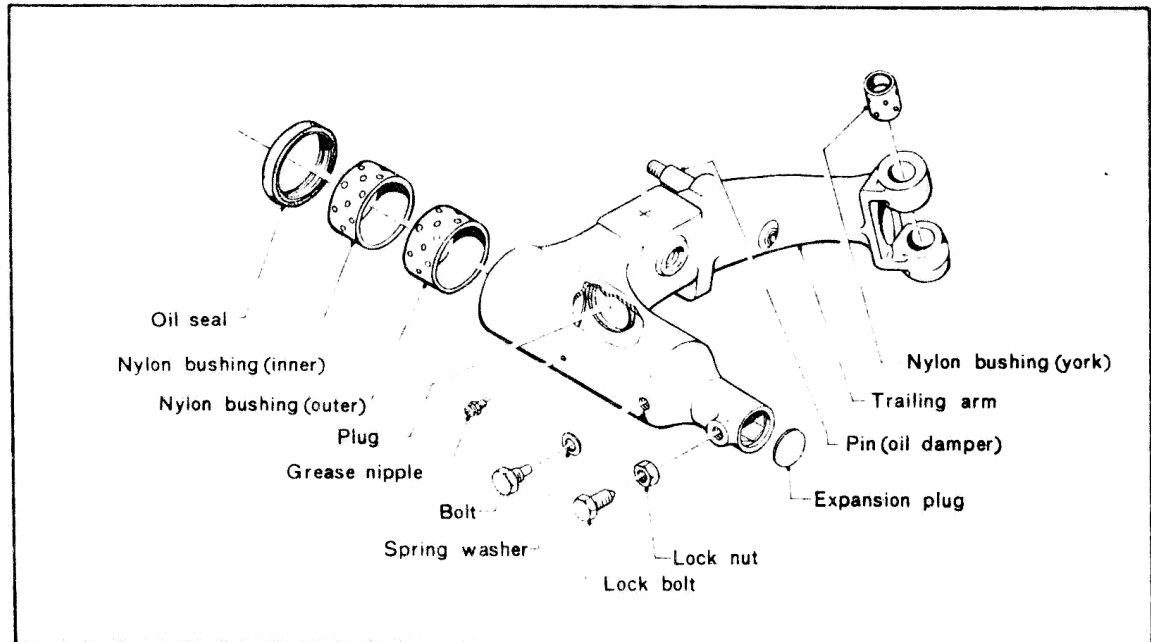
INSTRUCTIONS FOR ADJUSTMENT

- (a) Match the hole of the drum to the position of the adjuster.
 - (b) Insert the minus screwdriver and pry adjuster tooth.
 - (c) Turn the drum approximately 20° toward the side where the adjustment has been made.
 - (d) Insert the thickness gage through the peep hole and measure the gap.
Adjust the gap to 0.1mm ~ 0.15mm (0.004 ~ 0.006 in).
- (4) Mount the wheel and tighten the four 10mm nuts.

TIGHTENING TORQUE	3.6 - 5.5 kg-m (26 ~ 39 lb-ft)
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5-2: REMOVAL AND INSTALLATION OF THE TRAILING ARM

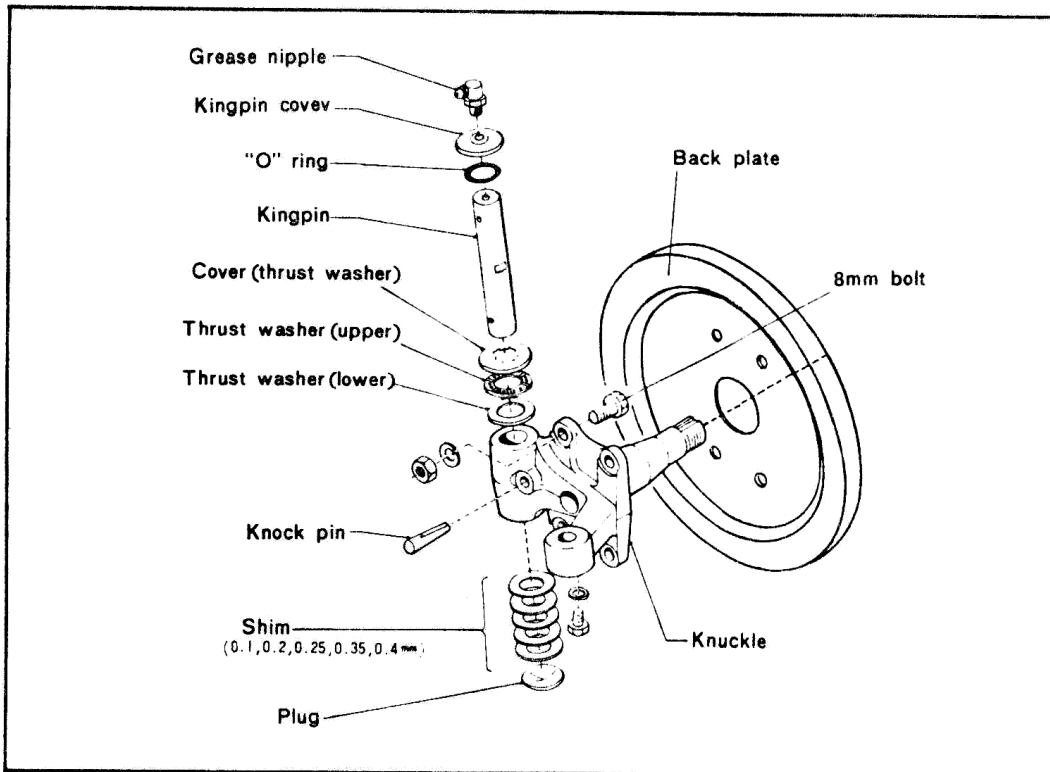
A: COMPONENT PARTS OF THE TRAILING ARM



B: REMOVAL OF THE TRAILING ARM

SPECIAL TOOL	921140000, 921240000
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- (1) Remove the front suspension according to the items (1) ~ (9) of the procedure for removing the front suspension. (See pages 2-3 to 2-6.)
- (2) Remove the brake drum according to the items (1) ~ (4) of the procedure for removing the brake drum. (See pages 2-12 to 2-13.)
- (3) Loosen the four 8mm bolts which attach the back plate to the knuckle and remove the back plate from the knuckle.
- (4) Remove the shock absorber.
- (5) Pull out the knock pin of the knuckle center section by striking with a hammer from the spindle side.
- (6) Remove the grease nipple and then remove the kingpin cover and "O" ring.
- (7) Fit special tool 921140000 against the upper part of the kingpin and screw it in. Then, the kingpin will come out and the trailing arm and knuckle can be separated.



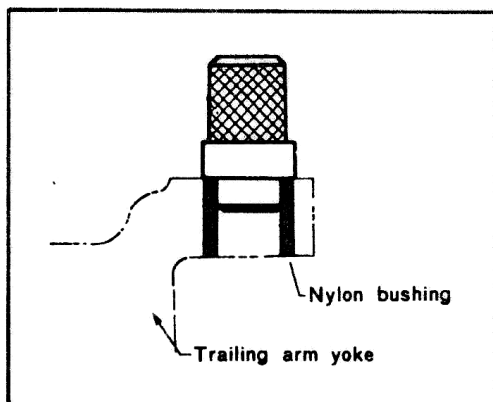
(CAUTION)

The plug located on the lower part of the kingpin and the knock pin cannot be used again. When assembling, be sure to replace them with new ones.

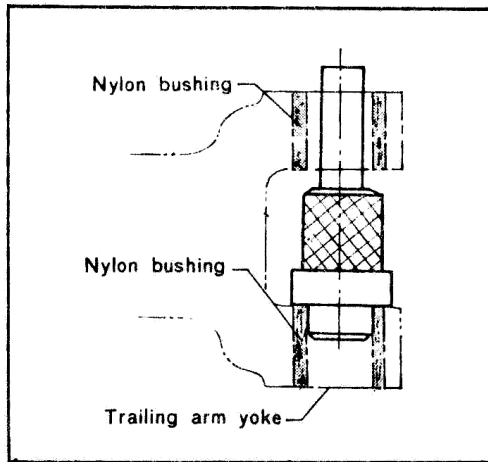
C: CHANGING THE BUSHINGS OF THE TRAILING ARM

SPECIAL TOOL	922090000
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(1) Change the nylon bushings of the trailing arm yoke.



(a) Hold the trailing arm in a vise; place a suitable rod against the bushing and remove the bushing by striking the rod with a wooden mallet.



- (b) Insert the new nylon bushing into the special tool 922090000. Place a suitable rod on the tool and press the bushing in by lightly striking the rod with a wooden mallet.

(CAUTION)

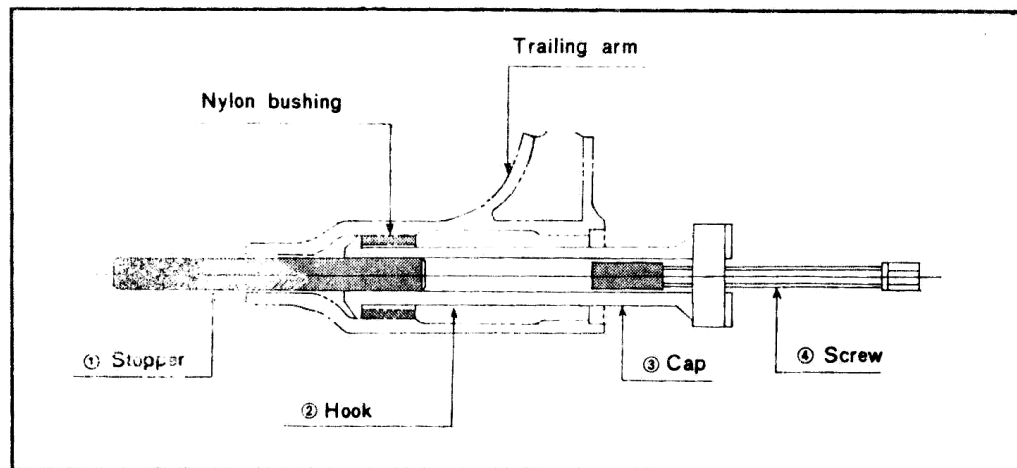
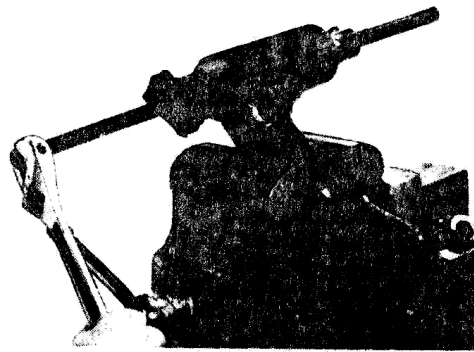
Pay attention to the position of the oil groove. If reversed, lubrication becomes impossible.

The nylon bushings must be pressed in fully so that they do not project from the inner end face of the trailing arm yoke.

- (2) Replacing the inner and outer trailing arm nylon bushings.

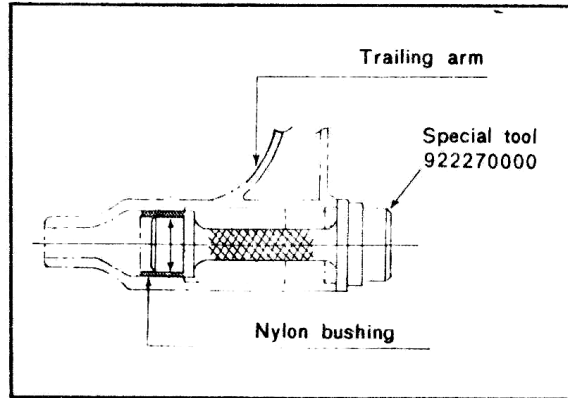
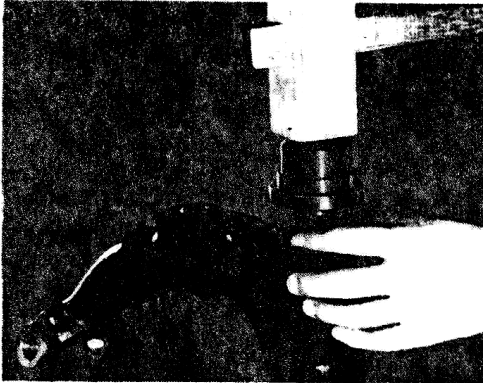
SPECIAL TOOL	922270000, 922280000, 922290000
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REMOVING PROCEDURE

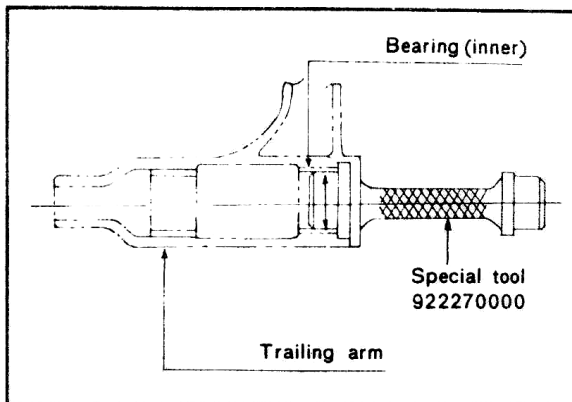


- (a) Remove the oil seal pressure-fitted in the trailing arm.
- (b) Insert the hook (2) into the trailing arm and match the cap (3).
- (c) Hook the hook (2) to the nylon bushing and prevent its shinking by inserting the stopper (1) into it from the opposite side.
- (d) Match the screw (4) to the cap (3) and remove the bushing by screwing in it.

PRESSING-IN PROCEDURE

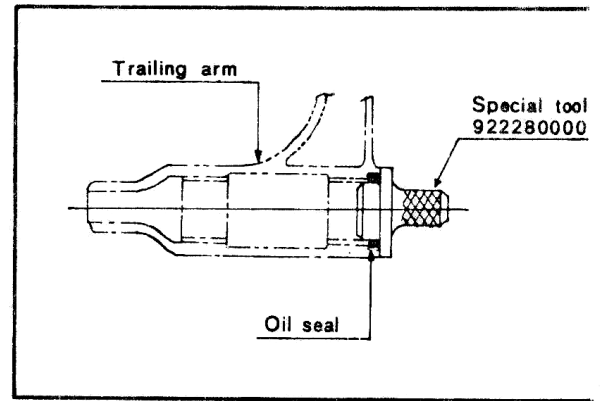
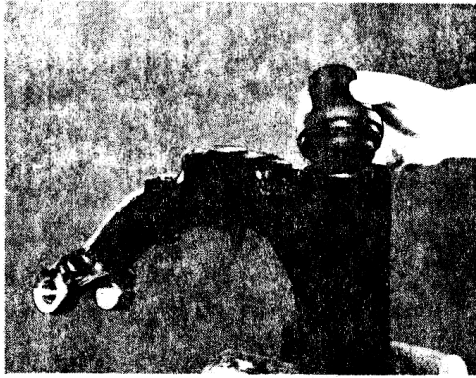


- (a) Insert the bushing into the 51.6mm (2.03 in) diameter side of the special tool 922270000 .
Press the bushing in the trailing arm by striking the tool with a mallet until the tool contacts with the end face of the trailing arm.



- (b) Insert the bushing into the 53mm (2.09 in) diameter side of the special tool 922270000. Press the bushing in the trailing arm by striking the tool with a mallet until the tool contacts with the end face of the trailing arm.

PRESSING-IN OF OIL SEAL



Insert a new oil seal into the special tool 922280000. Press the oil seal in the trailing arm by striking the tool with a mallet until the tool contacts with the end face of the trailing arm.

D: INSTALLATION OF THE TRAILING ARM

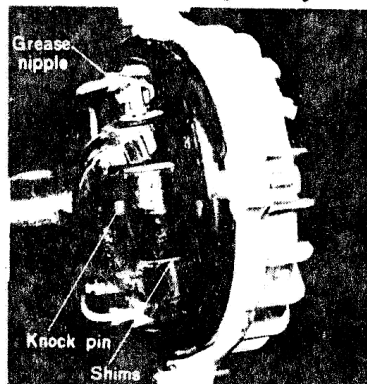
Apply a sufficient amount of grease to the thrust washer and threaded part of the grease nipple. Extra care must be exercised to ensure that the kingpin and yoke bushing are free of dust. Thoroughly clean these parts by clean rug prior to assembly.

- (1) Hold the trailing arm in a vise.
- (2) Insert the knuckle, thrust washers (upper and lower) into the trailing arm yoke. Adjust the gap in the axial direction by means of shims and drive the king pin into the knuckle so that the notch on the kingpin matches the knock pin hole in the knuckle.

(CAUTION)

There are shims with five different thicknesses of 0.1, 0.2, 0.25, 0.35 and 0.4mm. Select the appropriate shims to be inserted according to the gap of the trailing arm yoke.

- (3) Drive in the knock pin by striking it with a hammer to complete the connection. (The maximum gap between the kingpin and nylon bushing of the yoke is 0.15mm 0.0059 in). If the gap is greater than 0.15mm (0.0059 in), replace the nylon bushing with a new one. Refer to page 2-17 for the replacing procedure.)



- (4) After making the above connection, drive in the plug to the lower part of the knuckle and caulk it at three places on its circumference with a punch.
- (5) On the upper section of the kingpin, attach the "O" ring and tighten the kingpin cover with the grease nipple.
- (6) When mounting the trailing arm on the chassis, mount according to the order of (1) - (10) of the mounting procedure for the front suspension. (See pages 2-9 to 2-11)

The above completes the explanation of the removal and installation of each parts in the front section of the car. The items checking after the removal of parts and the precautionary items in assembling are listed as follows.

CHECKING ITEMS

- (a) Check each threaded part for wear and damage.
- (b) Check each part for breakages and cracks.
- (c) Check the torsion bars and trailing arms for any symptom of having received impacts which may have decreased the strength of them.
Also, check the surface coating of these parts for peeling off. Apply coatings if any peeling is noticed.
- (d) Check the bearings of the kingpin and others for lubricating condition.
- (e) Replace any damaged or worn part with a new one.

PRECAUTIONS FOR ASSEMBLY

- (a) Before assembly, thoroughly clean the kingpin and other bearing parts with clean cloths and keep these parts free of dust.
- (b) Make sure to apply grease to various threaded parts.
- (c) The suitable amount of grease for the wheel bearing is 18 - 20 g (0.6 ~ 0.7oz). Never apply more or less grease than the amount referred to above.
- (d) After assembly, be sure to lubricate all indicated lubricating points.

6. INSPECTION AND ADJUSTMENT FOR THE WHEEL ALIGNMENT

A: CONDITIONS FOR FRONT WHEELS

Before checking the wheel alignment, ascertain the following items:

- (1) Check the front section of the car for symptom of having been in a serious accident.
- (2) Check the front tires for abnormal wear.
- (3) Check the steering system for any trouble ever caused.

B: Preparatory inspections before measuring the alignment.

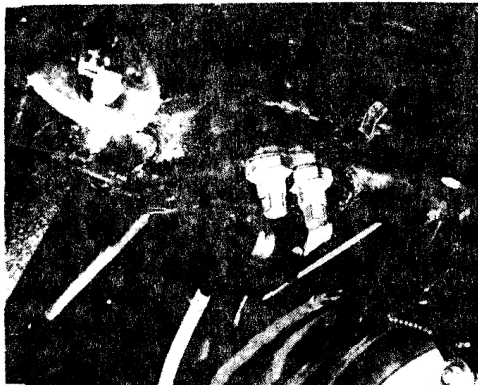
The following points have a close relationship to the alignment, check them with a special care. In this case, adjust the air pressure for the front and rear tires as follows.

TIRE PRESSURE	1.9 - 2.0 kg/cm ² (27.0 - 28.4 lb/in ²)
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- (1) The height of the car

Measure the height from the ground to the center of the torsion bar with the car empty. This height must be $275 \pm 5\text{mm}$ (10.6 ~ 11.0 in) at the front of the car and $255 \pm 5\text{mm}$ (10.0 ~ 10.2 in) at the rear.

If the measured values are different from those indicated above, adjust the height of the car according to the following procedures.



Loosen the lock nut and adjust the height by either loosening or tightening the bolts. When these bolts are tightened, the height of the car is raised and is lowered when the bolts are loosened. The rear side height is adjusted by the one adjusting bolts but the front side is adjusted by the two adjusting bolts.

- (2) The play in the kingpin and the bushing of the trailing arm yoke.
- (3) The play in the connecting section of the tie rod and the ball stud of the steering system.
- (4) The play in the wheel bearing.
- (5) Worn condition of the tires.
- (6) The operation of the shock absorber.
- (7) Mounting condition of the trailing arm on the cross member.

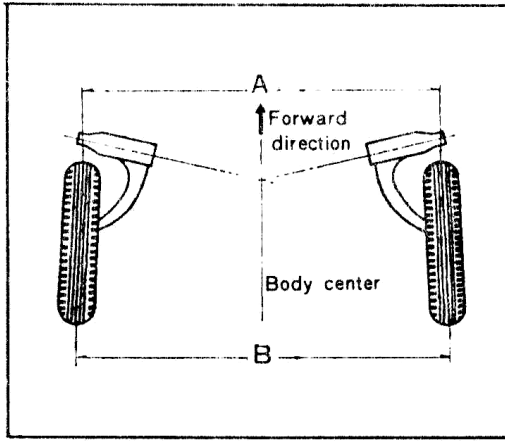
After checking the points indicated in (2) - (7) and restoring any defective part to normal condition, perform the following adjustments.

C: MEASUREMENT AND ADJUSTMENT OF FRONT ALIGNMENT (TOE-IN)

(1) Measurement

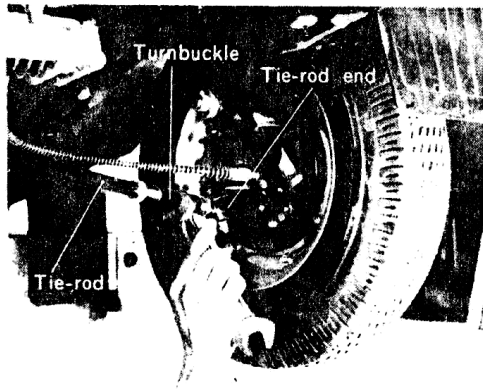
- (a) At the same height as the hub centers of the front wheels, mark one spot on each center line of the front tires and measure the distance (A) between the two wheels.

After that, move the vehicle forward so that the wheels turn for 180° and when the marked positions are the same height as the center of the hub, measure distance (B) between the two wheels. If the difference (B) - (A) is more or less than the range of 12 ~ 17mm (0.47 ~ 0.67 in) , toe-in must be adjusted.



- (b) Measure the amount of slippage with a side-slip tester. When value measured is more or less than the range of adjust the toe-in IN 1 - IN 6 with the vehicle unloaded, adjust the toe-in.
- (c) Measure the angles of the wheels by means of an angle tester. If the value measured is not about $1^{\circ}30'$ - $2^{\circ}30'$, adjust the toe-in.

(2) Adjustment



- (a) The adjustment of the toe-in can be made by the turnbuckle of the tie-rod. Loosen the lock nuts of the both ends of the turnbuckle. Note: The thread of the tie rod is right-hand thread and that of the tie-rod end is left hand thread.
- (b) Hook a wrench on the notch of the turnbuckle and turn the turnbuckle to adjust the toe-in.
- (c) Left side turnbuckle shrinks when it is turned upside coming looking from the front. Right side turnbuckle extends by the same operation.
- (d) After adjusting the toe-in correctly, tighten the lock nuts securely.

Tightening torque	8.0 - 8.5 kg-m (58 ~ 61 lb-ft)
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The above is an explanation of the specified values and simple method of adjustment for the front alignment. Each of these values greatly affects the maneuverability and stability of the vehicle. If the vehicle is driven without adjusting the front alignment to the specified values, the steering wheel may vibrate abnormally, the tires may wear rapidly and riding comfort may deteriorate. Maintain the vehicle in proper running condition by performing all adjustments correctly.

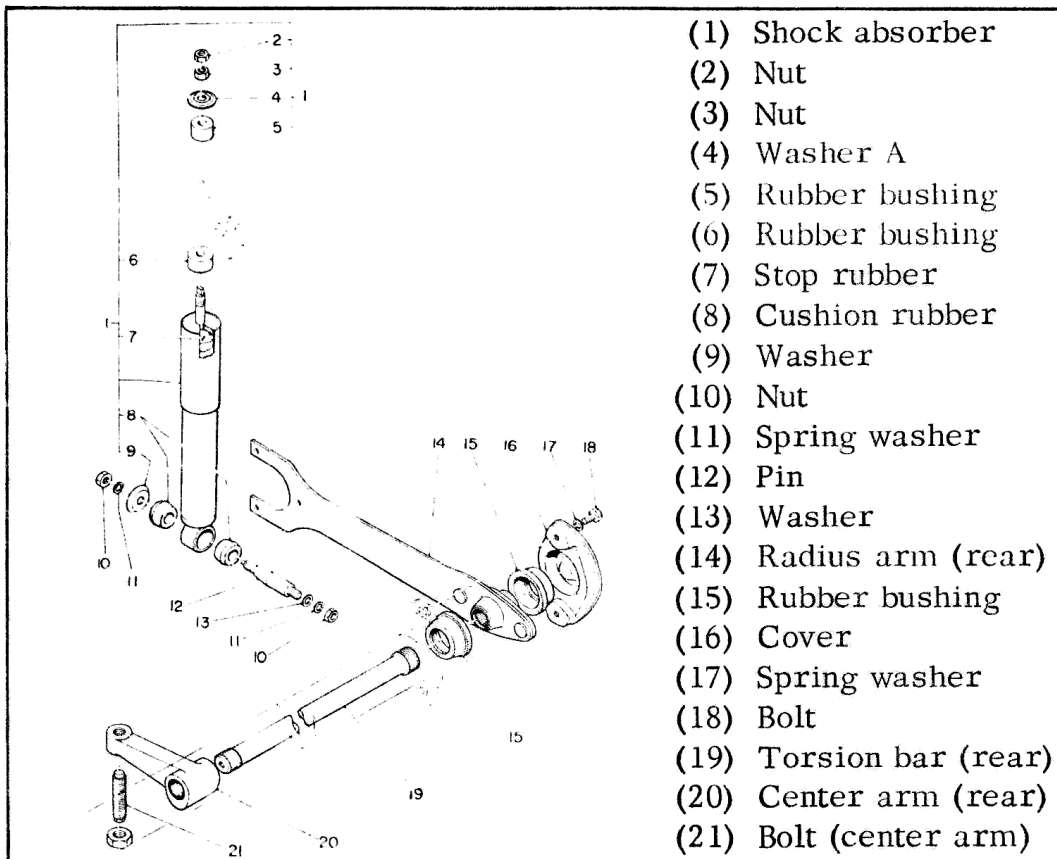
1. SPECIFICATIONS AND ADJUSTMENT STANDARDS OF THE REAR END

- Suspension system Independent suspension
- Tread 1080 mm (42.5 in)
- Rear tires 4.50 - 10 - 4 PR
- Rear tire air pressure 1.9 - 2.0 kg/cm²
(27.0 - 28.4 lb/in²)
- Rear wheel load when unloaded Truck: 235 kg (507.5 lb)
Van: 295 kg (650 lb)

OUTLINE

The rear end is composed of the rear suspension and the rear axle and supports the rear wheel load. For the suspension system, an independent suspension system using torsion bars is adopted and in a combination with shock absorbers, the system ensures a riding comfort which is comparable to that of a passenger car and high stability.

COMPOSITION OF THE REAR END

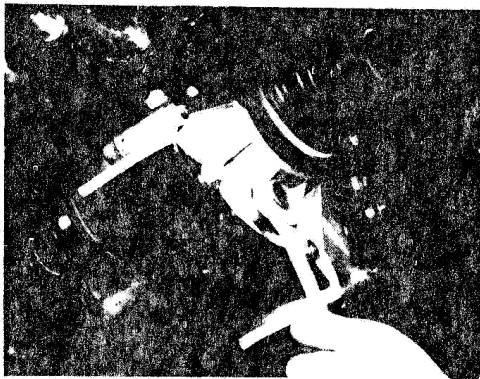


- (1) Shock absorber
- (2) Nut
- (3) Nut
- (4) Washer A
- (5) Rubber bushing
- (6) Rubber bushing
- (7) Stop rubber
- (8) Cushion rubber
- (9) Washer
- (10) Nut
- (11) Spring washer
- (12) Pin
- (13) Washer
- (14) Radius arm (rear)
- (15) Rubber bushing
- (16) Cover
- (17) Spring washer
- (18) Bolt
- (19) Torsion bar (rear)
- (20) Center arm (rear)
- (21) Bolt (center arm)

2. REMOVAL AND INSTALLATION OF THE REAR END ASSEMBLY

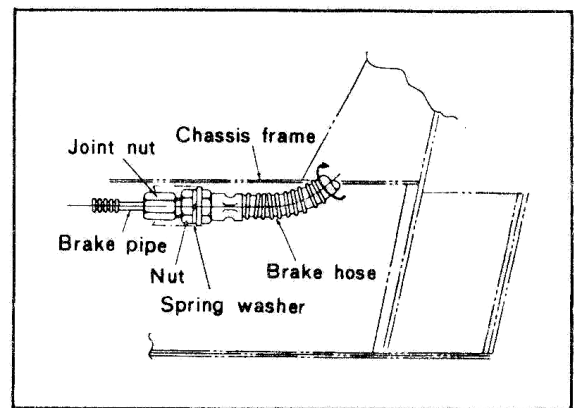
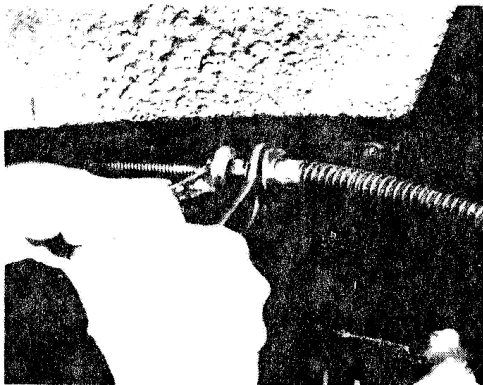
SPECIAL TOOL	921220000
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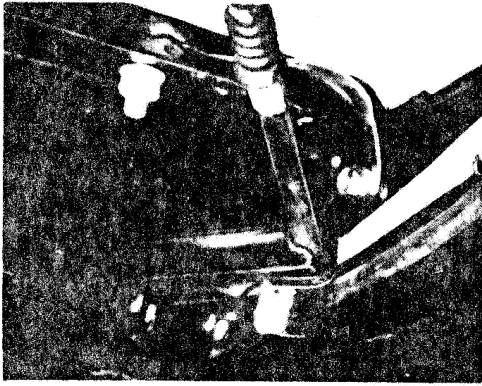
- (1) Place the car over a greasing pit or on an inspection rack. Jack up the rear end at the jack support points located at the rear part of the chassis frame so that the rear wheels can be turned freely.
- (2) Remove the wheel caps and loosen the four 10mm nuts fixing the rim to the brake drum. Pull the tires in the axial direction and remove the wheels.



- (3) Place an empty container underneath the engine. Remove the 22mm plug of the differential gear case and drain the gear oil.

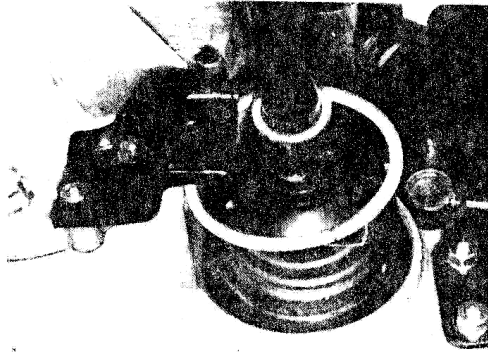
- (4) The left and right brake hoses are attached as shown in the figure. Hook a wrench on the hexagonal section of the rubber hose and remove the joint nut with another wrench. Next, loosen the 3/8 inch nut which fastens the rubber hose and pull out the rubber hose.





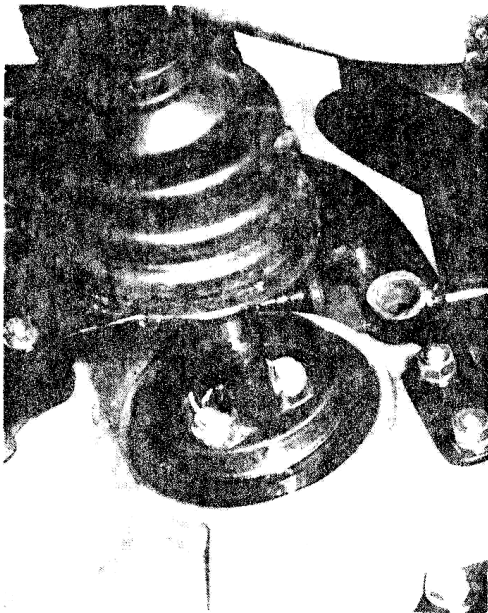
- (5) Detach the hard brake cable from the body.

When the cable mounting section at the central part of the under-side of the floor is detached, the hand brake cable will hang loose from the floor.



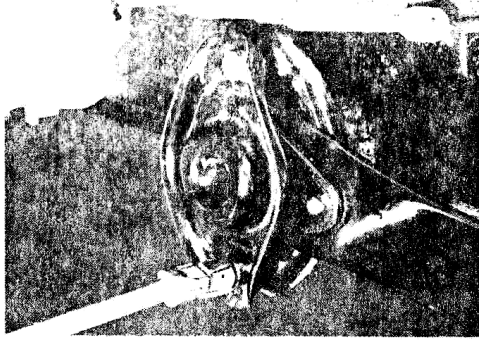
- (6) Remove the rubber boot located near the universal joint of the rear axle shaft.

At this time, if the rubber boot is pulled out on the tire side after removing the clip ring of the engine side, the subsequent operations will be easier.

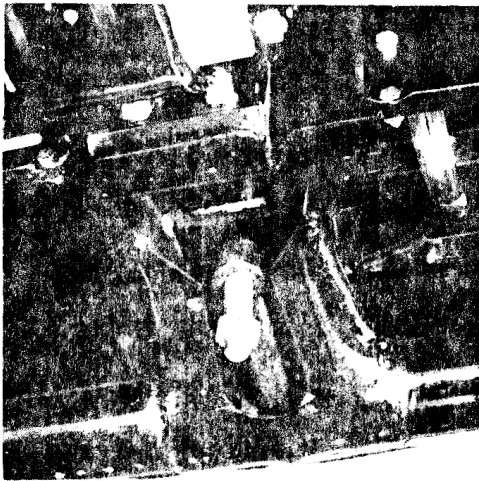


- (7) Cut and remove the lock wire of the 8mm bolt which connects the rear axle shaft to the universal joint.

Remove the 8mm bolt using special tool 921220000.



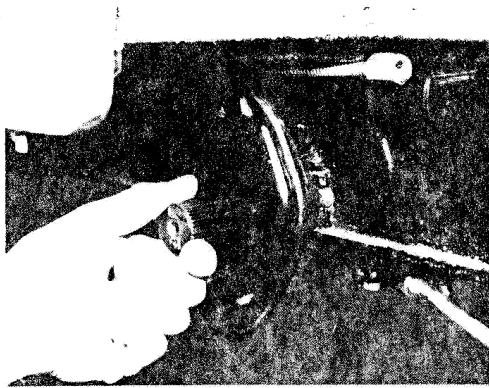
- (8) Remove the radius arm cover by removing the two 8mm bolts.



- (9) Fully loosen the adjusting bolt on the center arm.



- (10) Remove the 10mm nut which connects the shock absorber upper part to the body.
- (11) Hold the rear brake drum and the radius arm and lower them once to detach the shock absorber from the body. Then, pull them in the axial direction to remove.



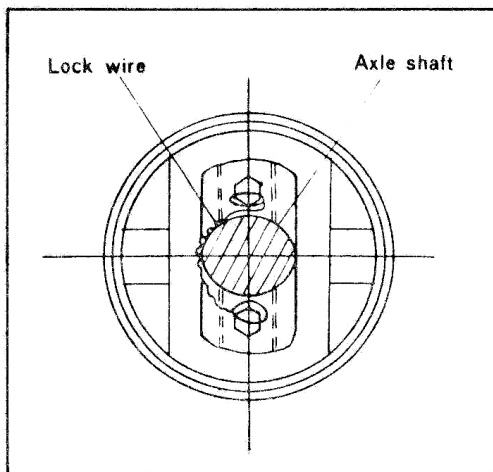
- (12) Pull out the torsion bars.
- (13) Take out the center arm.

B: INSTALLING THE REAR END ASSEMBLY

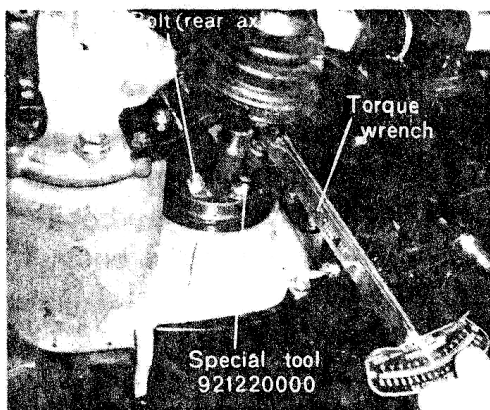
SPECIAL TOOL	921220000
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When mounting the assembled rear end on the body, check the rubber bush of the radius arm mounting section and replace it when it is worn excessively.

(CAUTIONS)



- (a) The torsion bars, center arm and radius arm cannot be mounted unless the positions of the missing tooth on the serrations are matched. Be sure to match them.
- (b) For the connection of the rear axle shaft and the universal joint, exclusive bolts are used and are tightened without using spring washers. The tightening torque for the bolts is 2.8 - 4.2 kg-m (21 - 30 lb-ft). After tightening, be sure to lock with lock wire.
- (c) The tightening torque of the 3/8-inch nut is 1.2 - 1.8 kg-m (9 - 13 lb-ft) for connecting the brake pipe and rubber hose.



3. SPECIFICATIONS AND ADJUSTMENT STANDARDS OF THE REAR SUSPENSION

Rear torsion bar

Effective length 435 mm (17.12 in)

Diameter 20.5 mm (0.81 in)

Material Spring steel

Specifications for the rear torsion bar serration

Inside end (type of tooth x number ... 0.75/0.375 x 35
of teeth)

Outside end (type of tooth x number..0.75/0.375 x 37
of teeth)

Position of missing tooth Outer side on center line

Shock absorber damping force

Extention stroke 35 ± 4 kg/0.3m/sec
(68.3 ~ 86.0 lb/lft/sec)

Compression stroke 30 ± 4 kg/0.3m/sec
(57.3 ~ 75.0 lb/lft/sec)

4. REMOVAL AND INSTALLATION OF THE REAR SUSPENSION

A: REMOVAL OF THE REAR SUSPENSION

SPECIAL TOOL

921120000, 921220000

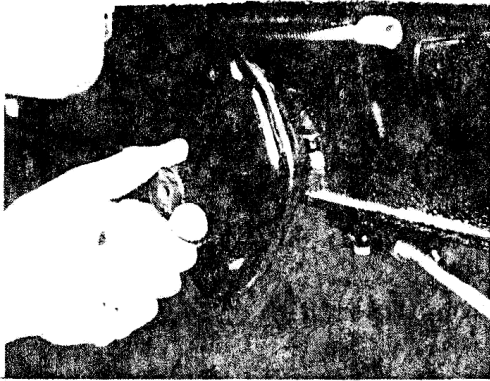
When removing the rear suspension from the body, the removal of the rear end, as explained in the preceding section, is necessary.

B: INSTALLING THE REAR SUSPENSION

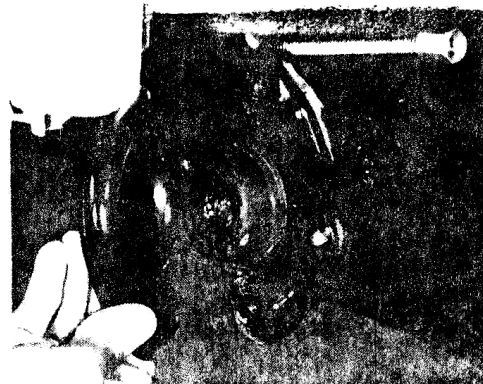
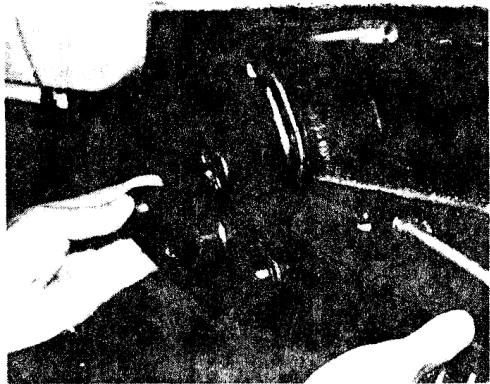
(CHECKING BEFORE ASSEMBLING)

- (a) Carefully check the torsion bar for existence of damage and flaking off of the coating.
- (b) Apply sufficient amount of grease to the serrations.

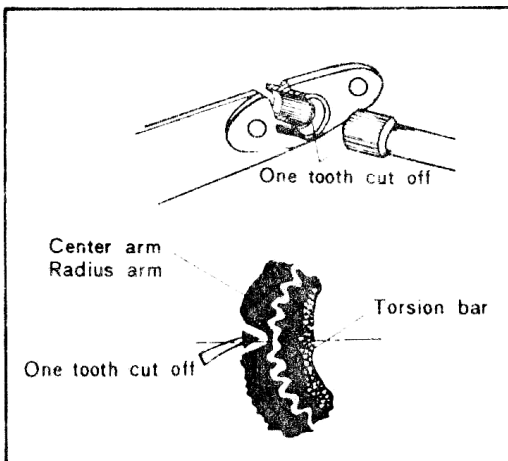
- (1) Insert the torsion bar into the cross member and insert it into the center arm.



- (2) Press the rubber bushing on the bracket and install the radius arm to the torsion bar. Fit the cover to the bracket.



(CAUTION)



- (a) In the cases of (1) and (2), for positioning the center and radius arms, one tooth of the serration of the torsion bar is cut off. Unless this position of missing tooth and the projection on the serration of the center arm are matched, the torsion bar cannot be inserted. Be sure to match them.

- (b) On the end face of the radius arm side (37 tooth serration side) of the torsion bar, the letter "R" or "L" is marked.

For the right side, mount the torsion bar marked with "R" and for the left side mount the torsion bar marked with L.

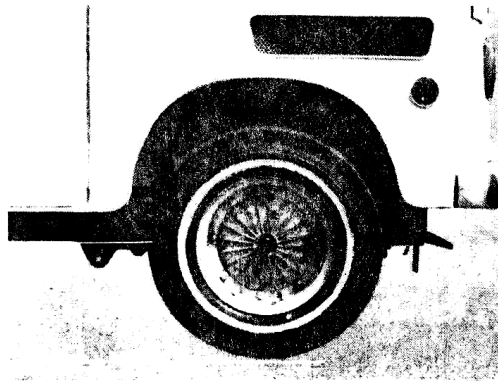
If the above mountings of the torsion bars are reversed, the torsion

bars will wear rapidly and may cause an accident.

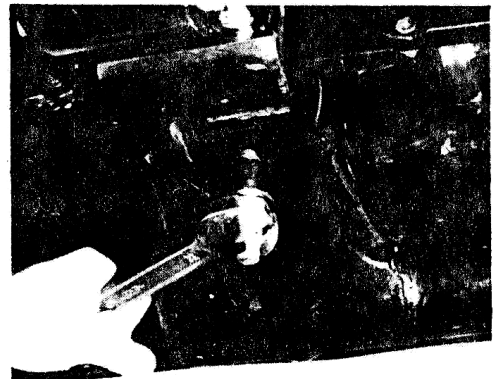
(3) Install the rear end. (See page 3-5.)

(3) Next, adjust the ground clearance. The ground clearance is adjusted with the center arm bolt after ascertaining the rear tire air pressure is $1.9 \sim 2.0 \text{ kg/cm}^2$ ($27.0 \sim 28.4 \text{ lb/in}^2$).

When the center arm bolt is driven in, the ground clearance increases. Adjust so that the center position of the torsion bar is $255 \pm 5 \text{ mm}$ ($9.8 \sim 10.2 \text{ in}$) above the ground.

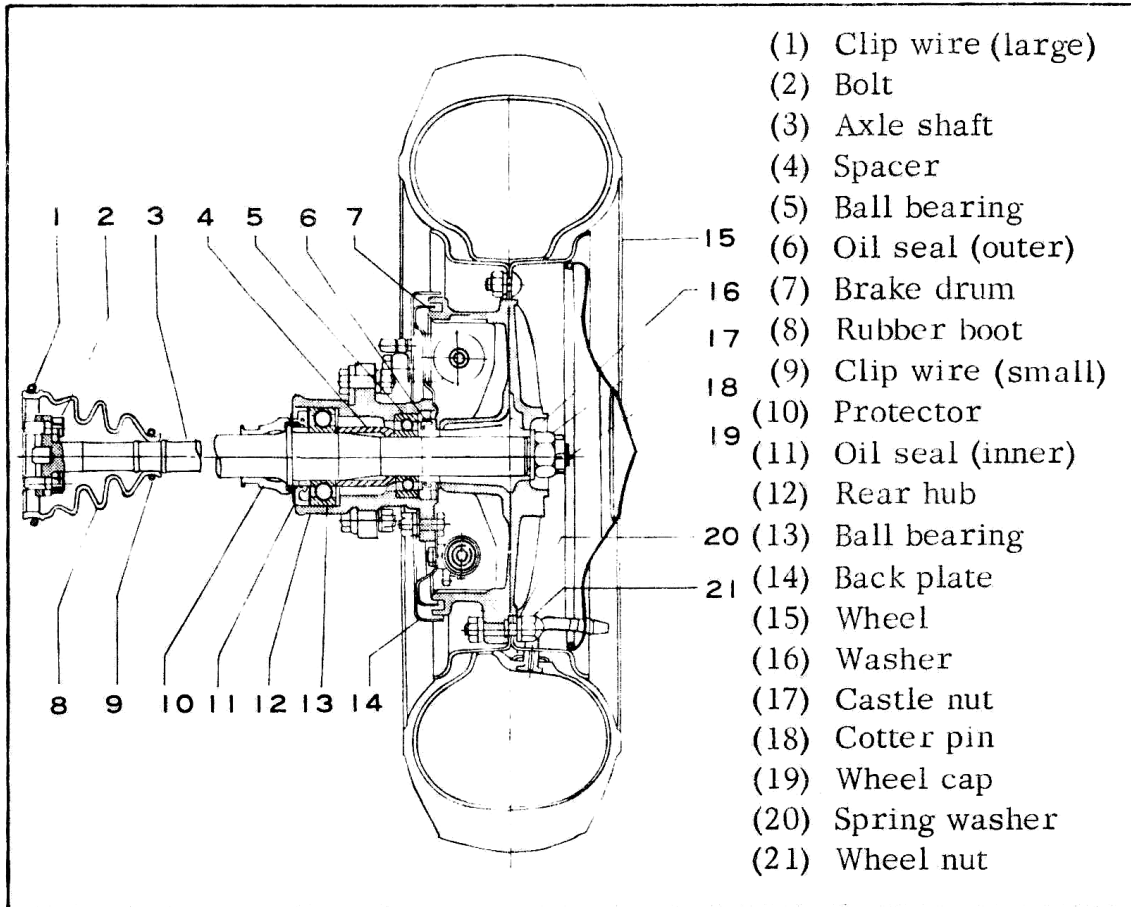


Ground clearance
measurement



Ground clearance
adjustment

5. REMOVAL AND INSTALLATION OF THE REAR AXLE

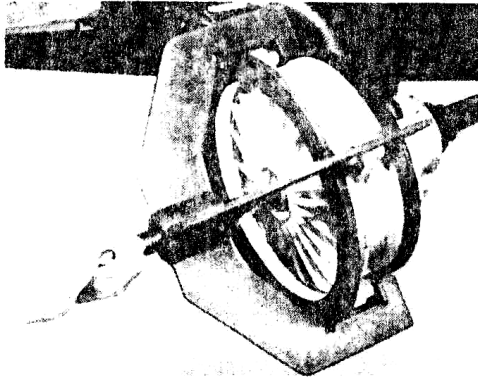


5-1. REMOVAL AND INSTALLATION OF THE BRAKE DRUM

A: REMOVAL OF THE BRAKE DRUM

SPECIAL TOOL	921120000
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- (1) Insert a minus screwdriver in the gap between the wheel cap and rim and pry to remove the wheel cap.
- (2) Remove the four 10mm wheel nuts which couple the rim and brake drum. Pull the tire in the axial direction and remove the wheel.
- (3) Pull out the 4mm split pin of the 16mm castle nut which holds the brake drum center and remove the castle nut.

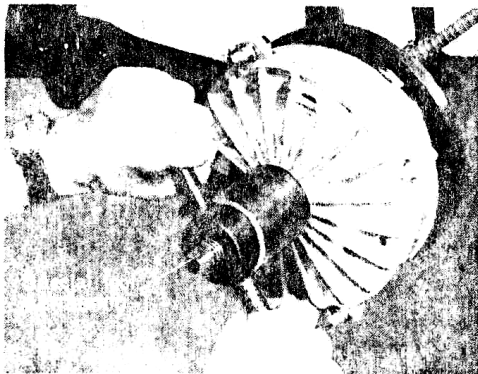


- (4) Hook the claws of special tool 921120000 on the four projections of the drum. Match the threaded tip of the tool to the center of the rear axle shaft and drive in the handle of the tool. The drum will come off easily.

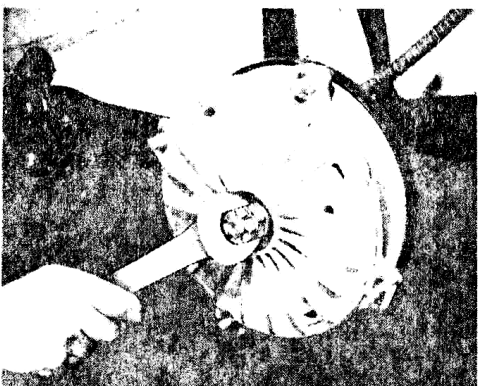
B: INSTALLATION OF THE BRAKE DRUM

SPECIAL TOOL	921180000, 922310000
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- (1) When installing the brake drum, thoroughly clean the surface which fits the brake shoe and completely remove all adhering oils, etc.



- (2) Use special tool 921180000 to press the brake drum in. Match the drum to the spline of the axle shaft, insert it slightly, hold the head of the tool; screw the end of the shaft of the tool onto the threaded portion of the axle shaft and operate the handle to press the drum in. In the above case, the pressing in of the drum becomes easier if grease is applied to the spline of the axle shaft.



- (3) After installing the drum, remove the special tool, fully tighten the drum onto the axle shaft with a washer and castle nut and insert the 4mm cotter pin to lock.

TIGHTENING TORQUE
10 - 20 kg-m (73 ~ 144 lb-ft)

In the above case, be sure to use new cotter pin.

- (4) Adjust the brake shoe gap to 0.1 - 0.15mm (0.004 ~ 0.006 in).
(See page 5-23)
- (5) Completely fasten the wheel on the brake drum with four 10mm wheel nuts and attach the wheel cap.

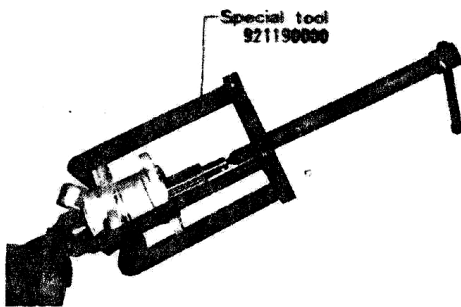
TIGHTENING TORQUE	3.6 - 5.5 kg-m (26 ~ 39 lb-ft)
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5-2. REMOVAL AND INSTALLATION OF THE REAR AXLE SHAFT

A: REMOVAL OF THE REAR AXLE SHAFT

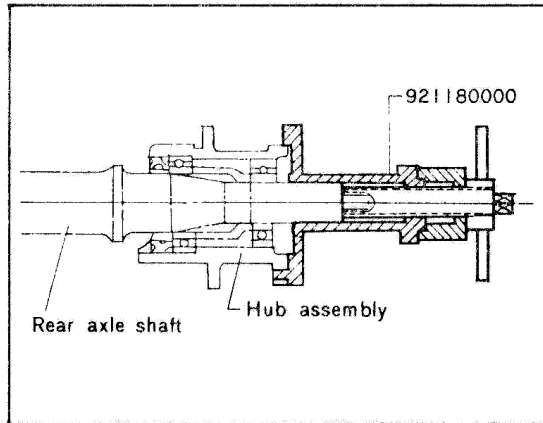
SPECIAL TOOL	921120000, 921180000, 921190000
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- (1) After removing the rear end from the chassis, hold the radius arm with a vise.
- (2) Remove the brake drum with special tool 921120000.
- (3) Remove the brake assembly from the rear hub. It is only necessary to loosen the three 8mm bolts which connect the rear hub and back plate.



- (4) Hook the three claws of special tool 921190000 on the projections of the hub. Place the center shaft against the center hole of the rear axle shaft and turn the handle of the tool. Then the shaft is pushed out.

B: INSTALLING THE REAR AXLE SHAFT



- (1) Check the rear axle shaft for abnormality. Apply a thin coat of grease to the fitting portion of the bearing.
- (2) Fit the rear axle shaft into a hub assembly which has been checked and maintained. The above operation can be performed easily when special tool 921180000 is used. Careful, so that no foreign matter such as dust enters inside of the hub.

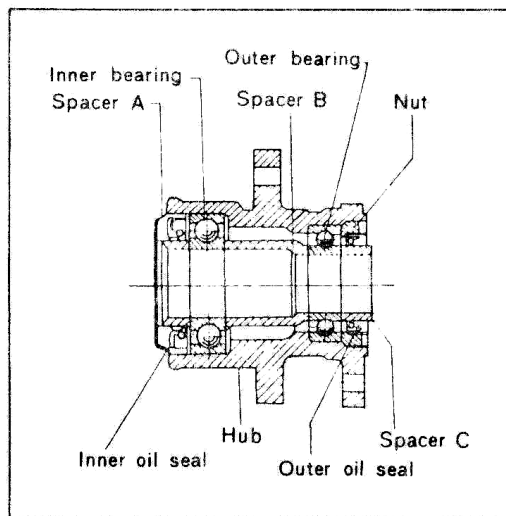
5-3. REMOVAL OF THE REAR HUB AND BEARINGS

To remove the hub and bearings, first remove the rear axle shaft next, remove the three 8mm connecting bolts. Then, the hub can be detached from the radius arm.

A: REMOVAL OF THE REAR HUB BEARINGS

SPECIAL TOOL	921190000, 921200000
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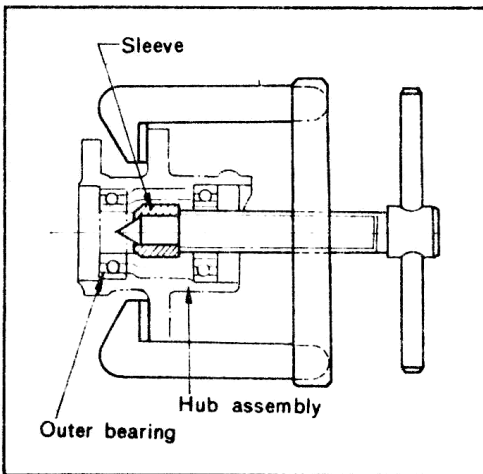
Extreme care must be used in handling the bearings.



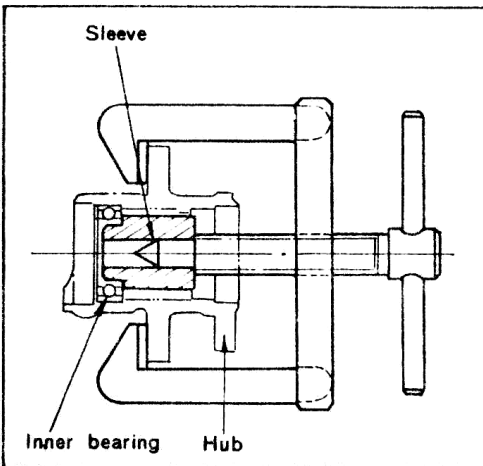
- (1) When the back plate is removed, the lock for the nut is removed at the same time. Then, remove spacers A and C.



- (2) Remove the nut with special tool 921200000.



- (3) For removing outer bearing, use special tool 921190000. As shown in the figure, insert the sleeve into spacer B; fit the tip of the tool in the sleeve and hook the three claws on the projections of the hub. Then, turn the handle. The outer bearing be pushed out together with spacer B.



- (4) For removing the inner bearing, special tool 921190000 is used also. As shown in the figure, insert the sleeve in to hub and when the special tool is operated in the same as the above, the inner bearing can be pushed out.

B: ASSEMBLING HUB BEARINGS

- (1) Checking and cleaning before assembly

When cleaning the bearings, prepare two containers for solvent for preliminary and finish cleaning operations. As cleaning solvent,

use moisture-free light oil or kerosine.

(a) Preliminary cleaning

Clean the bearing by shaking it strongly in the solvent without rotating it. If the bearing is permitted to rotate at the start of cleaning, it takes in foreign matter causing its accuracy to deteriorate.

(b) Finish cleaning

Let the bearing rotate in the solvent

(CAUTION)

For drying of the bearings after they have been cleaned, the use of compressed air is not advisable unless there is a device to remove the foreign matter such as dust and rust contained in the air. When the bearings have been cleaned and dried, apply grease to the bearings and wrap them up in clean wrapping paper to protect them from dust.

(2) Method of checking the bearings

The simplest method is to check the degree of the contamination of bearing lubricant. When the lubricant is exceedingly dirty or when it contains metal powders, it means either that foreign matter has entered the bearing from outside or that the bearing is worn or damaged.

Clean the bearing, check its surfaces for roughness and perform a thorough inspection. When necessary, replace the bearing with a new one.

However, even when the lubricant looks dark, if it is transmittant it is not a sign of any damage and care must be exercised on this point.

(3) Assembling the bearings

SPECIAL TOOL	921190000, 921200000
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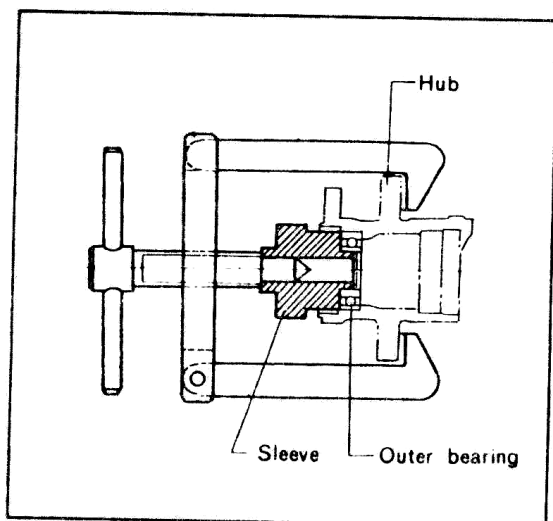
Exercise an utmost care to prevent dust from entering into the bearings. Maintain the working place and tools clean.

Do not unwrap the bearings until it is time for their assembly.

Also, thoroughly clean the hub and protect them from dust.

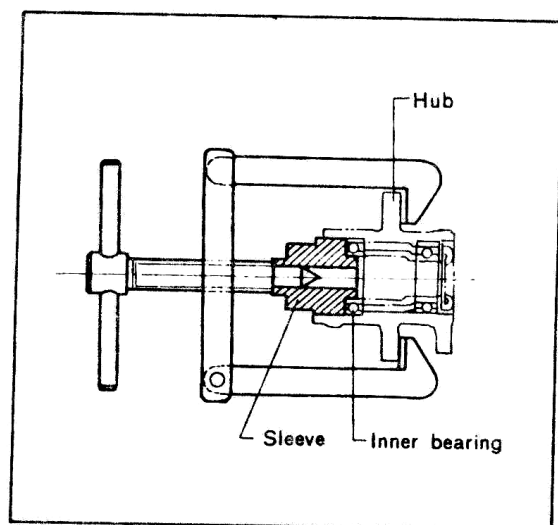
Assemble the bearings according to the following procedure.

Outer bearing	#6205
Inner bearing	#6206



(a) Installation of the outer bearing using special tool 921190000, insert the smaller end of the sleeve into the bearing. Hook the claws of the tool on the three projections of the hub; insert the tip of the handle in to the sleeve and operate the handle to press the bearing in.

(b) Fit the outer oil seal in and tighten the nut with special tool 921200000.



(c) Coat the bearing grease in a 3mm (1/8 inch) thickness to the inner surface of the hub and insert spacer B from the opposite side.

(d) Installation of the inner bearing. Fit the larger end of the sleeve in the bearing. Hook the claws of special tool 921190000 on the three projections of the hub. Insert the tip of the handle in to the sleeve; operate the handle and press the bearing in.

(e) Press in the inner oil seal in the same way.

(f) Lastly, insert spacers A and C in the oil seals. At this time, apply a small amount of the grease to the lips of the oil seals. The suitable amount of grease, including the grease to be applied to the both bearings and that used to fill the spaces inside the bearings is 30 - 35g (1.1 ~ 1.2 oz).

CHAPTER 4: STEERING SYSTEM

1. SPECIFICATIONS AND ADJUSTMENT STANDARDS OF THE STEERING ASSEMBLY 4- 1
2. TIGHTENING ORDER IN ASSEMBLING THE STEERING SYSTEM 4- 2
3. REMOVAL AND INSTALLATION OF THE STEERING GEAR BOX 4- 3
4. DISASSEMBLY AND ASSEMBLY OF THE STEERING GEAR BOX 4- 6
5. REMOVAL AND INSTALLATION OF THE BEVEL GEAR BOX (INCLUDING THE TORQUE ROD) 4-12
6. DISASSEMBLY AND ASSEMBLY OF THE BEVEL GEAR BOX 4-14
7. REMOVAL AND INSTALLATION OF THE STEERING WHEEL 4-15
8. DISASSEMBLY AND ASSEMBLY OF THE STEERING WHEEL 4-16
9. REMOVAL AND INSTALLATION OF THE STEERING SHAFT 4-17
10. REMOVAL AND INSTALLATION OF THE TIE-ROD END ... 4-20
11. DISASSEMBLY AND ASSEMBLY OF THE TIE-ROD END ... 4-21

1. SPECIFICATIONS AND ADJUSTMENT STANDARDS OF THE STEERING ASSEMBLY

Type of steering	Rack and pinion
Minimum turning circle	8 m (26.3 ft)
Steering angle	inner: 32°30' outer: 30°45'
Total gear ratio	22.5
Steering wheel diameter	380 mm (15 in)
Steering shaft diameter	20 mm (0.8 in)
Rubber coupling	Thickness 6 mm (1/4 in) x 5 ply
Pinion	Module 1.75 x 7 teeth
Rack	Module 1.75 x 24 teeth
Backlash	Less than 0.05 mm (0.002 in) (adjusted by turning of adjuster)
Dimensions of threaded section of tie-rod	17 mm x 1.5 P
Diagonal dimension of adjusting nut of tie-rod	23 mm
Diagonal dimension of tie-rod turnbuckle	19 mm
Tie-rod end ball stud	14 mm
Toe-in (unloaded)	12 ~ 17 mm (0.47 ~ 0.67 in)
Side slip (with one person riding) ..	IN 1 ~ 6
Bevel pinion	Module 2 x 15 teeth
Bevel gear	Module 2 x 21 teeth
Gear ratio	
Backlash	Less than 0.03 - 0.13 mm (0.0012 ~ 0.0051 in) (adjusted with shims)
Axial direction play of bevel pinion	Less than 0.03 - 0.06 mm (0.0012 - 0.0024 in) (adjusted by turning of adjuster)

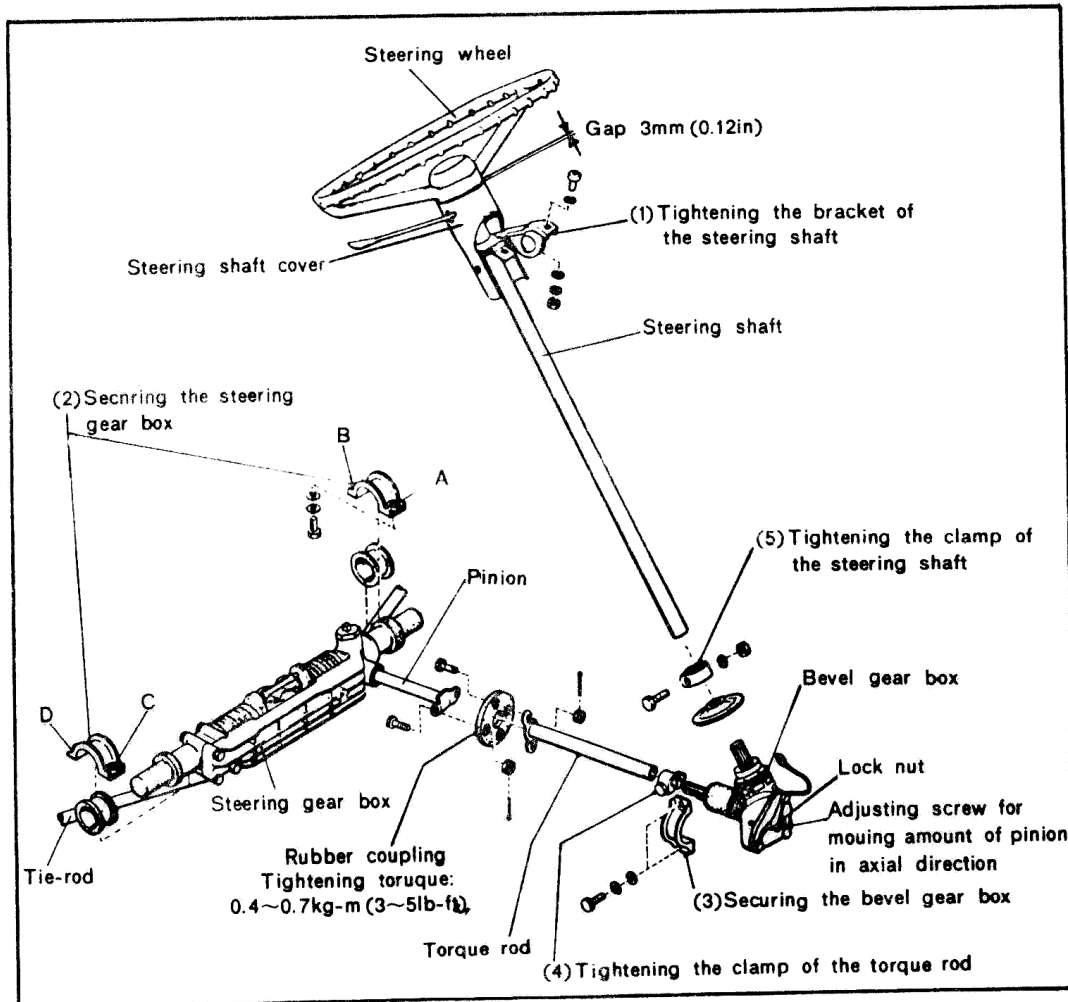
GENERAL

The construction of the steering gear box is simple and reliable rack and pinion type.

The minute adjustment of the backlash can be made easily since springs have been incorporated in the sleeve and adjuster and at the same time, once the backlash is adjusted, there is absolutely no need for re-adjustment. Because the turnbuckle and lock nut method is used for adjusting the toe-in, the minute adjustment is easily possible.

Because the minimum turn circle is 8m (26.2 ft), a small turning is possible and this is another feature of SUBARU 360 TRUCK AND VAN in addition to its comfortable riding and excellent maneuverability.

2. TIGHTENING ORDER IN ASSEMBLING THE STEERING SYSTEM



When assembling the steering system, assemble in order of (1) - (5) as shown in the above figure. Tighten each part with the specified tightening torque.

- (1) Tighten the steering shaft bracket to the instrument panel.
- (2) Lift the rubber coupling and secure the steering gear box in order of (A), (B), (C) and (D).
- (3) Slightly raise the bevel gear box and secure it at the bolt hole center of the clamp.

TIGHTENING TORQUE	1.0 - 1.8 kg-m (8 - 13 lb-ft)
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- (4) Tighten the clamp of the torque rod to the bevel gear box.

TIGHTENING TORQUE	1.4 - 2.2 kg-m (10 - 16 lb-ft)
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- (5) Tighten the clamp to connect the steering shaft to the bevel gear box.

TIGHTENING TORQUE	1.4 - 2.2 kg-m (10 - 16 lb-ft)
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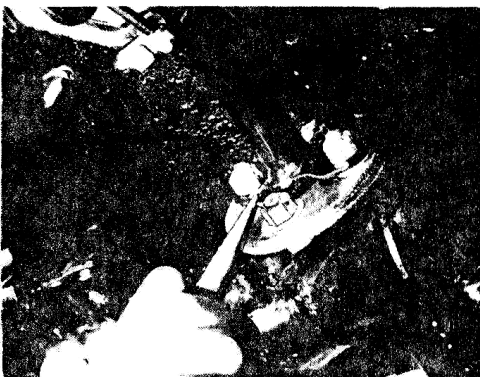
In this case, secure the gap between the steering shaft cover and steering wheel by lifting the steering shaft.

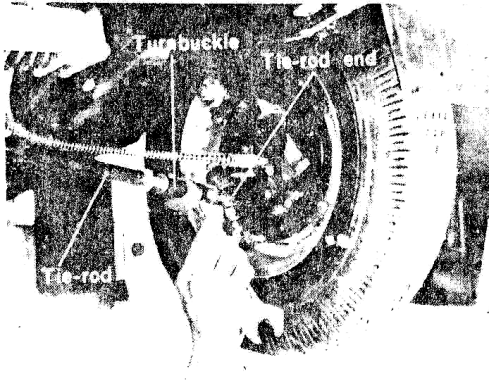
GAP	3mm (0.12 in)
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3. REMOVAL AND INSTALLATION OF THE STEERING GEAR BOX

A: REMOVAL

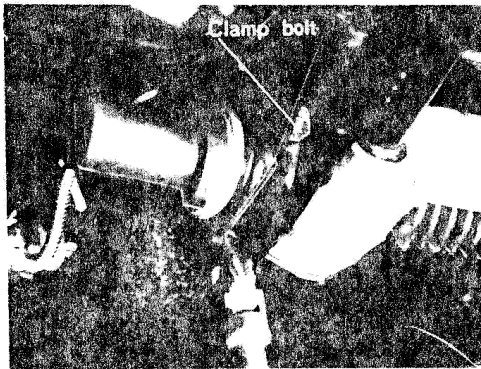
- (1) Set the body on a pit or an inspection stand.
Jack up the front section so that the front wheels will turn freely.
- (2) Remove the two 8mm bolts for tightening the rubber coupling to separate the torque rod from the pinion. Keep the rubber coupling attached on the torque rod.



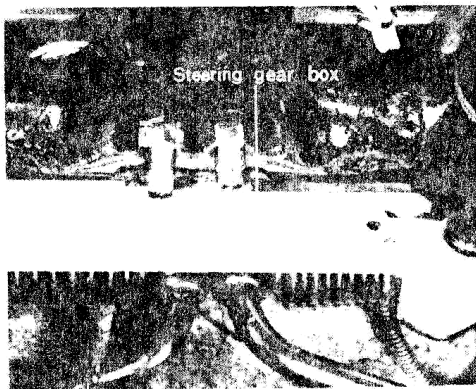


- (3) Loosen the 17mm nut of the turnbuckle.
The tie rod is right-hand thread and the tie-rod end (Wheel side) is left-hand thread.

- (4) Turn the turnbuckle and disconnect the tie rod and tie-rod end.



- (5) Remove the four 8mm bolts which fasten the steering gear box to the cross member.



- (6) Remove the steering gear box by shifting it toward the rear of the body.

B: INSTALLATION

- (1) Fit the rubber bushing on the steering gear box and place the steering gear box on the bracket of the cross member shifting from the rear of the body.
- (2) Place the clamp over and tighten the gear box with four 8mm bolts. At this time, secure the gear box so that the center of the pinion and that of the torque rod are aligned straight for smooth operation of the steering wheel.

TIGHTENING TORQUE	1.0 - 1.8 kg-m (8 - 13 lb-ft)
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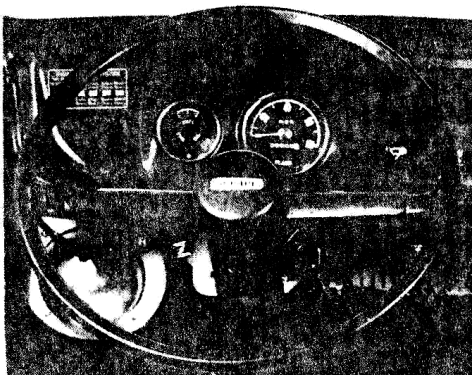
- (3) Connect the rubber coupling

TIGHTENING TORQUE	0.4 - 0.7 kg-m (3 - 5 lb-ft)
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After tightening the rubber coupling with the specified torque, lock with the new cotter pin.

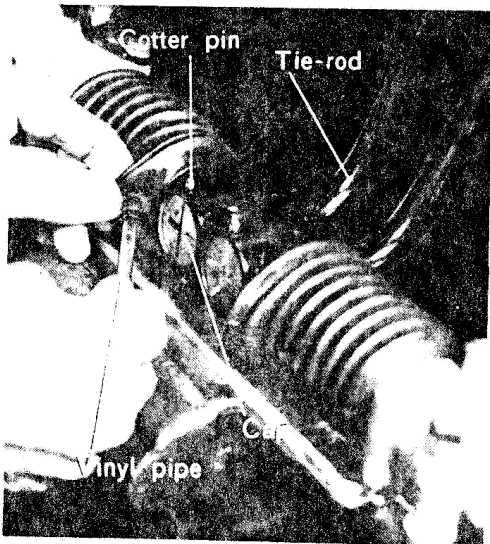
- (4) Turn the turnbuckle and couple the tie rod and tie-rod end temporarily. In this case, be careful that there will not be too much difference between the exposed threaded positions on the tie rod and tie-rod end sides.
- (5) Turn the steering wheel from lock to lock and check its operation. After finding it satisfactory, remove jack.
- (6) Turn the turnbuckle and adjust the toe-in. Then, tighten the 17mm lock nut perfectly.
When the car is not loaded, the toe-in is 12 ~ 17mm (0.47 ~ 0.67 in).

TIGHTENING TORQUE	8.0 - 8.5 kg-m (58 - 61 lb-ft)
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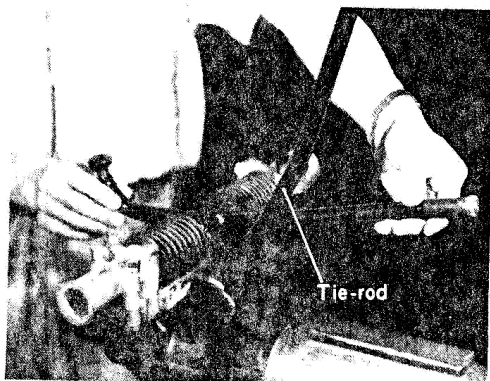


- (7) Adjust so that the steering wheel is on the specified position (the spokes are positioned as shown in the figure).
(For removal and installation of the steering wheel, refer to page 4-15)

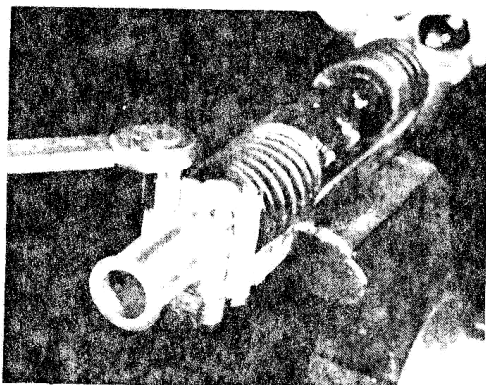
B: DISASSEMBLY



- (1) Hold the steering gear box in a vise and remove the rubber boots from the both ends of the steering gear box.
- (2) Remove the vinyl pipe from the center rubber boot, remove the dust seal from the tie rod and pull out the cotter pin.



- (3) Remove the cap, spring and ball seat and pull out the tie rod.



- (4) Remove the three 8mm bolts and remove the rack and housing from the steering gear box.
- (5) Remove the rack and boot from the housing. Also, remove the grease nipple on the rack.

- (6) Remove the 6mm bolt from the pinion cover to remove the cap, packing and retainer and pull out the pinion.

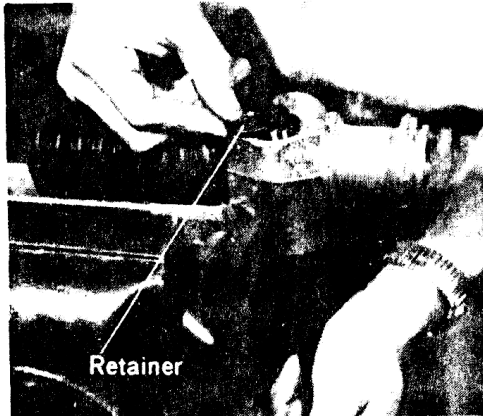
- (7) Loosen the lock nut and pull out the adjuster, spring and sleeve from the steering gear box.

C: ASSEMBLY

- (1) Thoroughly clean each part in solvent and remove dust and other foreign matter. Pay special attention to the bearing surfaces.



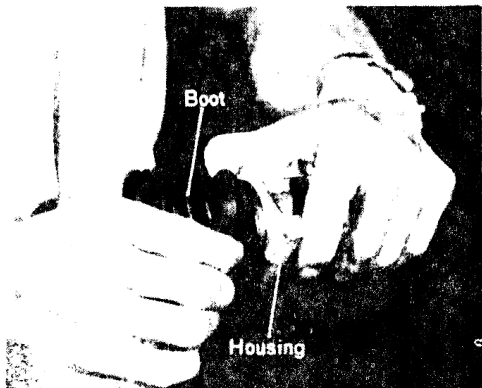
- (2) Install the boot to the steering gear box and hold the steering gear box in a vise.



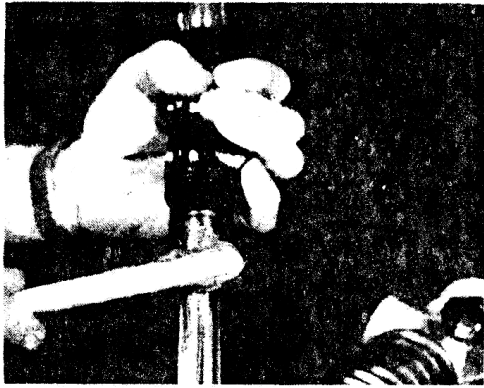
- (3) Apply sufficient amount of grease to the pinion and the bushing inside the steering gear box insert the pinion in the steering gear box and fit the retainer. Also, apply grease to the retainer.

- (4) Place the packing on the steering gear box and fix the cover with the 6mm bolt through the spring washer.

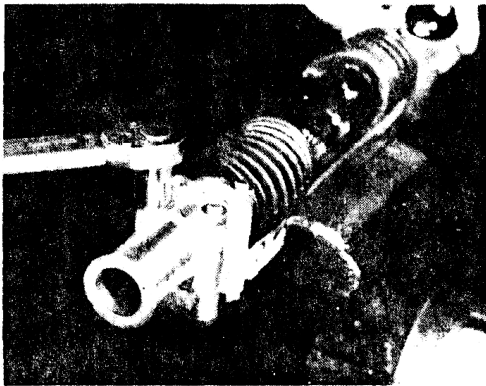
TIGHTENING TORQUE	0.5 - 0.8 kg-m (4 ~ 6 lb-ft)
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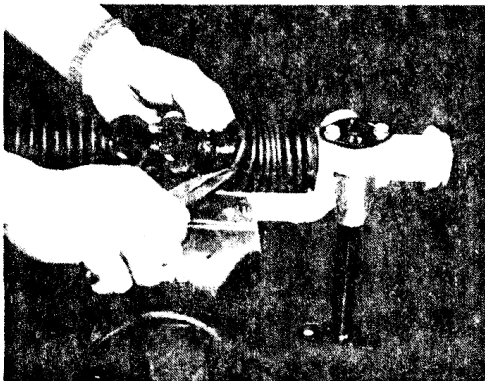
- (5) Install the boot to the housing.



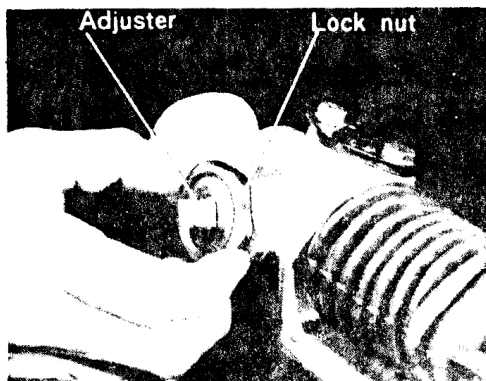
- (6) Apply sufficient grease to the rack.



- (7) Assemble the housing and rack on the box and temporarily tighten the housing with three 8mm bolts.



- (8) Fit the boot in the groove of the rack.



- (9) Apply grease to the sleeve and steering gear box (the portion where sleeve will be inserted). Also, coat the spring with grease.
- (10) Assemble the sleeve, spring, adjuster and lock nut on the steering gear box in the order named.

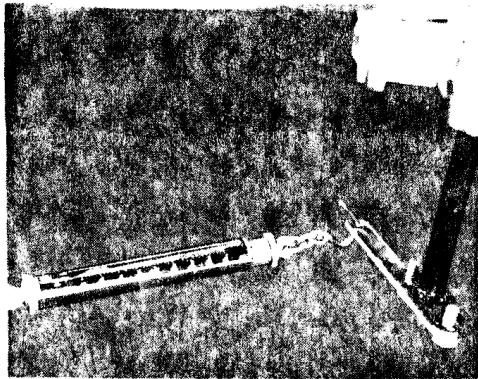
- (11) Screw in the adjuster fully. In this case, keep the lock nut loosened.
- (12) Tighten the three 8mm bolts of the housing fully.

TIGHTENING TORQUE	1.0 - 2.0 kg-m (8 ~ 14 lb-ft)
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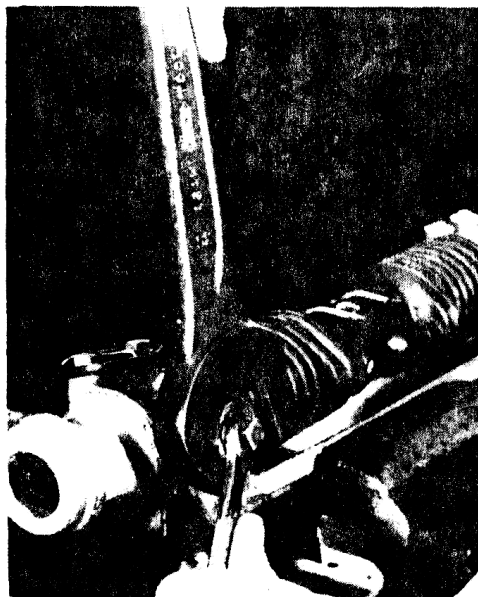


- (13) Mark the fully-tightened position of the adjuster and then turn it back for 15° - 30° from the above position to give the backlash.

- (14) Check the working condition by turning the pinion fully to the left and right.
(As long as the rotation is smooth, it is desirable that the amount of turning back of the adjuster is small).



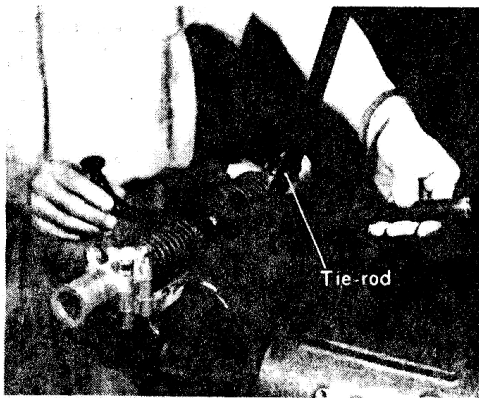
- (15) Measure the torque of the pinion.
The torque at the range of 25mm (1 in) to the left and right from the center is 0.01 - 0.11 kg-m (0.07 - 0.79 lb-ft) and the maximum torque through the full operating range is less than 0.22 kg-m (1.59 lb-ft).



- (16) Tighten the lock nut of the adjuster.

TIGHTENING TORQUE
3.0 - 4.0 kg-m (22 ~ 29 lb-ft)

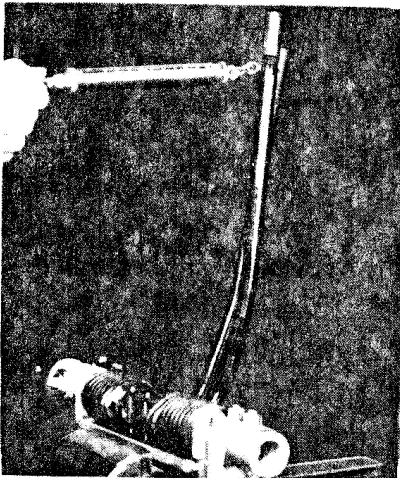
In this case, be careful so that the adjuster does not turn.



(17) Apply grease to the ball section of the tie rod and the socket section of the center of the rack and assemble the tie rod.

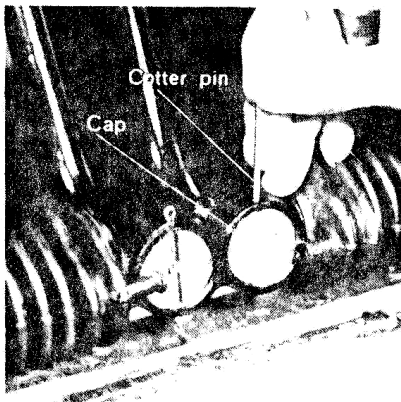
(18) Also, apply grease to the ball seat and spring and assemble in the order of the ball seat, spring and cap.

Assemble the spring with its larger diameter side pointing upward.

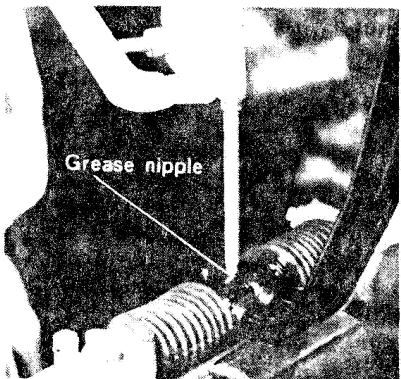


(19) Fully tighten the cap. Then, from that position, turn it back until its groove and the cotter pin hole of the socket match. Check the operation of the tie rod. If the tie rod moves with a force of about 1 kg, when measured in the manner shown in the figure, the condition is satisfactory.

(20) Lock the cap with a new cotter pin.



(21) Attach the grease nipple and lubricate with grease.



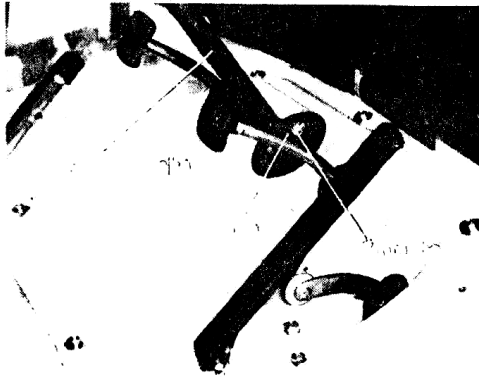


- (22) Install the dust seals to the tie rod and assemble the boots on the both ends of the steering gear box.

5. REMOVAL AND INSTALLATION OF THE BEVEL GEAR BOX (INCLUDING THE TORQUE ROD)

A: REMOVAL

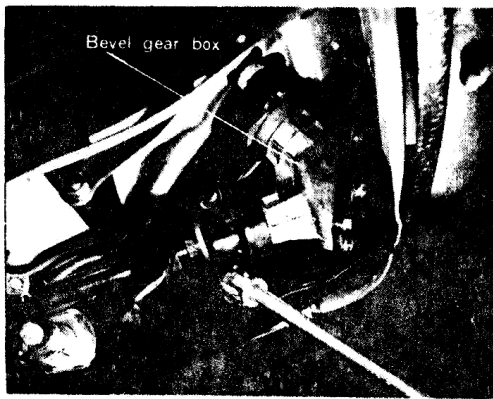
- (1) Set the body on a pit or an inspection stand.



- (2) Remove the clamp bolt (8mm) coupling the steering shaft and bevel gear box and pull out the steering shaft from the bevel gear box.



- (3) Remove the lock wire and two 8mm bolts to disconnect the torque rod and pinion.



- (4) Remove the two 8mm clamp bolts fixing the bevel gear box on the frame, then the bevel gear box will come off the frame together with the torque rod.
- (5) Remove the clamp bolt coupling the torque rod and bevel gear box.

B: INSTALLATION

- (1) Fit the clamp on the torque rod and temporarily fasten on the bevel gear shaft and torque rod with 8mm bolts, spring washers and nuts.
- (2) Attach the rubber bushing to the bevel gear box. Install the rubber bushing with the side marked "Down" downward.
- (3) Place the clamp on the rubber bushing and temporarily fix it on the frame with the 8mm bolts, washers and spring washers.
For the upper side, be sure to insert the terminal of the ground cord in the bolt and fix it.
- (4) Tighten the rubber coupling with 8mm bolts and castle nuts.

TIGHTENING TORQUE	0.4 - 0.7 kg-m (3 ~ 5 lb-ft)
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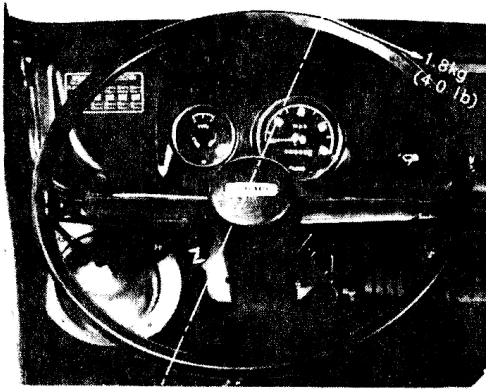
After tightening, lock the castle nut with the new cotter pin.

- (5) Temporarily couple the bevel gear shaft and steering shaft with the 8mm clamp bolts.
- (6) Move the bevel gear box up and down and to the left and right and fully tighten the clamp bolt of the bevel gear box at the position where the steering wheel moves most lightly.
The lightness of the steering wheel can be checked by turning the rubber coupling by hand.

TIGHTENING TORQUE	1.4 - 2.2 kg-m (10 ~ 16 lb-ft)
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- (7) Fully tighten the clamp bolts of the torque rod and steering shaft.

TIGHTENING TORQUE	1.4 - 2.2 kg-m (10 ~ 16 lb-ft)
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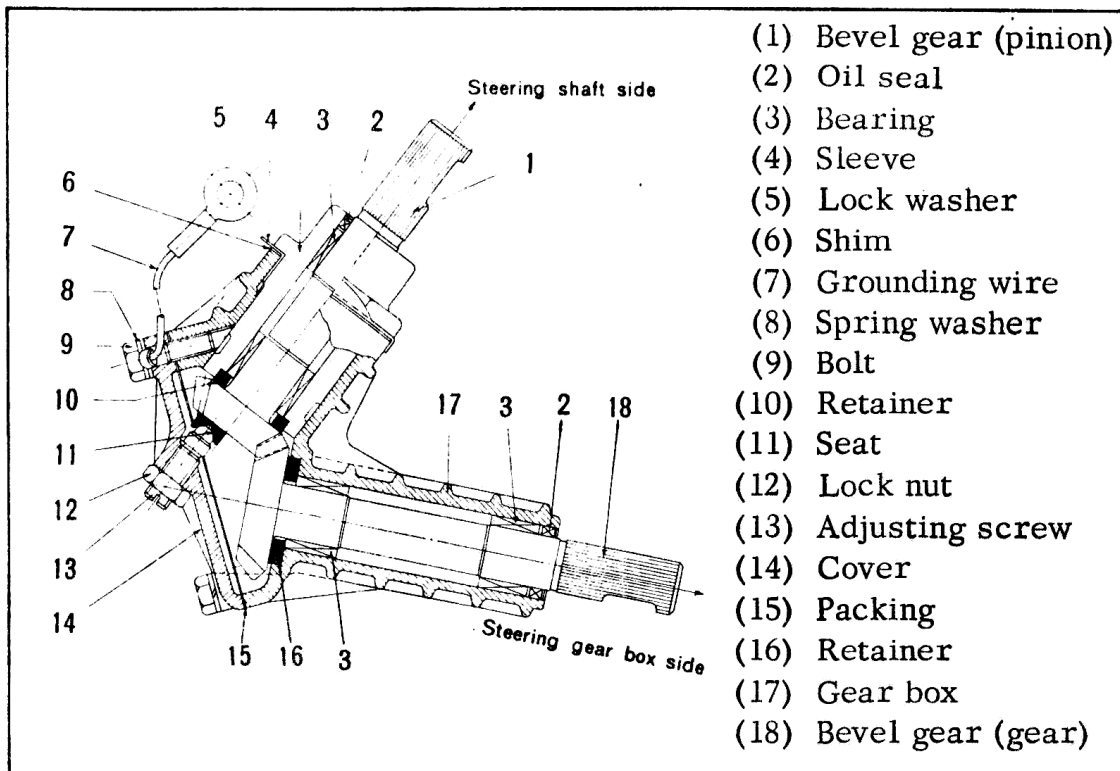
- (8) Fully turn the steering wheel from lock to lock and check its operating condition.

The condition is satisfactory when the tangential force of the steering wheel is less than 1.8 kg (4.0 lb) with one person on the turntable.

- (9) Adjust the steering wheel so that the spokes of the steering wheel are positioned as shown in the figure when the car is running straight.

6. DISASSEMBLY AND ASSEMBLY OF THE BEVEL GEAR BOX

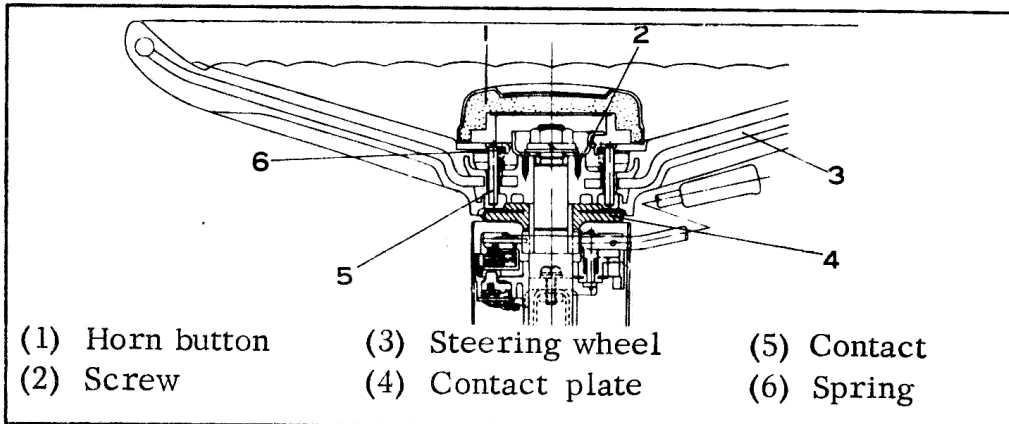
Since the bevel gear box, as a rule, is to be used without maintenance or adjustment, when there is an abnormality, replace the entire assembly without disassembling, adjustment or reassembly.



7. REMOVAL AND INSTALLATION OF THE STEERING WHEEL

A: REMOVAL

- (1) Disconnect the coupling of the horn cord (green) which comes out at the reverse side of the instrument panel and the harness.
- (2) The horn button can be removed easily, by pressing it fully and turned to the right for approximately 60°.

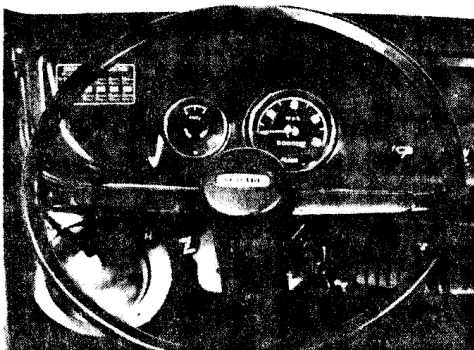


- (3) Remove the nut fixing the steering wheel to the steering shaft. Remove spring washer and plain washer.
- (4) Pull the steering wheel upward, and the serration coupling with the shaft will be detached.

B: INSTALLATION

- (1) Install the steering wheel to the steering shaft by matching the serration so that the spokes of the wheel are at the positions shown in the figure when the car is running on a straight course.
- (2) Fix the steering wheel with the nut after inserting washer and spring washer.

TIGHTENING TORQUE	2.0 - 4.0 kg-m (15 ~ 29 lb-ft)
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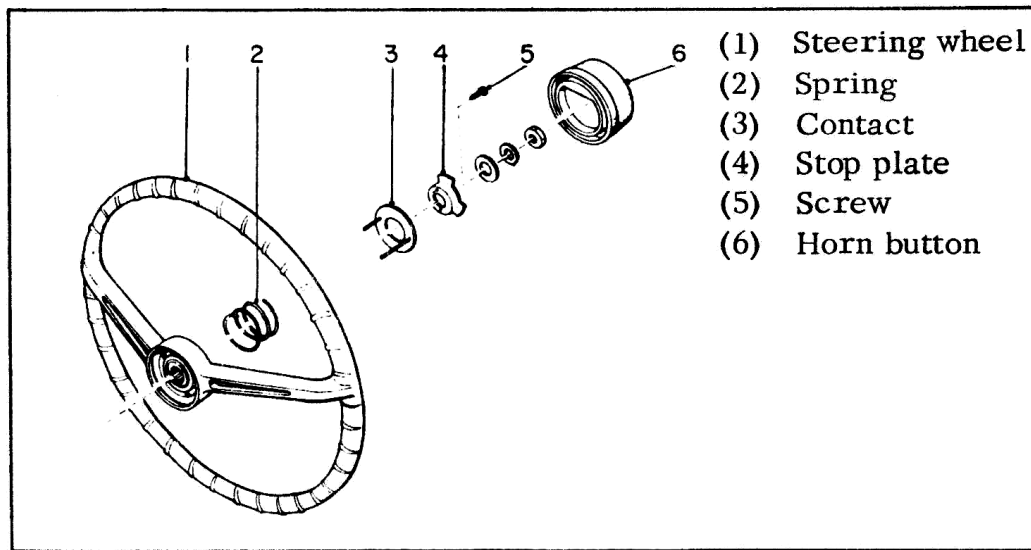
- (3) Match the notch of the horn button and the flange of the stop plate. Then, while fully pressing the horn button, turn it to the left for 60° to assemble. In this case, attach the horn button so that the letters are positioned as shown in the figure.

- (4) Connect the horn cord (green) which comes out at the reverse side of the instrument panel and the harness.
- (5) Press the horn button and check the sounding of the horn.

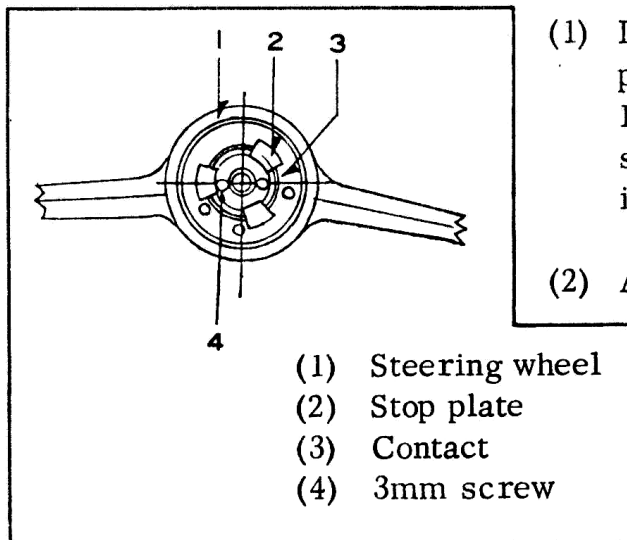
8. DISASSEMBLY AND ASSEMBLY OF THE STEERING WHEEL

A: DISASSEMBLING

- (1) Remove the horn button.
- (2) Remove the two 3mm screws which fasten the stop plate; then the contact plate and spring will also come off.



B: ASSEMBLING

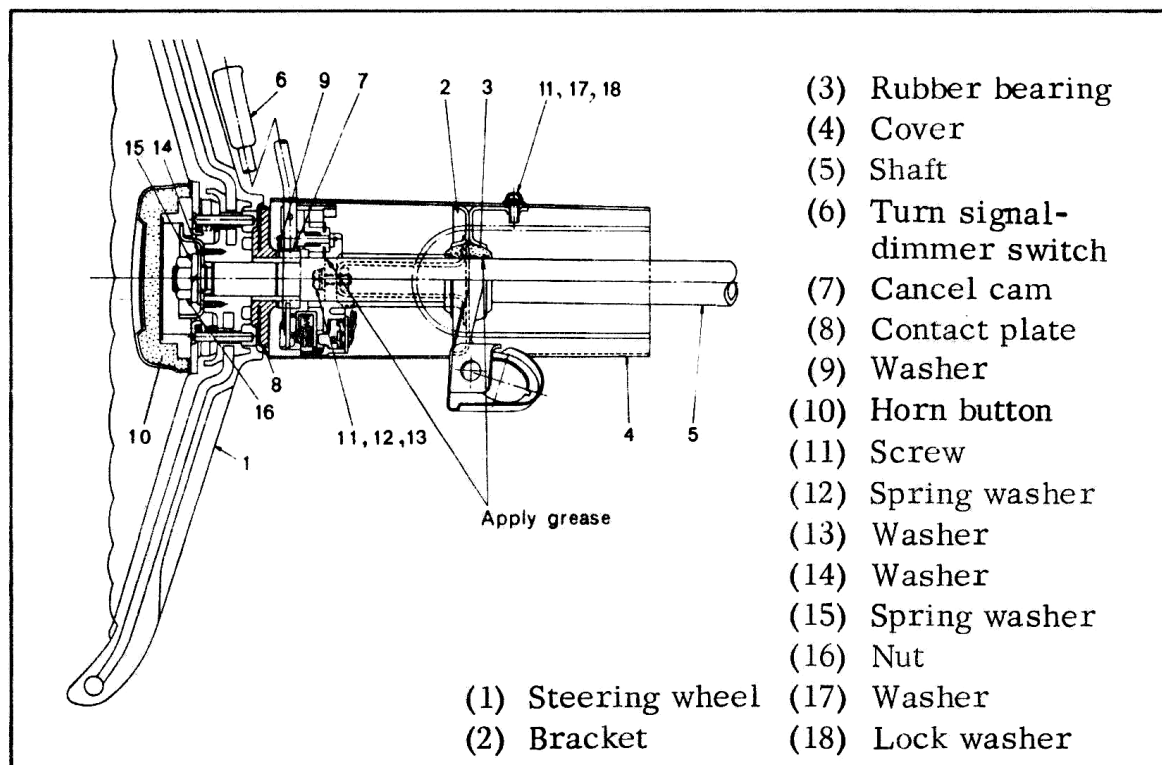


- (1) Insert the spring and contact plate in to the steering wheel. Fix the stop plate with two 3mm screws in the position as shown in the figure.

- (2) Attach the horn button.

REMOVAL AND INSTALLATION OF THE STEERING SHAFT

A: REMOVAL

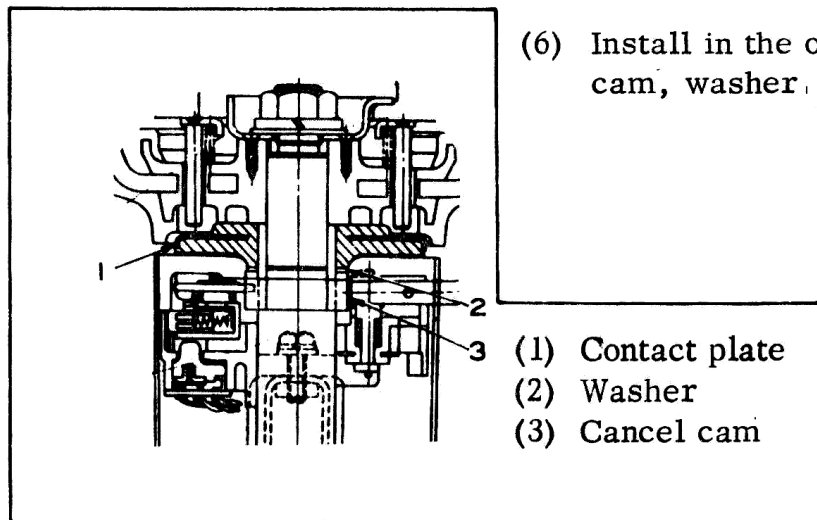


- (1) Remove the 8mm clamp bolt coupling the steering shaft and bevel gear box.
- (2) Remove the two 8mm screws which hold the steering shaft to the instrument panel.
- (3) Separate the cords such as the horn cord, cord for turn signal switch and so forth from the harness.
- (4) Take out the shaft upward.
- (5) Remove the steering wheel from the shaft.
(For the procedure for removal, refer to page 4-16.)
- (6) Take out the plate, contact plate, spacer and so forth from the shaft.
- (7) Remove the 4mm screws to remove the switch.
- (8) Remove the 4mm screws to remove the bracket and the dimmer switch, as set, from the notched section of the upper part of the cover.

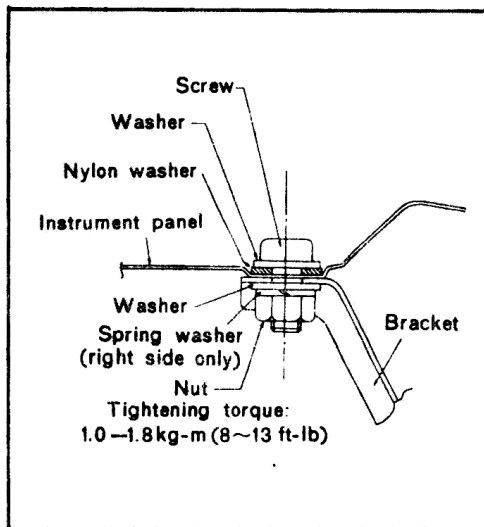
- (9) Remove the dimmer switch from the bracket and take out the rubber bearing by turning it for 90°

B: INSTALLATION

- (1) Clean the portion of the shaft above the bearing and apply grease.
- (2) Completely remove grease from the inside of the rubber bearing; fill the groove with fresh grease and install the rubber bearing to the bracket. When using a new rubber bearing, be sure to fill it with grease.
- (3) From the notched section on the upper part of the cover, assemble in the bracket and fasten it from the outside of the cover with 4mm screws, lock washer and washer.
- (4) Install the turn signal-dimmer switch with 4mm screw, spring washer and washer to the bracket inside the cover.
- (5) Insert the steering wheel shaft taking care not to damage the lip of the rubber bearing.



- (7) Temporarily assemble the steering wheel.



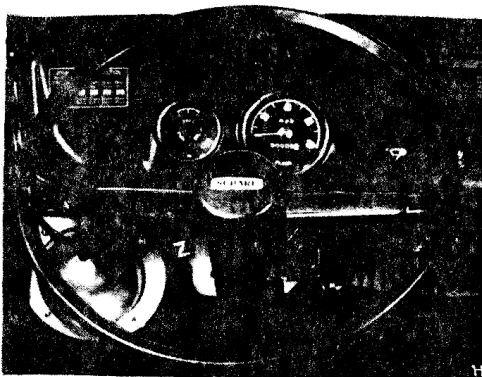
- (9) Install the steering wheel shaft to the instrument panel as shown in the figure.

- (10) Connect the steering wheel shaft and bevel gear box with 8mm bolts, spring washers and nuts.

TIGHTENING TORQUE	1.4 - 2.2 kg-m (10 ~ 16 lb-ft)
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- (11) Install the steering wheel adjusting it with the serrated fitting sections of the steering wheel and steering wheel shaft so that the spokes of the steering wheel are positioned as shown in photo when the car is running on a straight course.

TIGHTENING TORQUE	2.0 - 4.0 kg-m (15 ~ 29 lb-ft)
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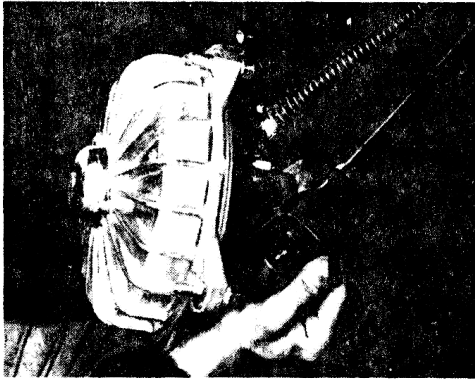
- (12) Connect the horn cord and the cords of switches (turn signal and dimmer) to the harness.
- (13) Check the horn, turn signal, dimmer and so forth for abnormality. Also, the steering wheel from lock to lock and check its operating condition.

10. REMOVAL AND INSTALLATION OF THE TIE-ROD END

A: REMOVAL

SPECIAL TOOL	921240000
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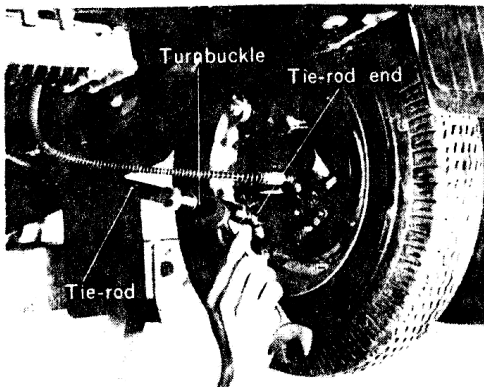
- (1) Set the body on a pit or an inspection stand and jack up the front wheels so that they can be turned freely.
- (2) Loosen the lock nut of the turnbuckle and detach the turnbuckle from the tie rod.
- (3) Pull out the cotter pin of the castle nut coupling the tie-rod end and the knuckle arm and remove the nut.



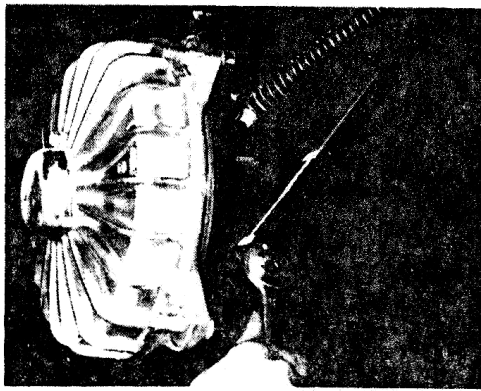
- (4) Pull out the ball stud of the tie-rod end from the knuckle arm with special tool 921240000.

B: ASSEMBLING

- (1) Fully screw the lock nut and turnbuckle on the tie rod.
- (2) Also, fully screw the lock nut on the tie-rod end.



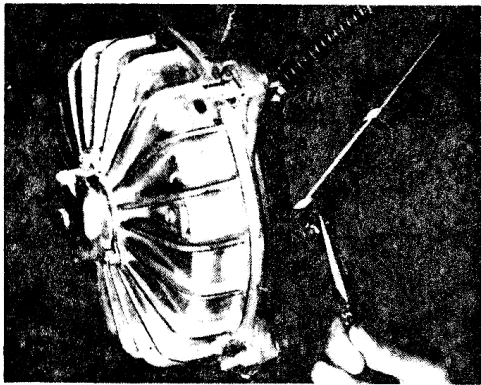
- (3) Fully screw the tie-rod end into the turnbuckle.



- (4) Fit a dust seal to the ball stud of the tie-rod end; insert the ball stud in the mounting hole of the knuckle arm and tighten it with castle nuts.

TIGHTENING TORQUE

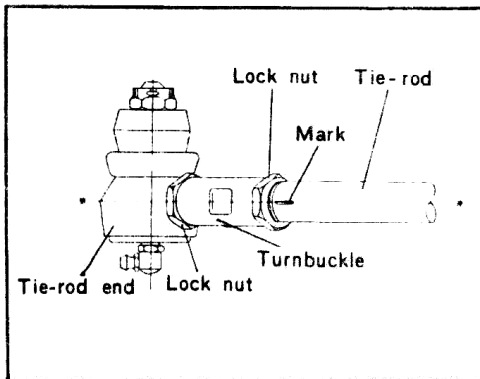
3.0 - 5.5 kg-m (22 ~ 39 lb-ft)



- (5) Lock the nut with a new cotter pin.
- (6) Remove the jack. Turn the steering wheel to check the operating condition. If satisfactory, turn the turnbuckle and adjust the toe-in. (See page 2-24)

TOE-IN

12 - 17 mm (0.47 ~ 0.67 in)



- (7) In this case, tighten the lock nut so that the form dividing line * of the tie-rod end and the position-matching mark of the tie rod come on the same line.

TIGHTENING TORQUE

8.0 - 8.5 kg-m (58 ~ 61 lb-ft)

11. DISASSEMBLY AND ASSEMBLY OF THE TIE-ROD END

The tie-rod end cannot be disassembled as it is a non-disassembling type.

CHAPTER 5: BRAKE SYSTEM

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1. SPECIFICATIONS AND ADJUSTMENT STANDARDS OF THE BRAKE SYSTEM

Type of brake

- Front Two-leading type
- Rear Leading and trailing type

Type of brake

- Service brake Hydraulic 4-wheel brake
- Hand brake Mechanical rear two-wheel brake

Master cylinder

- Body material Cast aluminum alloy
- Piston material Cast aluminum alloy
- Inside diameter 19.05 mm (3/4 in)
- Gap between body and piston 0.020 - 0.105 mm
(0.0008 - 0.0041 in)

Wheel cylinder

- Body material: Front and rear .. Cast aluminum alloy
- Inside diameter: Front 23.81 mm (15/16 in)
Rear 15.87 mm (5/8 in)

Brake drum (both front and rear)

- Inside diameter 170 mm (6.69 in)
- Usable limit 170.5 mm (6.71 in)
- Eccentricity Less than 0.05 mm (0.0020 in)

Thickness of open position of

brake steel pipe union 1.3 - 1.5 mm (0.05-0.06 in)

Tightening torque of master

cylinder nipple 0.9 - 1.1 kg-m (7 ~ 8 lb-ft)

Brake lining (both front and rear)

- Thickness: After bonding and finishing 4.5 mm (0.18 in)
- For servicing 5 mm (0.20 in)
- Usable limit 2 mm (0.08 in)

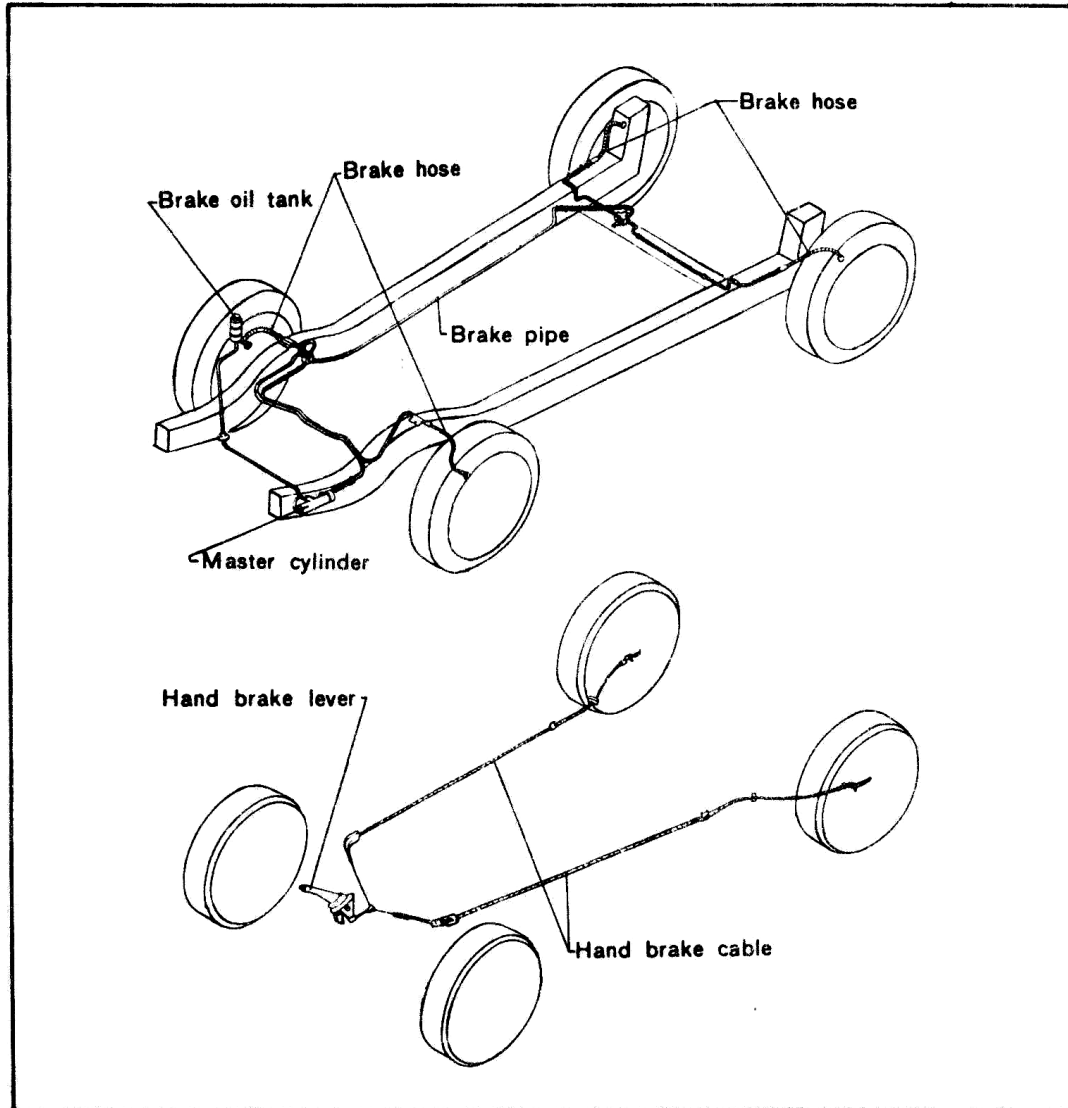
Width	
Front	35 mm (1.38 in)
Rear	30 mm (1.18 in)
Length	
Front	156 mm (6.14 in)
Rear	180 mm (7.09 in)
Mounting method	Bonding
Gap between brake lining and drum	0.1 - 0.15 mm (0.004 - 0.006 in)
Quantity of brake fluid (fill up to the indicated line on the oil tank) ..	0.45 l (0.95 pt)
Brake pedal	
Play	20 - 25 mm (0.8 ~ 6.0 in)
Adjustable limit of play	40 - 50 mm (1.6 ~ 2.0 in)
The gap between inside diameter of pedal boss and shaft	0.020 - 0.124 mm (0.0008 - 0.0049 in)
Adjustment standard for pulling range of hand brake	4 - 5 notches
Hand brake cable	
Diameter	2.5 mm (0.1 in)
Length: Right	2200 mm (86.6 in)
Left	1740 mm (68.5 in)

2. GENERAL

The brake is an essential part of any motor vehicle, and it is listed at the top of the important items for pre-operating the vehicle. It should be checked periodically and care should be exercised to maintain it in proper functioning condition at all times to insure safety driving.

The Subaru 360 Truck and Van are equipped with two types of brakes: a hydraulically-operated foot brake (main brake) and a mechanically-operated parking brake (hand brake) which brakes the two rear wheels. The brake shoes for the front and rear brakes are of the simple construction floating shoe type which is always dependable. Since the front wheels take more of the car weight at the time of braking,

the diameter of the wheel cylinders of the front wheels is made larger than that of the rear wheels. Moreover, because the two leading system used in the front wheels, the vehicle maintains a high directional stability even when the brake is applied quickly while the car is running at high speed. However, care must be used not to apply the brake too hard when driving on a slippery road.



3. PRECAUTIONS FOR SERVICING THE BRAKE ASSEMBLY

- (1) Do not mix brake fluids of different brands. Be sure to use only the recommended brands.
- (2) When using a different brand of brake fluid, disassemble the brake assembly, clean the entire brake assembly parts together with pipes by clean alcohol and reassemble. When assembling the brake assembly, must be careful not to allow dust or grease enter the pipings and cylinders.

After assembly, be sure to bleed the air out of the brake assembly.
(See pages 5-23 and 5-24)

- (3) When the tightening torque for the connection bolts of the pipings is excessive, the conical openings of the pipes becomes damaged and are weakened. This is dangerous. Be sure to use the specified tightening torque.

TIGHTENING TORQUE	1.2 - 1.8 kg-m (9 - 13 lb-ft)
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- (4) Do not handle the brake lining with oily or wet hand.
- (5) If possible, replacement of the brake linings for the front and rear wheels should be done at the same time to obtain balanced braking power. Also, for the front wheels replace the right and left brake linings at the same time.
- (6) The inside surface of the brake drum must be kept smooth and dry.
- (7) If the inside surface of the brake drum is scratched or damaged replacement of the brake lining with a new one becomes meaningless. Repair the defective part or replace the entire drum.

USABLE LIMIT (INSIDE DIAMETER)	170.5 mm (6.71 in)
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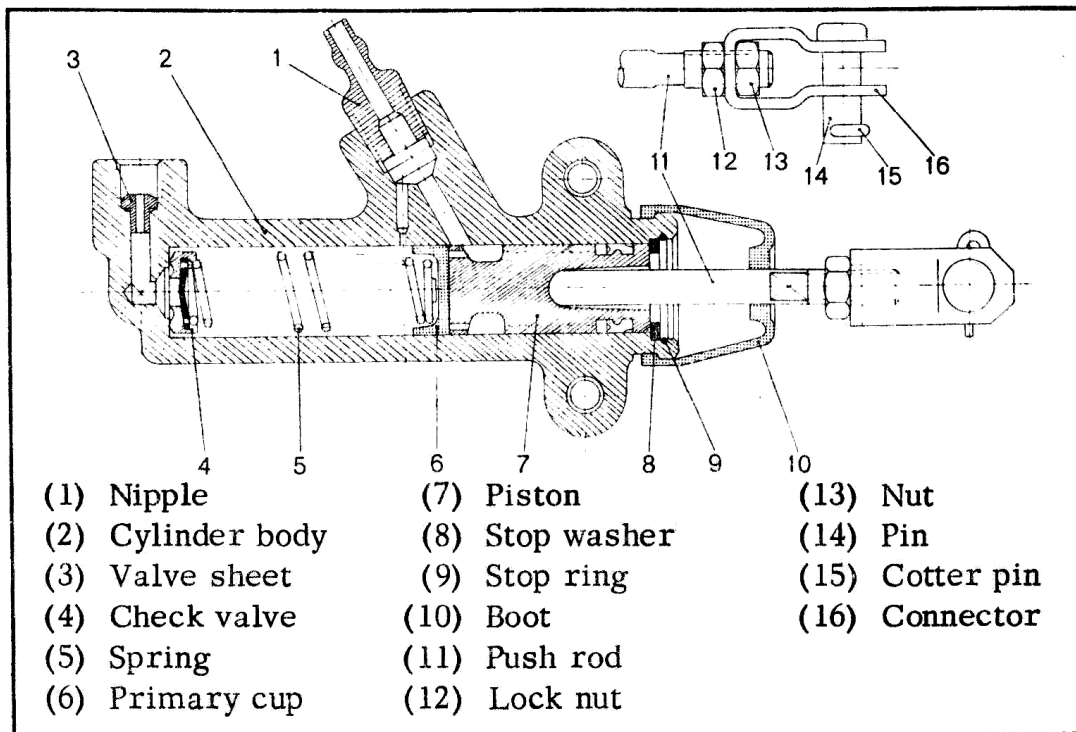
- (8) Adjust the brake shoes so that the brake lining does not rub against the inside surface of the drum when the brake is not applied.
- (9) The function of the brake pedal is determined by the following three factors:
- (a) Play in the brake pedal (the gap between the pedal and pedal shaft; the gap between the piston and push rod)
 - (b) The gap between the brake shoe and push rod
 - (c) The transmission of hydraulic pressure (compression of the fluid and swelling of the brake hose)
- (10) Refer to the chart below for troubles and countermeasures for the brake system.

TROUBLE SHOOTING CHART

Trouble	Cause	Counter measure
No resistance is felt, when pressing the brake pedal.	Air in the brake fluid pipings.	Bleed the air out.
Resistance is felt, when braking but stepping range diminishes as you keep pumping a few times.	Excessive clearance between drum & lining.	Adjust the gap.
	Swollen brake hose.	Replace the hose.
	Air in piping.	Bleed the Air out.
Loss of brake oil.	Leak in the piping.	Tighten leaking joints.
	Leak from cylinder.	Replace cylinder cup.
Brake becomes over-heated by braking too hard and starts to drag.	No pedal play.	Adjust play.
	Master cylinder return port is clogged.	Wash cylinder.
	Faulty adjustment of hand brake.	Adjust correctly.
	Brake shoe return spring is faulty.	Replace spring.
	Brake oil piping is clogged.	Replace piping.
Car pulls to one side when braking or the braking effect is unstable.	Brake lining is dirty with grease or oil.	Replace lining.
	Materials of lining are incorrectly matched.	Replace lining.
	Drum has become deformed.	Repair or replace drum.
	Piston cup is swollen.	Replace cylinder cup.
	Rust in the wheel cylinder.	Replace wheel cylinder.

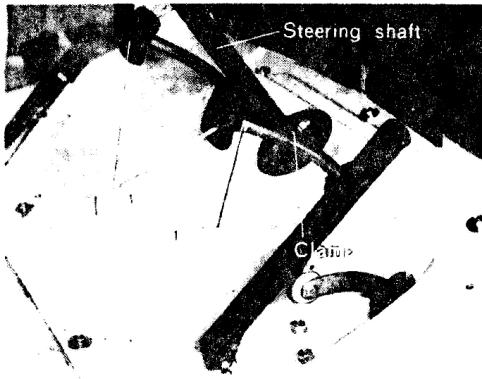
Trouble	Cause	Counter measure
	Piping is clogged.	Replace piping.
	Hand brake reacts, Unevenly for no apparent reason.	Replace drum; Replace brake shoes also if necessary.
Brake catches on one or two wheels.	Inadequate chamfering of the brake lining.	Make the necessary chamfering.
	Oil leakage from cylinder.	Replace cylinder cup.

4. DISASSEMBLY AND REASSEMBLY OF MASTER CYLINDER

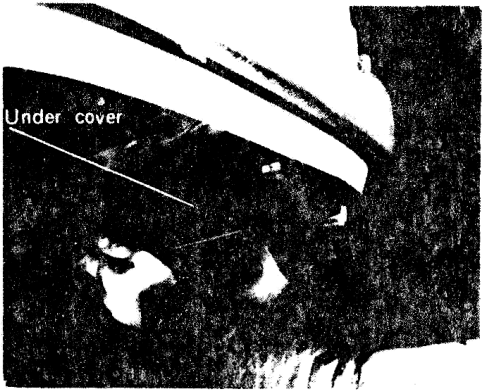


A: REMOVAL OF MASTER CYLINDER

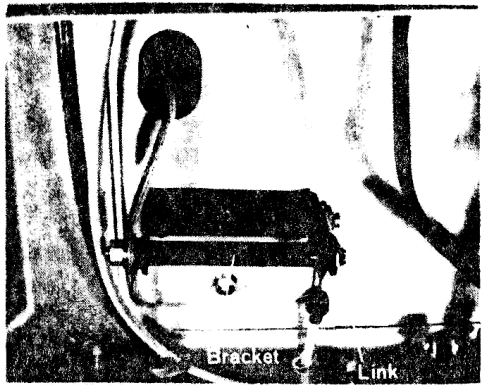
- (1) Remove the pads of brake pedal and clutch pedal.



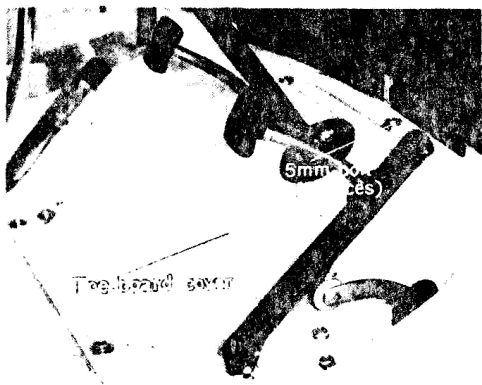
- (2) Remove the clamp, which is clamping the bevel gear and Steering shaft, then lifting up the steering shaft.



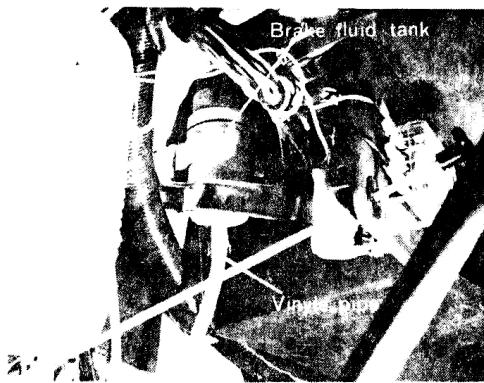
- (3) Remove the under cover (front) under the floor.



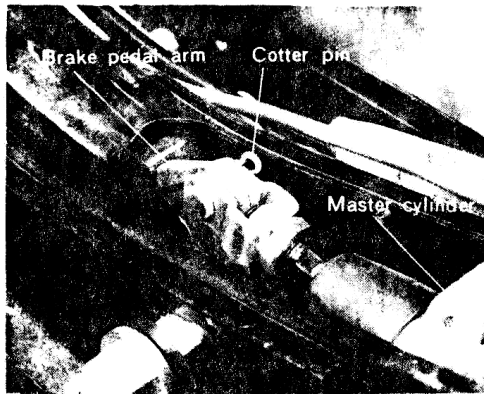
- (4) Remove the nut of the accelerator pedal shaft; pull out the arm and remove the accelerator cable from the link.



- (5) Remove the toe-board cover of the driver's seat.



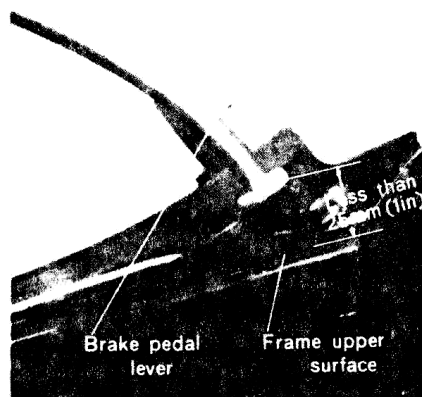
- (6) Detach the vinyl pipe from the brake fluid tank side and pull it out under the floor.
- (7) Loosen the joint bolt and detach the connection between the master cylinder and brake pipe.



- (8) Detach the connection between the brake pedal arm and push rod.
- (9) Remove the two 8mm mounting bolts of the master cylinder and lift up the master cylinder with the vinyl pipe attached.

B: INSTALLATION OF THE MASTER CYLINDER

- (1) Attach the master cylinder to the specified position using two 8mm bolts.
- (2) Connect the push rod and the pedal arm.
- (3) Securely attach the brake pipe with a joint bolt.
- (4) Connect the vinyl tube to the fluid tank.
- (5) After adjusting the play of the pedal, replace the toe-board cover.



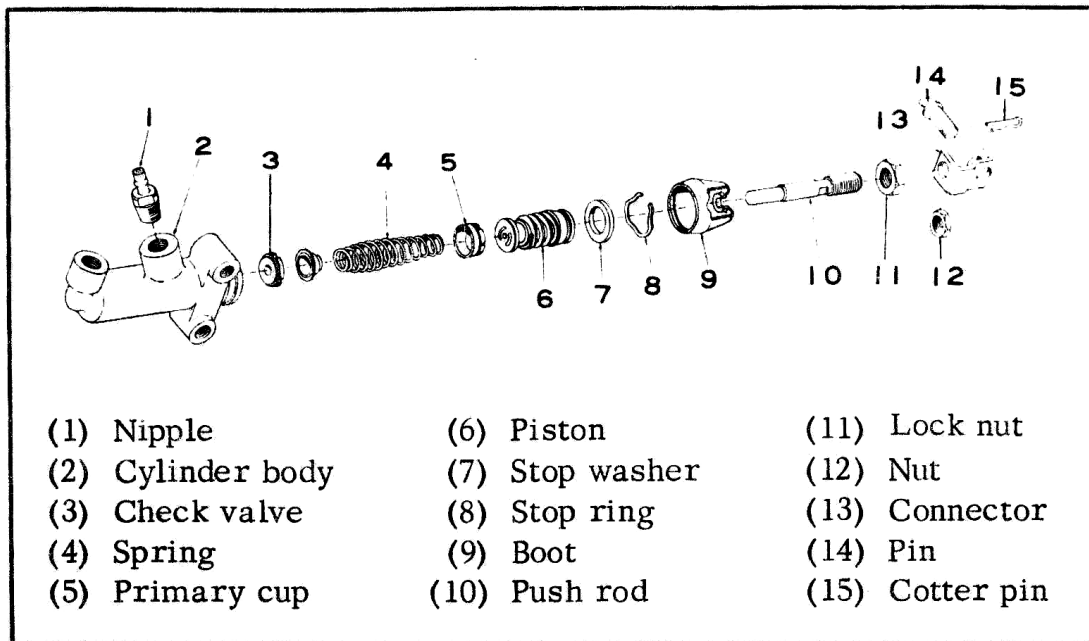
- (6) Unless the upper surface of the brake pedal lever is less than 25mm (1 in) from the frame upper surface, the pedal contacts the toe-board cover which may act as a brake stopper and it may be difficult to obtain the required amount of play for the pedal. Check the above before attaching the toe-board cover and correct when it is necessary.

- (7) Attach the accelerator cable.
- (8) Attach the steering shaft.
The clamp bolt tightening torque is 1.4 - 2.2 kg-m (10 ~ 16 lb-ft).
- (9) Attach the pedal pad.
- (10) Bleed the air out of the system and check the operation of the master cylinder. (See pages 5-23 and 5-24)

5. DISASSEMBLY, INSPECTION AND OPERATING PRINCIPLE OF THE MASTER CYLINDER

The bore (inside) of the master cylinder must be smooth and truly round. Replace the cylinder if the bore is worn or has jagged scratches. Do not repair to smooth the inner surface with sandpaper and so forth. Use the rubber parts especially prepared for this cylinder. Immerse all the sliding parts to be assembled inside the cylinder in clean brake fluid for cleaning before installing. When assembling, take care so that no dust or other foreign matter enters the cylinder.

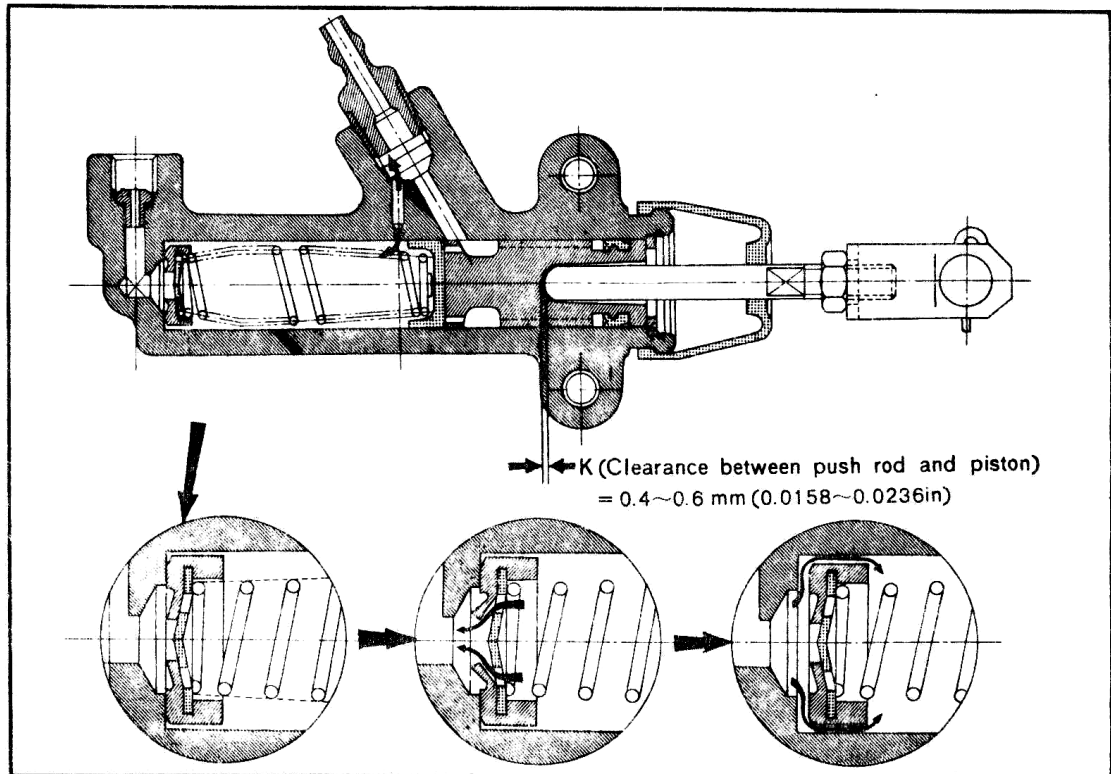
A: ORDER OF ASSEMBLING



- (1) Insert the valve seat in the deepest position of the cylinder body.
- (2) Next, insert the check valve, spring and primary cup (insert it so that its bottom surface contacts the piston).

- (3) Insert the piston with the secondary cup attached.
- (4) Insert the stop washer and lastly, fit the clip ring in the groove.
- (5) After assembly, ascertain that the piston moves freely and then attach the rubber boot and push rod.

B: OPERATING PRINCIPLE



When the brake pedal is pressed, the pedal pushes the piston in by means of the push rod. At this time, the primary cup closes the small hole (relief port) which connects the cylinder side and the fluid tank.

Then, the pressurized fluid pushes open the check valve located on the tip of the cylinder and the fluid reaches each wheel cylinder through the piping.

When the brake pedal is released, the piston is returned by a spring to its former position; the brake fluid flows out of the back of the primary cup to the spring side and, at the same time, the fluid which was sent to the wheel cylinders is also returned to the master cylinder by the return spring of the brake shoe. The returning fluid pushes the valve proper to the piston side and returns to the piston spring side from around the valve itself.

When the primary cup returns to its former position, the fluid which

has returned to the spring side goes back to the fluid tank through the small hole. However, since there is the mounting load of the piston spring, the valve closes before all the fluid of the wheel cylinder side returns to the master cylinder and a hydraulic pressure of about 0.8 - 1.2 kg/cm² (11.4 - 17.1 lb/in²) remains in the piping. This remaining pressure pushes the cups in the wheel cylinders against the cylinder walls, prevents leakage of brake fluid and keeps air and dust out of the cylinders. Also, when there is no gap between the push rod and piston and if the small hole (relief hole) is closed by the primary cup, the pressurized oil of the wheel cylinder side cannot return and the lining begins to rub against the brake drum.

GAP BETWEEN THE PUSH ROD AND PISTON	K = 0.4 - 0.6 mm (0.0158 - 0.0236 in)
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(CAUTION)

If sufficient hydraulic pressure for braking cannot be obtained by one pressing of the brake pedal, release the pedal and step on it again.

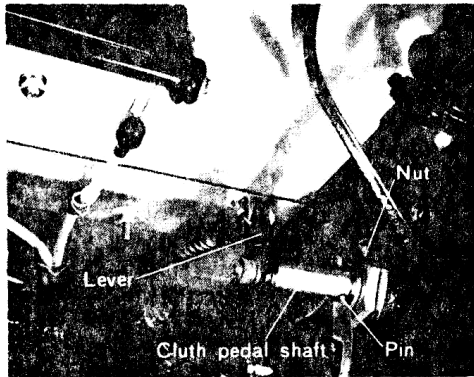
When the pedal is released, the piston is returned to its former position by the piston spring. However, since the pressure of the spring side becomes negative, the brake fluid flows into the spring side from the back of the primary cup through around the primary cup. Thus, when the pedal is pressed again, the hydraulic pressure rises.

The condition such as referred to above happens when there is air (bubbles) in the piping. In this case, completely bleed the air out of the piping. (See pages 5-23 and 5-24)

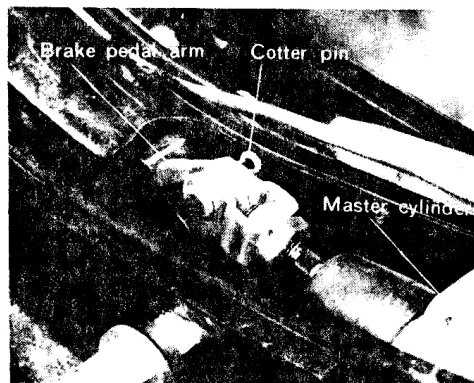
6. REMOVAL AND INSTALLATION OF THE BRAKE AND CLUTCH PEDALS

A: REMOVAL OF THE BRAKE AND CLUTCH PEDALS

- (1) Remove the toe-board cover at the driver's seat (Refer to page 5-7).
- (2) Remove the pedal pads. (Refer to page 5-6).



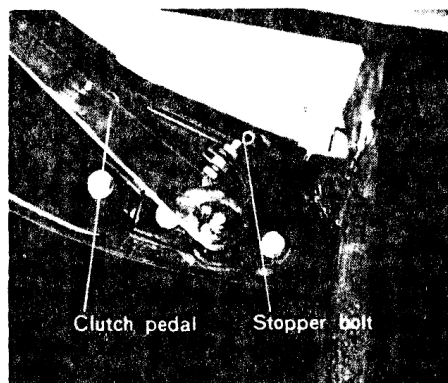
- (3) Disconnect the lever from the clutch pedal shaft.
- (4) Remove the pin of the clutch shaft.
- (5) Pull out the clutch pedal toward the left side and drop the tip of the pedal below the floor and then pull out the pedal.



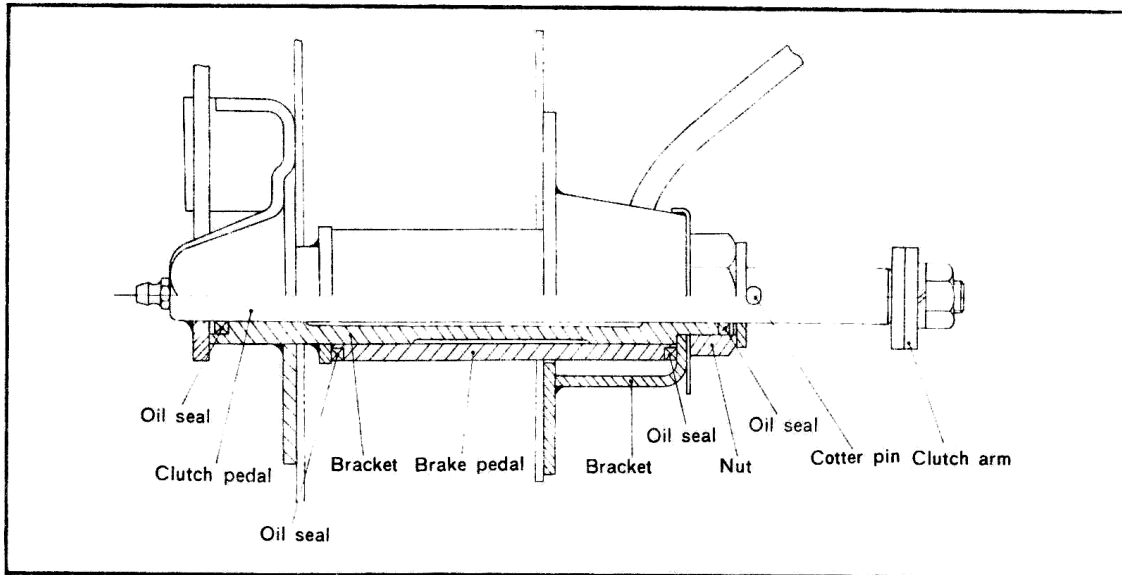
- (6) Loosen the nut of the brake pedal shaft.
- (7) Remove the two 8mm bolts which hold the bracket and pull out the bracket.
- (8) Remove the connection of the push rod of the master cylinder and take out the brake pedal.

B: INSTALLATION OF THE BRAKE AND CLUTCH PEDALS

- (1) Apply sufficient amount of grease to the shaft of the brake pedal bracket and install the brake pedal and bracket.
- (2) Connect the push rod of the master cylinder and the arm of the brake pedal.
- (3) Press the brake pedal and check its operating condition.
- (4) Apply enough grease to the shaft of the clutch pedal and attach.



- (5) If the pad surface of the pedal do not match, adjust by moving the clutch pedal return stopper bolt.

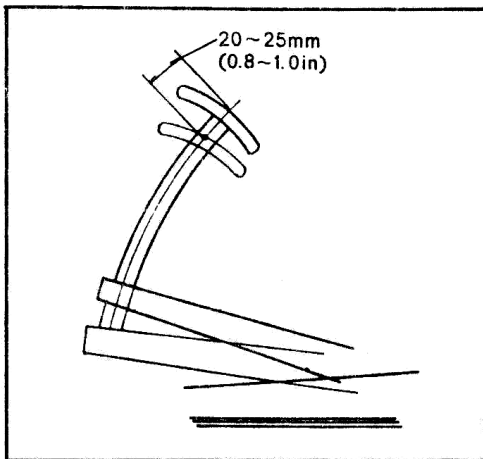


C: ADJUSTMENT OF THE PLAY OF THE BRAKE PEDAL

(CAUTION)

The adjustment of the play in the brake pedal must be made with an extreme care to insure safety driving.

- (1) The play of the push rod and position of the master cylinder is 0.4 - 0.6 mm (0.0158 - 0.0236 in) and it becomes 1.8 - 2.7 mm (0.071 - 0.106 in) at the center position of the pedal. The play is adjusted by loosening the 10 mm lock nut of the push rod with a wrench. When adjustment is completed, lock with the 10 mm lock nut.

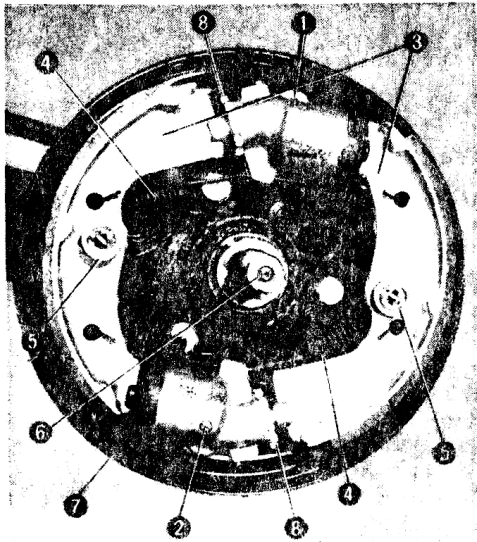


- (2) The play of the pedal from the point where the pedal is pressed and the brake takes hold is 20 - 25 mm (0.8 - 1.0 in).

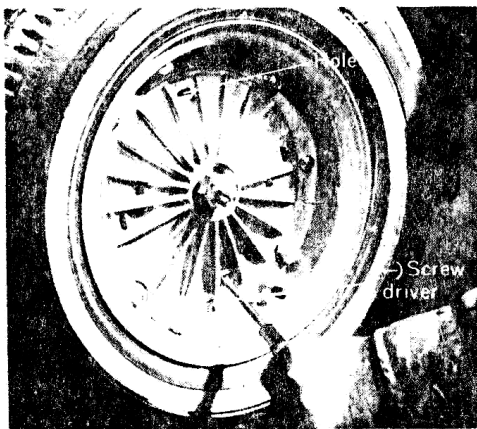
7. REMOVAL AND INSTALLATION OF THE BRAKE SHOE, WHEEL CYLINDER AND ANCHOR BLOCK

A: REMOVAL OF THE FRONT BRAKE

SPECIAL TOOL	921120000
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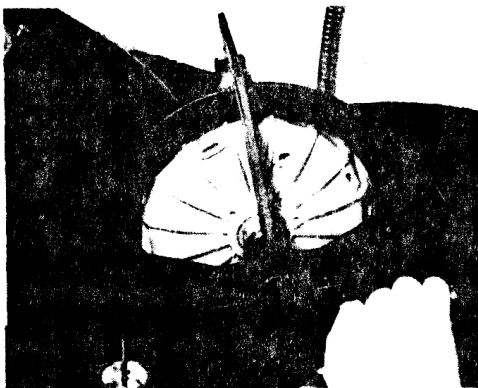


- (1) Wheel cylinder (upper)
- (2) Wheel cylinder (lower)
- (3) Brake shoe
- (4) Spring
- (5) Shoe-setting seat
- (6) Knuckle
- (7) Back plate
- (8) Adjuster wheel

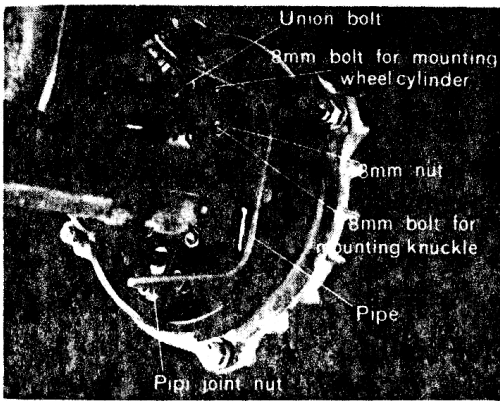


- (1) Take off the wheel cap; insert a screw-driver into the brake drum as shown in the photograph, turn back the upper and lower adjuster wheel so that the clearance between brake drum and shoes become wider. Then, remove the wheel.

*THIS IS A REAR DRUM
AND THE SCREWDRIVER
IS IN THE WRONG HOLE!*



- (2) Remove the brake drum using special tool 921120000.
(Refer page 3-10)

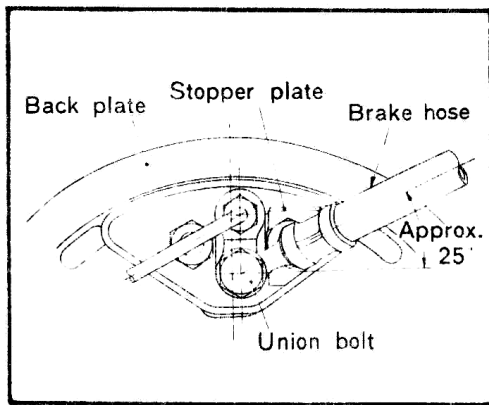


- (3) Remove the brake shoes, first from the adjuster-wheel supporter side, and then from wheel cylinder.
- (4) Loosen and take off the union bolt on the back side of the wheel cylinder.
- (5) Loosen and disconnect the pipe joint nuts on the back side of the upper and lower wheel cylinders.
- (6) Loosen four 8 mm bolts on the rear side of the back-plate, and take off upper and lower wheel cylinders.
- (7) To remove the back-plate, take the procedures through (1) to (6), then remove the four 8 mm bolts on knuckle. The back-plate can also be removed together with the upper and lower wheel cylinders.

B: INSTALLATION OF THE FRONT BRAKE

SPECIAL TOOL	92 1230000
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- (1) When the back plate is distorted and when the portion where the shoe supporter contacts is excessively worn, replace the back plate.
- (2) Attach the two wheel cylinders (upper and lower) to the back plate.
- (3) Attach the back plate to the knuckle with four 8mm bolts.
- (4) If the shoe holder spring is excessively worn, replace it.
- (5) If the brake lining is excessively worn and the lining thickness is 2mm (0.08 in) or less in anywhere, or if the brake lining is deformed, replace it.
- (6) Attach the upper and lower return springs to the brake shoe. First, hook the shoe on the shoe supporter on the wheel cylinder side and then hook the shoe on the shoe supporter of the adjuster side.
- (7) Then, use special tool 92 1230000 for brake shoe, adjust the centering and tilting of the brake shoe in reference to the knuckle spindle.



- (8) A stopper is provided so that the brake hose union bolt can be tightened at an angle of about 25° upward in respect to the wheel cylinder center line and fix it.

TIGHTENING TORQUE
1.2 - 2.2 kg-m (9 - 16 lb-ft)

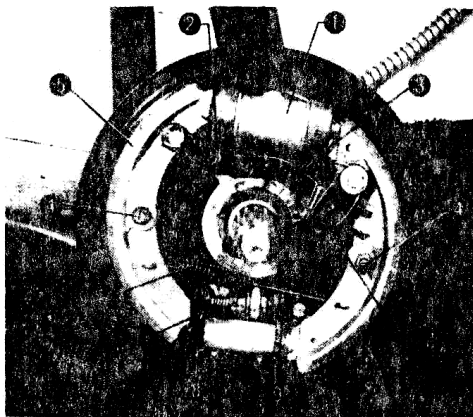
- (9) Attach the upper and lower joints of brake pipe to the upper and lower wheel cylinders respectively and tighten them.

TIGHTENING TORQUE	1.5 - 2.0 kg-m (11 - 14 lb-ft)

- (10) Attach the drum and wheel. Adjust the gap between the brake shoe and drum and bleed the air out of the system.

C: REMOVAL OF THE REAR BRAKE

SPECIAL TOOL	921120000



- (1) Wheel cylinder
- (2) Hand brake lever A
- (3) Spring
- (4) Supporter
- (5) Brake shoe
- (6) Spring
- (7) Hand brake cable
- (8) Adjuster (left)
- (9) Adjuster (right)
- (10) Hand brake lever B

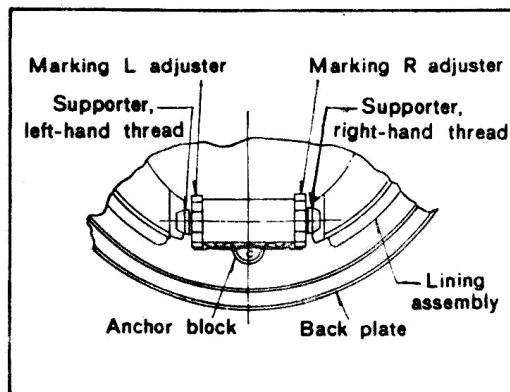
- (1) Remove the rear wheel and remove the brake drum using special tool 921120000.
- (2) Return the brake shoe supporter of the anchor block to its lowest position.
- (3) Remove the brake shoe from the anchor block first, and then remove it from the wheel cylinder side.

Detach the cable end from hand brake lever B.

- (4) Remove the union bolt from the back side of the wheel cylinder.
- (5) Loosen the two 8mm nuts on the back side of the back plate and remove the wheel cylinder.
- (6) In the same way as the above, loosen two more 8mm nuts and remove the anchor block.
- (7) To remove the back plate, perform the operations of (1) - (4) and then remove the three 8mm bolts on the rear hub. Also, the back plate can be removed with the wheel cylinder and anchor block attached.

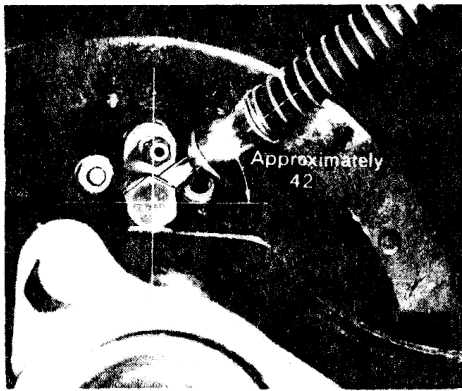
D: INSTALLATION OF THE REAR BRAKE

SPECIAL TOOL	921180000, 921230000
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- (1) When the back plate is distorted or the portion where the shoe supporter contacts is worn excessively, replace the back plate.
- (2) Attach the anchor block and wheel cylinder to the back plate.
- (3) Attach the back plate to the hub with three 8mm bolts.
- (4) When the shoe (nylon) attached to the tip of the shoe supporter is worn excessively, replace the shoe.
- (5) When the lining of the brake shoe is excessively worn or when some parts of the lining have a thickness less than 2mm (0.08 in) or when the brake shoe is deformed, replace.
- (6) Insert the cable end of the hand brake in to the back plate. In this case, be sure that the groove on the rubber dust seal is securely placed over the back plate so that the cable end connection will be safely protected from dust and water.

- (7) Install the hand brake levers A and B on the brake shoe, attach the cable end of the hand brake to the end hook of lever B, and then attach the upper and lower return springs.
- (8) Hook the brake shoe first on the supporter of the wheel cylinder side, and then hook it on the shoe supporter of the anchor block side.
- (9) Adjust the centering and tilting of the brake shoe in respect to the rear axle shaft using special tool 921230000 for brake shoe. In this case adjust the tilting of the shoe with the shoe supporter, tighten the lock nut firmly and bend the washer to prevent the nut from turning.



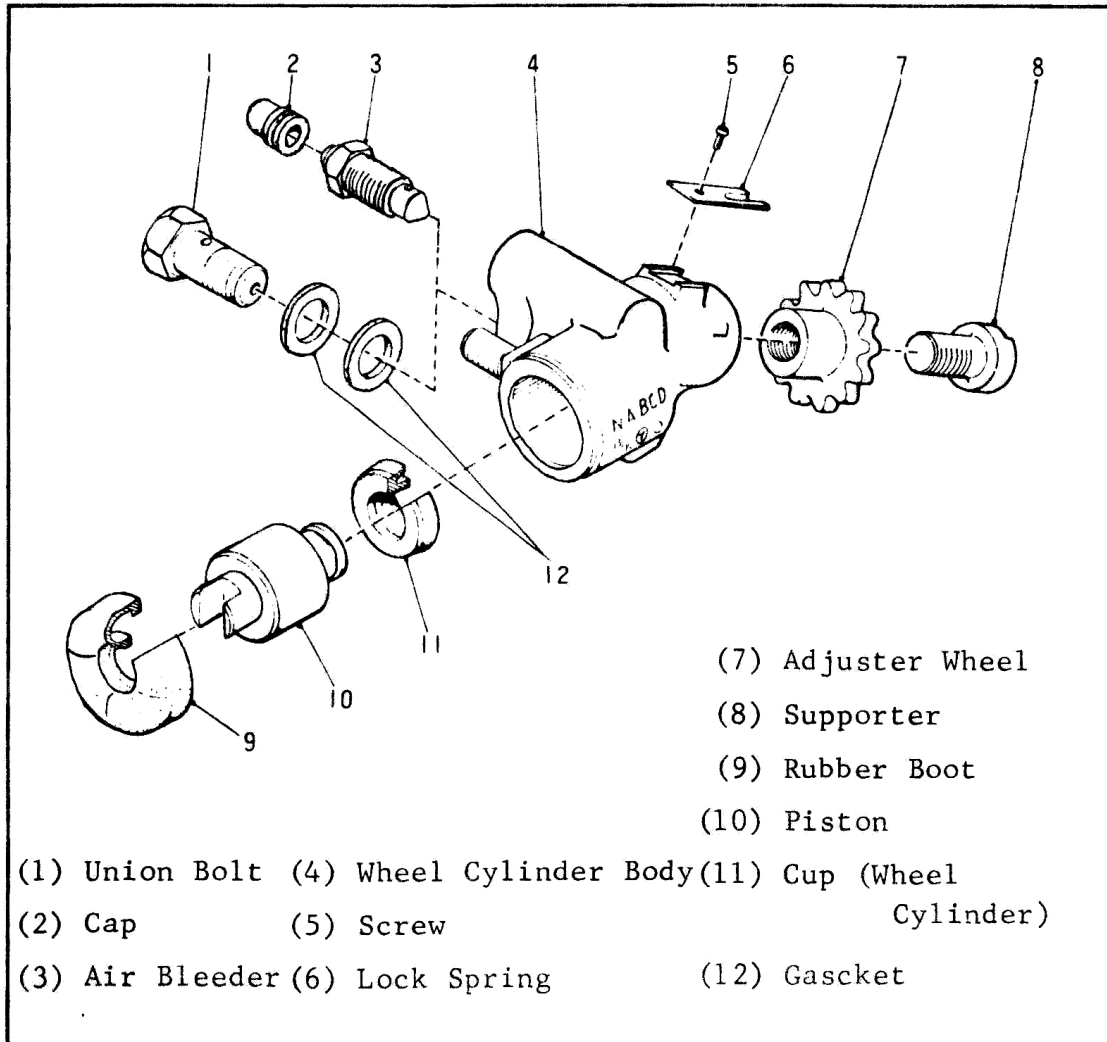
- (10) A stopper is provided so that the brake hose union bolt can be tightened at an angle of about 42° upward in reference to the wheel cylinder center line.
- (11) Brake adjustment and air bleeding off be performed after the drum and the wheel are installed. (See pages 5-23 and 5-24)

8. DISASSEMBLY AND SERVICING THE WHEEL CYLINDER ADJUSTER AND ANCHOR BLOCK

The bore (inside surface) of the wheel cylinder like that of the master cylinder must be truly around. If excessive wear or jagged scratches are found on the inner surface, replace the cylinder. It is not advisable to smooth the cylinder inside surface with sandpaper. The rubber parts to be used must be the parts especially made for use in the wheel cylinder. The sliding parts to be assembled in the cylinder must be cleaned thoroughly in clean brake fluid before installing. Be careful not to allow any dust or any foreign matter to enter the cylinder when assembling.

8-1: FRONT WHEEL BRAKE

A: FRONT WHEEL CYLINDER



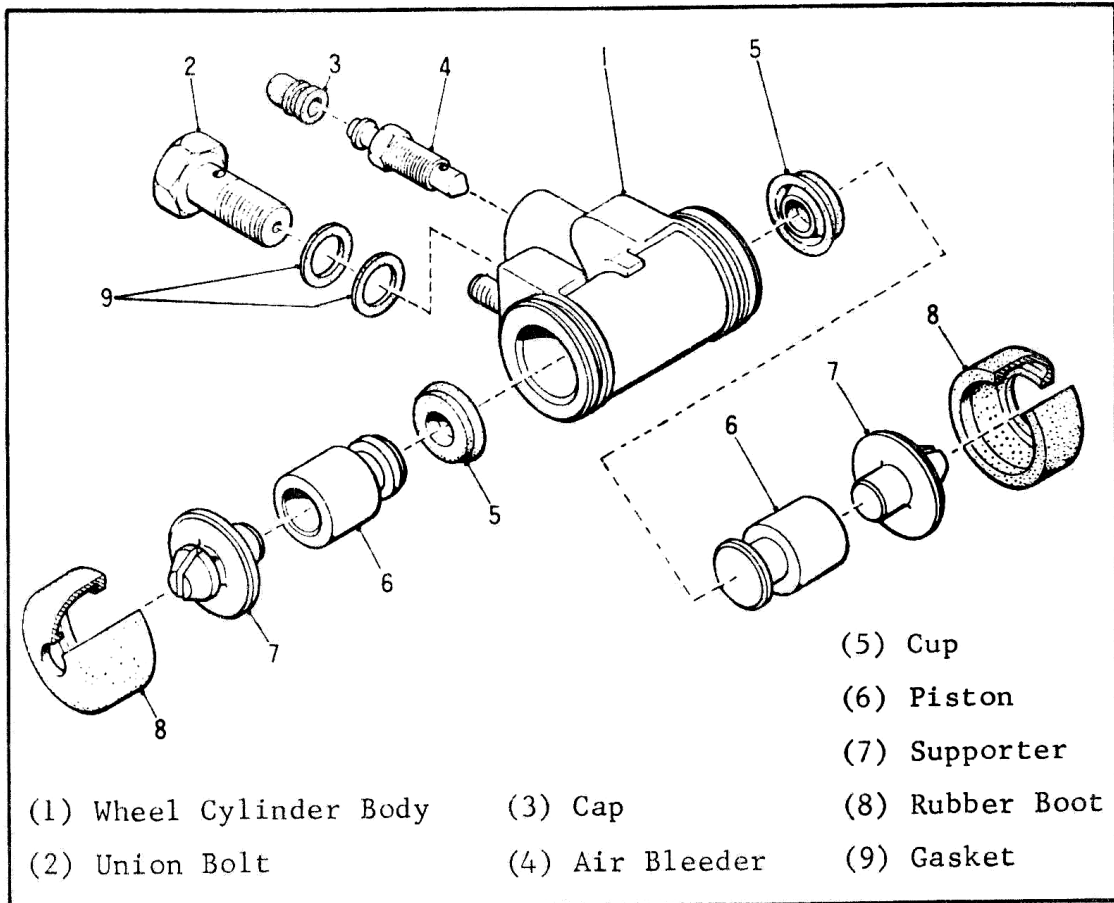
Assembling is performed according to the order described below.

- (1) Thoroughly clean the wheel cylinder body and screw the air bleeder plug with a rubber cap attached into the cylinder body.
- (2) All sliding parts inside the cylinder must be put into a bath of alcohol, carefully wipe with clean rag, and submerge into clean brake oil.
- (3) Attach the cup to the piston. At this time, make sure that the back of the cup points toward the supporter side. If the cup is damaged or deformed, replace it with a new one.
- (4) Insert the piston into the wheel cylinder. In this time be careful not to damage the lip of the cup.

- (5) Insert the rubber boot on the piston and attach the adjuster wheel. Screw in the supporter to the adjuster wheel. Ascertain that the adjuster can be turned easily by hand.

8-2: REAR WHEEL BRAKE

A: REAR WHEEL CYLINDER

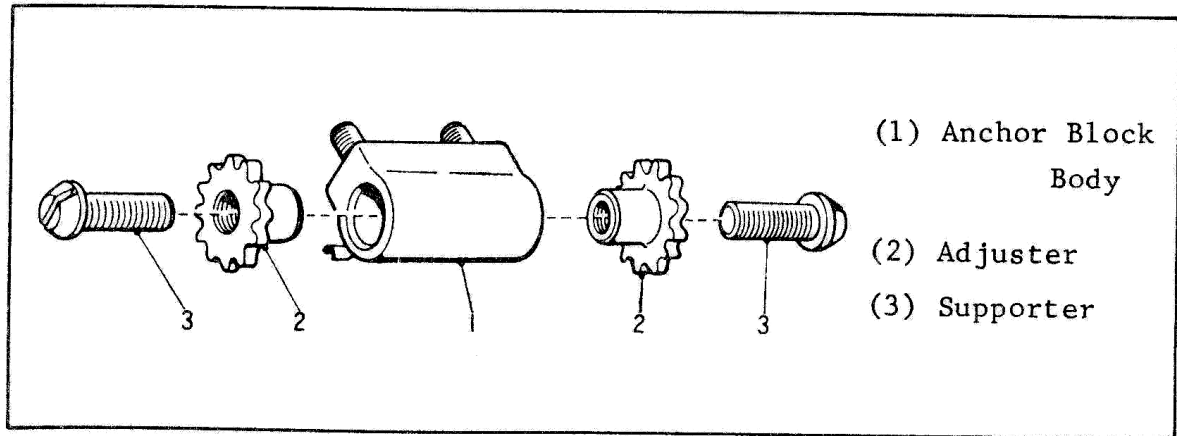


Assembly must be performed in the following order.

- (1) Wash the wheel cylinders cleanly, attach the rubber cap to the air bleeder plug, and screw it into the wheel cylinder.
- (2) All sliding parts in the cylinder must be kept submerged in clean brake oil.
- (3) Assemble the cup to the piston. In so doing, care must be taken so that the back side of the cup faces to the supporter side. When insert the piston into the cylinder, care must also be taken that the tip of the lip is not damaged.

- (4) Insert the supporter into piston with rubber boot attached on it, and pull the boot over the cylinder. After assembling, ensure that the piston moves lightly.

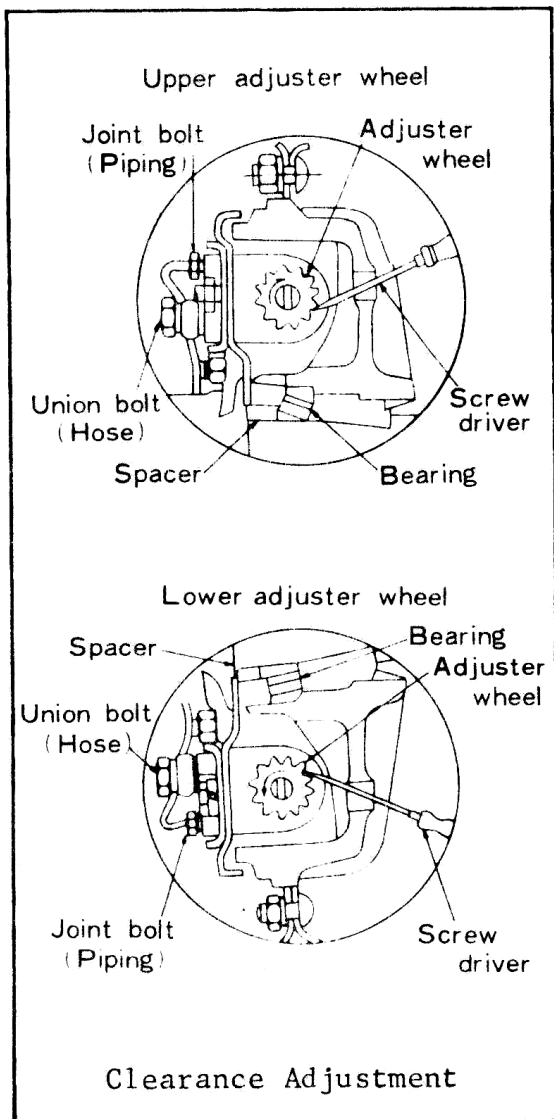
B: ANCHOR BLOCK



- (1) One supporter has right handed thread and the opposite one has left handed thread.
When warpage or wear is found on the threaded portion, replace the supporter together with the adjuster.
- (2) The adjuster is expected to be rotated lightly by fingers. Replace it with new one when the teeth are excessively deformed or worn.
- (3) Replace it, also, when the casted-in bolt is defective.
- (4) Before assembling, clean inner surface of the anchor block, outer surface and threaded hole of the adjuster, and threaded portion of the supporter, and apply enough grease.

9. ADJUSTMENT OF THE CLEARANCE BETWEEN THE BRAKE SHOES AND THE BRAKE DRUM

A: ADJUSTMENT OF THE FRONT BRAKE SHOE

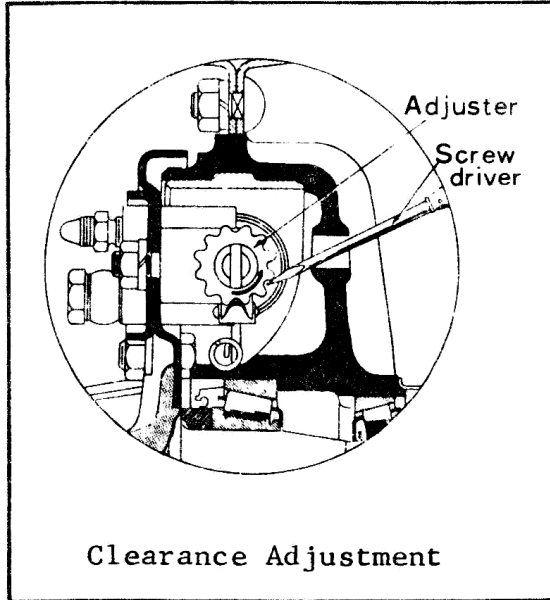


- (1) Insert a screwdriver into the adjusting hole in the drum, turn the adjuster wheels on both sides to the arrow direction as shown in the drawing and reduce the clearances of upper and lower sides. After adjustment is performed, insert thickness gage into the inspection hole and measure the clearance.



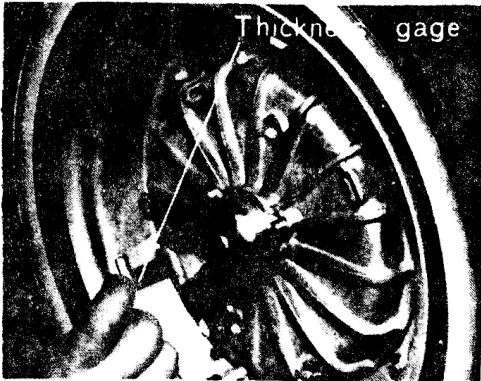
- (2) The clearance between the brake shoes and the drum must be adjusted 0.1 - 0.15 mm (0.004 - 0.006 in).

B: ADJUSTMENT OF THE REAR BRAKE SHOES



- (1) Insert the screwdriver into the adjustment hole in the drum, and push the tip of the screwdriver against the adjuster as shown in the drawing.
- (2) Pry the adjuster with the screwdriver with the adjustment hole as a fulcrum. An upward turn of the adjuster reduces the gap between the drum and shoe.

THIS IS MISLEADING - ADJUSTMENT IS ON HATCHER BLOCK AT BOTTOM SEE P. 21



(THIS IS A FRONT DRUM) (SHOW PIC AS P. 5-21)

(NOTE)

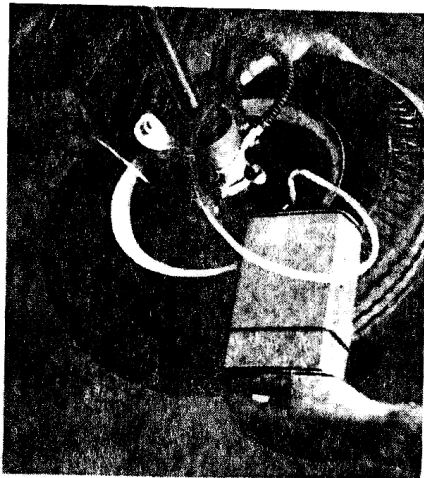
The hand brake must be loosened fully, before starting the adjustment of the rear wheel brakes.

10. PURGING AIR FROM THE BRAKE SYSTEM

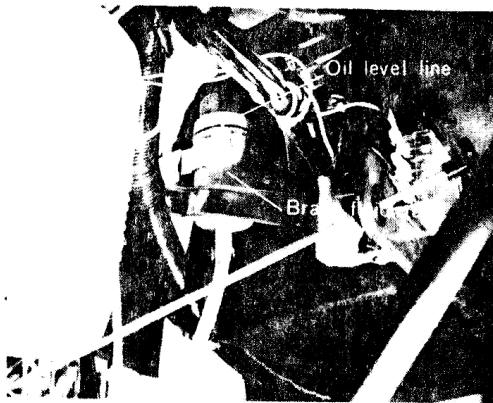
Bleeding of air from the brake system piping should be performed on all four wheels. This operation can be conducted easily by placing the vehicle over a work pit or raising it on a jack. Before starting, check the pedal for play and the oil level of the brake fluid in the tank. Start the bleeding operation from the wheel which is farthest from the master cylinder and then proceed to the next farthest wheel.

An item which must be noted in the bleeding operation is that in some cases the fluid tank becomes empty during the operation. First, fill the tank full.

If the fluid drained is excessive, it may become necessary to add more oil during bleeding.



- (1) First, remove the bleeder cap; clean the top of the plug and insert a vinyl pipe into the plug.
- (2) Place the other end of the vinyl pipe in a glass bottle or a can filled with a small amount of brake fluid.
- (3) Loosen the bleeder with a wrench and asked the brake pedal to be pressed gently.
- (4) Repeatedly press the brake pedal until bubbles no longer come out of the vinyl pipe.
- (5) When no more bubbles come out, tighten the bleeder while the brake pedal is pressed in, and after tightening the bleeder release the pedal.



- (6) Pull the vinyl pipe out of the bleeder plug and place the cap. Perform the same operation with other wheels.
- (7) When air has been purged out of all four wheels, check the amount of the fluid in the tank and replenish the tank with fluid until the fluid reaches the specified level.

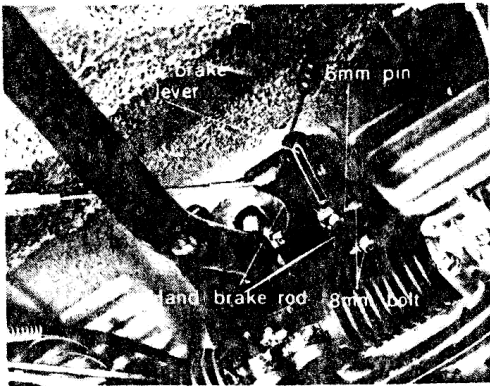
(CAUTION)

Do not use any fluid which has been used once.

In case used fluid must be used again, clean it with a filter of 200 mesh and left the filtered fluid stand for about 15 minutes until foreign particles in the oil settle. Use only the upper clear part of the fluid.

11. REMOVAL AND INSTALLATION OF THE HAND BRAKE LEVER ASSEMBLY

A: REMOVAL OF THE LEVER ASSEMBLY



- (1) Place the vehicle over a pit or on an inspection platform.
- (2) From the under of the floor, pull the cotter pin of the 6mm pin which couples the hand brake lever and hand brake rod and remove the 6mm pin. Then, separate the hand brake lever and hand brake rod.
- (3) Loosen the two 8mm bolts which hold the hand brake lever and detach the lever from the chassis.

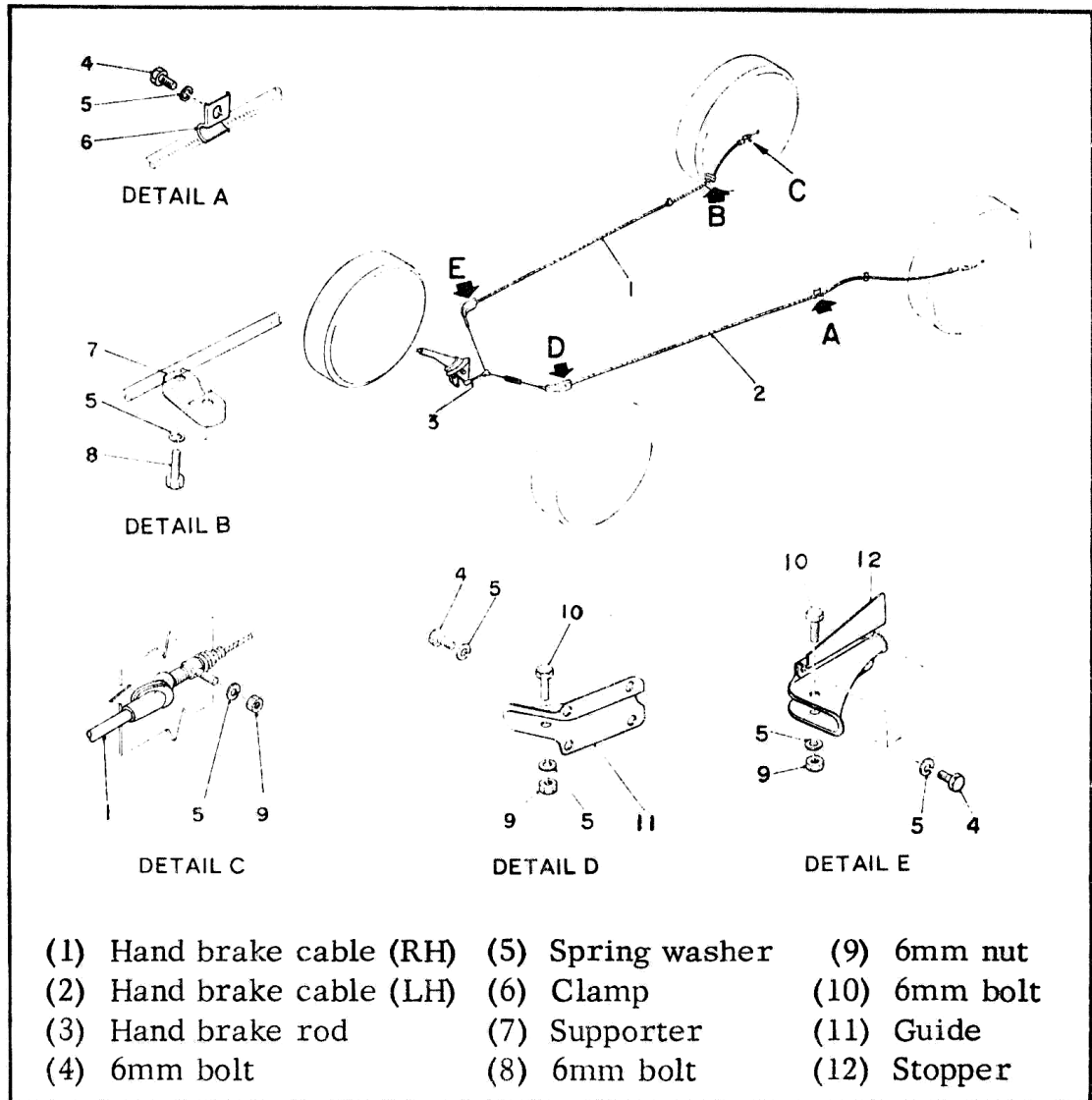
B: INSTALLATION OF THE LEVER ASSEMBLY

- (1) Tighten the lever assembly on the specified position with the two 8mm bolts after inserting the spring washer.
- (2) Match the pin holes of the yoke on the tip of the rod and the lower end of the lever; insert the 6mm pin and lock with the cotter pin.
- (3) After assembling, move the lever and check its operating condition.

12. REMOVAL AND INSTALLATION OF THE HAND BRAKE CABLE AND ROD

A: REMOVAL OF THE HAND BRAKE CABLE AND ROD

- (1) Remove both the right and left rear wheels, brake drums and brake shoes.
- (2) Remove the 6mm nut and spring washer of the eye bolt which is attached to the back plate and disconnect the rubber tube of the cable from the back plate.
- (3) Remove the clamps "4" and "5", by removing the 6mm bolts.



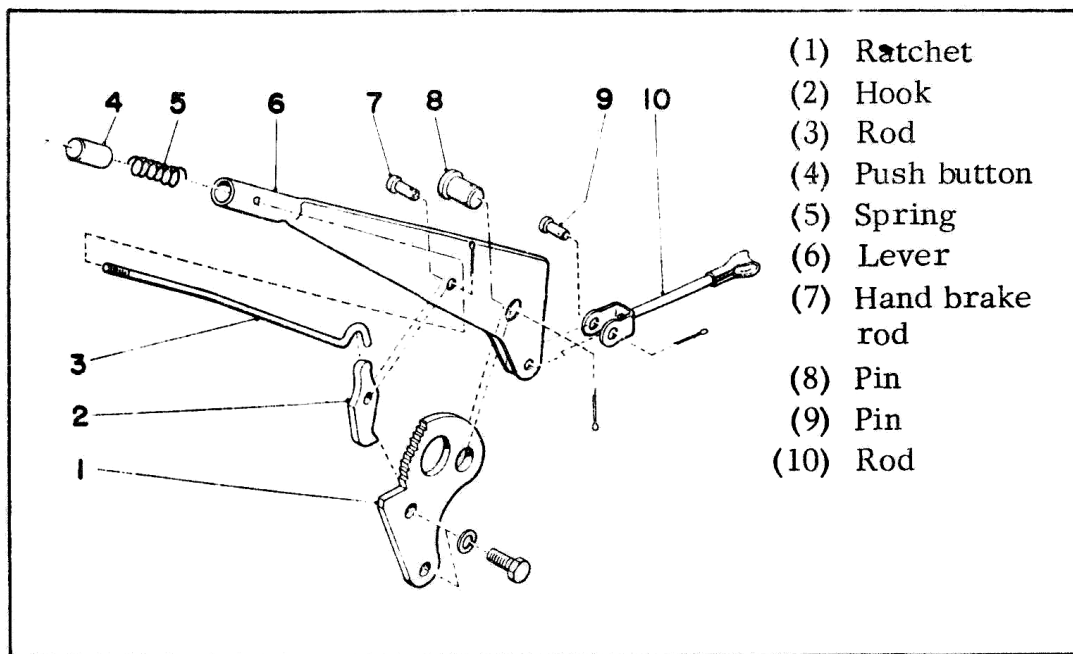
- (4) Remove the guide "6" and the stopper "7", by removing the 6mm bolts.
- (5) At the cable joint, separate the cables to the right and left and remove them from the rod.
- (6) Remove the 6mm pin, connecting rod and lever assembly, by removing the cotter pin used on it.

B: INSTALLATION OF THE HAND BRAKE CABLE AND ROD

- (1) After attaching the two ends on the hand brake cables, pass the cables through the hole of the back plate with the grease nipples pointing downward. Fit the groove of the rubber tube to the back plate and attach the eye bolt to the specified position on the back plate with 6mm nut and spring washer.

- (2) Attach the cable end to lever B which is connected to the brake shoe and install the brake drum and rear wheel in this order.
- (3) Install clamps "4" and "5" with the 6mm bolts.
- (4) Install guide "6" and stopper "7" with 6mm bolts.
- (5) Insert the cable in the rear end of the rod and connect it at the cable joint section.
- (6) Assemble the rod and the lever assembly with a 6mm pin, and fasten it with a cotter pin.

13. DISASSEMBLING AND ASSEMBLING OF THE HAND BRAKE LEVER ASSEMBLY



A: DISASSEMBLING

- (1) Pull up the 3mm cotter pin and detach the ratchet.
- (2) Next, remove the 2.5mm cotter pin and remove the hook.
- (3) When the rod is pushed out upward and the push button is removed, the rod can be taken out from below. At the same time, the spring can also be removed.
- (4) A spring stopper pipe is pressed in the lever but this does not have to be removed in normal disassembly.

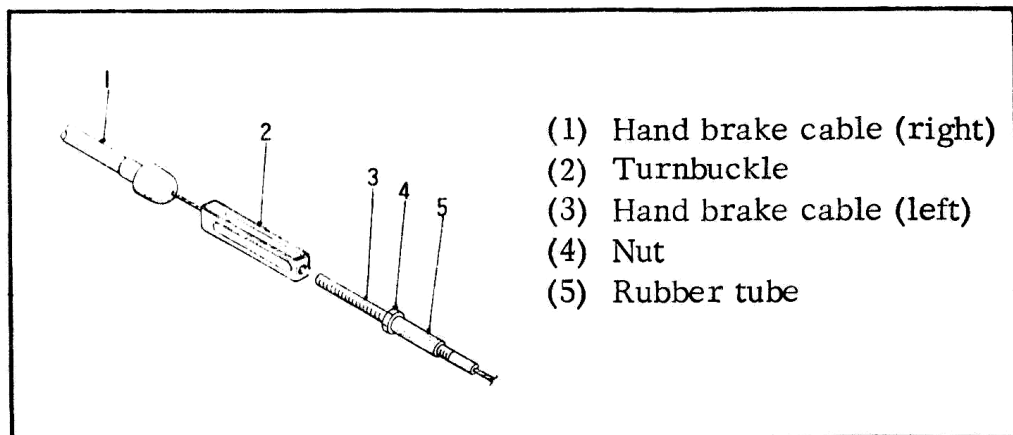
B: ASSEMBLING

- (1) Insert the rod from under the lever and fit in the spring.
Coat the threaded section with chemical adhesive and fully screw in the push rod.
- (2) Insert the hook from under side of the lever, match the pin holes, insert a pin and lock with a 2.5mm cotter pin.
Apply grease to the pin.
- (3) Insert the ratchet from under side of the lever, match the pin holes, insert a pin and lock with a 3mm cotter pin. Apply grease to the pin and teeth of the ratchet.
- (4) Press the push button and operate the lever and check the operating condition.

(CAUTION)

When installing the ratchet, be careful to insert the ratchet mounting pin from the correct direction (from inside toward outside)

C: ADJUSTMENT OF THE HAND BRAKE



If the hand brake does not take hold even when the hand brake lever is pulled fully, perform the adjustment by following manner.

- (1) Slide the rubber tube "5" of the hand brake cable.
- (2) Loosen the nut "4" on the end of the hand brake cable.

- (3) Pushed down forward the hand brake lever.
Then, turn the turnbuckle "2" and adjust the length of the cable.
- (4) Perform the adjustment of (3) above so that the hand brake takes hold effectively at 4-5th tooth of the ratchet when the hand brake lever is pulled.
- (5) Tighten the nut securely and slide the rubber tube until it touches the side of the nut.

(CAUTION)

Since this hand brake and foot brake use in common for brake shoe, it is necessary to adjust the foot brake before adjusting the hand brake.

CHAPTER 6: CONTROL SYSTEM & ENGINE ACCESSORIES

1. SPECIFICATIONS AND ADJUSTMENT STANDARDS OF ENGINE ACCESSORIES	6- 1
2. REMOVAL AND INSTALLATION OF THE GEAR CHANGE SYSTEM	6- 1
3. CLUTCH PEDAL	6- 4
4. REMOVAL AND INSTALLATION OF THE CLUTCH CABLE	6- 5
5. REMOVAL AND INSTALLATION OF THE FUEL STRAINER	6- 7
6. REMOVAL AND INSTALLATION OF THE FUEL TANK	6- 8
7. REMOVAL AND INSTALLATION OF THE OIL TANK	6- 9
8. REMOVAL AND INSTALLATION OF THE MUFFLER	6-11

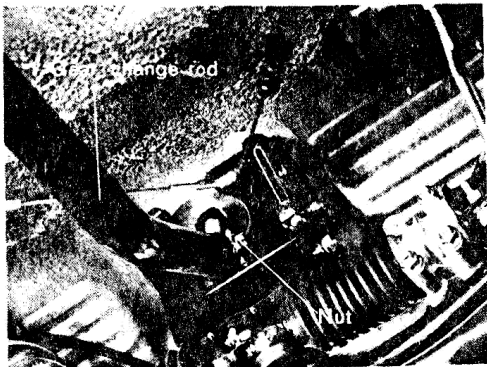


1. SPECIFICATIONS AND ADJUSTMENT STANDARDS OF ENGINE ACCESSORIES

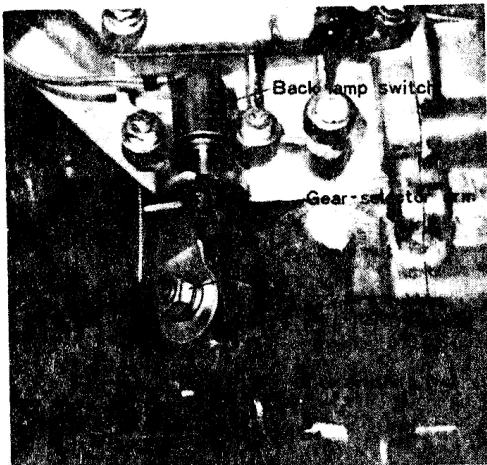
Standard position of accelerator pedal	.....	About 50 mm (2 in) from floor to roller center
Play of clutch pedal	.....	20 - 25 mm (0.8 - 1.0 in)
Fuel strainer	.....	filter paper
Fuel strainer capacity	.....	350 cc/min, at 200 mm (8 in) water column
Fuel tank capacity	.....	30 ℓ (8.0 U S gal)
Oil tank capacity	.....	2.5 ℓ (2.6 U S qt)

2. REMOVAL AND INSTALLATION OF THE GEAR CHANGE SYSTEM

A: REMOVAL OF THE GEAR CHANGE SYSTEM

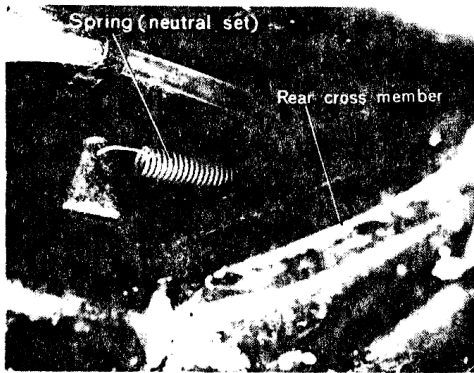


(1) Remove the pin from the change rod end; loosen the nut and remove the connection between the change rod and the lever.

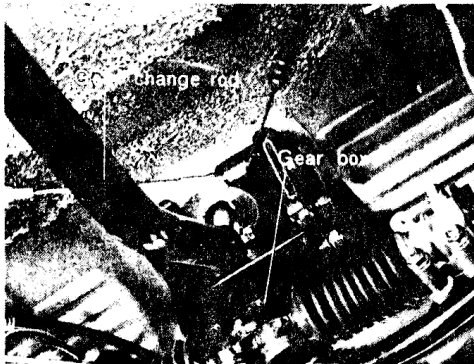


(2) Remove the trap door (rear bulkhead) in front of the engine compartment.

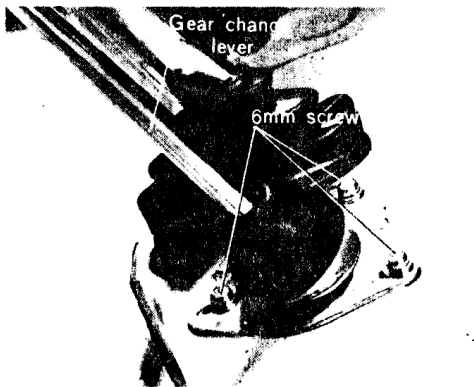
(3) Loosen the nut connecting the rear end of the gear change rod and remove the rod together with the rubber bushing.



- (4) Remove the return spring (neutral set) of the change rod located on the rear cross member of the under floor.

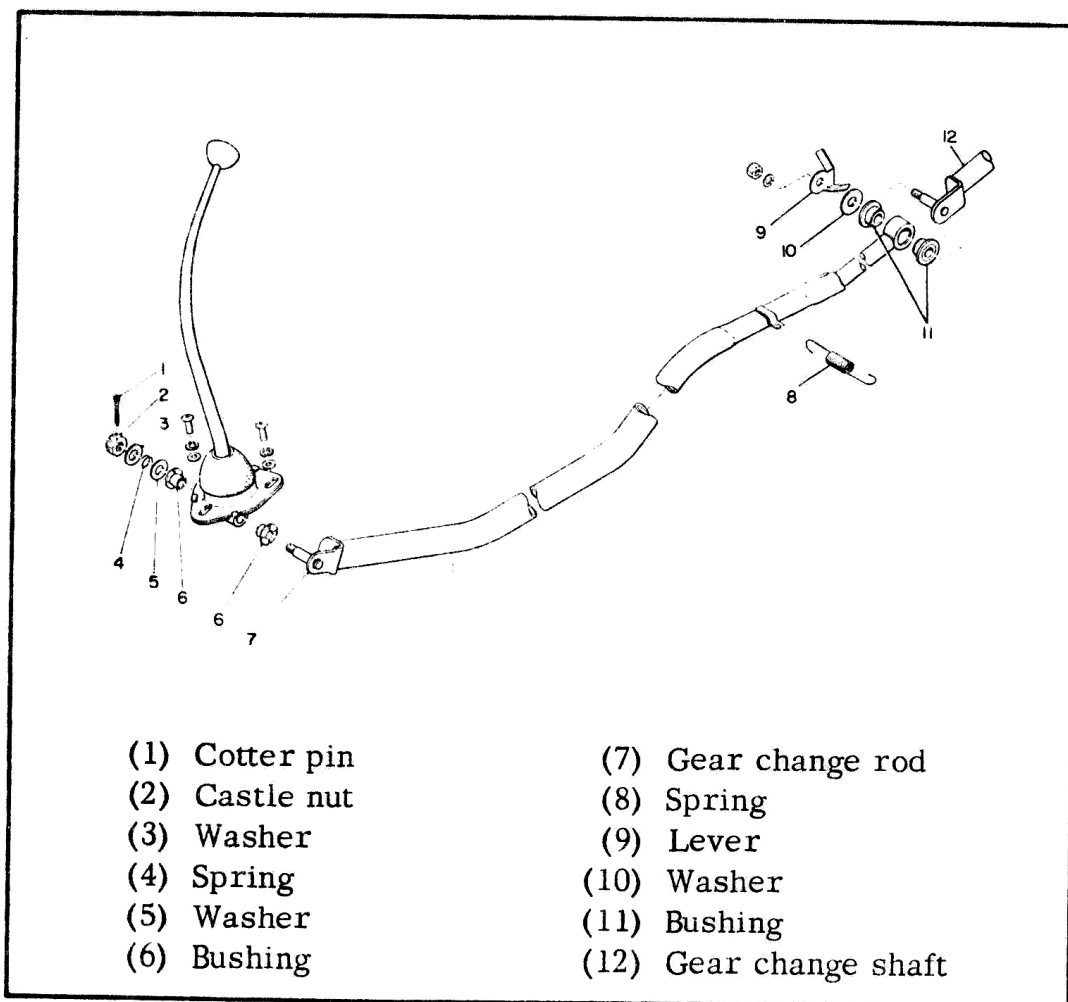


- (5) Pull out the change rod forward under the gear box while twisting it.

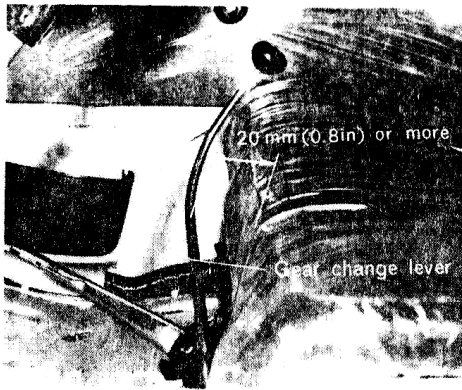


- (6) Loosen the 6mm screws mounting the change lever on the driver's seat and remove the lever.

B: INSTALLATION OF THE GEAR CHANGE SYSTEM



- (1) Check all parts and replace any excessively worn or damaged part with new one.
- (2) Temporarily fix the change lever on the floor with three screws.
- (3) Connect rear end of the rod and the lever of backup lamp to the gear change shaft.
- (4) Install the return spring (neutral set) to the rod.
- (5) Connect the front end of the rod to the lever.



- (6) Tighten the screw at the position where the gap between the change lever and the front edge of the seat is about 20mm (0.8 in) when thrust the change lever to the 1st position.
- (7) Install the trap door in front of the engine compartment.

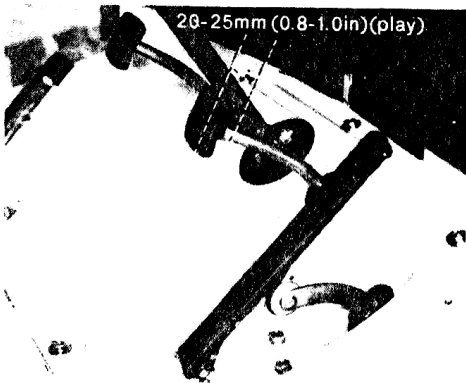
3. CLUTCH PEDAL

The clutch is operated, through the cable and release mechanisms, by pressing the clutch pedal.

A: REMOVAL AND INSTALLATION

Refer to the explanation for brake. (See page 5-11)

B: ADJUSTMENT FOR PLAY OF THE CLUTCH PEDAL



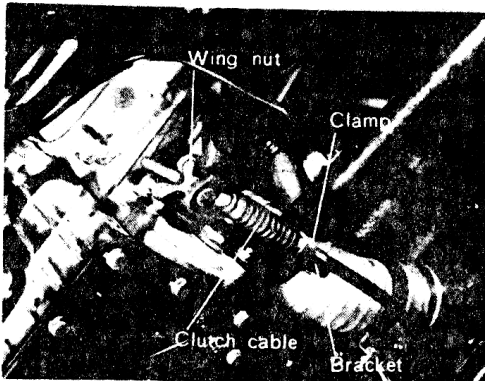
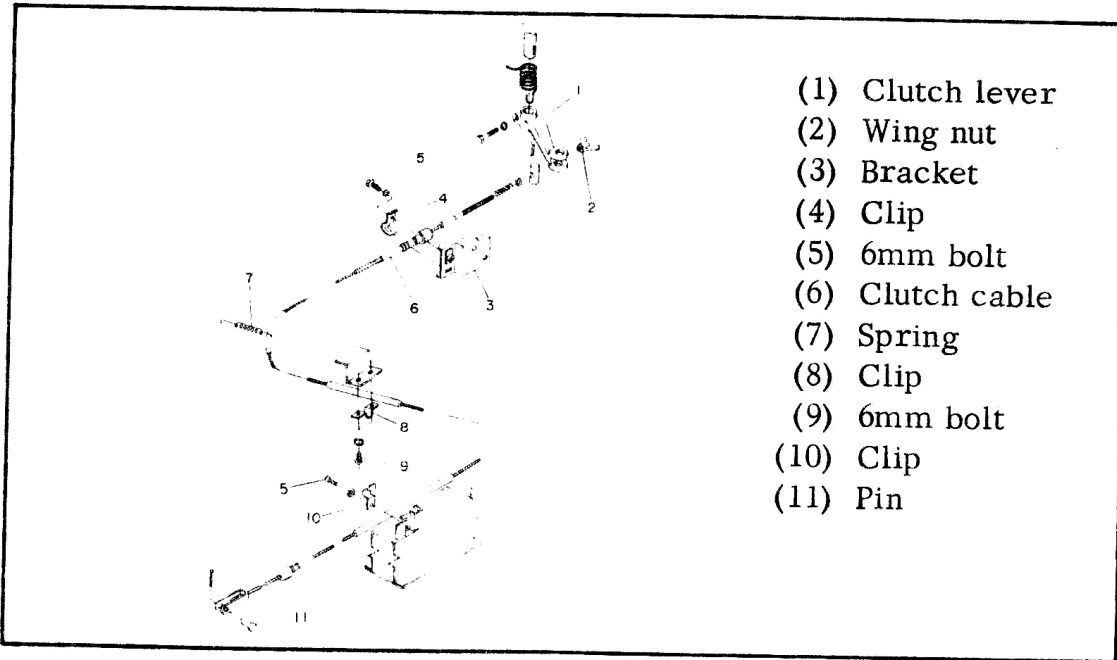
- (1) The play of the clutch pedal is 20 - 25mm (0.8 - 1.0 in) as brake pedal. If the play is too small, the clutch slips and early damage to the facing may occur. If the play is too large, a poor releasing of the clutch may be resulted to the gears chatter and the dog clutch may be damaged. As shown in the figure, adjust the play to

20 - 25mm (0.8 - 1.0 in) with the wing nut of the clutch cable end.

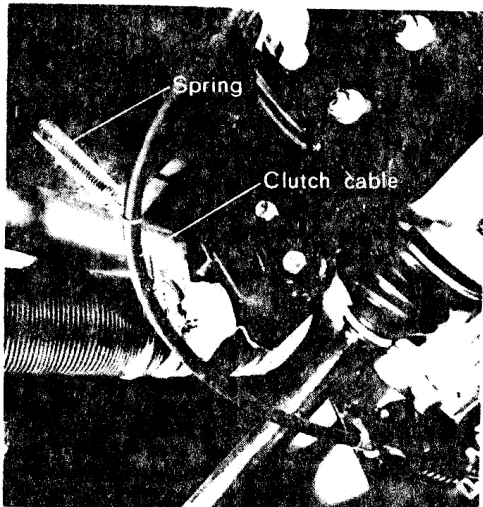
- (2) When it is impossible to adjust the play of the clutch pedal to about 20 - 25mm (0.8 - 1.0 in), change the clutch cable with a new one.

4. REMOVAL AND INSTALLATION OF THE CLUTCH CABLE

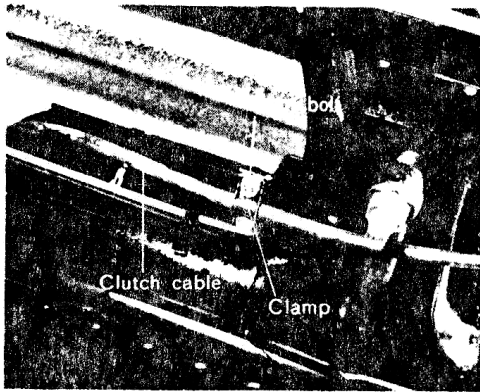
A: REMOVAL OF THE CLUTCH CABLE



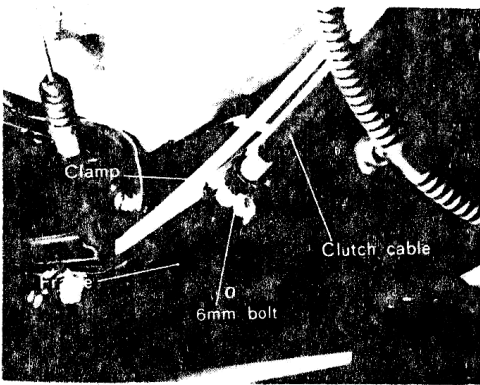
- (1) Loosen the wing nut and remove the clamp of the bracket by removing the 6mm bolt.



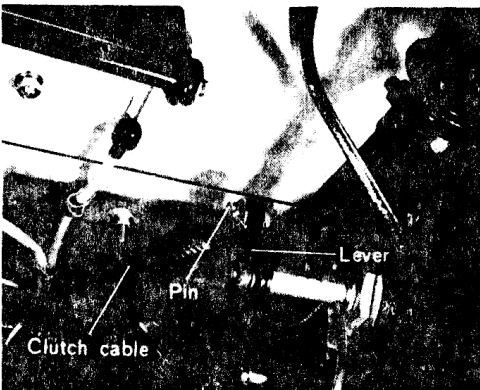
- (2) Remove the spring (cable hanger).



- (3) Loosen the two 6mm bolts and remove the clamp of the rear cross member.



- (4) Loosen the 6mm bolt and remove the clamp for mounting to the frame.



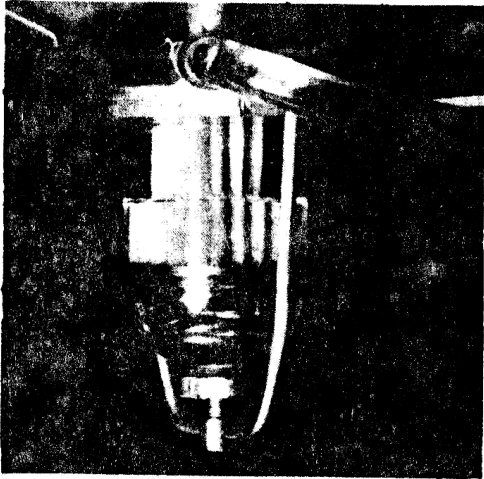
- (5) Take out the pin which connects the clutch pedal and cable and remove the cable.

B: INSTALLATION OF THE CLUTCH CABLE

Check the each part of the clutch cable. When no defect is found, install the clutch cable in an order which is reverse of the removal.

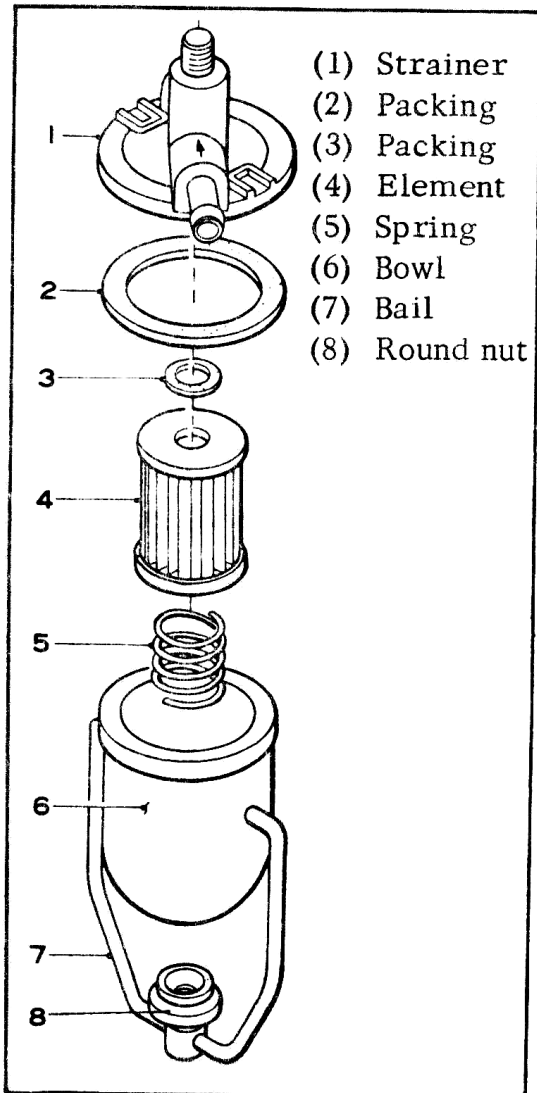
5. REMOVAL AND INSTALLATION OF THE FUEL STRAINER

A: REMOVAL OF THE FUEL STRAINER



- (1) Disconnect the connecting section of pipe A (the pipe coming from the tank).
- (2) Disconnect the connecting section of pipe B (the pipe going to the carburetor).
- (3) When the 6mm nut for mounting the strainer is removed, the strainer assembly can be taken out.

B: DISASSEMBLING AND ASSEMBLING THE FUEL STRAINER

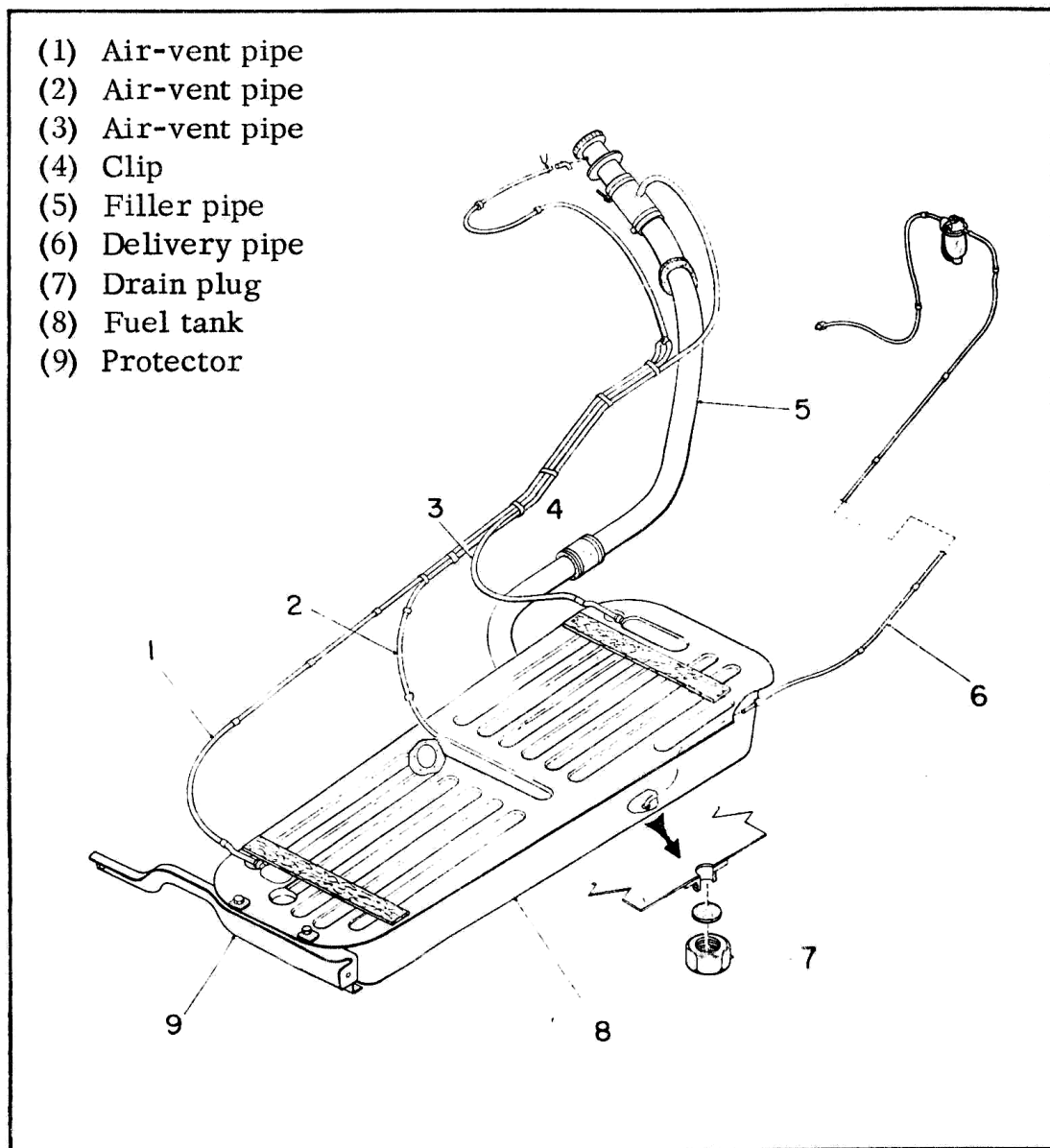


- (1) Disassembly
 - (a) When the round nut is loosened, the bowl can be removed. Then, the element and packing can be taken out.
 - (b) Unless damaged or defective, do not take out the bail. When its replacement is necessary, expand the inserted section into the strainer body outward and it can be removed.
- (2) Inspection before assembling.
 - (a) Make sure that all parts of the strainer are washed clean. The element and packing, in particular, must be kept free from foreign particles.
 - (b) Check the body, bowl, element, etc. for damage and replace defective parts.

(3) Assembling

- (a) Insert the packing in the strainer body; assemble the element and bowl and tighten the round nut of the bail from under the bowl. If tightened too much, the bowl becomes damaged. Tighten the nut suitably.
- (b) Install the strainer on the chassis with the 6mm nut, spring washer and plain washer.
- (c) Connect pipes A and pipe B to the fuel strainer.

6. REMOVAL AND INSTALLATION OF THE FUEL TANK



A: REMOVAL OF THE FUEL TANK

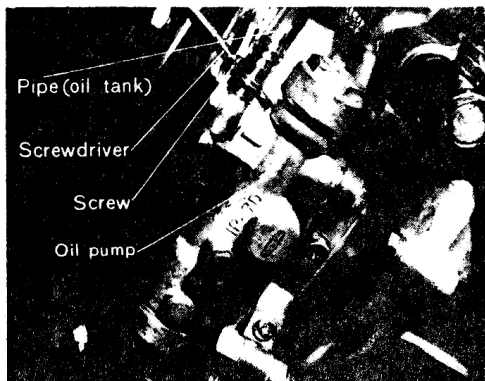
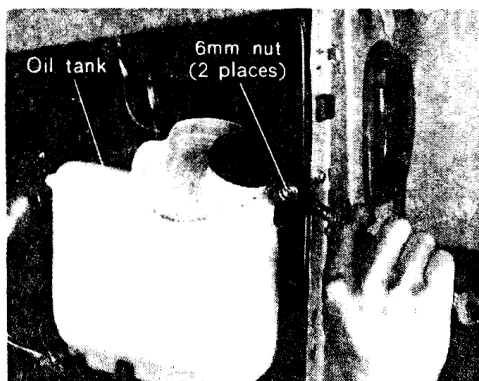
- (1) Remove the drain plug from under the body and drain the fuel tank.
- (2) Remove the two 8 mm bolts which connect the fuel tank to the protector located forward of the tank.
- (3) Loosen the tank side of the clip which fastening the filler pipe.
- (4) Remove the three air-vent pipes from the tank.
- (5) Remove the two 8 mm bolts which connect the protector to the chassis frame. Remove grounding plate, also.
- (6) Pull the tank forward a little, and remove the delivery pipe from the tank.
- (7) Lower the left side of the tank, and it is taken out easily.

B: INSTALLATION OF THE FUEL TANK

Before installing, thoroughly clean the interior of the tank as foreign matter such as dirt or glass-like substance often accumulate in the fuel tank. After cleaning, dry the fuel tank interior before installing. When the pipe connections are loose, the fuel will leak. Be sure to tighten each connection firmly as leaking of the fuel is dangerous. Especially, if the vinyl pipes have hardened and are loose, tighten it with wire.

Install the fuel tank following the order of removal in reverse. If any slackings are found on the air vent piping, stretch them.

7. REMOVAL AND INSTALLATION OF THE OIL TANK



A: REMOVAL OF THE OIL TANK

- (1) Loosen the one bolt inside the engine compartment and pull out the ignition coil.
- (2) Remove the six bolts on the under section of the engine compartment and remove the under cover.
- (3) Loosen the two tank mounting nuts.
- (4) Push up the float unit stopper and remove the cord.
- (5) Raise the clip of the air vent pipe.
- (6) Raise the clip of the delivery pipe.
- (7) Loosen the clip which holds the delivery pipe and pull out the delivery pipe from the oil pump joint section.
- (8) Remove the cap and rotor of the distributor.
- (9) The oil tank can be removed easily when it is pulled upward while turning counterclockwise as seen from the rear.

B: INSTALLATION OF THE OIL TANK

Water drops or foreign matters may be deposited in the oil tank.

Wash the inside cleanly, dry it and start installation.

Loosened joints on delivery pipes may cause oil leakage, so tighten them securely.

The order of installation procedures is reverse of the removal.

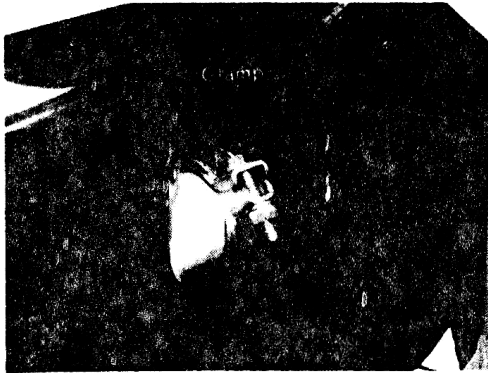
Supply the oil of the same brand as used before. Mixing of the different brand of oil must be avoided as it may effect the engine life.

If oil drops are fallen around the V belt, the belt may slip and the electric generating capacity may drop.

So wipe them off cleanly.

8. REMOVAL AND INSTALLATION OF THE MUFFLER

A: REMOVAL OF THE MUFFLER



- (1) Remove the inspection door on front side of the engine room.
- (2) Loosen the 8 mm bolt, fastening the clamp, and remove two (upper and lower) clamps and rings.
- (3) The muffler can be taken off downwards by removing four 8 mm bolts on the fan case of the engine.

B: INSPECTION BEFORE STARTING TO INSTALL THE MUFFLER

- (1) Inspect the flanged and curved portion inside of the exhaust pipe for carbon deposit.
In the following cases large quantity of deposit may accumulate.
 - (a) Oil, other than the 2-stroke oil of recommended brand by Fuji Heavy Industries, Ltd. is used.
 - (b) The car has been driven for many times at low speed continuously.
- (2) Any deposits of carbon must be wiped off by a wire-brush.
Do not burn them by a blow-torch, as it may cause a blow-up like a small carbon-powder explosion.

C: INSTALLATION OF THE MUFFLER



- (1) The muffler must be installed from the lower side of the engine. Attach it temporarily by four 8 mm bolts, washers and spring washers, on the fan case.
- (2) Insert the rings, and insert the 8 mm bolts to the upper and lower clamps from the upper side, put on the spring washers from the lower side, and tighten by nuts.

- (3) Tighten the bolts holding the muffler on the fan case.
- (4) Install the inspection door by tightening four bolts.

CHAPTER 7: SHOCK ABSORBER

1. SPECIFICATIONS OF THE SHOCK ABSORBER 7-1
2. REMOVAL AND INSTALLATION OF THE SHOCK
ABSORBER 7-1

1. SPECIFICATIONS OF THE SHOCK ABSORBER

Front shock absorber

Type	Cylindrical, double action type
Maximum length	291 ± 3 mm (11.34 ~ 11.57 in)
Minimum length	201 ± 3 mm (7.80 ~ 8.03 in)
Stroke	90 mm (3.54 in)
Damping force	Extension stroke: 80 ± 12kg/0.3m/sec (150 ~ 200 lb/1 ft/sec) Compression stroke: 55 ± 11kg/0.3m/sec (97 ~ 145 lb/1 ft/sec)

Rear shock absorber

Type	Cylindrical, double action type
Maximum length	332 ± 3 mm (12.95 ~ 13.19 in)
Minimum length	269 ± 2 mm (10.59 ~ 10.67 in)
Stroke	63 mm (2.48 in)
Damping force	Extension stroke: 35 ± 4 kg/0.3m/sec (68 ~ 86 lb/1 ft/sec) Compression stroke: 30 ± 4 kg/0.3m/sec (57 ~ 75 lb/1 ft/sec)

2. REMOVAL AND INSTALLATION OF THE SHOCK ABSORBER

A: REMOVAL OF THE FRONT SHOCK ABSORBER

- (1) Jack up the front section of the vehicle and remove the front wheels.
- (2) Loosen the two 10mm nuts on the upper section of the shock absorber.
- (3) When the above nuts are removed, the washer and the upper mounting rubber can be taken out easily.

- (4) Remove the 10mm nut at the connection to the trailing arm; remove the spring washer and washer and take down the shock absorber while pulling the lower mounting eye toward the operator.

B: INSTALLATION OF THE FRONT SHOCK ABSORBER

- (1) Fit a washer and rubber on the upper mounting bolt; insert the fixed rubber bushing in the lower mounting eye and compress it.
- (2) Insert the shock absorber through the hole of the front damper bracket. Then, insert a washer, rubber and washer in the order named and tighten temporarily with two 10mm nut.
- (3) Insert the lower mounting section in the damper pin extending out from the trailing arm. Insert a rubber bushing, washer and spring washer in that order and tighten until the washer contacts the shoulder of the pin after ascertaining that the absorber functions correctly with unloaded.
- (4) Permanently tighten the 10mm nut of the upper section of the shock absorber.

(CAUTION)

The suitable range of the tightening torque of the upper bolt is 0.55 - 0.70 kg-m (4.0-5.0 lb-ft).

C: REMOVAL OF THE REAR SHOCK ABSORBER

Jack up the rear section of the vehicle and remove the wheels then to make the removal of the shock absorber easier.

Perform the rest of operations in the same way as for the removal of the front shock absorber.

D: INSTALLATION OF THE REAR SHOCK ABSORBERS

Follow the instructions given for the installation of the front shock absorber.

1. SPECIFICATIONS, CONSTRUCTION AND HANDLING OF TIRE

A: SPECIFICATIONS

Tire	4.50-10-4PR
Rim	3.00D x 10
Tire width	122mm (4.8 in)
Tire outside diameter	499 mm (19.6 in)
Tire pressure	
Front and rear	1.9-2.0 kg/cm ² (27.0-28.4 lb/in ²)
Spare tire	2.0 kg/cm ² (28.4 lb/cm ²)

B: FEATURES AND CONSTRUCTION OF SUBARU 360 TRUCK & VAN

(1) Features

The 4.50-10 tire for Subaru 360 Truck and Van is a 4-ply construction. Excellent durability, high maneuverability and stability. In its design and construction, considerations has been given to the following features to give.

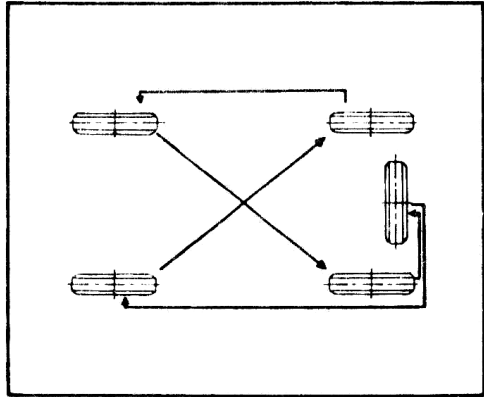
- (a) Light weight
- (b) Low spring constant
- (c) High stability
- (d) High frictional constant
- (e) Durability

(2) Construction

The load applied on the tire is supported by the air contained in the tire and the inner tube can be considered as a container which holds the air. The foundation of the tire is the cord. With the tensile force of this cord, the inner pressure of the tube is maintained. The rubber used causes the cords stick together to function as one body to withstand the inner pressure and insulates the friction between cords. The rubber, furthermore, is used to protect the cords from external damage and wear. To lessen external impacts, a layer of breaker is provided between the cords; and for the reduction of sudden changes in elasticity and prevention of separation, cushion layers which include the breakers are provided. To fix the tire on the rim, the beads made of steel wires are provided and to prevent damages to the cords due to the friction between the tire and rim, the exterior of the beaded portion is protected by a chafer. To decrease the hardness gradually from this hard bead section to the side of the tire where the flexibility is required most, the flipper is inserted between the cord layers. The tread is provided on the

crown of the tire, which comes in contact with the road surface, to prevent wear. A tread pattern is provided on the tread, so that the tire can demonstrate its full function, and has a large area for dissipating the heat accumulated in the tire.

C: MAINTENANCE



(1) Rotation of the tires

Because of the difference in the operation of the suspension systems, road conditions, and usual running conditions of the vehicle, it is inevitable that the loads applied on each tire differ to some degree. In a long run, even this slight difference makes the life span of the tires irregular. Therefore, rotate

the tires periodically at every 5,000 km (3,000 miles) as shown in the figure in order to make the wear of the tires uniform.

D: DISASSEMBLING OF THE WHEEL, TIRE AND INNER TUBE



(1) Removal and installation of the wheel

Apply the hand brake before jacking up the vehicle, and remove the wheel cap with a screwdriver and loosen the wheel nuts. The jack furnished with the vehicle can be used at the four places of each side of the chassis frame. Pay attention to the tilt of the jack. When the

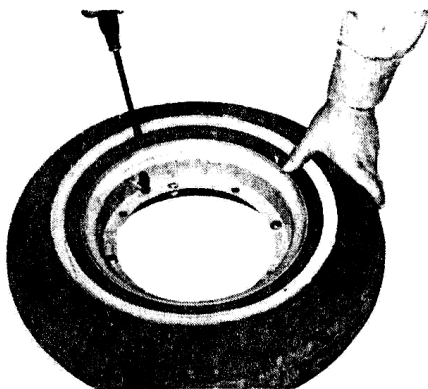
vehicle has been jacked up, remove the wheel nuts and spring washers and the wheel can be removed.

(2) Removal and installation of the tube

Release the air from the tube to decrease the inner pressure. The rim is a split type. Remove the four bolts which hold the outer and inner rims. Then the tube can be taken out from between the two rims. In this case, it is not necessary to remove the tire from the rim. When assembling the rims after inserting the inner tube,

attention must be paid to the following points;

- (a) Check the innersurface of the tire. Repair any abnormalities and remove all foreign matter.
- (b) Tighten the valve securely. Fill the tube with air and then submerge the tube and valve in water to see for air leakage.
- (c) Insert the tube through between the rims and adjust so that the valve sticks out of the valve hole straightly.
- (d) To prevent the tube from being pinched between the rims, inflate the tube with some air.
- (e) Match the rims and tighten with the specified bolts, nuts and spring washers. In this case, be sure to insert the bolts from outside (from the side where there are three pawls for mounting the wheel cap). By adjusting the inner and outer rims so that bolt holes match, the mounting to the brake drum is made easier.
- (f) Inflate the tire with the specified air pressure and attach the cap on the valve. Care must be taken as a rod-shaped air gauge indicates erroneous air pressures depending on how it contacts the valve. It is desirable that repair shops be equipped with a precise pressure gauge as a master gauge and check other gauges periodically.

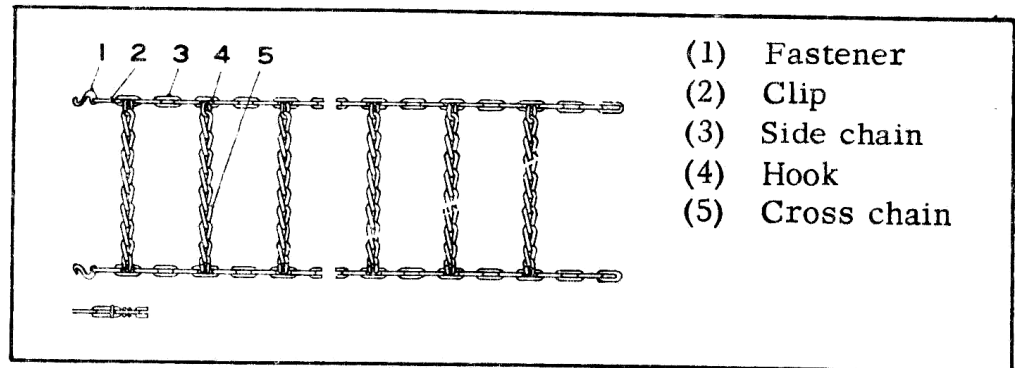


- (3) Removal of the rim
Remove the tube first, and lay the tire on the ground. Insert the tip of a large screwdriver or a tire lever between the rim and the tire and pry the bead downward gradually. Repeat this operation all around the tire.
Then, the rim on one side can be removed.

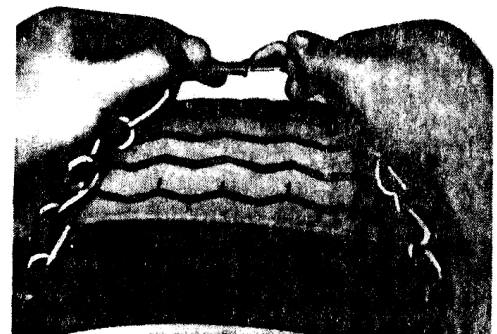
Avoid striking with a hammer to remove the rim from the tire will result in damage to the rim and tire. In case the use of a hammer is absolutely necessary, use a rubber hammer which will keep damages to a minimum. To remove the rim on the other side, turn over the tire and perform the same operation as described above. In this case, the operation becomes easier if the rim which has been removed first is placed under the tire.

E: TIRE CHAIN

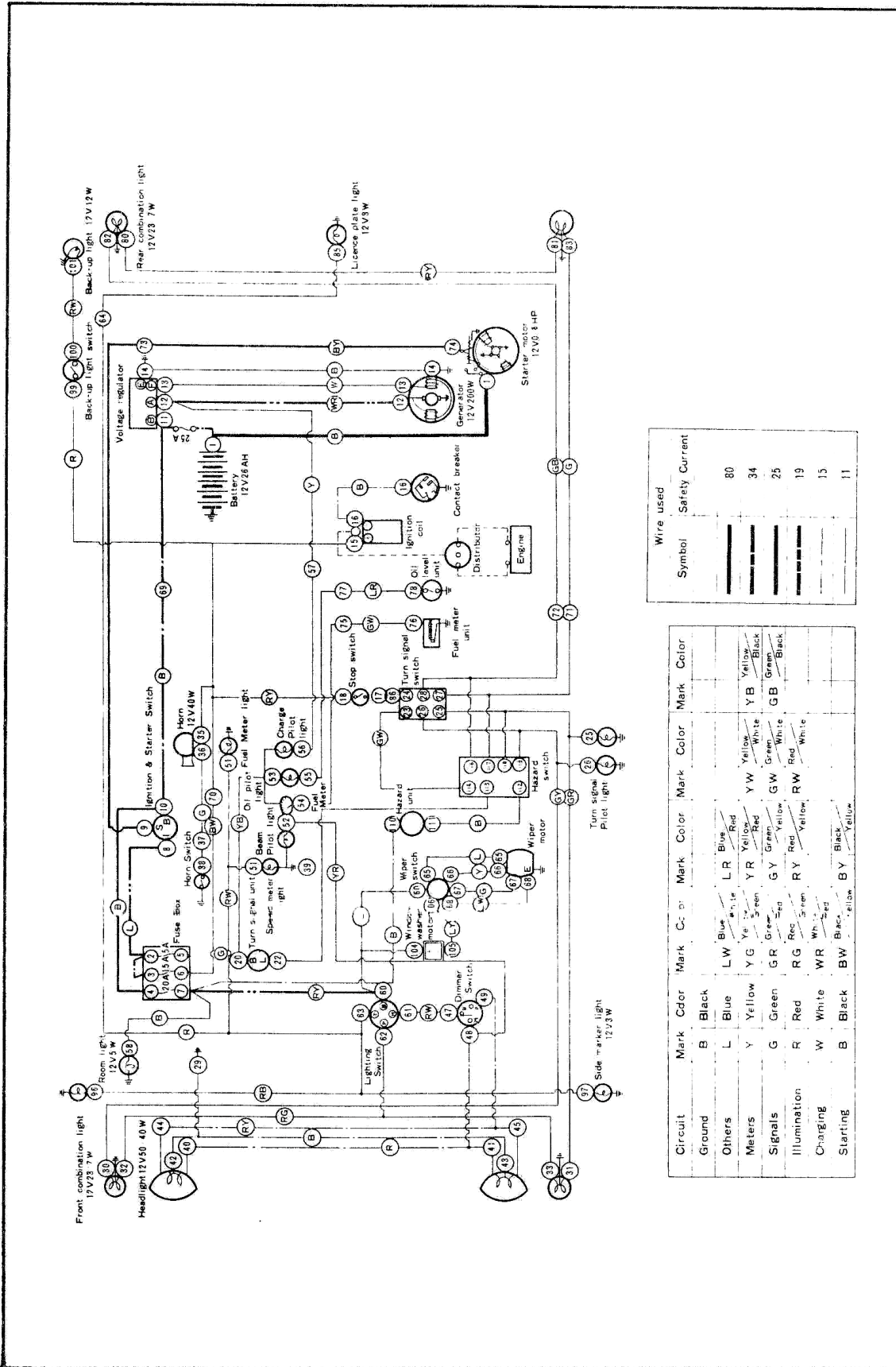
- (1) The tire chains are covered on the tires, when road conditions are poor because of snow, mud, gravel or sand, to decrease slipping, for safe driving and saving of fuel.
- (2) The chains for Subaru Sambar tires are specially designed for the above-mentioned purposes, and durability and economy are interga to their design.
- (3) The construction of the tire chains for the Subaru Sambar is shown in the figure.



- (4) To put the chains on, jack up the vehicle and place the center of the inner side of the chain on the lower side of the tire. Then, pull both ends of the chain up over and around the tire and connect the ends with the fasteners. Next, by connecting the outer side chain in the same way as the above, the chain can be put on easily. On the outside (wheel cap side), use rubber bands or springs to make the tire chains taut.



1. WIRING DIAGRAM



(1) The following can be used without the ignition-starter switch on:

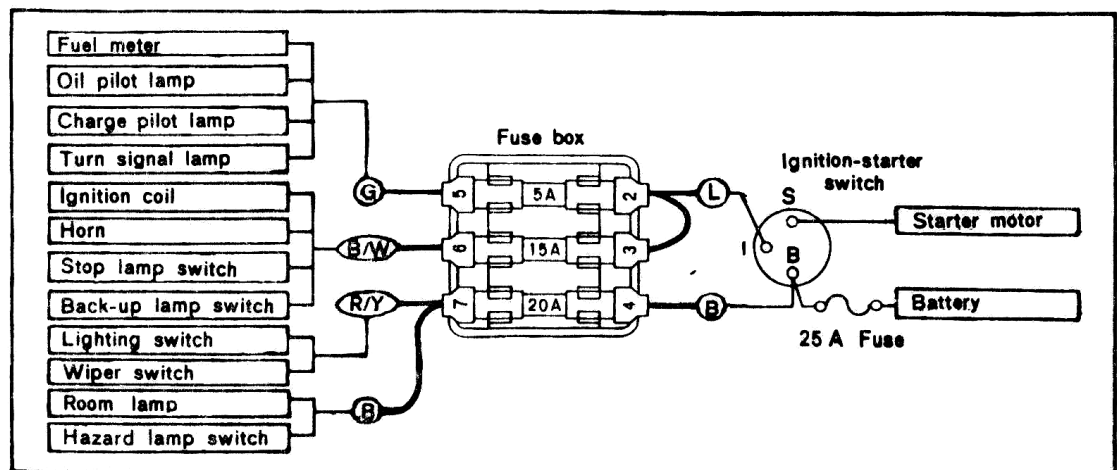
Battery	Fuse 20A	Lighting switch	Headlamps, Parking lamps, Tail lamps, License plate lamps, Side marker lamps, Beam pilot lamp, Illumination lamp
		Room lamp switch	Room lamp(s)
		Wiper switch	Windshield wiper
		Hazard switch	Hazard lamp

(2) When the ignition-starter switch is turned first step:

Battery	Fuse 5A	Ignition-starter switch on first step	Turn signal lamps, Charge pilot lamp, Oil pilot lamp, Fuel gage
	Fuse 15A	Same as above	Ignition coil, Stop lamps, Back-up lamp, Horn

(3) When the ignition-starter switch is turned further to the right (second step) In addition to (2) above, the starter motor turns.

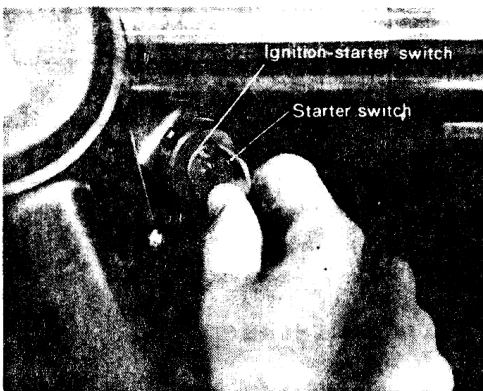
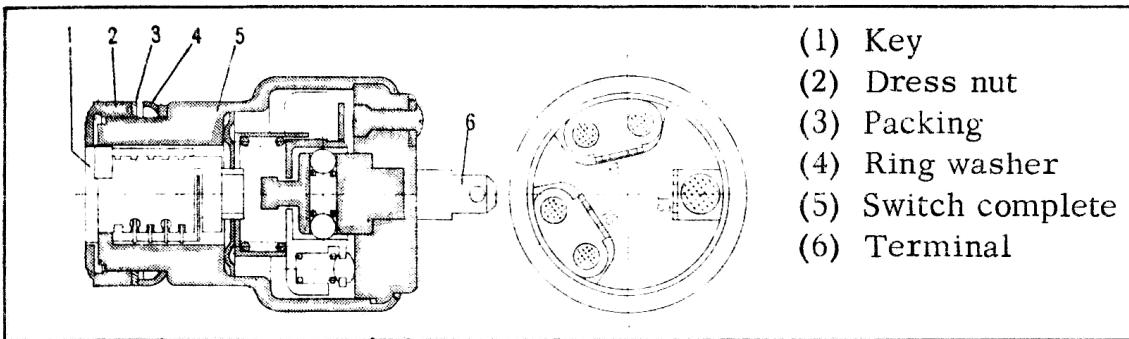
(4) Fuses



When any fuse other than that of the specified capacity is used, accidents cannot be prevented. Be sure to use only the fuses of the specified capacities.

2. SWITCHES

A: IGNITION-STARTER SWITCH

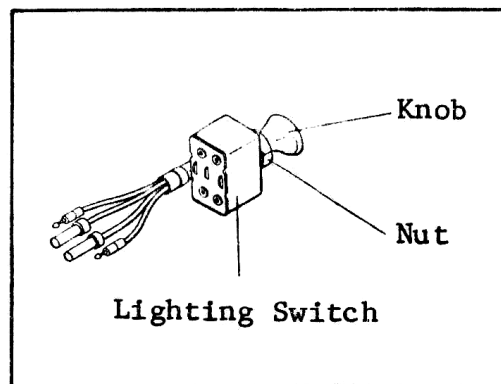
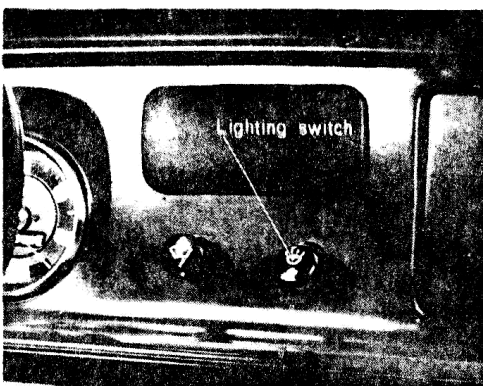


- (1) The ignition-starter switch is attached to the bracket on the right side of the steering shaft.
- (2) The ignition-starter switch is made exclusively for each individual vehicle and cannot be used for other vehicles. It fits the door lock on the same vehicle.
- (3) The positions and connection of the key are as shown above.

A spring is provided and giving resistance for the starter motor position so that the key returns automatically to the ignition position (first step) when the key is released from fingers.

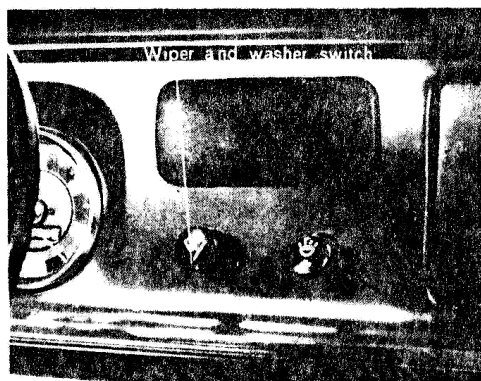
- (4) The ignition-starter switch can be removed using the special tool (921270000).

B: LIGHTING SWITCH



- (1) The lighting switch is mounted on the instrument panel next to the wiper and washer switch, together with the fuse and turn signal unit mounting bracket.
- (2) With the operation of the lighting switch, the headlamps, side marker lamps, parking lamps, tail lamps and license plate lamp can be turned on.
- (3) The switch can be removed from the instrument panel by removing the knob and the nut.

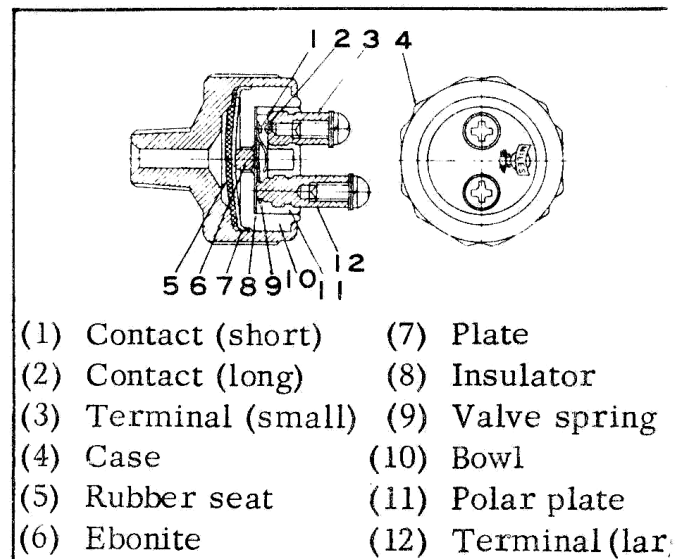
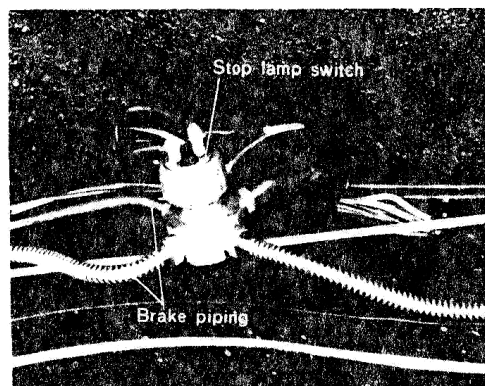
C: WIPER AND WASHER SWITCH



- (1) This switch is mounted on the instrument panel next to the lighting switch by the same mounting method as that for the lighting switch.
- (2) When pulled, this switch operates as a wiper switch.
 First step: low operating speed.
 Second step: high operating speed.

- (3) When turned, to the right, this switch operates as a washer switch and water is ejected.

D: STOP SWITCH

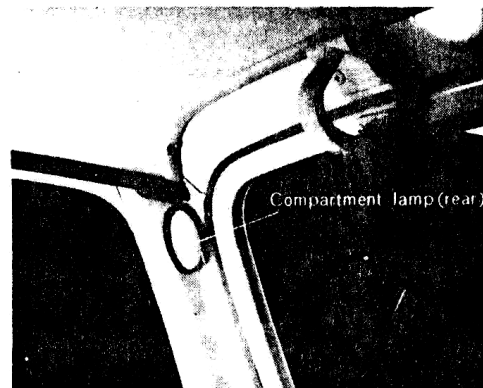
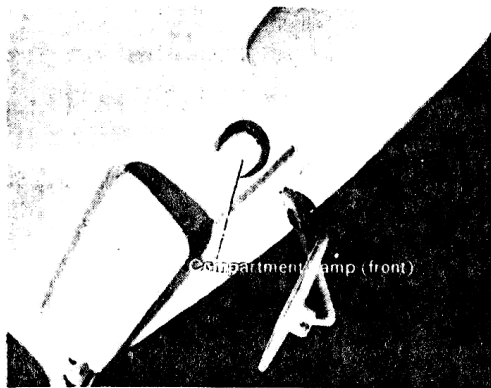


- | | |
|----------------------|-----------------------|
| (1) Contact (short) | (7) Plate |
| (2) Contact (long) | (8) Insulator |
| (3) Terminal (small) | (9) Valve spring |
| (4) Case | (10) Bowl |
| (5) Rubber seat | (11) Polar plate |
| (6) Ebonite | (12) Terminal (large) |

- (1) The stop switch turns on the stop lamps inside the left and right rear combination lamps when the brake is applied.
- (2) The stop switch is operated hydraulically and is attached to the tip of the front connector of the brake piping.
- (3) The hydraulic pressure required to light the stop lamps is 4-8 kg/cm², (57 - 114 lb/in²).

When the pressure for lighting is other than 4 - 8 kg/cm², or when the voltage drop between the terminals when a current of 10A flows while the lamp is on is more than 0.2V, or when oil leaks while the pressure is less than 150 kg/cm² (2,140 lb/in²), replace the stop switch with new one.

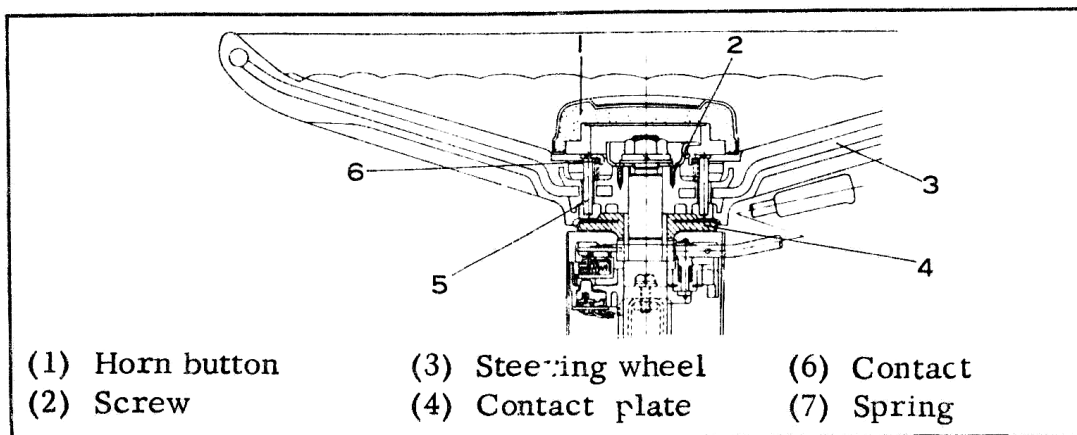
E: COMPARTMENT LAMP SWITCH



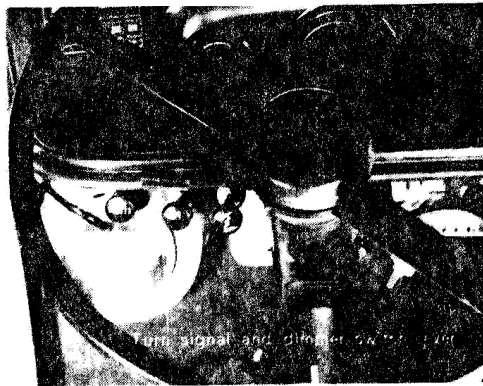
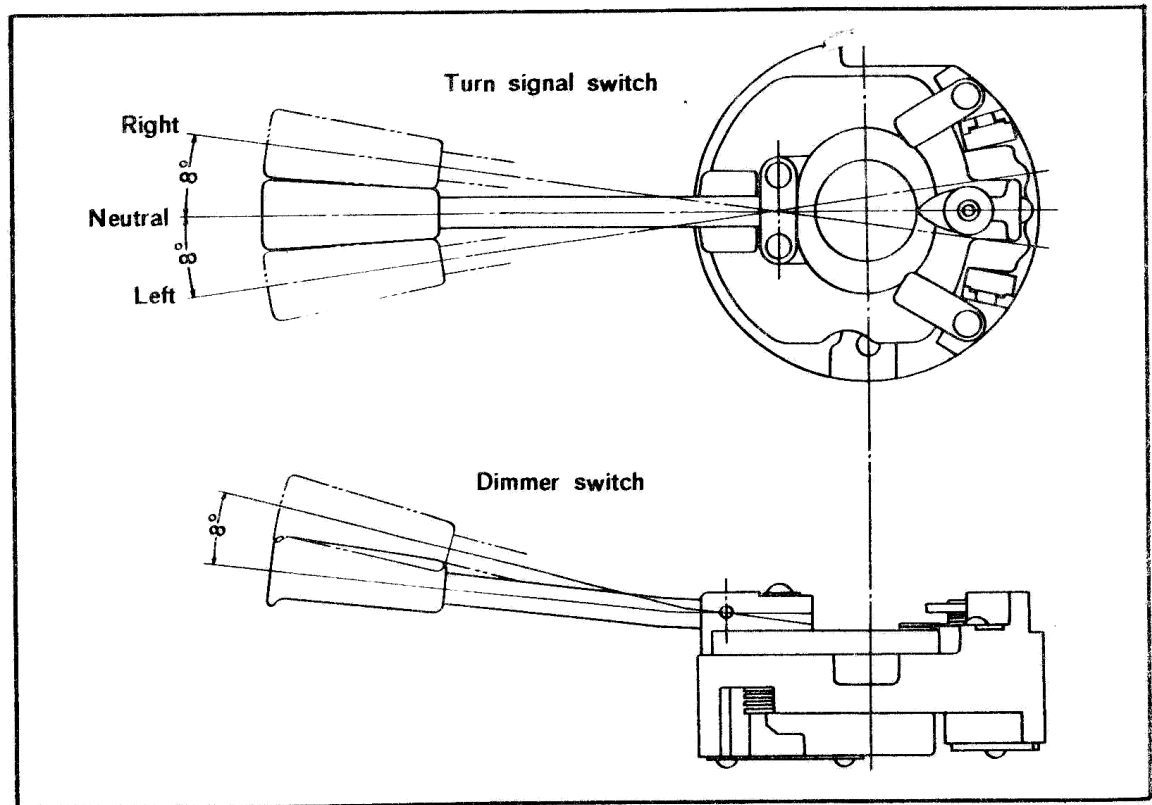
The switch and the compartment lamp are made as a unit. Operate the knob to turn on the lamp.

F: HORN SWITCH

This switch is located at the center of the steering wheel. The horn sounds when this switch is pressed lightly.



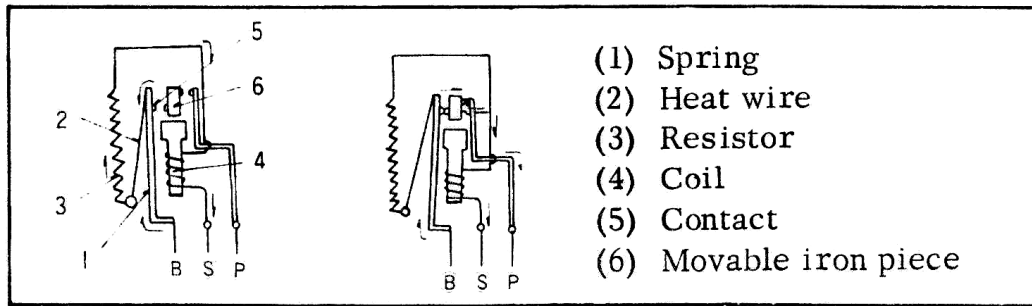
G: TURN SIGNAL AND DIMMER SWITCH



- (1) The beams of the headlights which turned on by the lighting switch can be directed up or down with the turn signal and dimmer switch lever projecting out on the left side of the steering column.
- (2) When the turn signal and dimmer switch lever projecting out from the left side of the steering column is raised, the right turn signal lamps (both front and rear) flash; when the lever is lowered, the left turn signal lamps (both front and rear) flash.

H: TURN SIGNAL UNIT

(1) Construction and operation



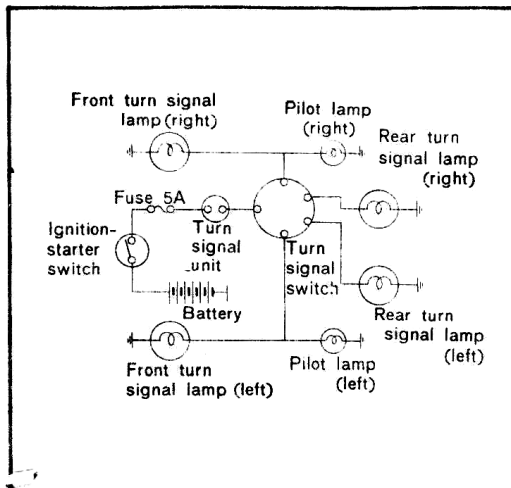
When the turn signal switch is turned on, the current flows in the direction indicated by the arrows in the above drawing, left side, i.e. terminal (B) → spring → heat wire → resistor → coil → terminal (S).

When the turn signal switch is turned on, the heat wire is heated by the resistance, the current is expended and the flash bulbs do not light. However, the heated heat wire elongates and the contact point closes because of the effect of the spring and the current flows as shown by the arrows in the above drawing, right side, i.e. terminal

(B) → spring → contact point → movable iron piece → spring → coil → terminal (P) and since the resistance is not in the circuit, a large current flows; the flashes bulbs light brightly and the pilot lamp lights at the same time.

Now, since practically no current flows in the heat wire, it cools and contracts. It pulls back the moving iron piece against the magnetic force; the contact point opens and returns to its former position.

(2) Connection diagram



Now that you understand the construction and operating principle of the flasher from the explanation given in (a) above, utilize the connection diagram shown here as a reference when troubles occur. (Refer to the section on switches for the connection of the turn signal switch.)

(3) Troubles and countermeasures

- (a) If the turn-signal lamps light continuously and brightly, replace the turn-signal unit.
- (b) If both the left and right turn-signal lamps do not light, remove the terminals of the turn-signal unit (B) L; connect these mutually. If the left and the right turn-signal lamps light respectively when the switch is turned to the left and right, the unit is defective and must be replaced. If one or both of the lamps do not light in the above case, then check the switch, wiring, bulbs, ground connection and so forth. Also, check to see if light bulbs smaller than the specified wattage are used.
- (c) When either the left or right side turn-signal lamps do not light or when they light dimmly and continuously, the turn-signal unit is not defective. Check the light bulbs of the defective side for burned-out and insufficient wattage bulbs. (for the turn-signal lamps, 23/7W double filament lamps are used and sometimes they are mistaken for the parking or tail lamps (7W). Also, check the ground connection of the lamps and poor contacts in wiring of the defective side.
- (d) When only one of the front or rear flasher lamp does not light, the turn-signal unit is not defective. Check the bulb of the lamp which does not light for broken connection and poor ground connection.
- (e) When the cycle of flashing is too high (over 110 times per minute) Check that both the front and rear lamps are flashing. If so, check the light bulbs and replace them with specified bulbs. If not, replace the un-lit bulb with specified bulb.
- (f) When the cycle of flashing is abnormally low (less than 50 times per minute) make sure that all the bulbs are of the specified wattage. Allow the flashers to operate and ascertain that the voltage is over 11V. Also, disconnect the wire of the terminal (B) and connect a DC ammeter between the terminal and wire. Then, turn the switch either to the left or right and check to if an excessive current (over 5A) is flowing.

I. HAZARD SWITCH

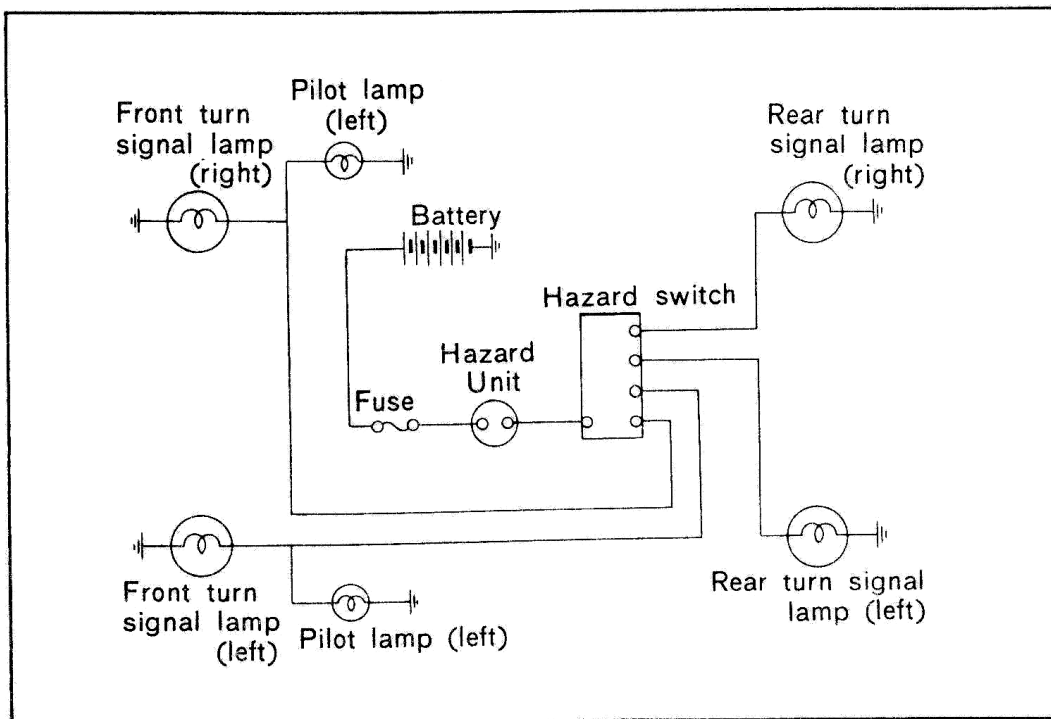
(1) Make and operation

The hazard switch is made after heat-band snap-action method. When the knob on the hazard switch is pulled, the electric current flows in the following way.

Terminal (B) - Heat band - Resistor - Terminal (L).

When the switch is on, the heat-band is heated and the resistor is short-circuited by snap action, and the heat band is cooled and shrink to its original form.

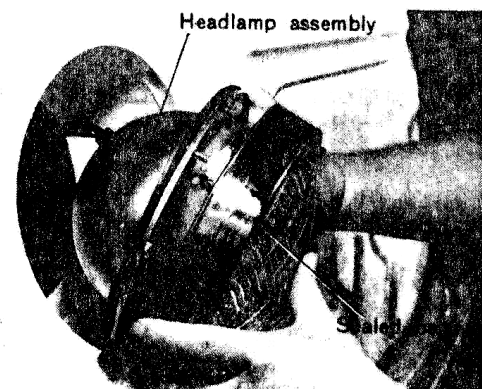
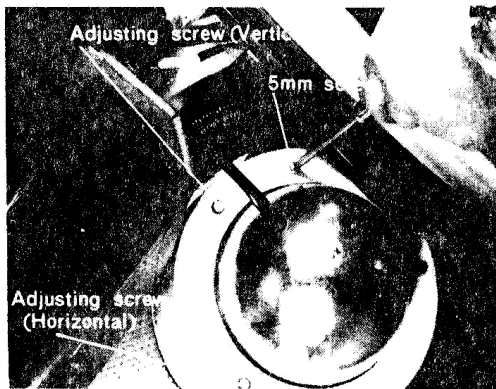
This process is repeated and all the 4 flashers repeat their flashing.



3. LAMPS

Name	Capacity	Quantity	Remarks
Headlamp	50/40W	2	
Front turn signal lamps	23/7W	2	Serves also as parking lamps (7W)
Rear turn signal lamps	"	2	Also as tail lamps (7W) and stop lamps (23W)
Compartment lamps	5W	2	
License plate lamp	8W	1	
Illumination lamps	3W	2	for speedometer and fuel gage
Charge pilot lamp	3W	1	
Turn signal pilot lamps	3W	2	
Beam pilot lamp	3W	1	
Oil pilot lamp	3W	1	
Side marker lamps	3W	2	
Back-up lamp	12W	1	

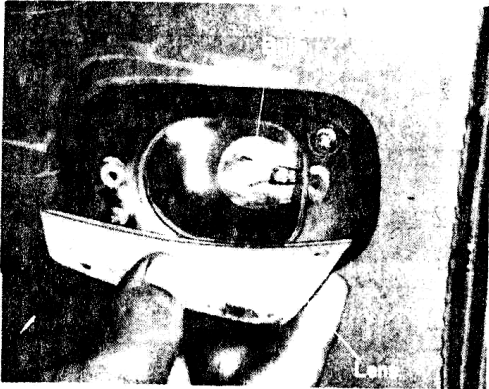
A: HEADLAMP



- (1) The headlamp is of a all-glass sealed beam type.
- (2) Two filaments, 50 and 40W, are encased in the bulb and the lights are changed over by means of a dimmer switch.

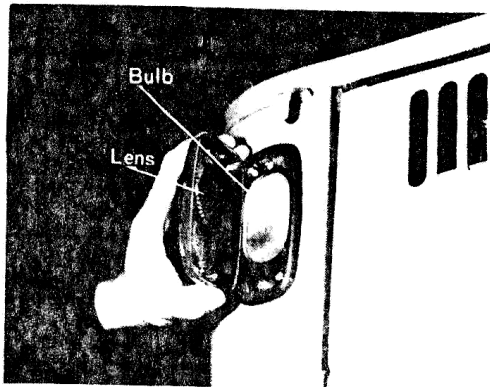
- (3) Adjustment is performed with screws.
- (4) To replace the sealed beam unit, remove the four 5mm mounting screws and detach the headlamp assembly. Then, remove the two adjusting screws, a spring and three 4mm screws and disconnect the cord connector.

B: FRONT TURN SIGNAL LAMP



- (1) The bulb is a double-filament (23/7W) and this lamp also functions as a parking lamp (7W).
- (2) Remove the lens mounting screws and lens. Then, turn the bulb to the left while pushing it to remove.

C: REAR COMBINATION LAMP



- (1) The bulb of this lamp is a double-filament type (23/7W). The turn signal lamp (23W) and stop lamp are changed over by means of the turn signal switch. (When the right signal lamp and the stop lamp are used simultaneously, the right side is connected to the turn-signal circuit and the left side is connected to the stop circuit

automatically by the turn signal switch). This lamp functions also as the tail lamp (7W).

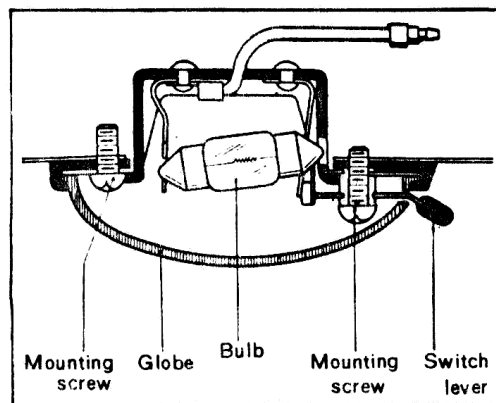
- (2) Remove the lens mounting screws and lens. Then turn the bulb to the left while pushing it to remove.

D: LICENSE PLATE LAMP



- (1) This light is activated when headlamps and/or parking lamps are on.
- (2) The bulb is a 12V/8W.
- (3) When removing the bulb, remove the globe mounting screws and turn the bulb to the left while pressing the bulb.

E: ROOM LAMP

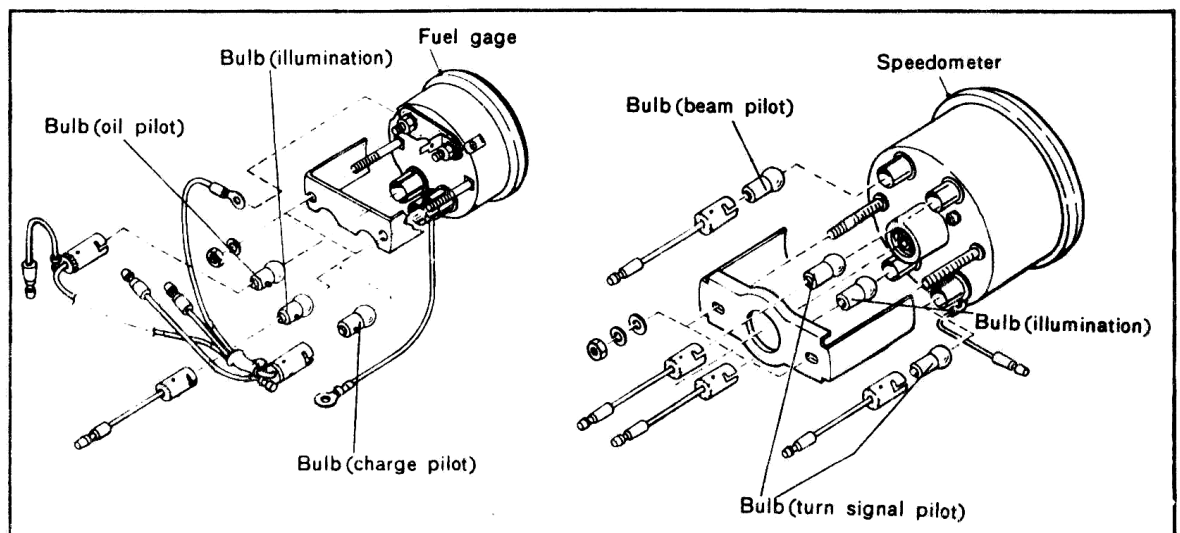


- (1) The bulb is a 12V/5W.
- (2) The bulb can be removed by loosening the packing and pulling out the globe.

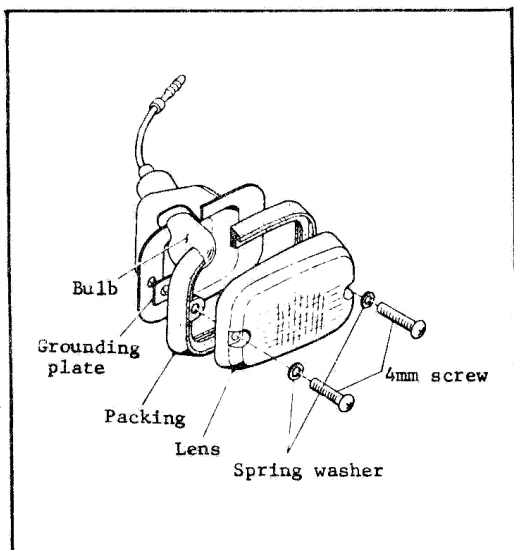
F: PILOT LAMPS AND ILLUMINATION LAMPS

These lamps light in conjunction with the headlamps, parking lamps and each unit.

To replace the bulbs, pull out the sockets at the back of the meters. Turn each bulb to the left while pressing it to remove.

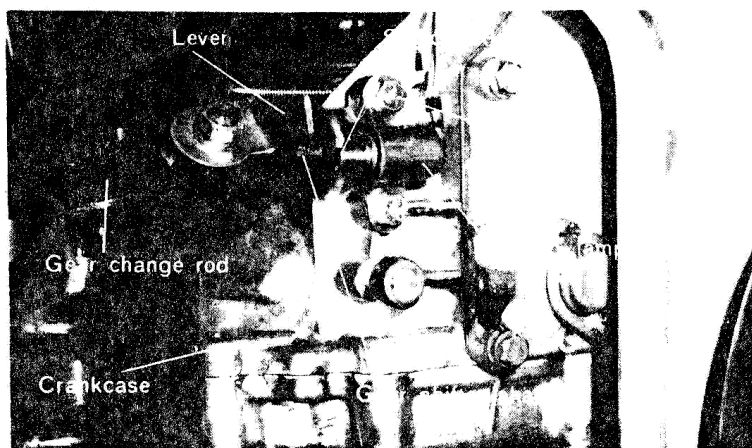


G: BACK-UP LAMP



- (1) The back-up lamp is provided in the lower portion of the rear right-side combination lamp.
- (2) The bulb is a 12V - 12W.
- (3) To replace the bulb, remove the lens by removing the two 4 mm screws and turn the bulb to the left while pressing it.
- (4) Do not forget to attach the grounding plate when reinstalling the lens:

H: BACK-UP LAMP SWITCH

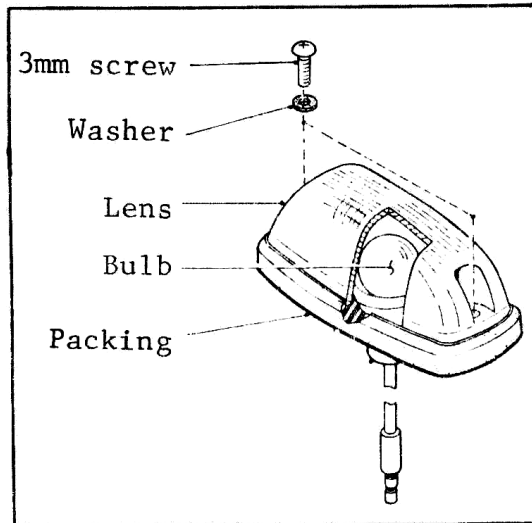


- (1) The switch is installed on the upper side of the crankcase by the two 6 mm bolts and operated by the lever on the tip of the gear change rod.
- (2) When reinstalling the lever and/or the switch, move the gear shift lever to the reverse position and adjust the switch position so that the switch operates surely.
- (3) The stroke of switch axle is about 8 mm (0.32 in) and the stroke when the switch is on is about 2.5 mm (0.098 in).

(CAUTION)

Be sure that the switch does not activated in the lever position other than reverse position.

I: SIDE MARKER LAMP



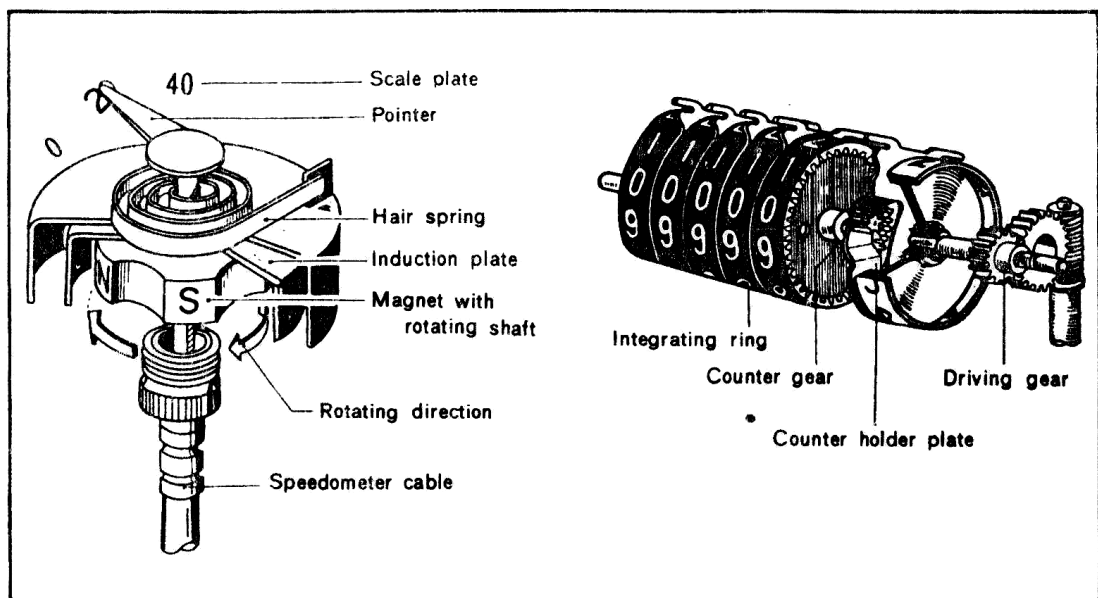
- (1) Side marker lamps are installed on both (right and left) side of the cabin roof.
- (2) The bulb is a 12V - 3W.
- (3) When replacing the bulb, remove the lens by removing the two 3 mm screws and turn the bulb to the left while pressing it.

4. SPEEDOMETER

A: CONSTRUCTION

The speedometer consists of a speed indicator composed of a magnet with a rotary shaft, an induction plate (ring) with a pointer and a hair spring which balances the torque, and an integrating meter composed of integrating rings and special gears for driving the integrating rings. The indicator shaft is equipped with a damper to prevent fluctuation of the pointer.

B: OPERATING PRINCIPLE



(1) Speed indication

As shown in the abovementioned figure, with the rotation of the magnet, a torque is created in the induction plate and the speed of the vehicle is indicated when the above torque balances with the counter force of the hair spring.

The rotating magnet is driven by a sealed wire cable fitted in the driving shaft. The torque induced in the plate changes in corresponding to the rotating speed of the magnet (the speed of the vehicle) and is balanced by the hair spring and transmitted to the pointer.

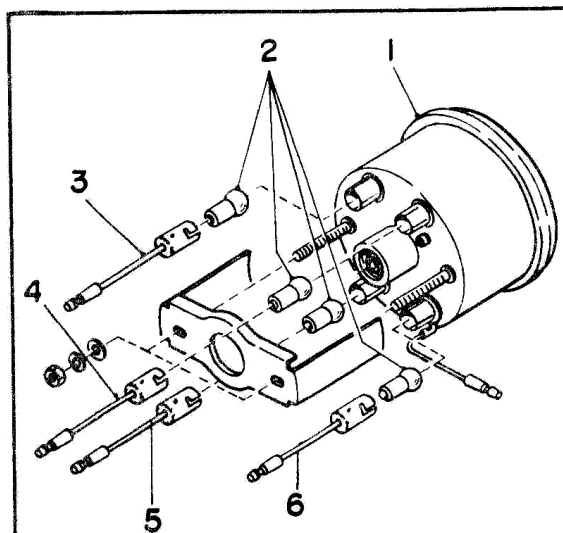
The integrating indication is performed by driving the integrating rings with the rotation of the speedometer shaft through special gears. That is, the extreme right (lowest digit) integrating ring is turned by a special gear. Then, the torque is transmitted successively to the integrating rings of higher digits for integration of mileages.

(2) Headlight lamp changeover pilot lamp

The red lamp is connected to the headlight lamps changeover switch and indicates that the headlamp beams are directed upward.

(3) Turn signal pilot lamp

The green lamp is connected to the flasher unit and indicates the operating condition of the flasher lamps.



(4) Removal of the speedometer and replacement of the bulb

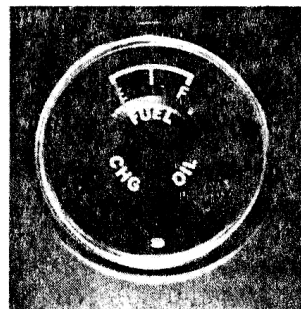
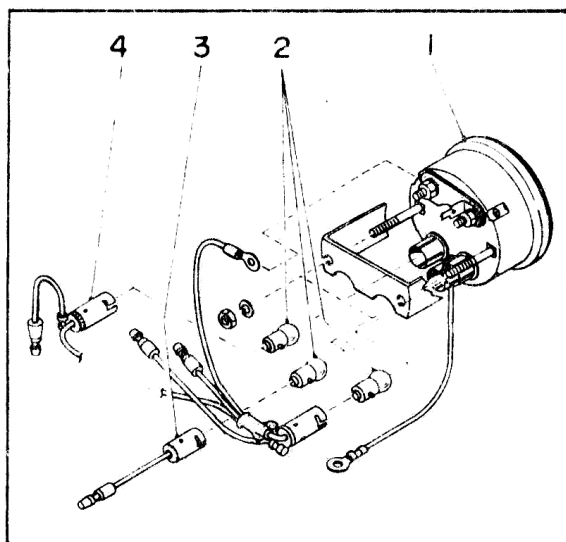
When the two 5mm mounting nuts on the back of the instrument panel are removed, the speedometer can be taken off from the front side of the instrument panel.

For replacement of the bulb, press the socket and turn it counterclockwise to remove the socket. The bulb can be removed in the same way.

- (1) Speedometer
- (2) Bulb (12V 3W)
- (3) Cord (beem pilot)

- (4) Cord (illumination)
- (5) Cord (turn signal pilot)
- (6) Cord (turn signal pilot)

5. FUEL GAGE



- (1) Fuel gage
- (2) Bulb (12V 3W)
- (3) Cord (illumination)
- (4) Cord (Oil pilot, charge pilot and fuel gage)

The fuel meter is mounted on the instrument panel next to the speedometer by the same mounting method.

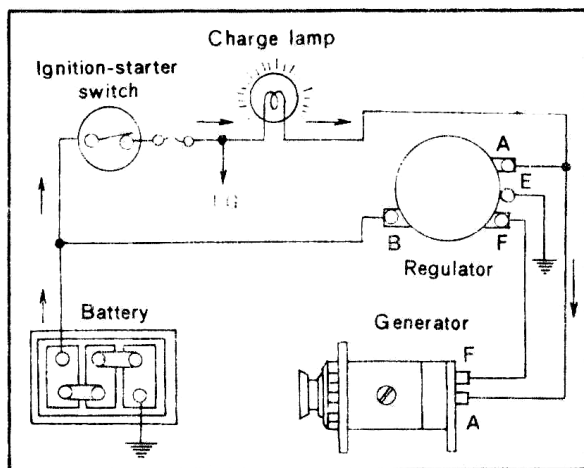
In the fuel meter are combined the fuel meter, oil pilot and charge pilot lamps.

A: CHARGE PILOT LAMP

The charge pilot lamp lights brightly when the key switch is on. It goes out when the cut-out relay closes by starting of the generator to generate the charging current after the engine has been started. If the lamp does not go out even when the generator is rotating with enough speed, then the generator and/or the regulator must be checked.

However, the lamp may light dimmly, even if the generator is operating fully, (at times), when a poor contact exists in the key switch, fuse or the contact point of the relay.

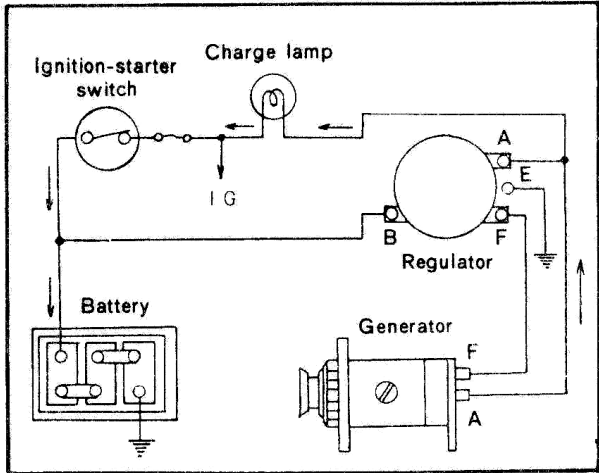
A condition such as this has practically no effect on charging of the battery.



(1) Operation of the charge pilot lamp

- (a) When the key switch is turn on.
When the engine switch is turn on, current flows from the battery in the order of the charge lamp and armature of the

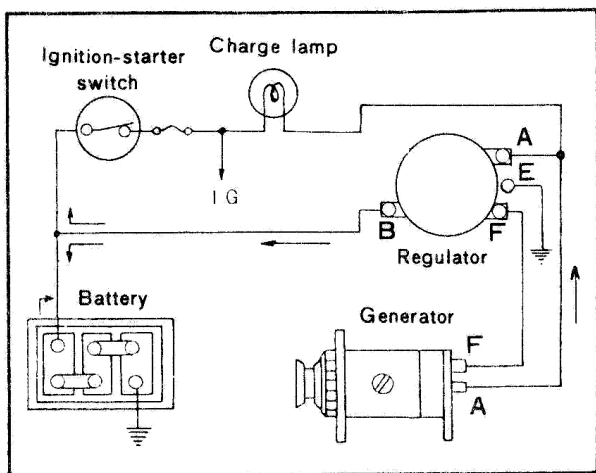
generator as indicated by arrows in the figure and the lamp lights. (The lamp and armature of the generator are connected in series). However, since the resistance value of the armature is very small as compared to that of the lamp, practically all of the battery voltage is applied to the lamp and the lamp lights.)



- (b) When the engine starts
When the revolution of the generator rises and the generator starts to generate after the engine has been started, the generator tends to send its current into the battery as opposite to that of (a) above. Consequently, a voltage which is the difference between the battery terminal voltage and

generated voltage of the generator is applied to the charge pilot lamp. For instance, if the battery voltage is 12V and the generator is generating a voltage of 10V, a voltage of 2V is applied to the lamp.

Thus, when the generator voltage becomes equal to the battery voltage (12V), the voltage applied to the lamp becomes zero and the lamp goes out completely.



- (c) When the generator voltage rises
When the engine revolution rises and the generator voltage becomes higher than the battery voltage, a voltage difference is again applied to the lamp and the lamp lights as before. However, when the voltage of the generator rises to 12.5V, the cutout relay closes and a new

circuit is formed for the charging current in addition to the circuit through the lamp. This shorts the charge lamp circuit and the lamp does not light.

(2) Oil level pilot lamp

When the amount of the oil in the oil tank is less than 0.5 l , the float in the oil level unit is lowered; a contact point inside the unit closes and the yellow lamp inside the meter goes on. When this lamp lights, replenish the oil.

B: FUEL METER

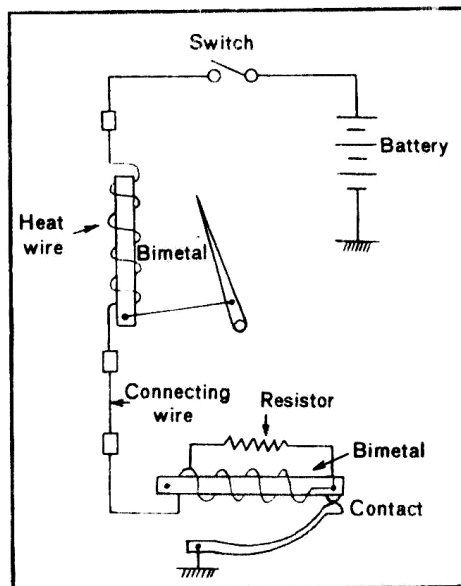
The fuel meter is a kind of electric meter. A general explanation of its operating principle is given below.

(1) Operating principle of the electric meter

Ordinary oil pressure meters, fuel meters and water thermometers utilizes the characteristics of a bimetal and each gauge can be understood all in the same way. Each meter consists of a gauge and a unit and these two are connected by a wire.

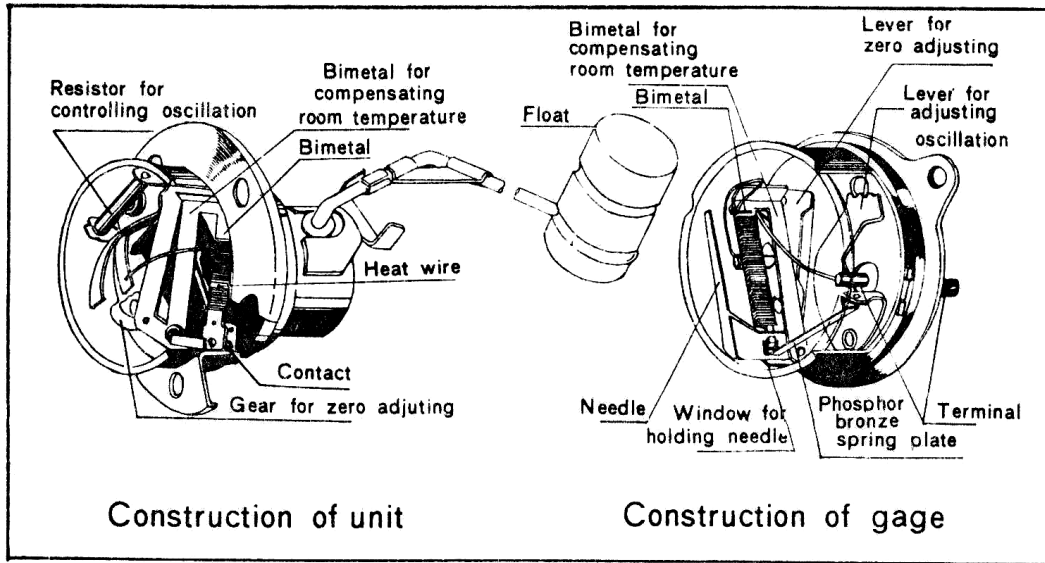
When the key switch is turned on, a current flows through the heat wire of the gauge, the heat wire of the unit and the contact point and then is grounded.

With the flow of this current, heat is produced in the heat wires and this heat is conducted to the bimetal. Since the bimetal is made by laminating two different metals which have different expansion factor, when the bimetal is heated, the metal with larger expansion coefficient warps over toward the metal of smaller expansion coefficient. The degree of its warping is determined by the temperature or the amount of the current (current value x time during which the current has flowed). Since the amount of currents which flows



in the gauge is same that of the unit, the bimetal in the gage warps in proportion to the bimetal of the unit. The bimetal of the gauge is connected to the pointer and performs indications; the bimetal of the unit has a contact and this contact point has the function of determining the amount of current which flows in the heat wires.

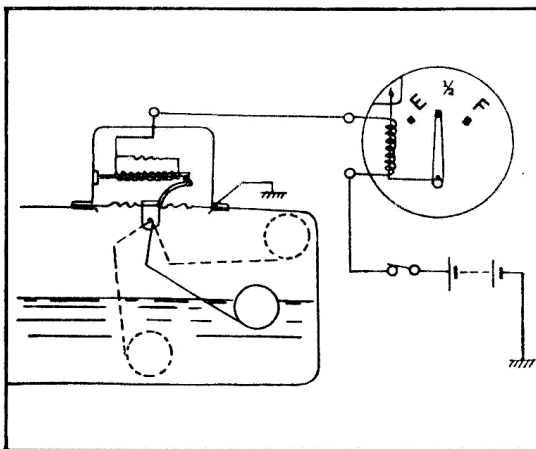
(2) Construction of the fuel gage



The fuel meter consists of a gauge and a unit.

On the scale plate of the gauge are marked readings of E, 1/2 and F. E indicates no fuel; F indicates a full tank. In the unit is provided a float which moves with the change in the fuel level.

- (a) When there is a small amount of fuel in the tank
 When there is only a small amount of fuel in the tank, the float comes down to near the lowest position and the contact is pressing very lightly. Under a condition such as this, the contact opens with a slight warpage of the bimetal caused by a small amount of heat or by a very short duration of current flow. Because of this the temperature of the gauge bimetal does not rise; the needle does not deflect and remains near E (empty). (When the float drops to the lowest position, the point opens slightly.)



- (b) When the fuel tank is half full
 When the fuel tank is half full as shown in the figure, the contact is being pressed harder than when the tank contains only a small amount of fuel and less harder than when the tank is full. Consequently, the temperature at which the contact opens is higher than that of

the former and is lower than that of the latter. Thus, the temperature is of a medium value.

In this manner when the temperature of the unit bimetal is of a medium temperature, the bimetal of the gauge is maintained also at the same temperature and the needle indicates 1/2 of the meter scale.

(3) Troubles and causes of the fuel meter

- (a) When the needle indicates always E (empty)
The line between the key switch and gauge is disconnected.
Poor conductivity on contact point due to a burned contact.
The float does not move. (The float arm is engaged by some reason).
- (b) When the pointer indicates always F (full)
A part of the wiring of the gauge and unit is grounded.
Heat wire is shorted or grounded.
- (c) When the pointer does not return to E even when the key switch is turned off
Deformed bimetal due to excessive current.
- (d) Unstable indication
Poor operation of the float shaft
Gasoline leakage in the unit
Heat wire is about to break.

Note: Indication of the fuel gage may vary within $\pm 2 \ell$ (2.1 US qt).

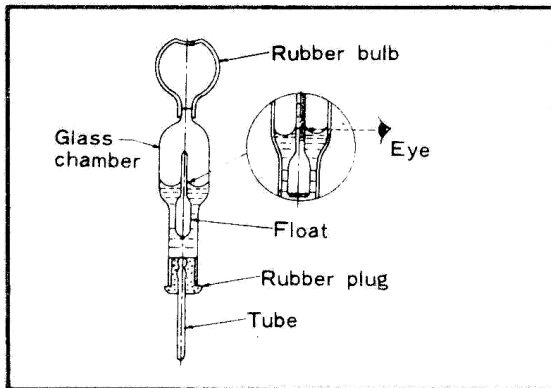
6. BATTERY

A: MEASURING THE SPECIFIC GRAVITY

A suction-type hydrometer is used to measure the specific gravity of the electrolyte. Insert the glass tube vertically in the electrolyte and slowly suck the electrolyte up into the tube. Read the indication where the upper surface of the electrolyte pushed up by the surface tension ends alongside the hydrometer floating in the tube. In this case, bring the eyes to the level of the surface of the electrolyte to observe. Wipe off the glass tube before using as any grease or oil on the inner surface of the glass will result in incorrect height of the solution. Also, lightly tap the glass tube before taking readings to make sure that the float moves freely. The specific gravity of the dilute sulphuric acid used in the battery changes with

temperature. The specific gravity of the electrolyte at 20°C is used as a standard. When the specific gravity is measured, the temperature of the electrolyte must be measured also for calibration.

READING OF HYDROMETER



Conversion equation

$$S = S_t + 0.0007 (t - 20)$$

Where S - Specific gravity when converted to that of 20°C

S_t - Measured specific gravity at $t^\circ\text{C}$

t - Measured temperature on Centigrade scale

0.0007 - Change in the specific gravity for 1° of temperature (Coefficient of the temperature)

B: PERIODIC INSPECTION OF BATTERY

Check the battery every 1000 km (600 mile) or every month according to the procedure below.

(1) Inspection of battery exterior



Check the case, cover, filler caps, terminals and so forth for cracks and dirt. Wash the exterior with water to remove sulphuric acid and wipe clean with dry rag. Rust can be prevented by applying grease to external parts of the battery.

(2) Checking the specific gravity of the electrolyte, temperature and electrolyte level

Measure the specific gravity and temperature of the electrolyte. Convert the measured specific gravity to that for 20°C and ascertain

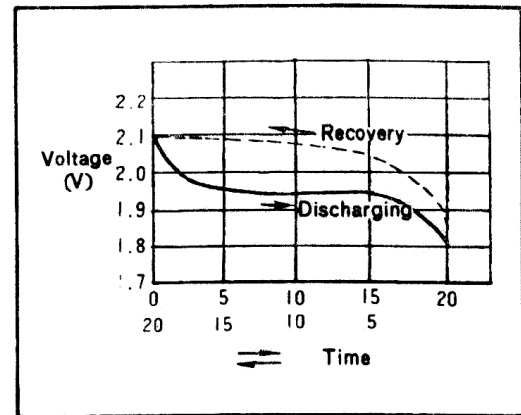
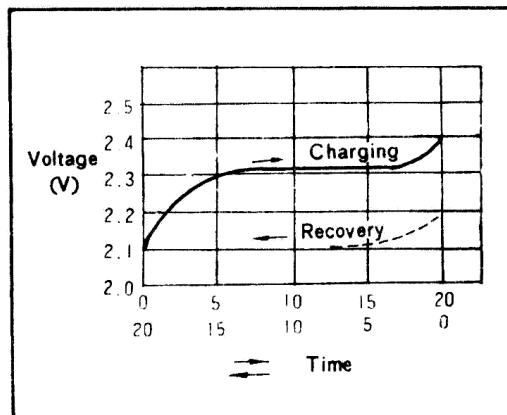
that it is between 1.220 - 1.280. (Take care so that it does not become lower than 1.220.)

Check the electrolyte level to see if it is below the specified level (Min. Level). If it is lower than the specified level, replenish distilled water. In this case, watch the long side of the battery and replenish distilled water until the electrolyte in each cell reaches the specified level. If the electrolytic level exceeds Max. Level, the electrolyte may spurt out when the vehicle is running. Do not use dilute sulphuric acid for replenishing since excessive sulphuric acid will increase the specific gravity and will damage the plates, separators and so forth.

(3) Measuring the voltage

When the battery is in an open condition (a condition in which the battery is neither charged nor discharged), its voltage is always about 2V per cell.

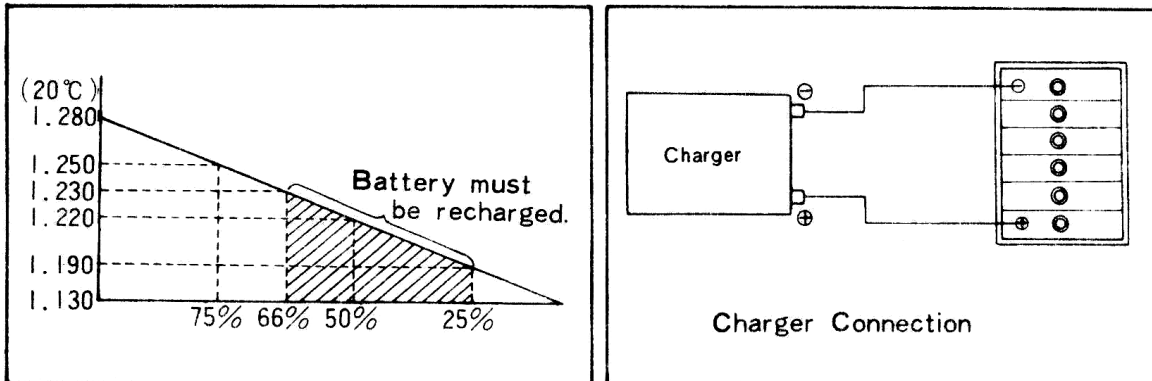
As shown in the figures, the voltage which has been raised or lowered by charging or discharging increases or decreases rapidly at first and then gradually and it eventually reaches an electro-motive force (about 2V) which corresponds to the concentration of the electrolyte. Thus, a measurement of the voltage when the battery is in open condition does not indicate the true state of the battery. For this reason, the voltage must be measured while the battery is being charged or discharged. A simple method for measuring the voltage is to measure using an Excel tester (a 4-0-4 voltmeter). Apply the tester to each cell and see if the voltage is over 1.5V after 5 seconds, and the voltage differences between the cells are less than 0.1V.



C: ORDINARY CHARGING AND RAPID CHARGING

The charge condition of a battery can be identified by measuring the specific gravity of the electrolyte while the battery is being used.

The relationship between the electrolyte and the charge condition of the battery is shown in the figure below.



(1) Ordinary charging

When the specific gravity of the battery electrolyte is below 1.220 (20°C or 68°F), the battery must be charged immediately by the ordinary charging method. When a charger is available, connect it as shown in the preceding figure and with a current of 3A, charge until the voltage and specific gravity reach the values of full charge and until the values measured every 30 minutes are constant for over three times.

(CAUTION)

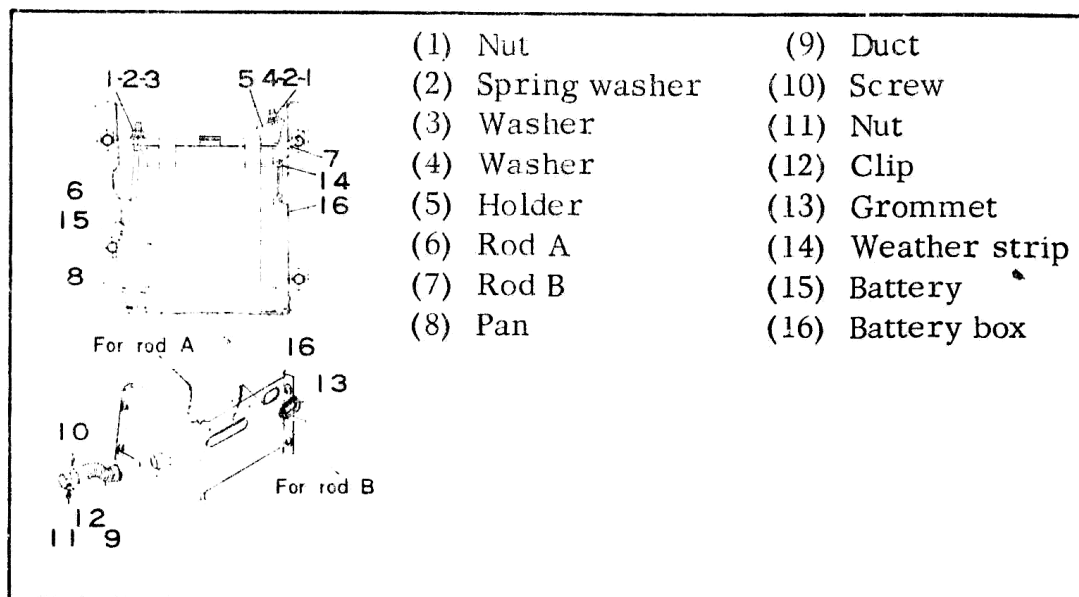
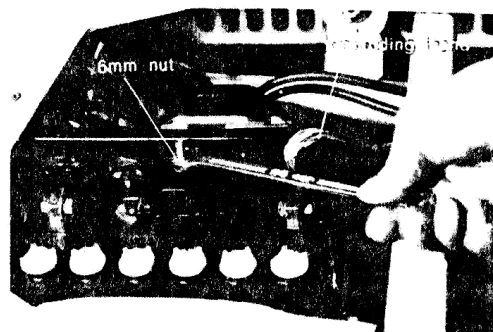
In this case, gas is discharged in great quantity from each cell. Be sure to remove all the filler caps and be careful of fire.

(2) Rapid charging

When it is necessary to charge a discharged battery in a limited time, the use of a rapid charger will charge the battery to some extent in a short time. In the rapid charging, a large charging current is used. However, a large charging current can be allowed to flow only at the start of the charging and since an excessive temperature rise accompanies the large current charging, a sustained use of this method will result in damage to the battery. Thus, when performing a rapid charging, it must be performed with a current which will keep the temperature within 40°C (104°F).

This method should be performed in an unavoidable case. Charging of the battery, as a rule, should be done using a small current and a long time.

D: INSTALLATION OF THE BATTERY



To remove the battery, loosen the two 6mm nuts which secure the holder (the nuts can be left remained on the rod), remove the grounding band of the battery cable and take out the battery from the box by holding the handle of the pan.

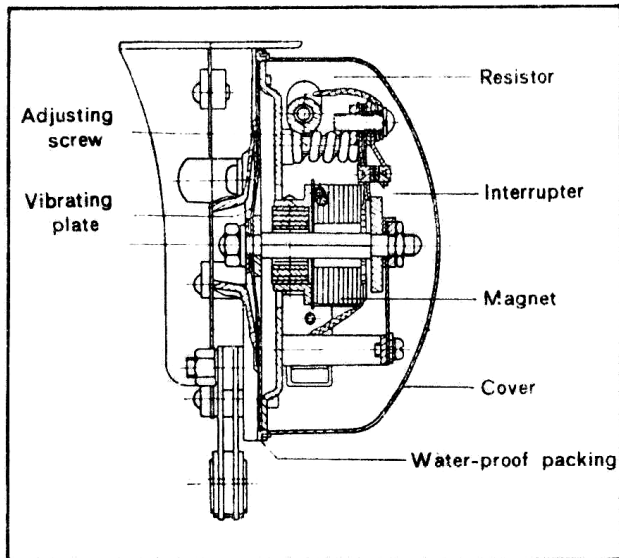
To remove the battery cable, first remove the grounding band and remove the cable taking care not to cause short-circuiting.

E: BATTERY FOR SUBARU 360 TRUCKS AND VAN

Yuasa	Type:	12N24-3
	Capacity:	12V-26 AH

7. HORN

A: CONSTRUCTION AND OPERATION



The horn is sounded by oscillating the vibration plate by means of the magnet and interrupter located inside the horn. The decrease in volume and deterioration of tone are caused by loose wiring terminals, lowered capacity of the battery, poor contact point of the horn button due to dirt, poor insulation of the arc-suppressor resistor and so forth.

Check these.

When the horn does not sound, check the wiring for the horn button inside the steering shaft and grounding wire of the rubber coupling of the steering shaft for broken connection. Also, when the point inside the horn is worn, replace the entire assembly. The life of the point will be shortened if it is polished with a file as this point is finished by an electrolytic polishing.

B: PRECAUTIONS IN HANDLING

- (1) When washing the vehicle be careful not to let water or oil get in the horn. If water or oil gets into the spiral tube of the horn, remove the horn from the chassis, place the mouth of the spiral tube on its side and rotate it to force water or oil out.
- (2) When the horn does not sound properly, check the battery, horn button and lead wire.
- (3) Near the contact point, an adjusting screw with a spring is provided. If the horn does not operate properly, adjust by turning this screw either to the left or right and lock the screw at the position where the horn operates properly.
- (4) When attaching the cover, be sure to fully fit the water-proof rubber packing on the cover.

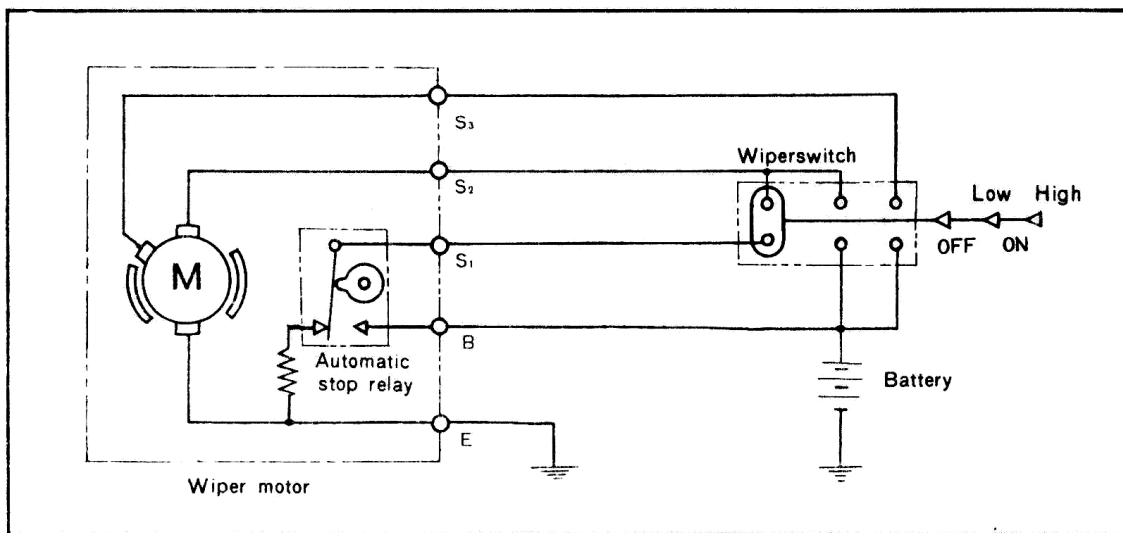
- (5) Since the horn has been adjusted precisely at the factory, avoid unnecessary disassembling.

8. WINDSHIELD WIPER

A: CONSTRUCTION OF WINDSHIELD WIPER

The rotation of a small-size DC Motor shaft is reduced by means of the gears and converted into a reciprocal motion by a link mechanism to obtain a wiping angle of 113° .

B: WIRING



C: PERFORMANCE

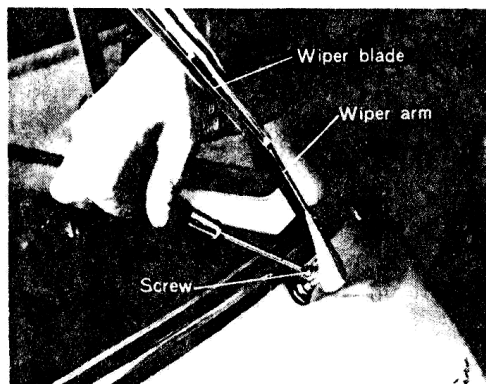
	Low	High
Maximum stop torque	80 Kg-cm (69.5 lb-in)	70 Kg-cm (60.8 lb-in)
Maximum current	14A	12A
Maximum reciprocating frequency	45 ± 5 rpm	65 ± 7 rpm
Wiping angle	113°	

D: REMOVAL AND INSTALLATION OF THE WINDSHIELD WIPER

(1) Removal

- (a) Disconnect the grounding wire of the battery cable.
- (b) Loosen the mounting bolt of the blade arm and remove the blade arm.
- (c) Next, pull out the rubber cap of the wiper arm shaft; loosen the shaft installation nut and remove the washer, rubber bushing etc. successively.
- (d) Take out the wiper from inside the compartment.
- (e) When the wiring are disconnected, the wiper can be taken out of the vehicle.

(2) Installation



The wipers can be installed by following the procedure for removal in reverse. However, pay attention to the points listed below. When the rubber cap attached to the tip of the wiper arm shaft is not proper, rain water will enter the interior by flowing along the shaft and may cause troubles. In a case like this replace the rubber cap.

Pull the water-proof rubber cap well over the oscillating tube; push the wiper arm fully into the shaft and tighten the bolt lightly. Turn on the wiper switch. Adjust the angle of the wiper to the windshield before securing.

CHAPTER 10: BODY

1. OUTLINE OF BODY	10- 1
2. OUTLINE OF EQUIPMENT	10- 5
3. MAINTENANCE STANDARDS	10- 9
4. DISASSEMBLY AND ASSEMBLY	10-10
5. PAINTING PROCESS AND RE-TOUCHING	10-19
6. HEATER	10-20

1. OUTLINE OF BODY

A: GENERAL

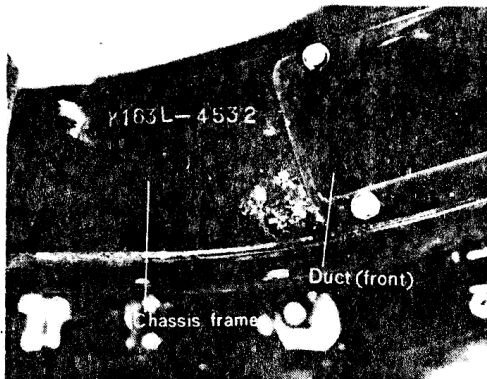
Since the "Subaru" light truck adopted a rear-engine and cab-over type layout, a wide cargo area is obtained and the displacements of the center of gravity in various loading conditions are very small. As a result, the best possible riding comfort for this size of light weight truck has been achieved. The cab doors are wide to facilitate getting in and getting out of the vehicle.

Basically, the Subaru light van is the same as the Subaru light truck but its side doors have been widened and a folding bench seat can be attached as required.

B: SPECIFICATIONS OF BODY

	TRUCK	VAN
Overall length	2995mm (117.9in)	2995mm (117.9in)
Overall width	1295mm (51.0in)	1295mm (51.0in)
Overall height	1545mm (60.8in)	1535mm (60.4in)
Cargo bed length	1785mm (70.3in)	1515mm (59.6in)
Cargo bed width	1185mm (46.7in)	1110mm (43.7in)
Cargo bed height	365mm (14.4in)	1170mm (46.1in)

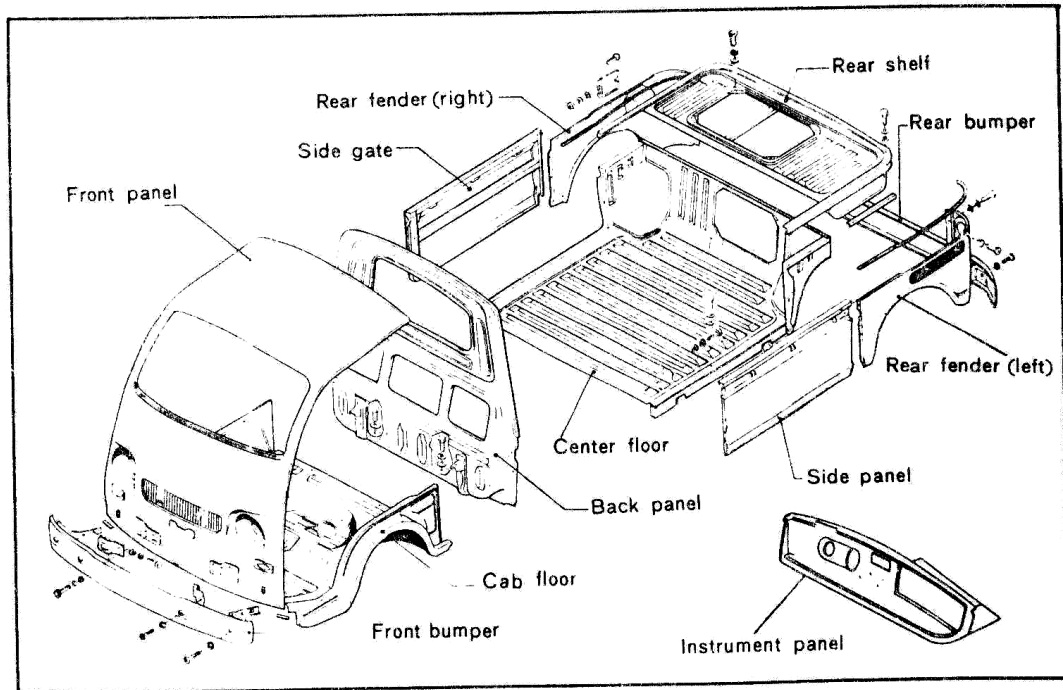
C: LOCATION OF CHASSIS NUMBER



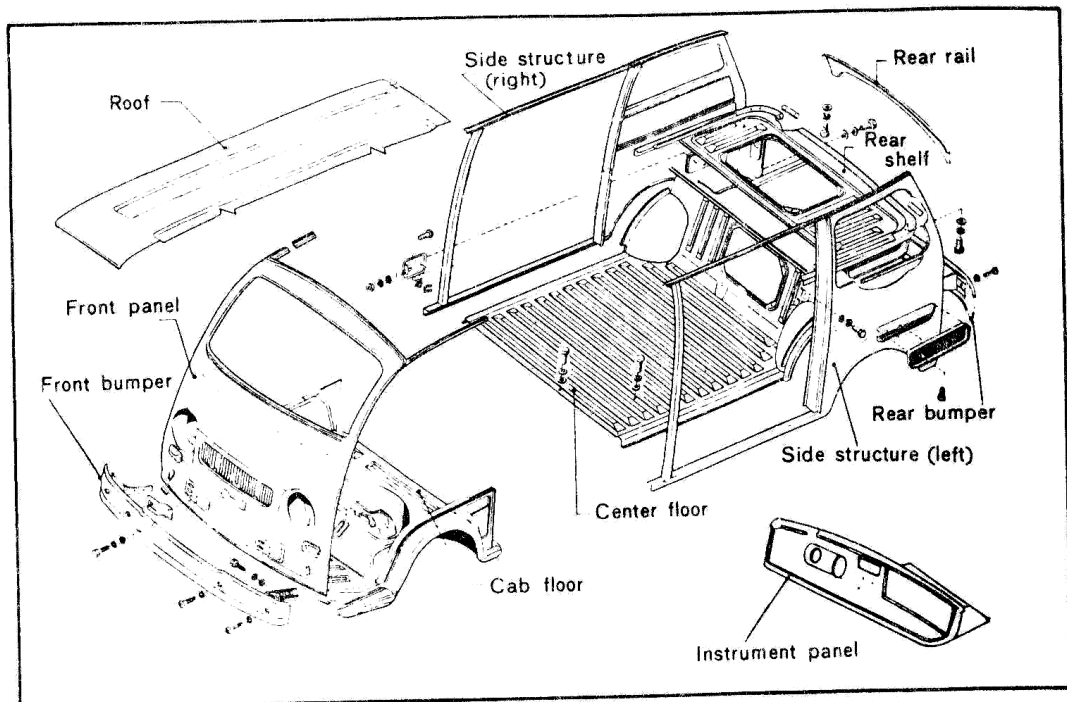
The chassis number is punched on the rear part of the duct (front) located on the right side of the chassis frame.

D: MAJOR COMPONENTS OF THE BODY

(1) Truck

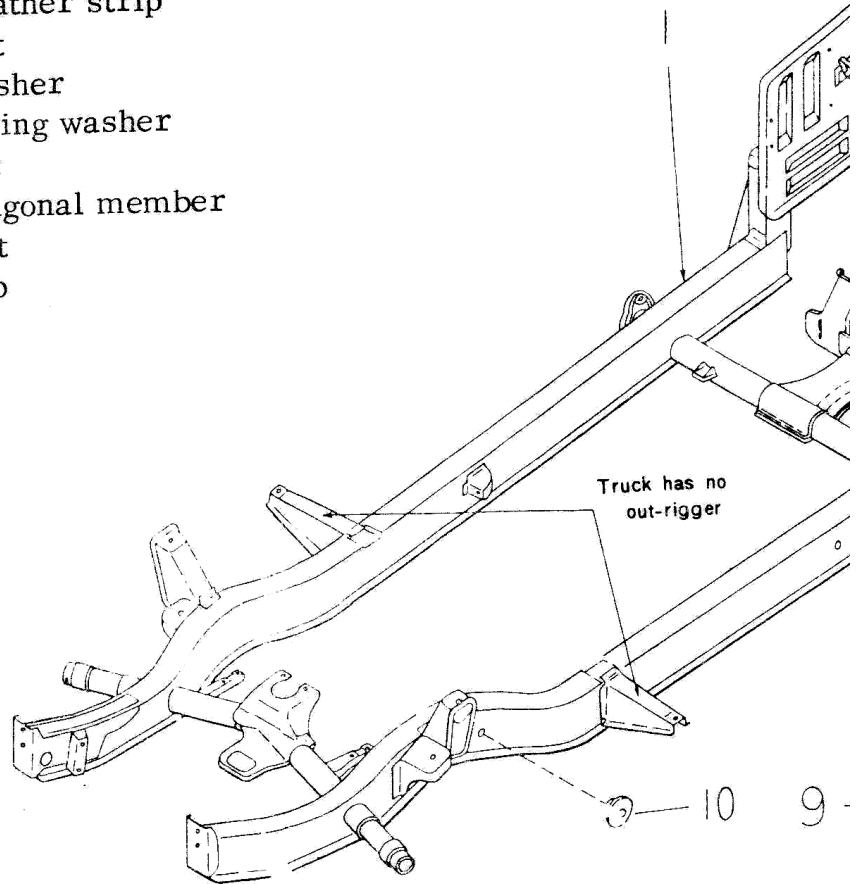


(2) Van

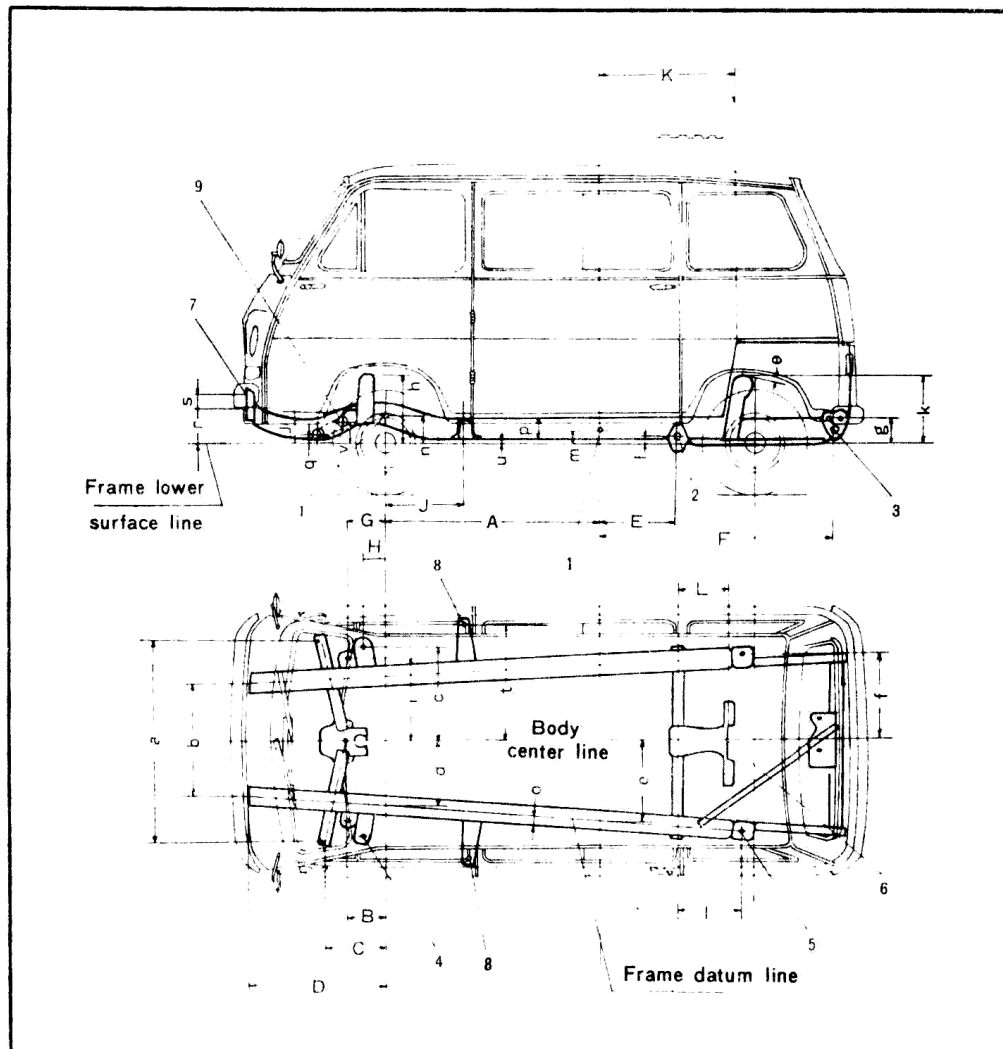


10-3

- (1) Chassis frame
- (2) Cross member (rear)
- (3) Weather strip
- (4) Bolt
- (5) Washer
- (6) Spring washer
- (7) Nut
- (8) Diagonal member
- (9) Bolt
- (10) Cap



STANDARD FRAME DIMENSIONS



- (1) Gage hole
- (2) Rear cross member center
- (3) Rear cross member center (engine support center)
- (4) Front damper bracket (damper lower side hole center)
- (5) Rear damper bracket (damper upper side hole center)
- (6) Engine mounting (front)
- (7) Cab and chassis frame (connecting hole center)
- (8) Outrigger hole center
- (9) Front cross member center

A=1000 mm (39.37 in)
B=269.3 mm (10.61 in)
C=383.8 mm (15.12 in)
D=747 mm (29.43 in)
E=310 mm (12.21 in)
F=1071 mm (42.19 in)

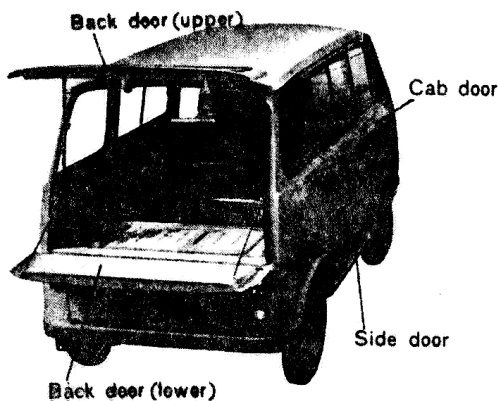
G=257 mm (10.13 in)
H=151 mm (5.95 in)
I=321.2 mm (12.66 in)
J=339 mm (13.36 in)
K=611 mm (24.07 in)
L=240.5 mm (9.48 in)

a=992 mm (39.08 in)
b=519 mm (20.45 in)
c=422 mm (16.63 in)
d=305.8 mm (12.05 in)
e=367.8 mm (14.49 in)
f=414.3 mm (16.32 in)
g=145 mm (5.71 in)
h=303 mm (11.94 in)
i=386 mm (15.21 in)
j=140 mm (5.52 in)
k=286 mm (11.27 in)

l=27 mm (1.06 in)
m=60 mm (2.36 in)
n=115 mm (4.53 in)
o=30 mm (1.18 in)
p=100 mm (3.94 in)
q=50 mm (1.97 in)
r=161 mm (6.34 in)
s=35 mm (1.38 in)
t=590 mm (23.23 in)
u=14 mm (0.55 in)
v=94.5 mm (3.72 in)

2. OUTLINE OF EQUIPMENT

A: DOORS



- (1) The cab door is a rear-hinge, front opening type convenient for getting in and getting out of the vehicle.

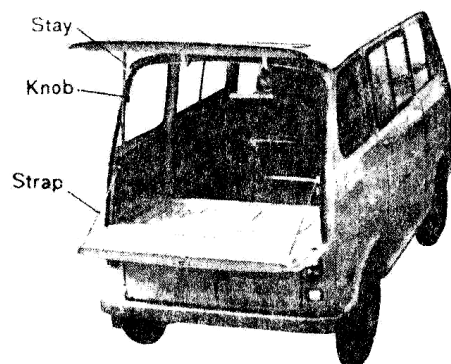
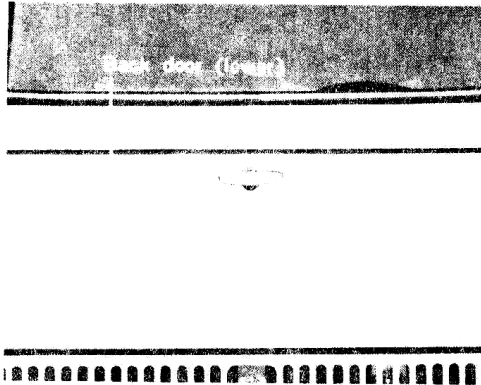
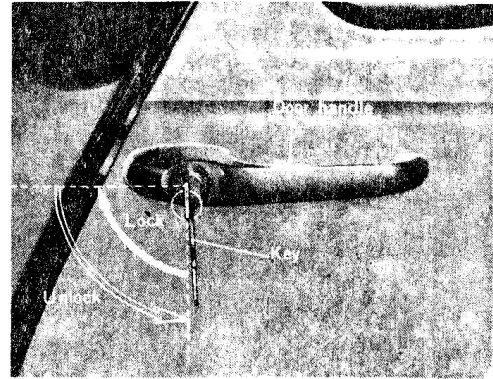
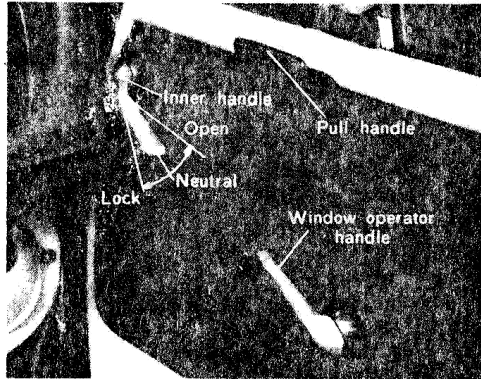
The glass is a vertical-moving type and has a single-arm regulator.

The locks for the cab doors and side doors are rack and pinion type. The back door can be locked securely with a slide type lock.

The outer handles for the cab and side doors are push-button type and that for the back door is a turn and pull type.

Right side cabin door can be locked from inside by turning the inner lever clockwise.

The other doors can be locked from outside using the key.



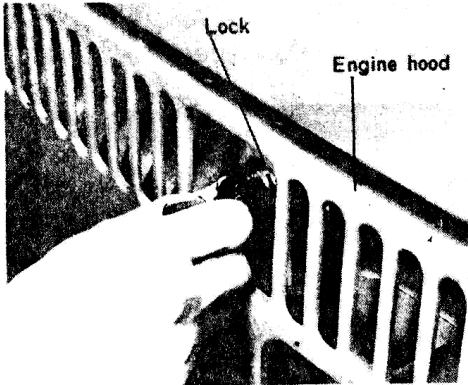
- (2) The back doors (upper) and (lower) can be opened by operating the back door handle. Moreover, when the back door (upper) is opened, the knob of the stay put in automatically and the door is locked in open position. During hot weather when it is desired to drive the vehicle with the back door open, the door can be prevented from rattling by tightening the knob. When the back door (lower) is opened, it becomes horizontal and kept parallel to the rear shelf by the support of the strap and is convenient for transporting long object.

By disconnecting the straps, the back door (lever) is dropped downward and loading and unloading will be more easy.

B: GATE

The gate is provided to Truck. The gate is equipped with protectors so that they are not damaged even if they fall on ground. Also, the gates are made removable for easy loadings and unloading.

C: HOOD

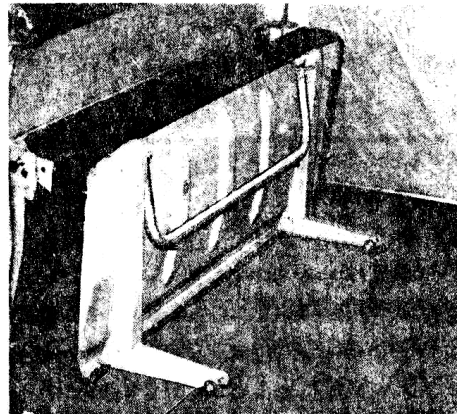
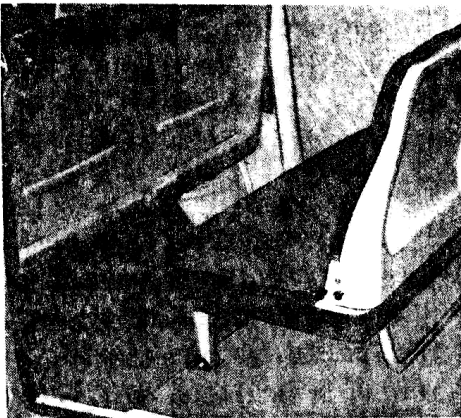


The hood is equipped with a lock and key. The hood can be closed only when it is locked with the key-plate, the possibility to forget of locking the hood is minimized. Also, for easy checking and maintenance of the engine, the opening angle of the hood is made wide.

D: SEAT

The seat is a bench type seat for two persons. The front seat cushion can be removed easily as the space underneath is used to house a spare tire and jack.

In order to utilize the cargo space to the greatest degree, the rear seat is a folding type seat.



E: GLASS

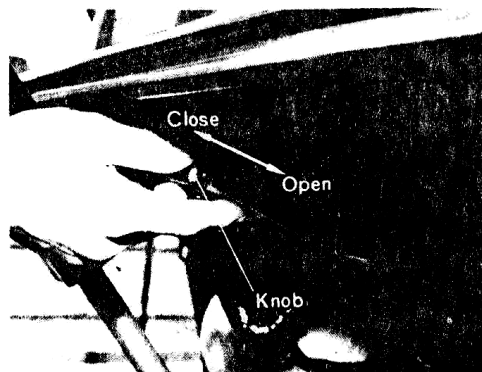
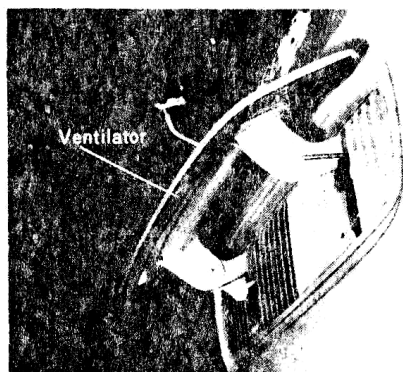
Every piece of the glass used has corners with small roundness to widen the field of view and makes the interior of the vehicle very bright.

F: INNER TRIMMINGS

For the trimming of interior, thick moisture-proof paper covered by vinyl leather is used. The trimming of the ceiling is secured by braces; the door and side linings are assembled firmly by the use of a combination of hooks and clips.

G: FRONT VENTILATOR

A ventilator is provided at the front of the body. When this is used together with the door ventilators, a cool driving is possible even on very hot summer day. The ventilator can be controlled by means of knob remotely.



H: INSTRUMENT PANEL

The instrument panel contains the meters, ashtray and glove box. The instrument panel can take care of small packages and improves the sturdiness of the front panel.

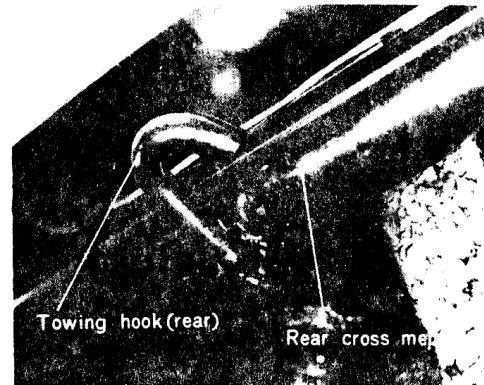
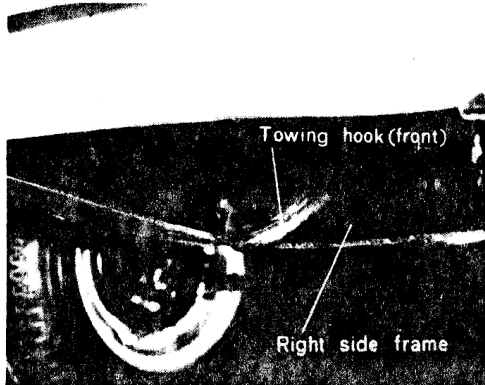
I: BUMPERS

The front and rear bumpers are single bumpers made of 1.4mm (0.057in) thick pressed steel plate and are attached to the chassis frame by means of stays.

J: TRACTION HOOKS

One traction hook is welded on the right front of the chassis frame and another on the cross member (rear).

The hooks have sufficient rigidity against the impact of traction time.



K: MISCELLANEOUS

Other equipments such as the rear view mirror, sun visor, marks, mats and so forth are attached. (Moldings are mounted for Model K163.

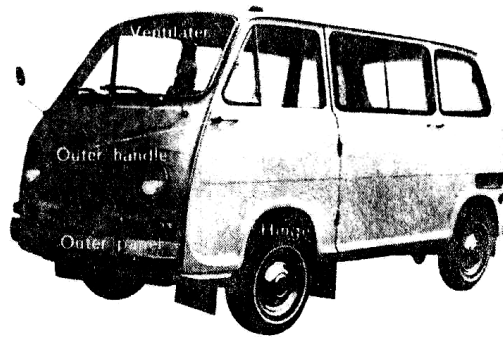
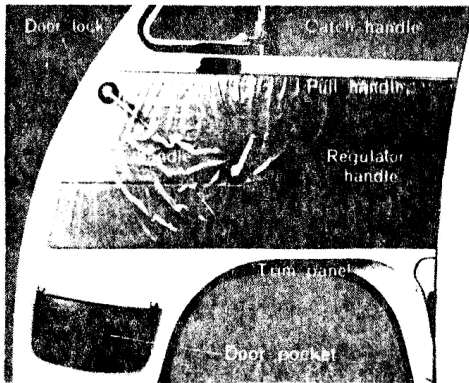
3. MAINTENANCE STANDARDS

A: INSPECTION OF VARIOUS PARTS OF THE BODY

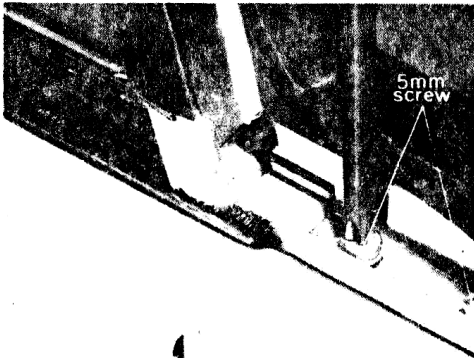
- (1) Check the gas-welded and spot-welded parts for cracks and separation and correct all defective parts.
- (2) Check various parts of the body for cracks, deformation and loose mounting bolts. Correct and re-tighten.
- (3) Check the weather strips for the doors for close adherence, damage and deterioration. Corret them, if any.
- (4) Check the door hinges
Check the doors for rattling by moving the doors up and down. When any door rattles or when any door is sagging or when any door does not more smoothly, loosen the hinge mounting bolts and re-tighten them while adjusting the door.
Lubricate each hinge through the hole at the center of the hinge.

4. DISASSEMBLY AND ASSEMBLY

A: MAIN PARTS FOR THE CAB DOOR

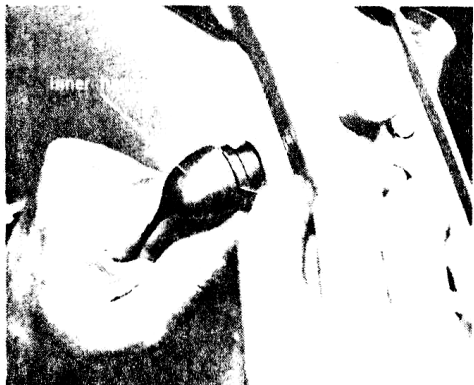


B: DISASSEMBLY OF THE CAB DOOR



(1) Removal of the ventilator

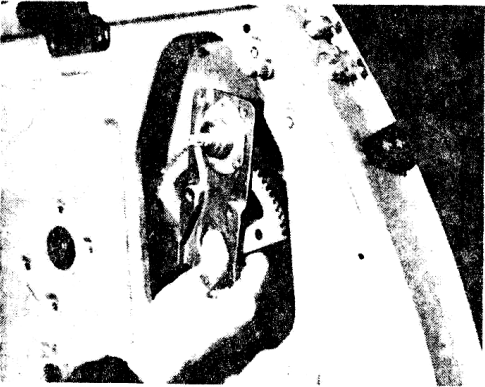
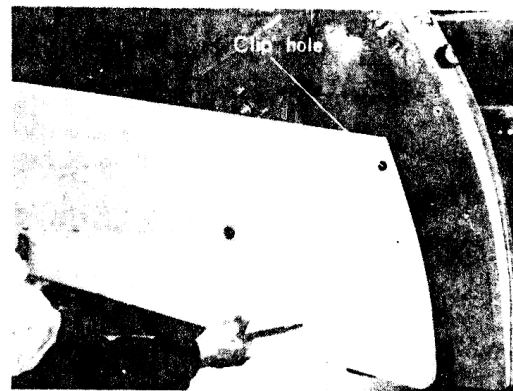
- (a) Open the ventilator; remove the plate by inserting the tip of a screwdriver.
- (b) Pull out the weather strips.
- (c) Remove the two screws for the upper and lower pivot. Then, the ventilator can be removed.



(2) Removal of the slide glass

- (a) When the escutcheon is crushed, a clip can be seen in the groove of the handle shaft. Push this clip out with a screwdriver to pull out the handle. In the same way, pull out the regulator handle.

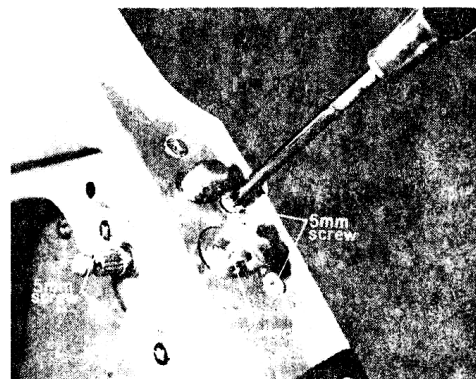
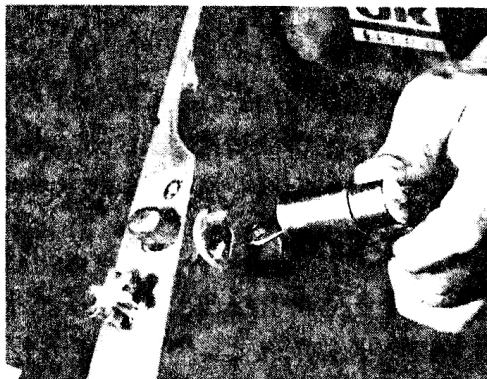
- (b) Pry the trim panel with a screwdriver and remove the nine clips to detach the trim panel.



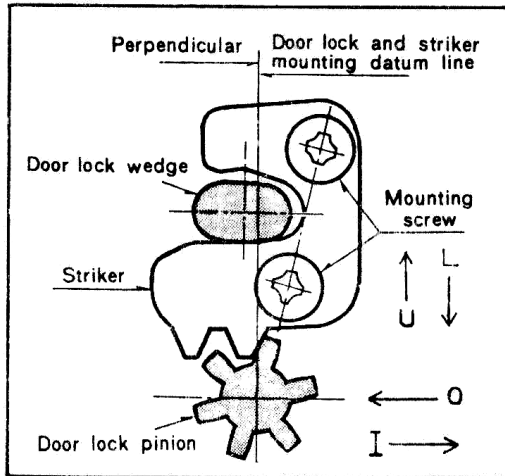
- (c) Peel off the sealing cover
Remove the upper and lower mounting screws of the center sash; pull the center sash so it is tilt forward, and slowly pull out the glass.
The glass is removed or installed with the arm of the regulator in horizontal position. When pulling the glass out, be careful not to damage the glass channel.

(3) Removal of the door lock

- (a) The door handle can be removed by removing the two mounting screws. Be careful not to drop the screws inside the door.
- (b) The door lock can be removed easily by removing the four mounting screws.

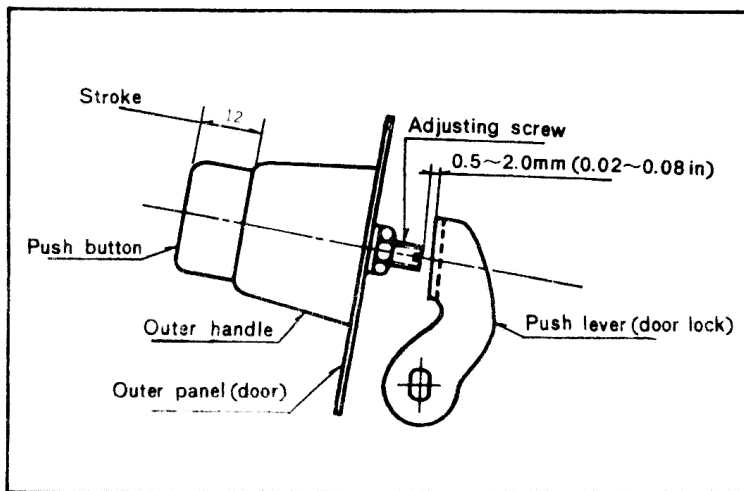


C: ADJUSTMENT OF THE CAB DOOR



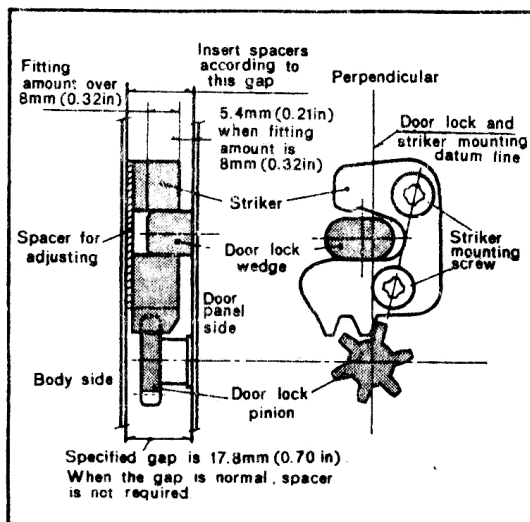
- (1) Adjustment of the outer handle and lock push lever.

Before installing the outer handle, adjust the play of the push button to 0.5 - 2.0mm (0.02-0.08in). When this play is too large, the door does not open even when the push button is fully pressed. If the adjusting screw is made too long, it pushes the push lever from the beginning and the door cannot be locked completely.



- (2) Adjustment of the striker

Adjust so that the wedge of the door lock will move in horizontally on the slide surface of the striker. The striker can be adjusted within the upper and lower circles (in the directions indicated by the arrows).

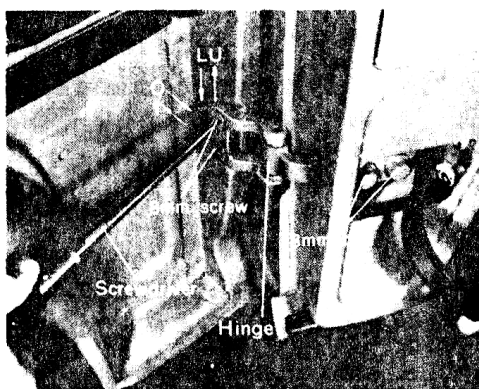
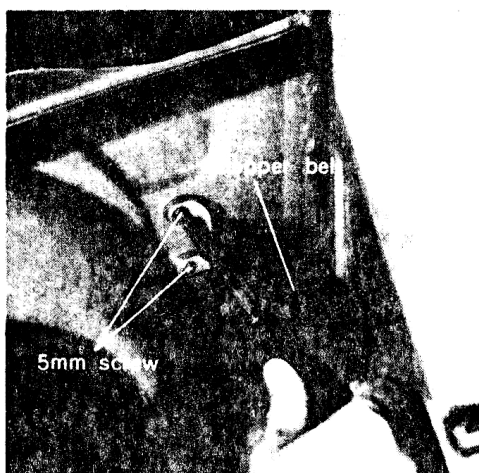
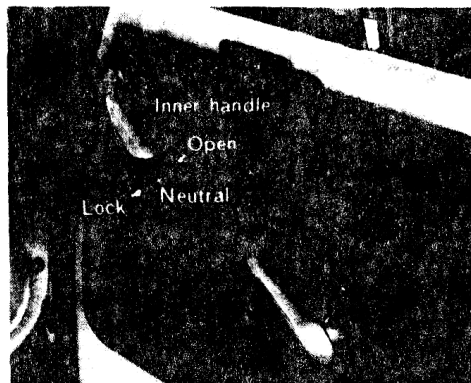
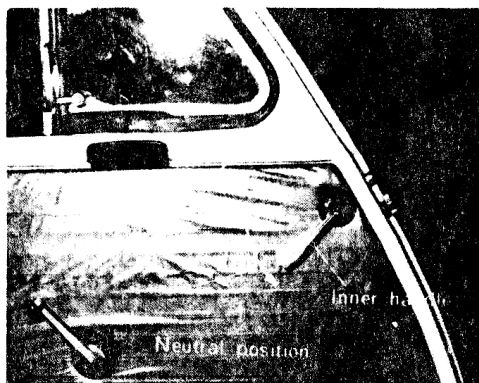


When closing of the door is too hard, the striker is to be adjusted in the direction of O mark. Adjust with the hinge mounting holes or spacers so that the fitting amount between the striker and door lock wedge is over 8mm (0.32 in). After adjusting, fully tighten the striker.

TIGHTENING TORQUE
0.4 - 0.55 Kg-m (2 ~ 4 lb-ft)

(3) Mounting angle of the inner handle (door lock)

When mounting the inner handle for door locking, mount it at the angle indicated below.



(4) Adjustment of the door hinges

When the fitting of the door is out of order and the striker cannot be adjusted, adjust by loosening the hinge mounting bolts.

To loosen the mounting bolts of the hinges, remove the stopper belt and trim panel.

When the hinge mounting bolts are loosened, the adjustment in the direction FB becomes possible as the hinge bolt holes are slit shape. Also, when the hinge plate mounting screws of the pillar side are loosened, a slight adjustment in the directions of UL and OI becomes possible. After adjustment, fully tighten the screws.

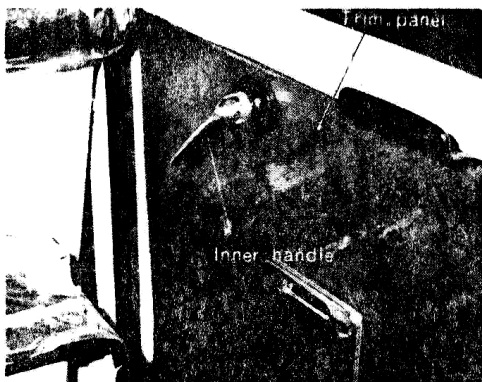
TIGHTENING TORQUE	
1.4 ~ 1.6 Kg-m	(10 ~ 11 lb-ft)

D: ADJUSTMENT OF THE SIDE DOOR (VAN)

(1) Adjustment of the door lock and related parts

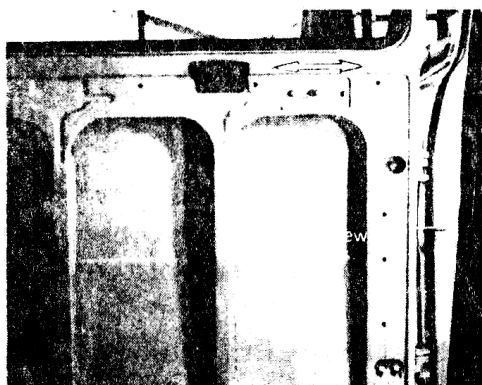
The hinges, door lock and outer handle are adjusted according to the same procedure as for the cab door.

When the inner handle is turned, if the door does not open because of poor operating condition of the door lock, adjust according to the procedure below.



- (a) Crush the escutcheon and remove the clip of the handle shaft with a screwdriver to pull out the inner handle.

- (b) Pry the trim panel with a screwdriver and pull out the clips to remove the trim panel.



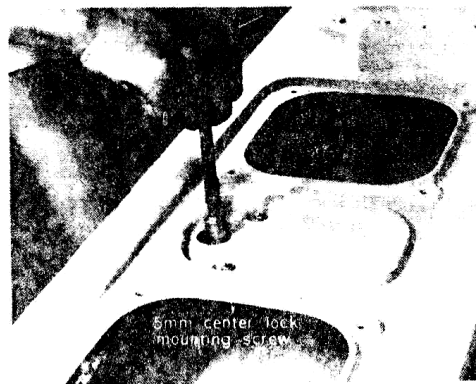
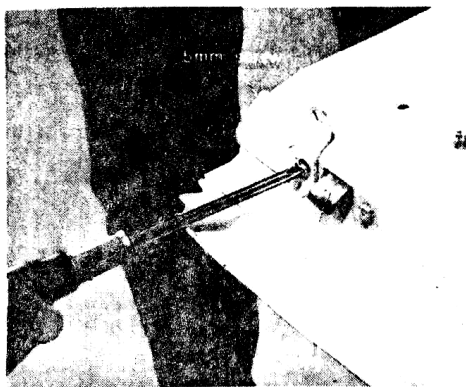
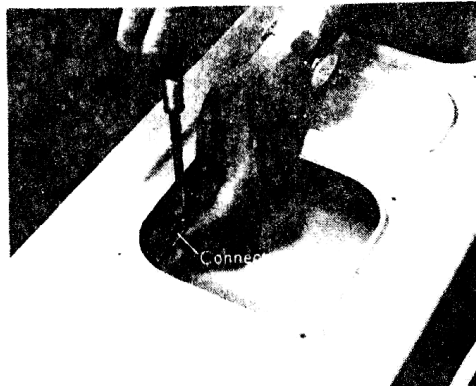
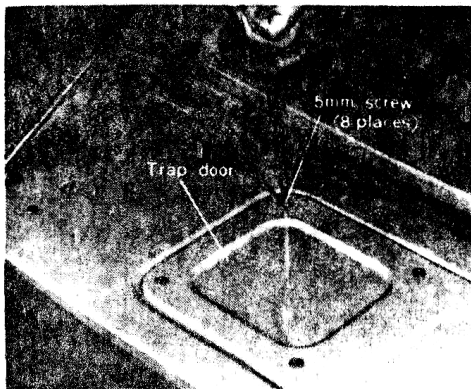
- (c) Loosen the two 6mm screws and adjust in the direction indicated by the arrow until the door can be opened or closed smoothly.

For the adjustment mentioned above, decrease the play of the handle lever in the same way as for the adjustment of the push button for the outer handle, set the inner handle at a position where the pinion of the door lock will rotate lightly when the handle lever is turned.

E: ADJUSTMENT OF THE BACK DOOR (VAN)

(1) Adjustment of the side lock

Remove the trap door. Then, the joint section of the connector which couples the side lock and center lock can be seen. Loosen the screw and adjust the tension of the connector. A slackened connector will cause noise to generate and care must be exercised. The slider of the side lock can be adjusted by removing the connector and rotating the hook.

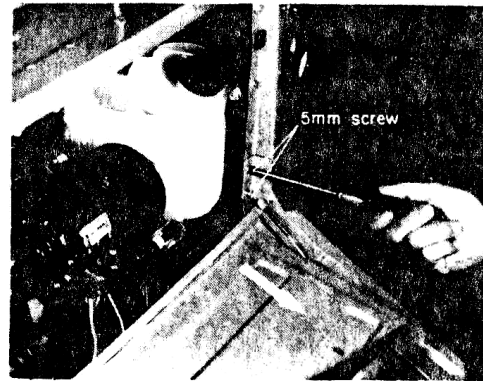


(2) Adjustment of the strap

When either the left or right strap is slack, detach the hook of the right strap and rotate the hook to adjust the length of the strap. Adjust so that the tension of the left and right straps is the same.

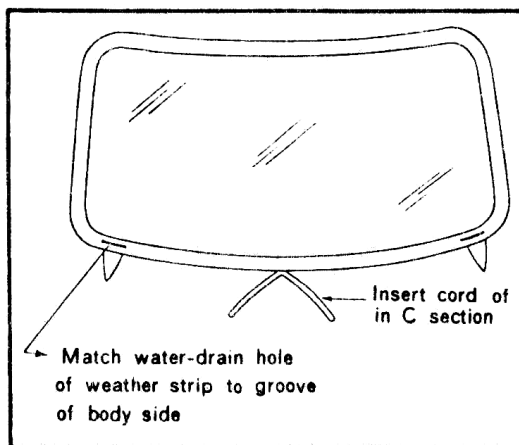
F: REMOVAL OF THE ENGINE HOOD

Remove the joint of the wiring harness for the license plate lamp. Raise the clip and remove the wiring harness. Then, when the two mounting screws of the hinge bracket of one side are removed, the hood can be pulled out in the direction indicated by the arrow.

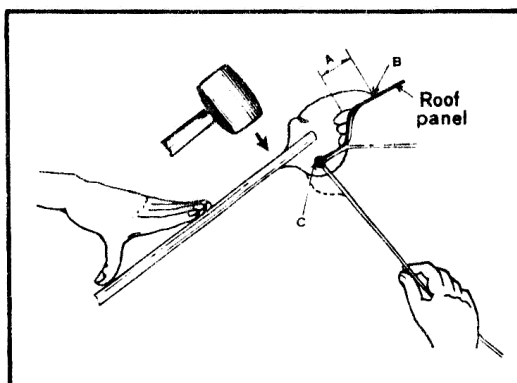


G: ASSEMBLING THE FRONT GLASS, TRIM PANEL AND MOLDINGS

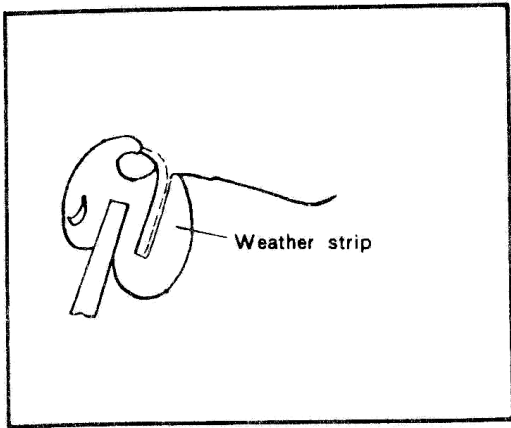
(1) Assembling the front glass



(a) When fitting the front glass in the body, make the gap A between the body and weather strip uniform all round. Hold the front of the glass lightly from outside; while pulling the cord of the inner side, tap on the glass near the weather strip from outside with a rubber hammer to fit.

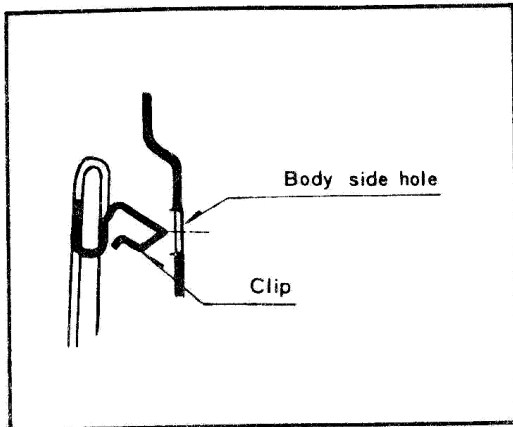
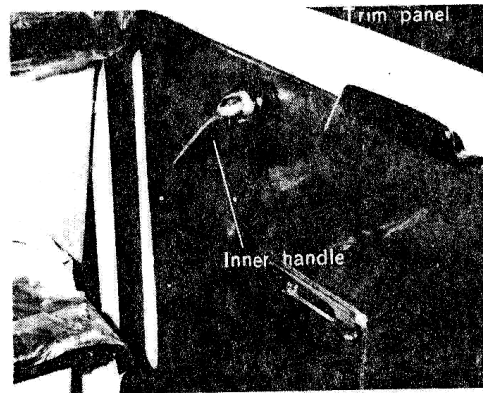
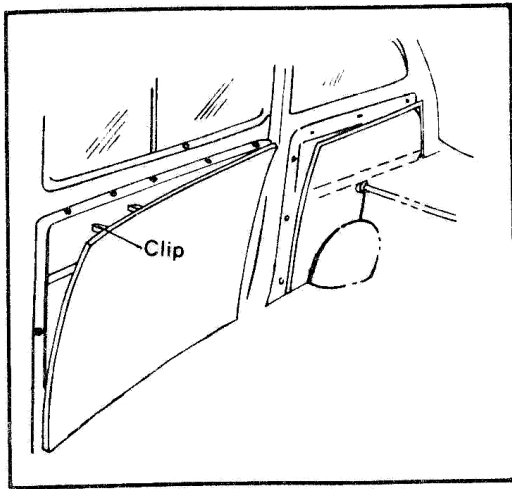


(b) To make the weather strip of portion B to adhere to the body closely, tap it all around with rubber hammer. The weather strip will become smooth when some gasoline is applied to the weather strip all the way around.



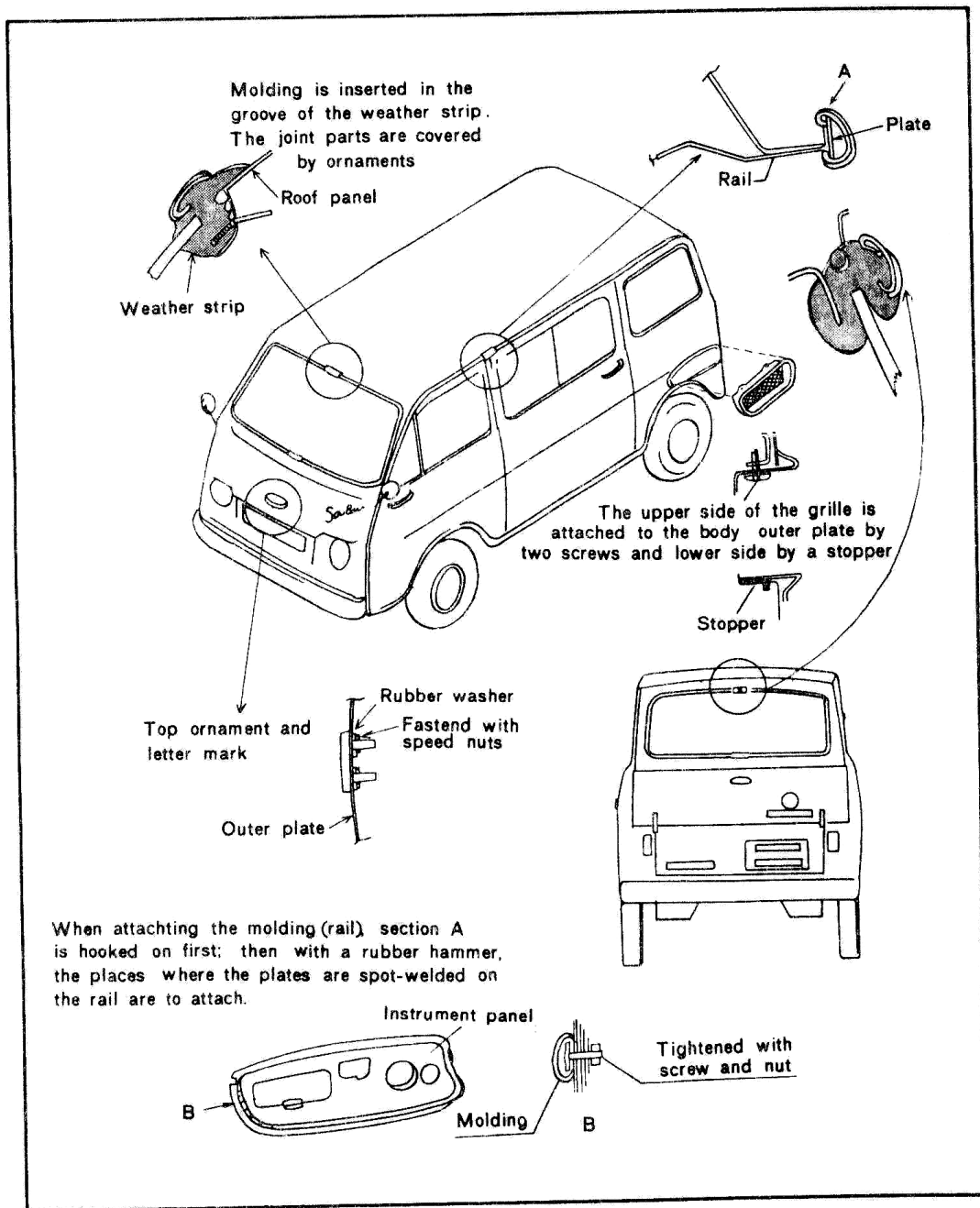
- (c) Assemble the side glass and back door glass in the same way as above. But install the back door glass by lightly striking the glass near its edge all around.

(2) Assembling the trim panel (side door)

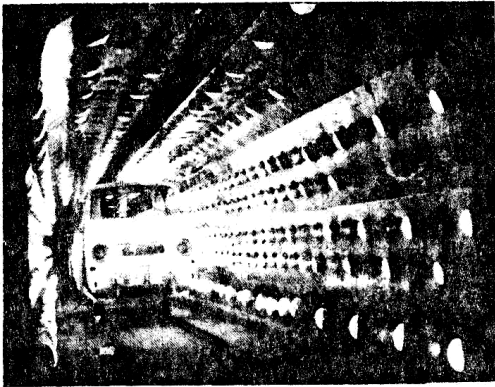


- (a) The trim panel (rear quarter) is assembled by matching the clips to the body side hole and by lightly striking the panel.
- (b) Trim panel (door)
 Insert the inner handle.
 Match the clips to the door side holes and lightly strike the panel to assemble.

(3) Assembling the moldings



5. PAINTING PROCESS AND RE-TOUCHING



Painting of the body is a chemical treatment and thorough under-coatings are given to ensure perfect rust-proofing. For floor, special chassis black for baking is applied to the bottom side, a thick undercoat for inside of the fenders, and rust-proof synthetic resin paint is applied on the upper side. For both the undercoating and finish coating, baking type

paints are used and in addition newest synthetic resin paints are used for the interior and exterior of the body. The baked paints are highly durable and will retain their color and luster for a long time without the need of polishing.

A: RETOUCHING

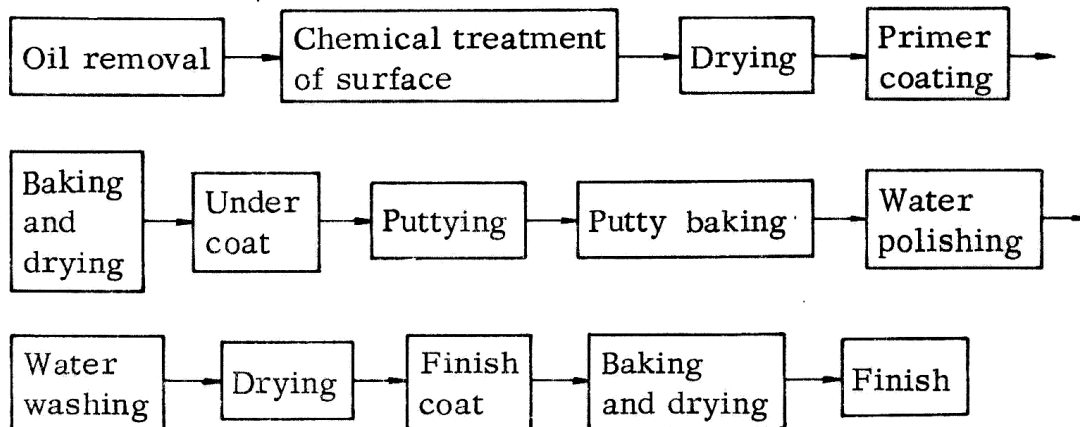
For small scratches on the painted surface, repair can be made with a low temperature baking resin paint (natural drying is possible). When the damage is large area, the specified baking paint must be used. Otherwise, the colors may not match and defect such as spalling may occur. When baking facilities are not available, low temperature baking paint can be used, and when the paint must be dried by natural drying, thoroughly clean the surfaces to be sprayed using paint thinner and polish before painting.

Unless a thorough thinner cleaning is applied to the surfaces to be painted, the paint may be repelled by wax adhering to the surfaces. After spraying and before the paint dries, if the sprayed surface is blown lightly by thinner, the mists (rough particles) can be removed. Since the pigments in paints easily settle, be sure to stir the paint from time to time while painting.

(NOTE)

When re-touching, perform the operation referring to the standard procedure described in B.

B: STANDARD PAINTING PROCESS



PAINTS

Top coat Melamine alkyd baking paint

Under coat Epoxide resin primer surfacer, baking paint

6. HEATER

GENERAL DESCRIPTION

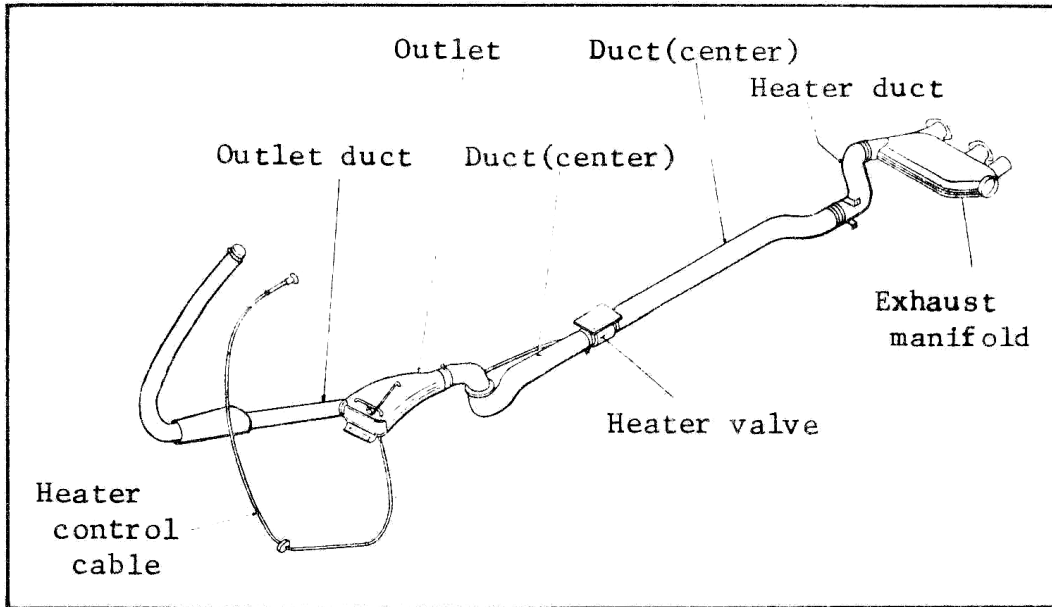
The heater used for Subaru 360 Truck and Van adopts the following system. Part of the cooling air of the engine is re-heated by exhaust gas through exhaust manifold wall and is delivered to the cabin. This system is developed from the principle of the air-conditioning system used for aircraft.

It is easy to handle, it has little effect on engine power, and yet it gives enough heating capacity.

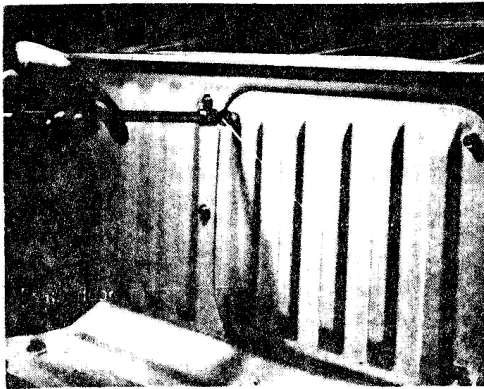
The heater is controlled only by pulling or pushing the knob by which a valve is opened or closed.

The change-over from room to defroster can be done by a selector valve provided under the seat next to the driver's.

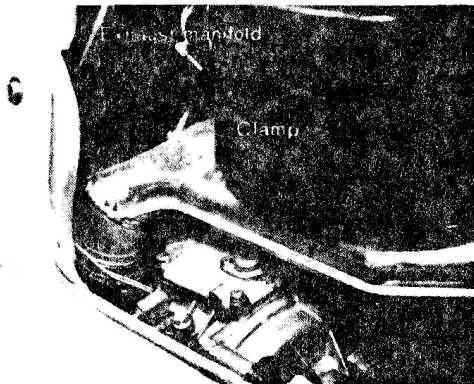
General View of Heating System



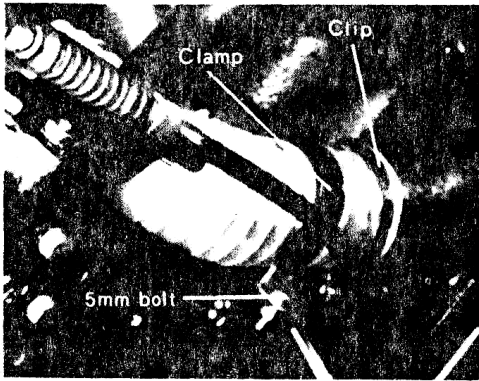
A: REMOVAL OF THE HEATER



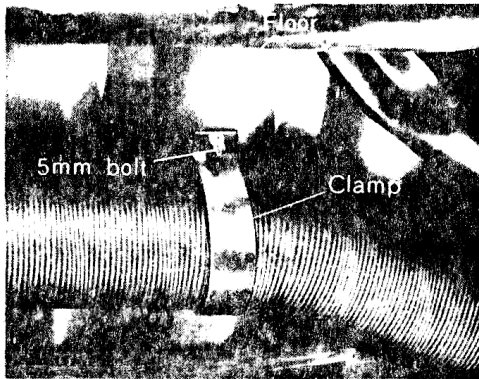
- (1) Remove the trap-doors from the rear shelf and rear bulkhead by loosening the 8 mm bolts.



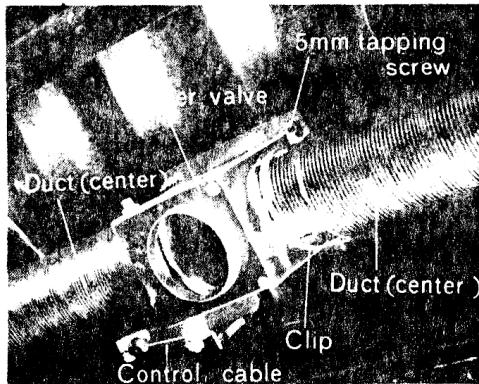
- (2) Loosen the clip and disconnect the heater duct from the exhaust manifold.



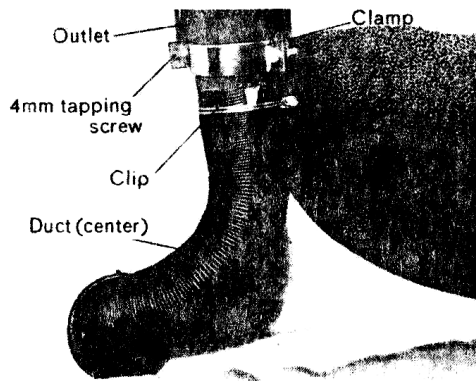
- (3) Remove the 5 mm bolts to remove the clamp.
Loosen the clip and disconnect the heater duct from the duct (center).



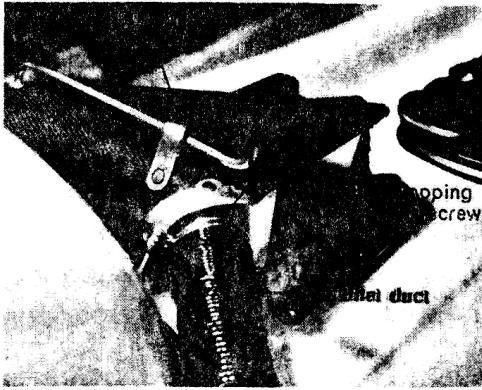
- (4) Remove the 5 mm bolts and detach the clamp from the floor.



- (5) Remove the 5 mm tapping screws to detach the heater valve from the floor.
Remove the heater control cable from the heater valve.
Then, loosen the clips and disconnect the ducts (center) from the heater valve.



- (6) Loosen the clip and disconnect the duct (center) from the outlet.
Then pull off the duct (center) down-ward under the floor with the grommet left on it.



- (7) Loosen the clip and disconnect the outlet duct from the outlet.
Remove the clamp by removing the 4 mm tapping screw and detach the outlet from the cabin floor by removing the two 4 mm tapping screws.

B: INSTALLATION OF THE HEATER

Installation is performed in the reverse sequence of removal.

CHAPTER 11: MAINTENANCE STANDARDS

1. MAINTENANCE STANDARD TABLE 11-1
2. TIGHTENING TORQUE 11-5
3. PERIODICAL INSPECTION CHART 11-7



1. MAINTENANCE STANDARD TABLE

ITEM	ASSEMBLY STANDARD	CORRECTION LIMIT	USABLE LIMIT	REMARKS
<p>A. SUSPENSION</p> <p>(1) Torsion bar Effective length:Front :Rear :Front :Rear</p> <p>Diameter :Front :Rear</p>	<p>500 mm(19.69 in) 435 mm(17.12 in) 19.5 mm(0.77 in) 20.5 mm(0.81 in)</p>			
<p>(2) Oil damper</p> <p>Front: Max. length Min. length Stroke Damping force Extension side Compression side</p>	<p>291 ± 3 mm(11.34-11.57 in) 201 ± 3 mm(7.80- 8.03 in) 90 mm(3.54 in) 80 + 12 kg/0.3 m/sec(150-200 lb/ft/sec) 55 ± 11 kg/0.3 m/sec(97-145 lb/ft/sec)</p>			
<p>Rear: Max. length Min. length Stroke Damping force Extension side Compression side</p>	<p>332 ± 3 mm(12.95-13.19 in) 269 ± 2 mm(10.59-10.67 in) 63 mm(2.48 in) 35 ± 4 kg/0.3 m/sec(68.3-86.0 lb/ft sec) 30 ± 4 kg/0.3 m/sec(57.3-75.0 lb/ft sec)</p>			
<p>(3) Tire</p> <p>Rim size Tire size Tire air pressure Front & rear Spare tire Tire width Tire outer diameter</p>	<p>3.00D x 10 4.50-10-4PR 1.9-2.0 kg/cm²(27.0-28.4 lb/in²) 2.0 kg/cm²(28.4 lb/in²) 122 mm(4.8 in) 499 mm(19.6 in)</p>			

ITEM	ASSEMBLY STANDARD	CORRECTION LIMIT	USABLE LIMIT	REMARKS
B. AXLE (1) Front alignment Toe-in Camber Caster Kingpin angle Side slip (w/2 persons)	12-17 mm (0.47-0.67 in) 1°30' - 2°30' 13°10' 7° IN 1-6 mm(0.04-0.23 in)	+ 3 mm (± 0.12 in)		
(2) Kingpin Outer diameter Clearance; Kingpin and bushing Play of axial direction	17 mm(0.67 in) 0.008-0.129 mm (0.0003-0.0050 in) No play, but lightly rotate, when assembled.	0.15 mm (0.0059 in)		Adjust by adjusting shims; 0.1, 0.2, 0.25, 0.35, 0.4 mm
(3) Front axle Bearing tightening torque	Tighten the nut fully, then turn loose 1/8 - 1/10 rotation and bend washer. The starting torque after tightening be 0.07-0.1 kg-m(6.1-8.7 lb-in).			
(4) Rear axle Clearance; rear drum and rear axle (spline)		-0.003-0.020 mm (-0.0001-0.0008 in)		
C. BRAKE (1) Master cylinder Inner diameter Clearance; master cylinder and piston (2) Wheel cylinder Inner diameter: Front : Rear (3) Brake drum inner diameter (Front & rear)	19.05 mm(3/4 in) 0.020-0.105 mm (0.0008-0.0041 in) 23.81 mm(15/16 in) 15.87 mm(5/8 in) 170 mm(6.69 in)		170.5 mm(6.71 in)	

ITEM	ASSEMBLY STANDARD	CORRECTION LIMIT	USABLE LIMIT	REMARKS
(4) Eccentricity:Front :Rear	Less than 0.05 mm(0.0020 in) Less than 0.05 mm(0.0020 in)			
(5) Brake lining Thickness:for bonded for service Width: Front Rear Length: Front Rear	4.5 mm(0.18 in) 5 mm (0.20 in) 35 mm(1.38 in) 30 mm(1.18 in) 156 mm(6.14 in) 180 mm(7.09 in)		2 mm(0.08 in)(at min.thickness portion) 2 mm(0.08 in)(at min.thickness portion)	Oil fill to the indi- cation line of the tank is recommended.
(6) Brake oil quantity	0.45 l (0.95 pt)			
(7) Brake pedal Play	20-25 mm (0.8-1.0 in)	40-50 mm (1.6-2.0 in)	0.25 mm (0.0098 in)	
Clearance;bushing and shaft	0.020-0.124 mm (0.0008-0.0049 in)			
(8) Tightening torque, brake rubber hose union bolt	1.2-2.2 kg-m (9-16 lb-ft)			
(9) Adjustment standard for pulling range of hand brake	4-5 notches			
(10) Hand brake cable Diameter Length:Right Left	2.5 mm(0.1 in) 2200 mm(86.6 in) 1740 mm(68.5 in)			
D. STEERING SYSTEM				
(1) Steering wheel play along the circle	Less than 10 mm(0.39 in)			
(2) Min. turning circle	8 m(26.2 ft)			

ITEM	ASSEMBLY STANDARD	CORRECTION LIMIT	USABLE LIMIT	REMARKS
(3) Steering angle: Inner Outer (4) Steering gear box Pinion torque, at the center of rack Backlash (5) Bavel gear box Backlash Pinion play, axial direction F. BODY (1) Vehicle dimensions Overall length Overall width Overall height: Truck Van Wheelbase Tread: Front Rear Ground clearance F. POWER TRAIN (1) Fuel strainer capacity (2) Location; accelerator pedal roller center to floor (3) Fuel tank capacity (4) Oil tank capacity	32°30' 30°45' 0.01-0.11 kg-m(0.07-0.79 lb-ft). Less than 0.22kg-m(1.59 lb-ft) at any point of rack less than 0.05 mm(0.002 in) 0.03-0.13 mm (0.0012-0.0051 in) 0.03-0.06 mm (0.0012-0.0024 in) 2995 mm(117.9 in) 1295 mm(51.0 in) 1545 mm(60.8 in) 1535 mm(60.4 in) 1750 mm(68.9 in) 1120 mm(44.1 in) 1080 mm(42.5 in) 185 mm(7.3 in) 350 cc/min at 200 mm Aq. 50 mm(2 in) 30. / (8.0 US gal) 2.5 / (2.6 US qt)			

2. TIGETENING TORQUE

GROUP	ITEM	TIGHTENING TORQUE		NOMINAL DIAMETER
		kg-m	lb-ft	
Wheel	Wheel installation nut	3.6 - 5.5	26 - 39	10 mm
	Brake drum bolt	2.8 - 4.2	21 - 30	10 mm
	Back plate and knuckle	1.2 - 2.5	9 - 18	8 mm
	Back plate and hub	1.2 - 2.5	9 - 18	8 mm
	Rear axle shaft and drum	10.0 - 20.0	73 - 144	16 mm
	Rear axle shaft and differential	2.8 - 4.2	21 - 30	8 mm
	Radius arm and hub	1.2 - 2.5	9 - 18	8 mm
Brake	Brake hose and wheel cylinder	1.2 - 2.2	9 - 16	3/8 in
	Master cylinder installation bolt	0.8 - 1.2	6 - 9	8 mm
	Brake piping	1.2 - 1.8	9 - 13	1/8 in
	Master cylinder nipple	0.9 - 1.1	7 - 8	PT 1/4 in
Suspension	Torsion bar lock nut	3.0 - 4.5	22 - 32	10 mm
	Radius arm cover installation bolt	1.5 - 3.0	11 - 22	8 mm
Steering	Steering wheel installation nut	2.0 - 4.0	15 - 29	12 mm
	Steering shaft clamp	1.4 - 2.2	10 - 16	8 mm
	Bevel gear box installation bolt	1.0 - 1.8	8 - 13	8 mm
	Torque rod clamp	1.4 - 2.2	10 - 16	8 mm
	Torque rod rubber coupling	0.4 - 0.7	3 - 5	8 mm
	Steering gear box installation	1.0 - 1.8	8 - 13	8 mm
	Tie-rod turnbuckle lock nut	8.0 - 8.5	58 - 61	16 mm
	Tie-rod end and knuckle	3.0 - 5.5	22 - 39	10 mm
	Steering gear box pinion cover installation bolt	0.5 - 0.8	4 - 6	6 mm
	Steering gear box adjuster lock nut	3.0 - 4.0	22 - 29	28 mm
	Steering gear box housing installation bolt	1.0 - 2.0	8 - 14	8 mm
	Bevel gear box cover installation bolt	0.5 - 0.75	4 - 5	6 mm
	Bevel gear box adjuster lock nut	1.0 - 1.5	8 - 10	8 mm

GROUP	ITEM	TIGHTENING TORQUE		NOMINAL DIAMETER
		kg-m	lb-ft	
Engine Mounting	Front cushion rubber	3.0 - 4.0	22 - 29	10 mm
	Rear engine mounting	5.0 - 7.0	36 - 50	12 mm
	Rear cross member	1.2 - 2.5	9 - 18	8 mm

3. PERIODICAL INSPECTION CHART AND LUBRICATION CHART

A: PERIODICAL INSPECTION CHART

●: Replacement

ITEMS	ENGINE				
	FIRST 1000 km (600 miles)	FIRST 3000 km (1800 miles)	EVERY 5000 km (3000 miles)	EVERY 10000 km (6000 miles)	EVERY 20000 km (12000 miles)
V BELT, tension: inspection & adjustment	○		○		
DISTRIBUTOR CAP, ROTOR, POINTS: inspection	○		○		
SPARK PLUG: inspection, cleaning & replacement		○	○	●	
IGNITION TIMING: inspection	○		○		
GENERATOR BRUSH: inspection					○
STARTER BRUSH: inspection					○
STARTER PINION & RING GEAR: inspection				○	
AIR CLEANER ELEMENT: inspection & replacement			○	●	
OIL PUMP: inspection	○		○		
CARBURETOR LINK MECHANISM, THROTTLE VALVE, CHOKE VALVE, FLOAT, NEEDLE VALVE: inspection			○		
FUEL LEAKAGE FROM CARBURETOR: inspection			○		
TRANSMISSION OIL, leakage: inspection			○		
DIFFERENTIAL UNIVERSAL JOINT, play & damage: inspection				○	
ENGINE MOUNTING BOLTS & NUTS: retightening	○				
BOLTS & NUTS FOR INTAKE & EXHAUST SYSTEMS: inspection & retightening	○		○		
COMPRESSION PRESSURE: inspection				○	
ENGINE NOISE: inspection				○	

ITEMS	FIRST 1000 km (600 miles)	FIRST 3000 km (1800 miles)	EVERY 5000 km (3000 miles)	EVERY 10000 km (6000 miles)	EVERY 20000 km (12000 miles)
SUSPENSION SYSTEM & AXLE					
WHEEL: rotation			o		
WHEEL NUT: inspection & retightening	o		o		
FRONT WHEEL BEARING, play: inspection			o		
REAR WHEEL BEARING, play: inspection				o	
WHEEL RIM, damage: inspection			o		
TIRE AIR PRESSURE: adjustment			o		
AXLE BOLT, looseness: inspection			o		
TIE-ROD, damage & play: inspection			o		
TORSION BAR, damage & looseness: inspection			o		
CENTER SPRING, damage & looseness: inspection			o		
CENTER ARM, damage: inspection				o	
CENTER SPRING BRACKET, damage: inspection				o	
SUSPENSION ARM, play & damage: inspection				o	
KNUCKLE SUPPORT, play & damage: inspection				o	
KINGPIN, play: inspection				o	
AXLE & BRAKE DRUM SPLINE, play: inspection				o	
SUSPENSION SYSTEM & AXLE PARTS: retightening	o				
SHOCK ABSORBER, oil leakage: inspection					o
STEERING SYSTEM					
STEERING SYSTEM PARTS: retightening	o				
STEERING WHEEL, play, looseness & operation: inspection			o		

ITEMS	FIRST 1000 km (600 miles)	FIRST 3000 km (1800 miles)	EVERY 5000 km (3000 miles)	EVERY 10000 km (6000 miles)	EVERY 20000 km (12000 miles)
STEERING GEAR BOX PINION & BUSHING, play: inspection				o	
STEERING GEAR BOX MOUNTING PARTS, looseness: inspection				o	
STEERING ANGLE: inspection				o	
WHEEL ALIGNMENT: inspection				o	
BRAKE SYSTEM					
BRAKE FLUID, quantity: inspection	o	o	o		
BRAKE PEDAL, play: inspection	o	o	o		
HAND BRAKE LEVER, allowance: inspection	o		o		
HAND BRAKE LEVER RATCHET, wear & damage: inspection	o			o	
HAND BRAKE CABLE, looseness & damage: inspection	o		o		
BRAKE HOSE, oil leakage & damage: inspection	o	o	o		
BRAKE PIPE, oil leakage & damage: inspection	o	o	o		
FOOT & HAND BRAKES, operation: inspection			o		
BRAKE DRUM & LINING CLEARANCE: inspection			o		
MASTER CYLINDER, function: inspection				o	
WHEEL CYLINDER, function: inspection				o	
BRAKE LINING, wear: inspection			o		
BRAKE SYSTEM					
CLUTCH, ACCELERATOR & CHOKER CABLES, operation: inspection	o	o			
CLUTCH PEDAL, play: inspection			o		

ITEMS	FIRST 1000 km (600 miles)	FIRST 3000 km (1800 miles)	EVERY 5000 km (3000 miles)	EVERY 10000 km (6000 miles)	EVERY 20000 km (12000 miles)
FUEL SYSTEM					
FUEL STRAINER: inspection		o			
FUEL LEAKAGE: inspection	o	o	o		
FUEL PUMP, operation: inspection			o		
ELECTRICAL EQUIPMENT					
BATTERY ELECTROLYTE, specific gravity & quantity: inspection	Every 1000 km (600 miles)				
BATTERY TERMINAL: cleaning	o	o	o		
LAMPS, operation: inspection			o		
TURN SIGNAL SWITCH, operation: inspection			o		
HORN: inspection			o		
WINDSHIELD WIPER, operation: inspection			o		
COMBINATION METER, operation: inspection			o		
FUEL GAGE, operation: inspection			o		
WIRING HARNESS, looseness & damage: inspection			o		
OTHERS					
DOOR PARTS: retightening	o				
BODY PARTS, damage & looseness: inspection				o	
CROSS MEMBER, damage & looseness: inspection				o	
VEHICLE HEIGHT: inspection				o	