



WORKSHOP MANUAL

HFC1061 SERIES TRUCKS

(EQUIPED WITH **EQB125** ENGINE AND **LC6T46** TRANSMISSION)

(**E8AF0, E8AF1**)

Version No.[**JAC-201210030193801**]

JAC INTERNATIONAL

2012.10

HFC1061 SERIES

WORKSHOP MANUAL

Foreword

This workshop manual was prepared as reference to properly carry out servicing and maintenance on JAC vehicles.

The contents, pictures and technical parameters this manual supplied are the latest data. Because of the continuously development and renewal of technique and products, there may be some difference between the explanations and the vehicles.

The workshop manual for the engine will be compiled separately.

This manual was prepared for HFC1061 series light duty trucks. Configurations as follows:

EQB125 engine, LC6T46 transmission, 5.714 gear ratio rear axle,

Please inform Customer Service Department of JAC International if there is any mistake, and you will be highly appreciated.

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GENARAL GENERAL

SPECIFICATIONS

VEHICLE MODEL

VIN

THE MECHANIC PERFORMANCE TABLE OF BOLTS IN CHINA

GENERAL

SPECIFICATIONS

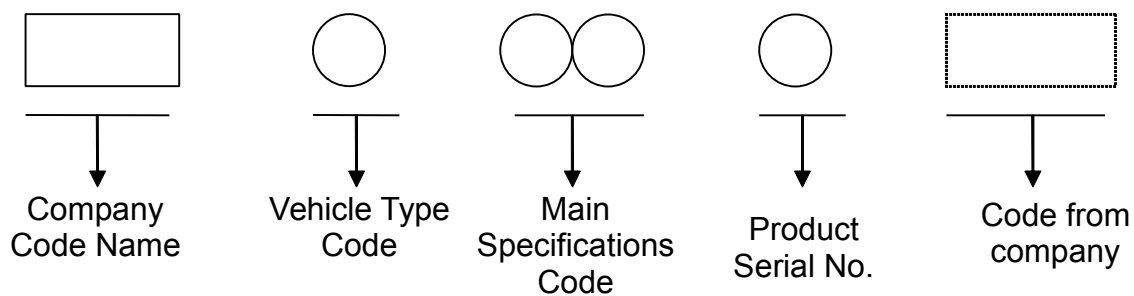
Main parameters of left-hand **1061** series trucks

Configurations: Left hand, **EQB125** engine, **3920**cc displacement, rated power (Kw/rpm)**92/2800**, **92/2500**, torque (N.m/rpm)**410/1500**; **LC6T46** transmission, **5.714** rear axle, **air** brake.

Vehicle model	Configuration code	Wheel Base (mm)	Overall dimension (mm)	Cargo dimension (mm)	Curb Weight (kg)	Gross weight Kg	Tire	Power steering	Remark	First 8 digits of VIN
HFC1061K	E8AF0	3815	6950×2110×2256	5175×2006×550	3380	7575	7.50R16、 8.25R16、 215/75R17.5	Standard Equipment		LJ11KFBD
HFC1061K	E8AF1	↑	↑	↑	↑	↑	↑	↑		LJ11KFBD

GENERAL

Vehicle Model



Company Code Name: HFC----represents JAC motor

Vehicle Type Code: 1---Cargo truck 2---Off-road vehicle 3---Dumper
4---Tractor 5---Special purpose vehicle 6---Passenger car
7---Sedan 9---Semitrailer

Main Specifications Code: 25---represents the maximum gross weight is 25 tons.

Product serial No.: 1---Product development serial No. (1st change, 2nd development)

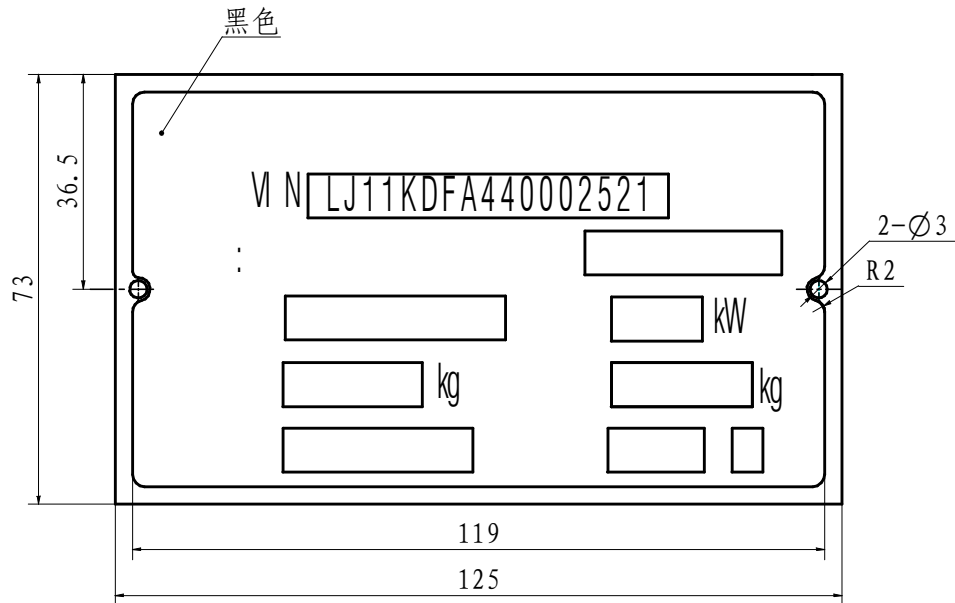
Code from company: K---Diesel R1---King cabin

For example: HFC1061KR1 represents JAC vehicle with king cab, 6 tons maximum gross weight, the first change.

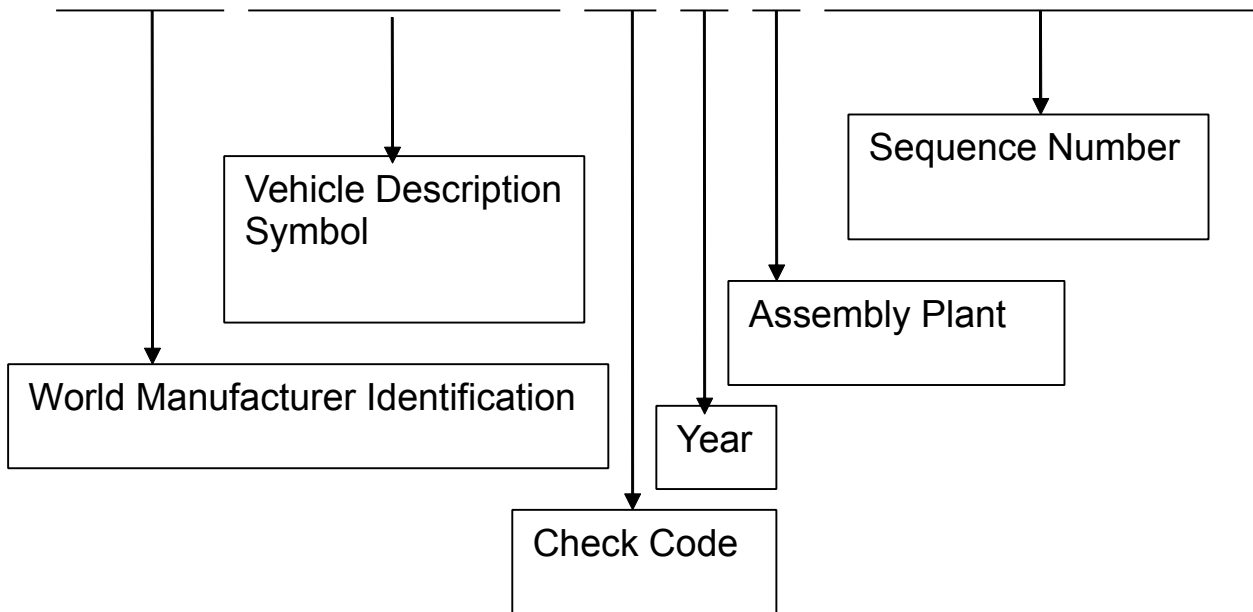
GENERAL

VIN----Vehicle Identification Number

VIN comprises of 17 digits. They generally represent:



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
L	J	1	1	K	D	B	C	X	8	X	X	X	X	X	X	X



GENERAL

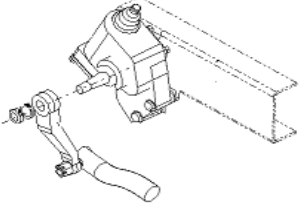
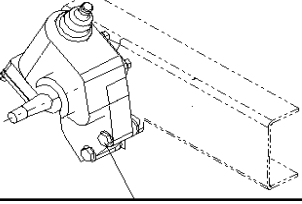
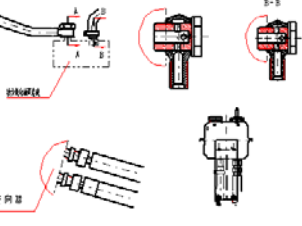
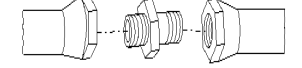
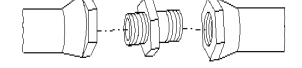
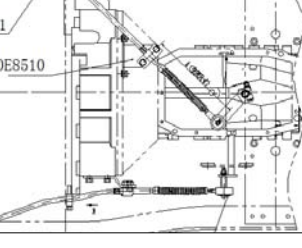
The mechanic performance table of bolts in China

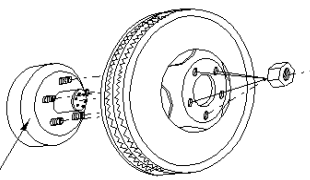
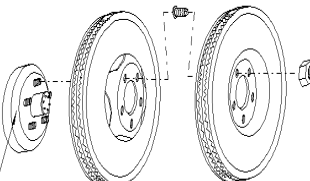
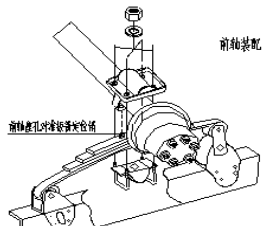
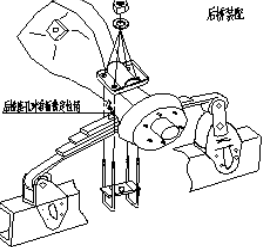
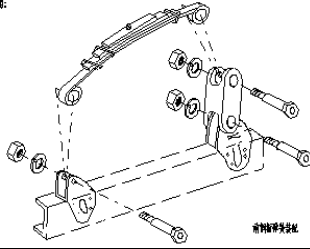
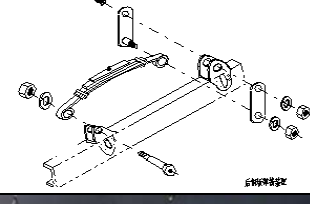
Quality Grade(mark)	6.8	8.8	9.8	10.9	12.9
Tensile strength limit σ_{bmax} (MPa)	600	800	900	1040	1220
Yield limit σ_{smax} (MPa)	480	640	720	940	1100
Corresponding to Hyundai standards	4T	6T	7T	8T	10T

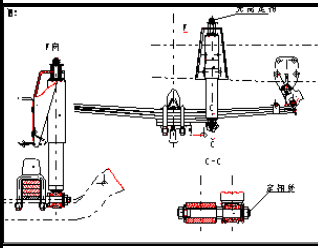
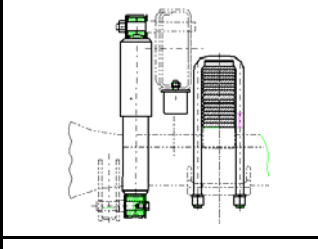
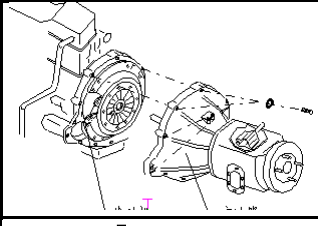
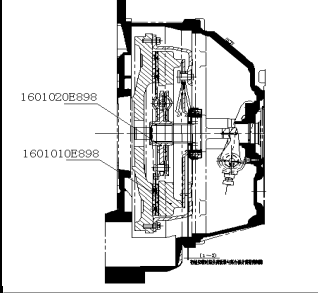
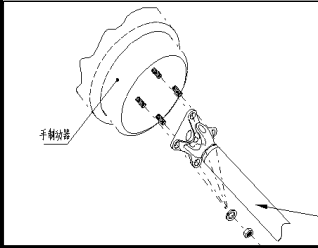
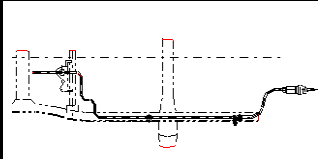
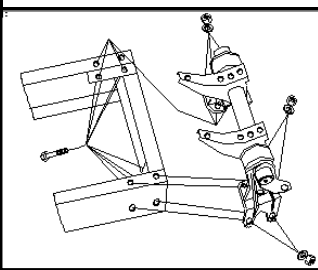
The number before the radix point represents one percent of the nominal tensile strength;

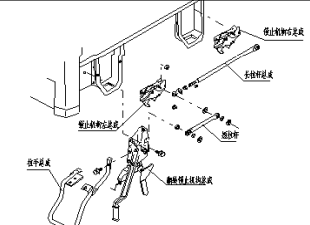
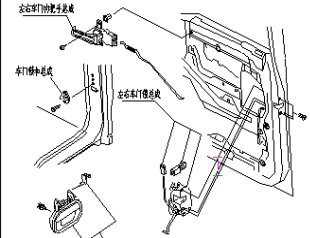
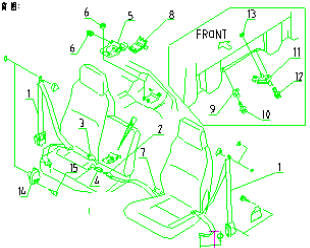
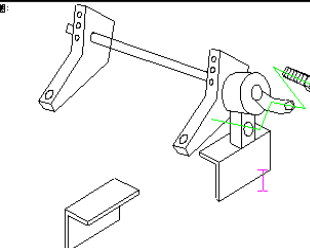
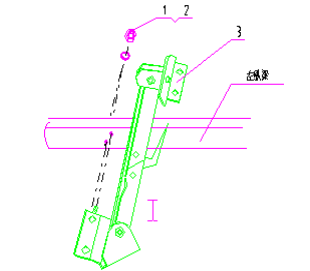
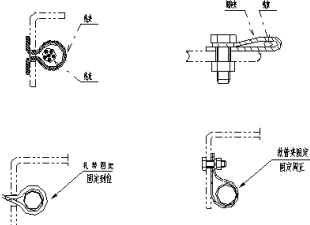
The number behind the radix point represents ten times of the ratio between the nominal yield limit and nominal tensile strength.

STANDARD TORQUE TABLE (JAC - All Models)

group	code	item	picture	Standard (N·m)
Steering system	1	steering wheel tightening nut		1020: 54-69
				M20×1.5: 60-79
	2	Connection of pitman arm and steering gear box		1020: 54-69
				J1、E0、Z1、Z2: 196-250
				A1、M1、Z15、E22CH: 250-320
				M15、T0、T4: 500-600
	3	connection of steering gear box, support and chassis		M10×1: 65-95
				M12×1.25: 108-161
				M14×1.5: 146-205
				M16×1.5: 240-335
				M18×1.5: 397-507
				M20×1.5: 475-598
	4	connection of steering column steering gear box		M10: 37-75
				M14×1.5: 50-55
	5	power steering pipe connection		Perforation bolt: according to the brake pipe system connection
				M14: 53.9-73.5
				M16: 88.3-118
				M18: 100-130
				M20: 100-130
				M22: 130-160
Brake system	6	Brake pipe connection		Φ4.76 pipe: 16-20
				Φ6 pipe: 23-27
				Φ8 pipe: 27-33
				Φ10 pipe: 45-53
				Φ12 pipe: 60-80
				Φ15 pipe: 70-90
				Φ6 nylonpipe: 22-25
				Φ8 nylonpipe: 25-32
				Φ10 nylonpipe: 37-42
				Φ12 nylonpipe: 46-52
				Φ16 nylonpipe: 59-67
				Φ20 nylonpipe: 64-72
	7	brake draw bench equipment		by eyes, to make the spring mat flat

Tyre nut equipment	8	D series tyre nut (M18X1.5)		287-346
		3103104N\3103204N (M25X1.5)		343-441
		N series tire nut(inner) (M16X1.5)		
		N series tire nut(outer) (M25X1.5)		485-593
		3103226J1\3103227J1 (M20X1.5)		
		E4 series tire nut(inner) (M20X1.5)		485-593
		E4 series tire nut(outer) (M30X1.5)		
		3103203M1\3103204M1 (M24X1.5)		485-593
		M1 series tire nut(inner) (M20X1.5)		
		M1 series tire nut(outer) (M30X1.5)		485-593
		3103056A1\3103057A1 (M20X1.5)		
		A2 series tire nut(inner) (M20X1.5)		485-593
		A2 series tire nut(outer) (M30X1.5)		
		3103104N\3103204N (M25X1.5)		485-593
		Z15AA series tire nut(inner) (M18X1.5)		
		Z15AA series tire nut(outer) (M27X1.5)		518-598
		T206 series tire nut (M24X1.5)		
		T206 series tire nut(inner) (M20X1.5)		540-670
		T206 series tire nut(outer) (M30X1.5)		
		T4 series tire nut		M22x1.5: 590-680
		Heavy Truck series tire nut		
suspension	9	Front U-bolt		M14: 126-154
				M16:157-216
				M18:287-346
				M20:396-480
				M22:441-539
				M24:618-843
				heavy truck M20×1.5: 440-550
	10	Rear U-bolt		M14: 126-154
				M16:157-216
				M18:287-346
				M20:396-480
				M22:441-539
				M24:618-843
	11	front leaf spring pin		E、C、B、K、Q、D、M: 157-196 (for mexico E8510 belongs to E category for wide cabin truck)
				N、T、Z: 190-260
				heavy truck(M14×1.5):85-110 (for mexico E8510 belongs to E category for wide cabin truck)
	12	Rear leaf spring pin		E、C、B、K、Q、D、M: 157-196
				N、T、Z: 190-260
	13	front spring pin locking bolt		heavy truck(M14×1.5):85-110
				M12:73-89
				M14:126-154

suspension	14			M12:73-89
		Rear spring pin locking bolt		M14:126-154
	15	Front shock absorber		M10:46-56
				M12×1.25:78-96
				M14: 126-154
	16	Rear shock absorber		M18:219-257
				M20×1.5:324-396
				M10:46-56
				M12×1.25:78-96
				M14: 126-154
engine	17	Engine and transmission connection		transmission and engine clutch shell connection:
				6782: 155.4-194.6
				1045: 80-110
				1061: 127.2-156.9
				Gearbox clutch shell with engine flywheel shell connection:
				37-75(aluminium alloy:36-44)
				Clutch platen bolt((10.9 class)) :
				M10×1.5:74×(1±5%);
				M12×1.5: 142×(1±5%);
				M14×1.5:210×(1±5%)
Drive axle	18	Drive axle		M10×1: 46-62
				M12×1.25: 78-110
				M14×1.5: 130-180
				M16×1.5: 175-260
clutch	19	Clutch pipeline		According to the pipe drawing
	20	Cabin titling mechanism		M10:41-51 M12:75-96 M16:182-222

cabin	21	Cabin locking mechanism		M8:17-28 M10:37-75 M12:75-96 M16:182-222
	22	Door locks		9-11
	23	Safety belt		M12: 75-96
	24	engine titling torsion arm		M16:182-222 M12: 75-96
	25	cabin support rod		up M8:17-28 down M10:37-75
	26	cabin front support bolt		M14×1.5: 99-115
	27	connection bolt of Cabin titling mechanism torsion bearing bush and the cabin front support		M14×1.5: 99-115
Electric device	28	electric plugs		6-8(wide cabin)
	29	electric wire hranness		Make spring mat flat

CLUTCH

CLUTCH

General

Main data and specifications

Clutch assembly

Clutch control equipment

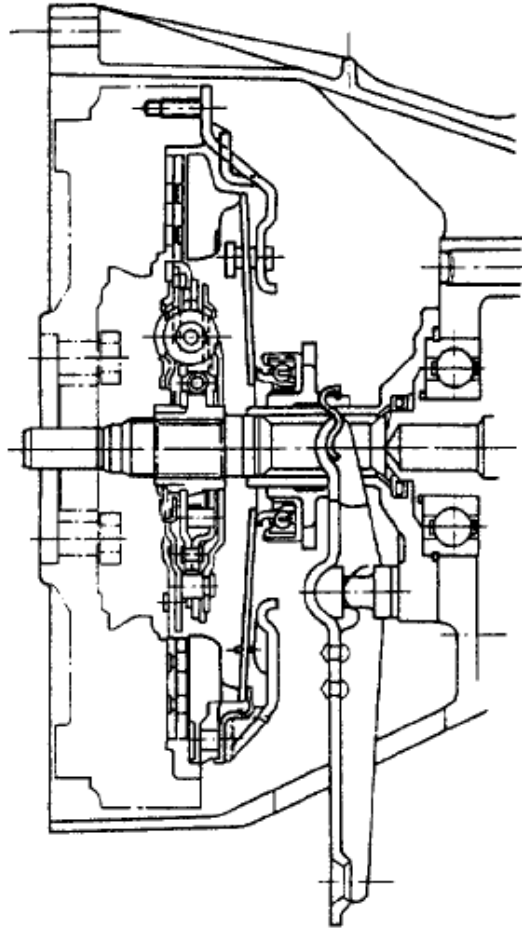
Clutch main cylinder

Clutch cylinder

CLUTCH

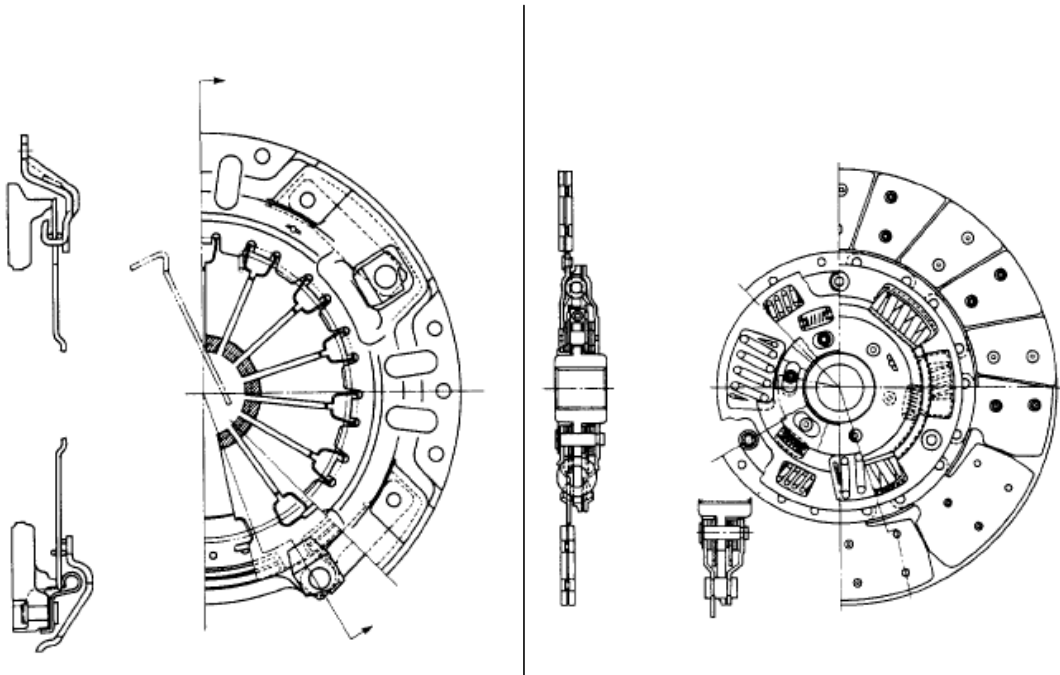
General

Clutch assembly

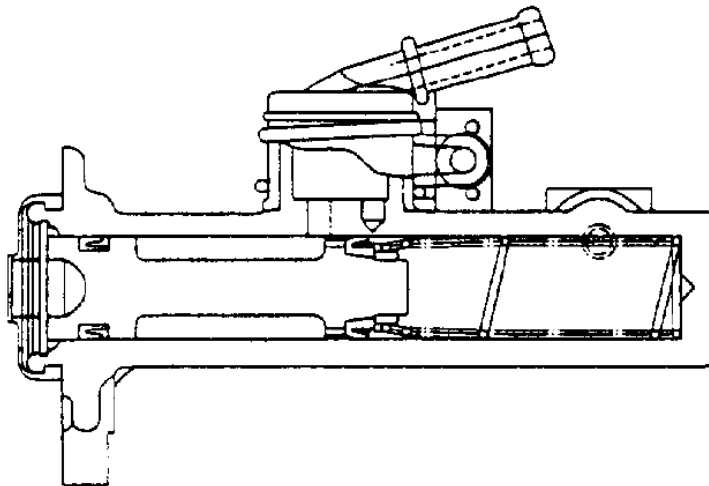


CLUTCH

Clutch driven plate assembly



Clutch main cylinder

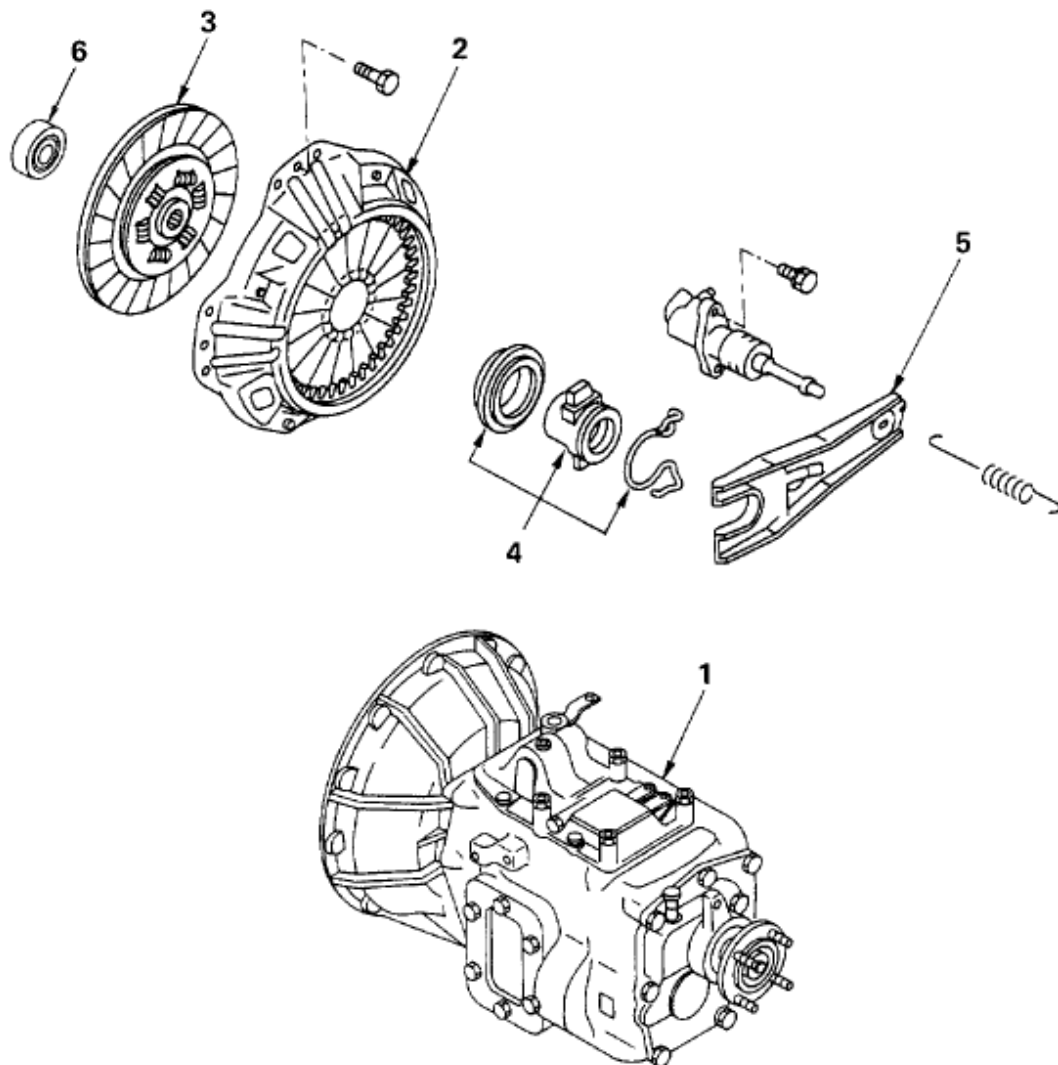


CLUTCH

Clutch assembly



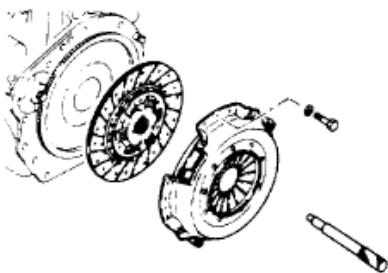
Disassembly



Disassembly sequence

- (1) Transmission assembly
- (2) Clutch pressure plate
- (3) Clutch drive plate
- (4) Release sleeve
- (5) Release fork

CLUTCH



Disassembly steps:

Support vehicle and hold it safely.

Note: do not let brake liquid flow on painted surface in disassembly process.

If having, wipe off immediately.

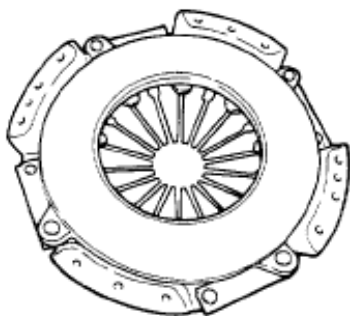
1. Dismantle gearbox (referring to the operation about gearbox in this manual).
2. Pressure plate assembly
3. Driven plate assembly

Prevent driven plate assembly from sliding with a guiding shaft.

Make marks on flywheel and pressure plate, and head these marks in re-assembly.

4. Dismantle clutch separator fork.
5. Separate sleeve assembly

Dismantle separator sleeve together with return spring.



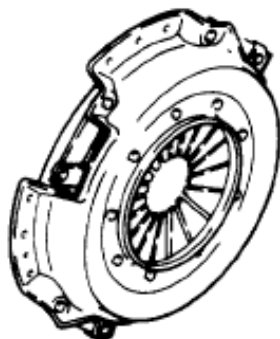
Inspection and repair

If excessive abrasion and damage have been found in checking process, it is necessary to adjust, repair or change parts.

Check abrasion and heat crack of pressure plate with eyes, if there is any excessive abrasion or too-deep heat crack, it is necessary to change pressure plate.

Distortion of pressure plate

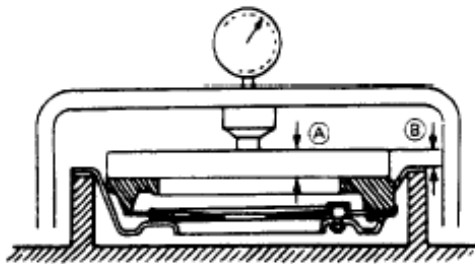
Measure plane degree of friction surface of pressure plate, if it exceeds limit, change pressure plate assembly. Using limit: 0.3mm



Clutch cover

Check the abrasion, crack and other damages on whole clutch cover with eyes, if there is any excessive abrasion, crack or other damages, change the cover.

CLUTCH



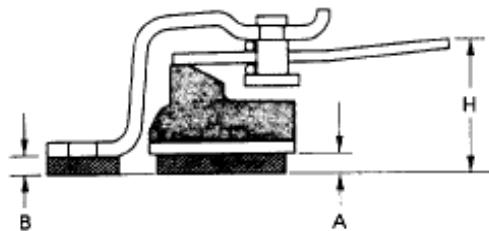
Assembly pressure of clutch

- 1) Reverse clutch pressure plate.
- 2) Put a metal block with depth of 8.3mm on pressure plate.
- 3) Press down pressure plate until distance "B" has reached 0 mm.
- 4) Record pressure reading on meter.

Standard pressure: **480 ka**



Height of film-sheet spring separator finger



- 1) Put a metal block with depth of 8.3mm under pressure plate.
- 2) 2) Press down pressure plate until distance "B" has reached 0 mm.. Two methods could be used:
 - a. Press down it from the top of pressure plate.
 - b. Screw assembly bolts of pressure plate.
- 3) Measure the height from base surface to separator finger end. Standard height



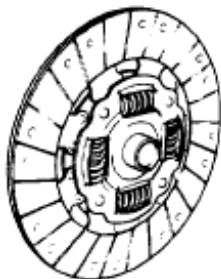
Driven plate assembly

Check whether torsion spring has been loosened, softened or ruptured with eyes.

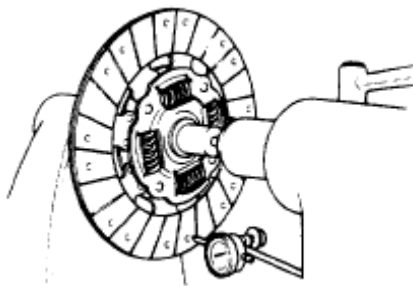
If there is any situation above, it is necessary to change driven plate assembly.

Check whether there is any crack, grease or excessive scorch on friction surface with eyes.

If there is any situation above, it is necessary to clean or change driven plate assembly. Check whether driven plate assembly could slide on spline of one shaft of gearbox.



CLUTCH



Distortion of driven plate

Insert guiding shaft in spline hub.

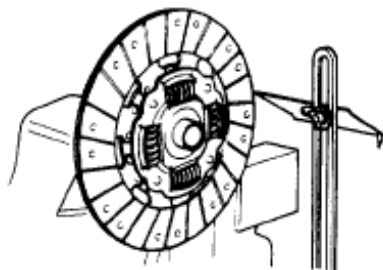
Guiding shaft should be level and straight.

Install a scale meter on exterior circle of driven plate.

Turn driven plate assembly slowly, and read the scale on meter.

If measured value exceeds limit, it is necessary to change driven plate assembly.

Limit 1.0mm



Abrasion of driven plate spline hub

Clean inner part of spline hub.

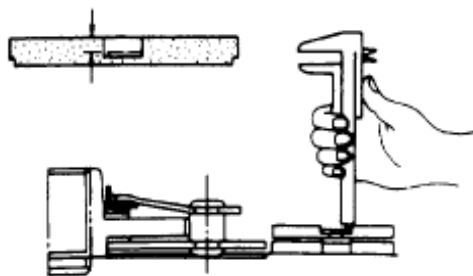
Install driven plate on spline of one shaft of gearbox.

Install a surface measuring meter on exterior circle of driven plate.

Turn driven plate slowly, and measure the change of exterior circle.

If measured value exceeds limit, it is necessary to change driven plate assembly.

Abrasion limit of driven plate spline hub 1.0mm



Depth of rivet head of driven plate

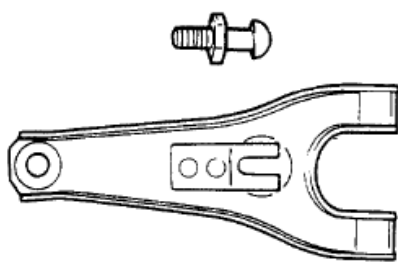
Measure the distance from rivet head to friction surface with a depth gauge.

Measure two sides.

If measured value exceeds limit, it is necessary to change driven plate assembly.

Depth limit of rivet head of driven plate 0.2mm

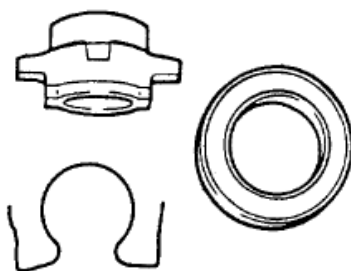
CLUTCH



Release fork and supporting

Check the surface contacting with release sleeve and supporting on release fork with eyes.

If there is any excessive abrasion or surface roughness, it is necessary to change parts.



Release sleeve assembly

Check the abrasion and roughness of release sleeve assembly before separating sleeve assembly.

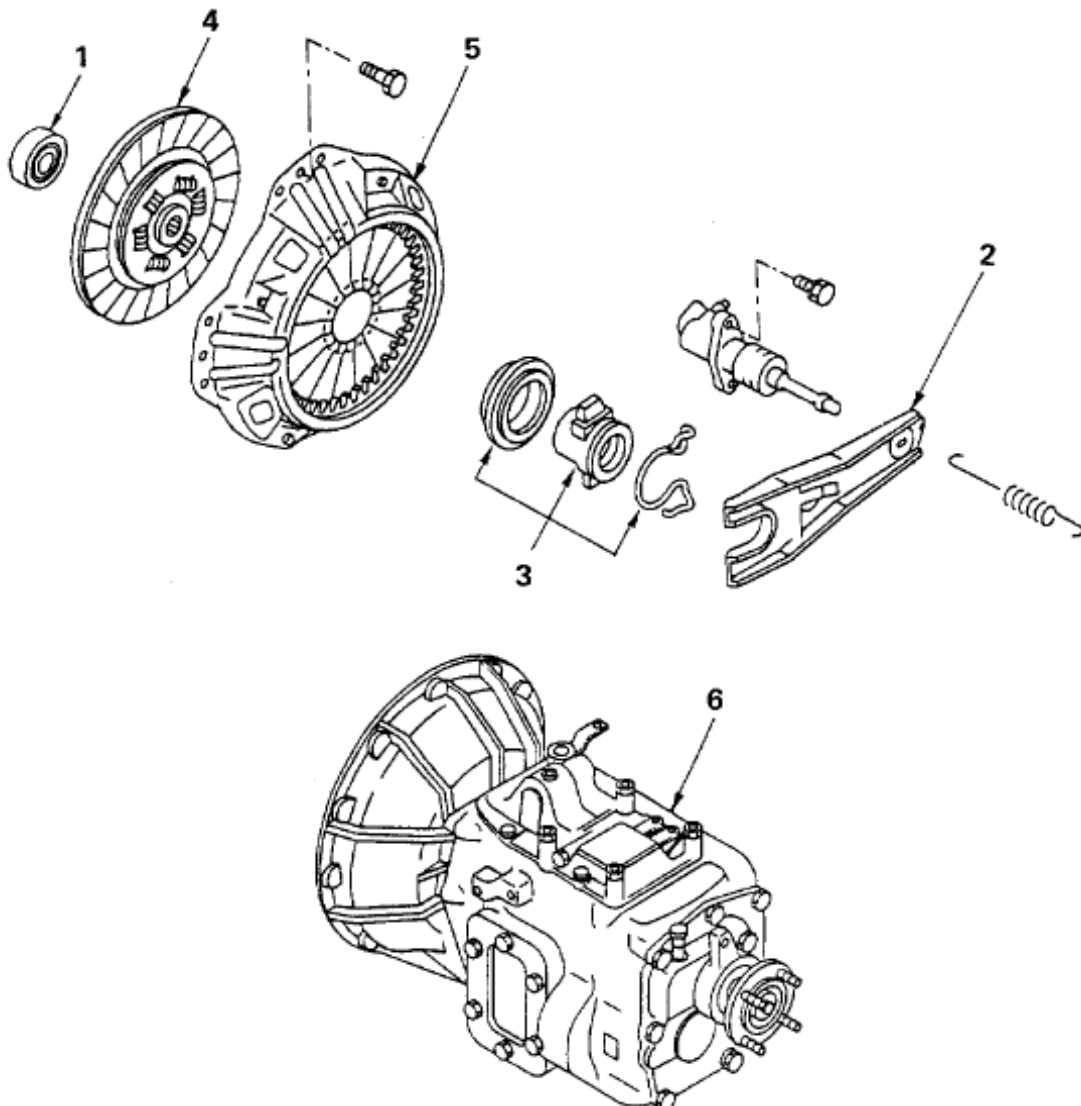
- a. There is any surface roughness of release bearing or noise caused by rotation under light press.
- b. There is surface roughness or damage.
(With contacting surface of release fork and front cover surface of release bearing)

Warning: for release bearing has been installed with lubricant, do not put it in solvent to wash, this could dissolve lubricant. Note if there is any problem, do not disassemble the sleeve. Check whether return spring has been ruptured or softened. If there is any situation above, it is necessary to change parts.

CLUTCH



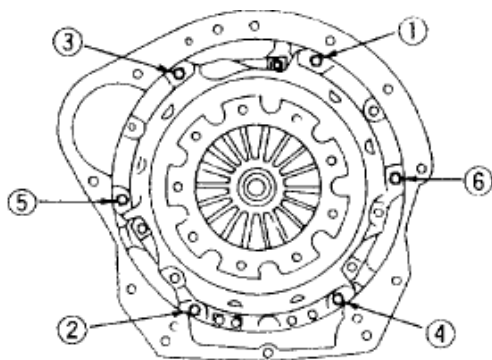
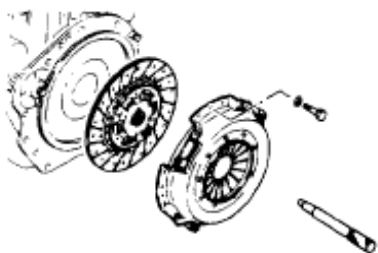
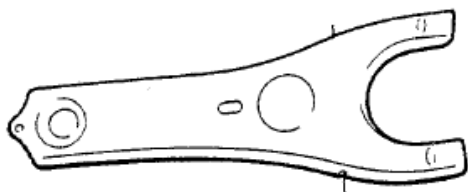
Re-assembly



Re-assembly sequence

1. Clutch release fork 2;
2. Release sleeve assembly 3;
3. Driven plate assembly 4;
4. Pressure plate assembly 5;
5. Gearbox 6.

CLUTCH



Re-assembly step

1. Release fork

Apply multi-purpose lubricating grease (**molybdenum** disulfide) on the surface which contacts with release sleeve assembly and supporting on release fork.

2. Release sleeve assembly

Install release sleeve together with return spring.

3. Driven plate assembly

4. Pressure plate assembly

Apply multi-purpose lubricating grease (**molybdenum** disulfide) in spline hub of driven plate.

Install driven plate assembly with guiding shaft.

Screw assembly bolts of pressure plate tightly by numeric sequence.

Tightening torque of assembly bolts of pressure plate 1.8kgf.m.

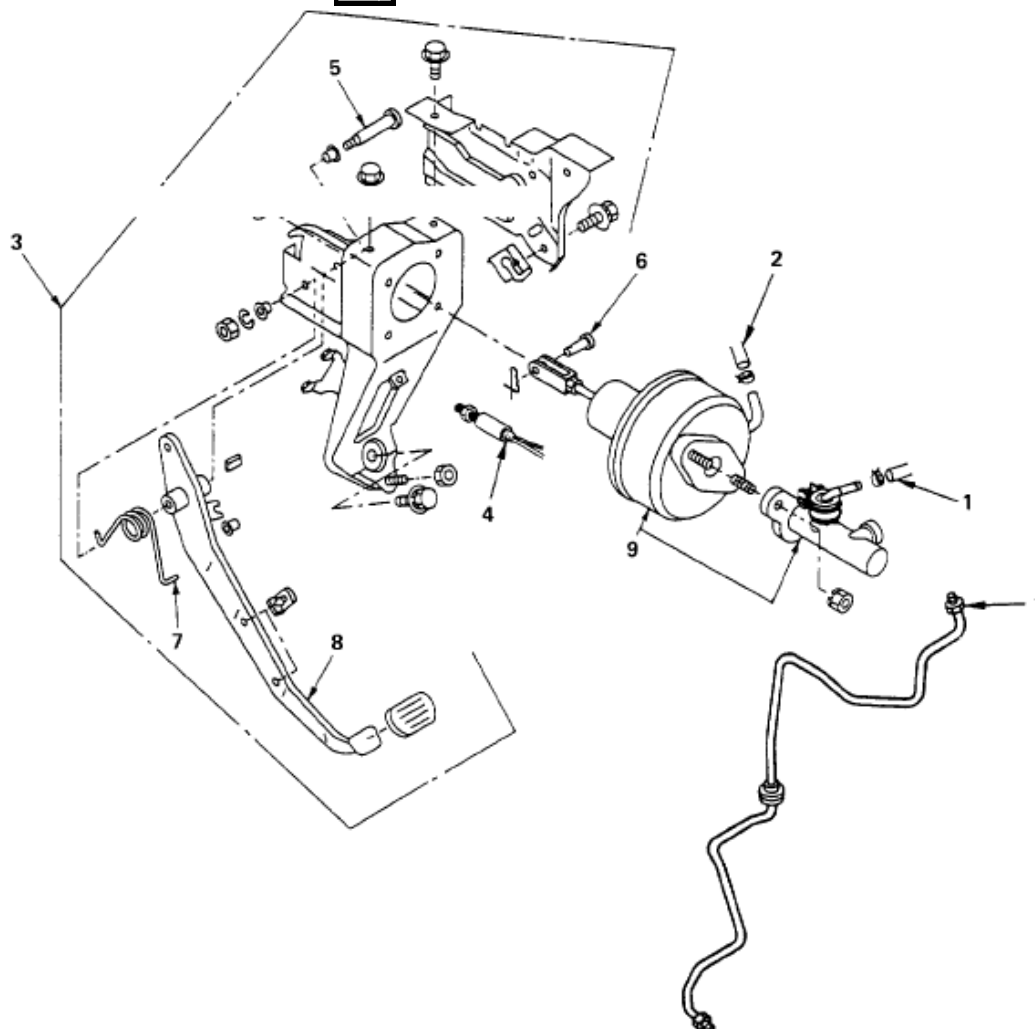
Warning: after screwing assembly bolts of pressure plate, take off steel wires used for protecting diaphragm spring.

CLUTCH

Clutch control equipment



Disassembly



Disassembly sequence

1. Clutch pipe and soft pipe 2. Oil-intake soft pipe of main pump 3. Clutch panel and bracket assembly 4. Clutch switch or limit bolt 5. Shaft 6. Pin 7. Return spring 8. Clutch panel 9. Clutch main pump assembly 10. Soft pipe 11. Clutch cylinder

Preparation

Dismantle instrument shell and instrument.

Disassembly step of clutch control equipment

Drain out brake liquid in hydraulic pressure pipeline of clutch.

Warning: do not let brake liquid remain on the surface with paint, if having, wipe off immediately.

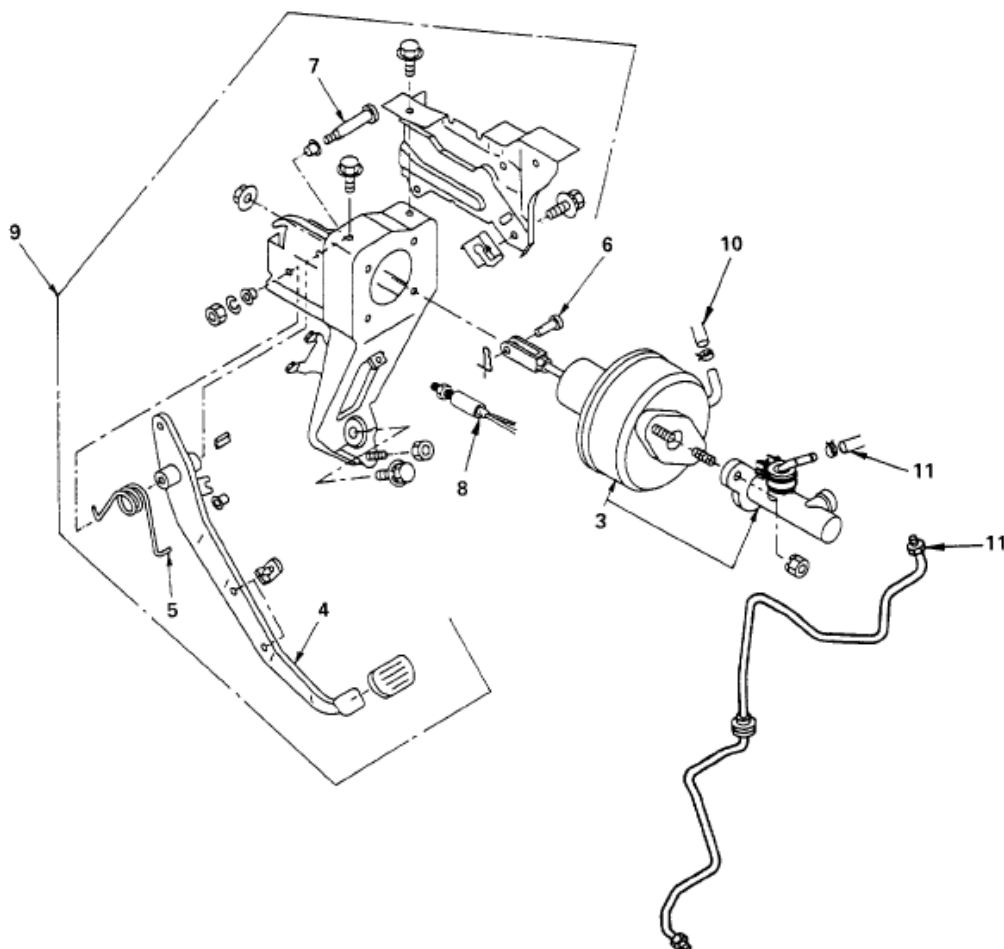
Inspection and repair

If there is any excessive abrasion or damage about parts in checking process, it is necessary to adjust, repair or change those parts.

CLUTCH

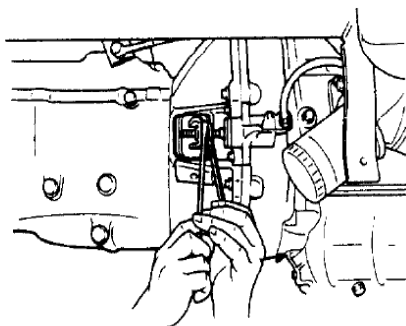


Re-assembly



Re-assembly sequence

1. Clutch cylinder
2. Soft pipe
3. Clutch main pump assembly
4. Clutch panel
5. Return spring
6. Pin
7. Shaft
8. Clutch switch or limit bolt
9. Clutch panel and bracket assembly
10. Oil-intake soft pipe of main pump
11. Clutch pipe and soft pipe



Re-assembly step

1. Clutch cylinder

Tightening torque of assembly bolts of clutch cylinder 1.6 kgf • m

Adjust handspike of clutch cylinder rightly before installing return spring of clutch cylinder.

Unscrew locking nuts of clutch handspike.

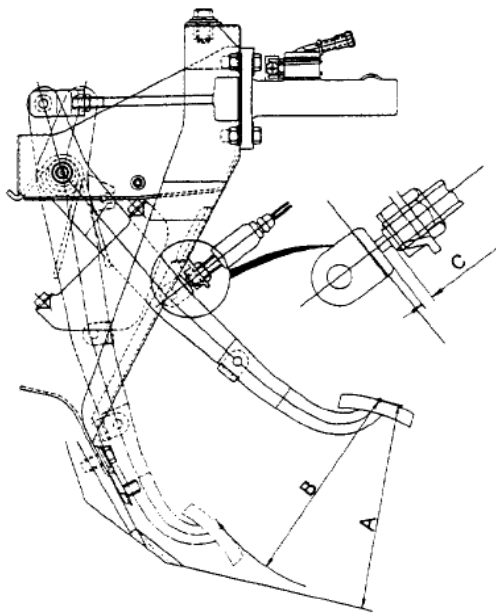
Turn handspike until supporting separator fork.

Turn back handspike for 1.5 circles. (Free travel of separator fork is about 2 mm)

Screw locking nuts.

Tightening torque of locking nut 1.9 kgf.m

CLUTCH



1. Clutch soft pipe
2. Clutch main cylinder

Install clutch main cylinder on clutch panel and bracket. Tightening torque of assembly nut 1.3 kgf.m.

3. Clutch panel
4. Return spring
5. Pin and shaft
6. Clutch switch or limit bolt
7. Clutch panel and bracket assembly

Tightening torque of clutch panel and bracket assembly bolt 3.8 kgf.m

After those assemblies above, it is necessary to adjust clutch control equipment

Height and travel of clutch panel

- 1) Unscrew locking nuts of clutch main pump handspike

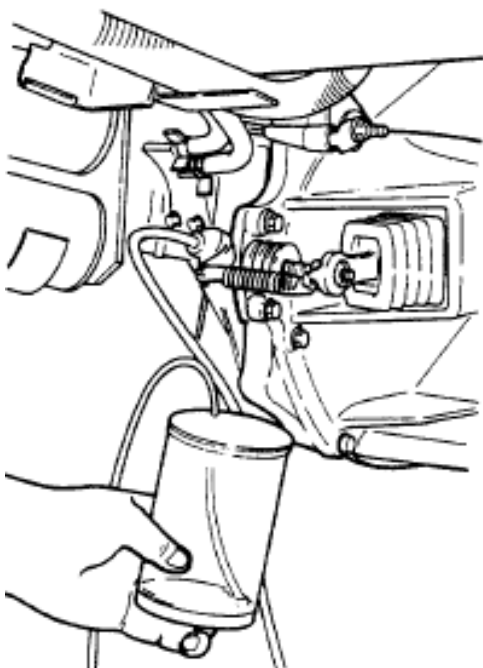
- 2) Turn handspike to adjust panel.

Height of clutch panel A: 160-170mm

Travel of clutch panel B: 159-169mm

- 3) Tightening torque of locking nuts of clutch main pump handspike 1.3 kgfm

- 4) Re-install instrument to adjust free travel of clutch panel, unscrew clutch switch or panel limit bolt, Adjust clutch switch or panel limit bolt to make free travel of clutch panel is 3—5mm.



Deflation of clutch pipeline should be made by following steps:

1. Strain park arrester.
2. Put brake liquid in oil storage pot until reaching maximal liquid level. It is necessary to note whether there is any brake liquid in oil storage pot.
3. Dismantle bleed screw rubber cap on clutch cylinder, link plastic pipe on bleed screw, and insert the other end of plastic pipe into translucent vessel with brake liquid.
4. After stepping down clutch panel for several times continually, step on clutch panel.
5. When keeping on stepping on penal, unscrew bleed screw to discharge air, then screw bleed screw.
6. Repeat those operations above, until the air in pipeline has been drained out completely.

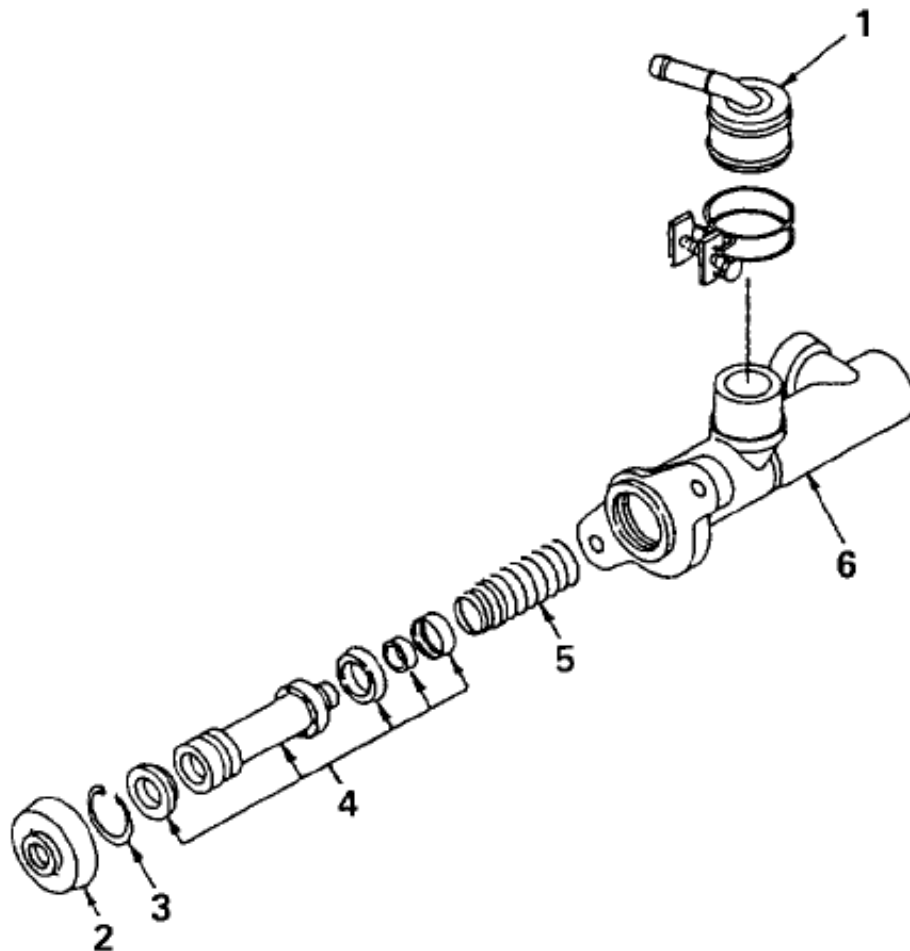
After deflation operation, intake brake liquid until " MAX " mark in oil storage pot.

CLUTCH

Clutch main cylinder

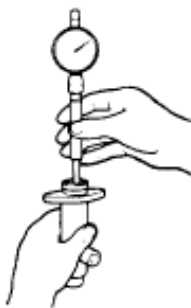


Disassembly



Disassembly sequence

- | | | | | |
|----------------|-------------------|--------------------|--------------------|---------------|
| 1. Pipe tie-in | 2. Handspike fork | 3. Locking nut | 4. Dustproof cover | 5. Clamp ring |
| 6. Limit block | 7. Handspike | 8. Piston assembly | 9. Return spring | 10. Pump body |



Inspection and repair

Measure the inner diameter of main pump body.

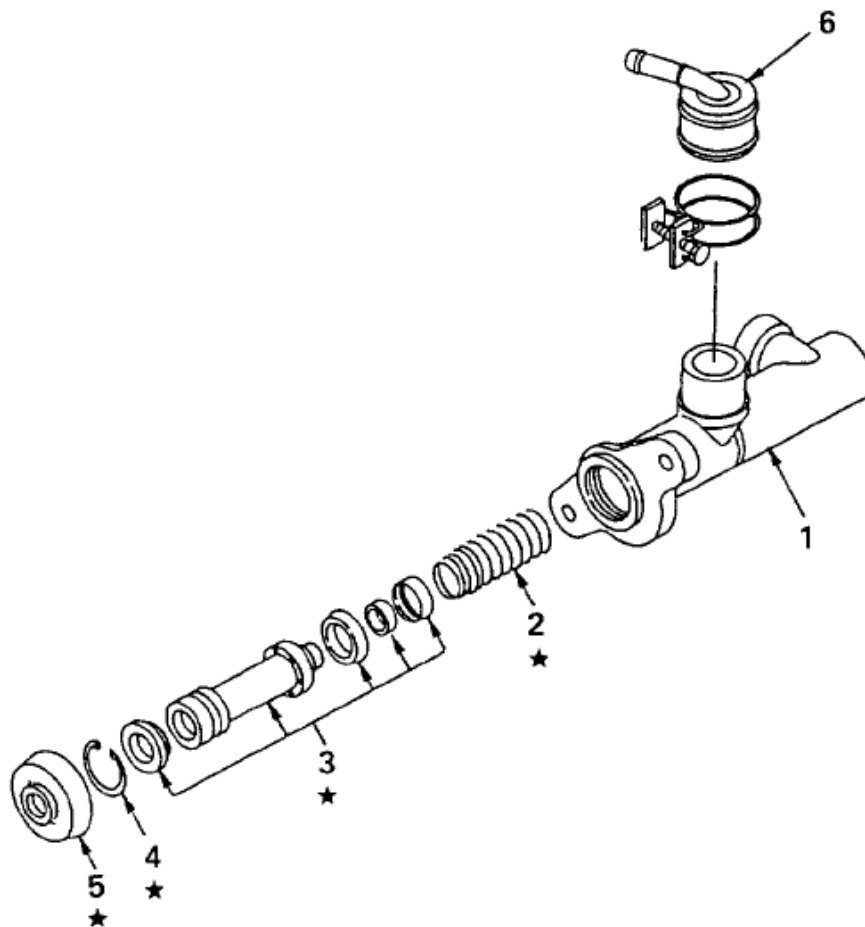
Inner diameter of main pump body :
19.050---19.102mm

Clearance between clutch main pump piston and
inner diameter of main pump body:
0.12mm(limit)

CLUTCH



Re-assembly



Re-assembly sequence

1. Pump body 2. Return spring 3. Piston assembly 4. Handspike 5. Limit block

6. Clamp ring 7. Dustproof cover 8. Locking nut 9. Handspike fork 10. Pipe tie-in

Re-assembly notes:

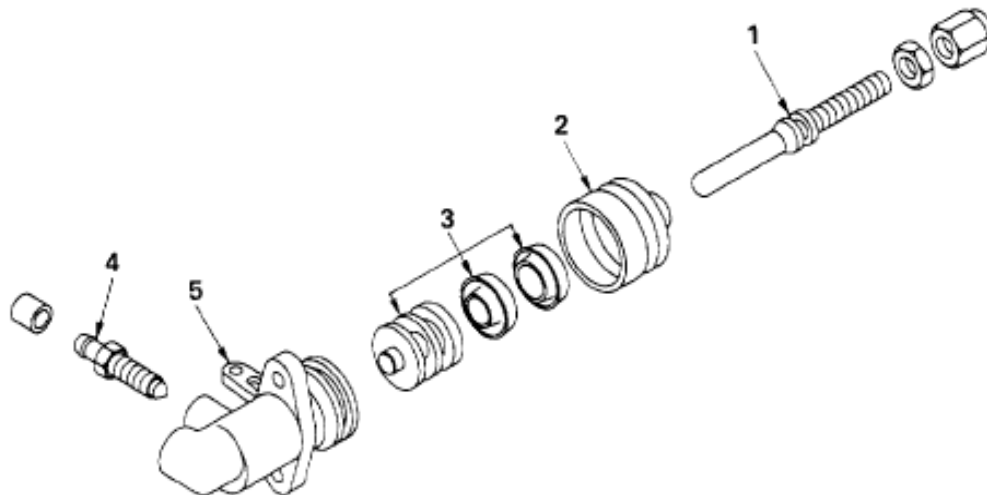
1. Dip the pump body and piston with clean brake liquid before re-assembly.
2. Spread a sheet of thin lubricating grease on skin bowl.
3. It is necessary to note to prevent the lip of skin bowl from being damaged in assembly process.

CLUTCH

Clutch cylinder



Disassembly

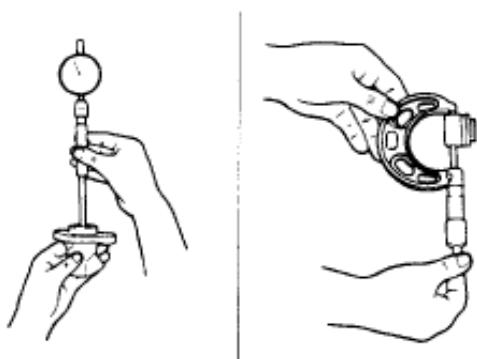


Disassembly sequence

1. Handspike 2. Dustproof cover 3. Piston assembly 4. Deflation screw 5. Cylinder body

Inspection and repair

If there is any excessive abrasion or damage about parts in checking process, it is necessary to adjust, repair or change those parts.



Clutch cylinder assembly

Wash clutch cylinder body with brake liquid.

Measure the inner diameter of cylinder body.

Inner diameter of cylinder body :
23.99---24.042mm

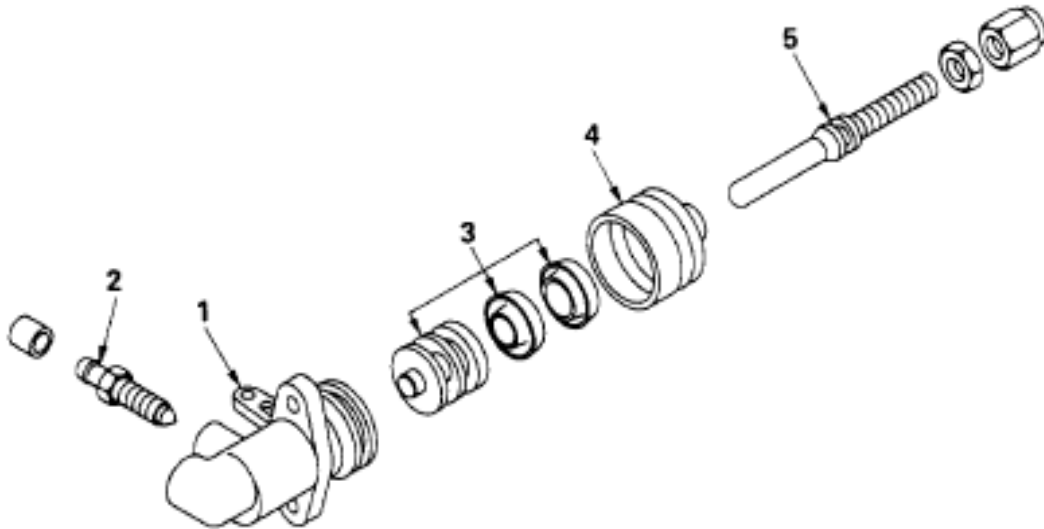
Clearance between clutch cylinder piston and
inner diameter of cylinder body: 0.12mm(limit)

Warning: for disassembled clutch cylinder, it is
necessary to change repair bag.

CLUTCH



Re-assembly



Re-assembly sequence

1. Cylinder body 2. Deflation screw 3. Piston assembly 4. Dustproof cover 5. Handspike

Re-assembly notes:

1. Dip the pump body and piston with clean brake liquid before re-assembly.
2. Spread a sheet of thin lubricating grease on skin bowl.
3. It is necessary to note prevent the lip of skin bowl from being damaged in assembly process.

TRANSMISSION

TRANSMISSION

LC6T46

Type	LC6T46								
Model	6 Forward gears, 1 Rearward gear (synchronic devices are equipped to 2-6 gears)								
Gear type	Remote control manual shift								
Shift type	1. R gear						Spur gear		
	2~6 gear						Helical gear		
Speed ratio	1st gear	2nd gear	3rd gear	4th gear	5th gear	6th gear	R gear		
	6.314	3.913	2.262	1.393	1.000	0.788	5.874		
Number of tooth (1 st shaft, main shaft / middle shaft)	1st gear	2nd gear	3rd gear	4th gear	5th gear	6th gear	R gear	Small reverse	
	43/13	41/20	32/27	27/37	22/42	19/46	40/23	23/13	
Dosage of lubricating oil (L)	5.2 L								

TRANSMISSION

2. Maintenance data:

Unit : mm

item		Standard	Limit	Memo
Upper cover of the gear box	Space between gear-select and gear-shift-head (mm)	0.1~0.4	0.8	
	Space between gear-shaft-head and spline of gear-shift rearing. (mm)	0.05~0.11	0.5	
	Space between gear-shift-head and block (mm).	0.7~1.0	1.4	
	Space between upper cover and shaft shift (mm)	0.1~0.2	0.8	
	Space between upper cover and gear-select rearing (mm)	0.04~0.07	0.1	
	Pressure of yoke spindle lock ball spring (N)	80.71		Compressed to 26.1mm
	Pressure of resistance pin lock ball spring (N)	37.46		Compressed to 19.6mm
		26.48		Compressed to 19.3mm
	Pressure or resistance spring of the resistance pin (N)	43.35		Compressed to 34.5mm
		36.29		Compressed to 39.5mm
	Pressure of neutral limiting spring (N)	147.11		Compressed to 20.8mm
	Space between gear-shift shaft and synchronic sleeve (mm)	0.1~0.29	1.0	
Inherent parameters	Side clearance of gear		0.09~0.20	0.50
	Axial clearance between each main shaft	Main I . Main II	0.28~0.70	0.80
		Main III. Main IV	0.26~0.70	0.80
		Main VI	0.26~0.70	0.80
		Main reverse	0.21~0.64	0.80
	Axial clearance between each small reverse gear		0.28~0.42	0.70
	Radial clearance between hub and sleeve	Reverse	0.20~0.30	0.50
		1/2 gear	0.20~0.30	0.50
		3/4 gear	0.20~0.30	0.50
		5/6 gear	0.20~0.30	0.50
	Axial movement of ball bearing		0.20~0.30	0.50

TRANSMISSION

3. Torque:

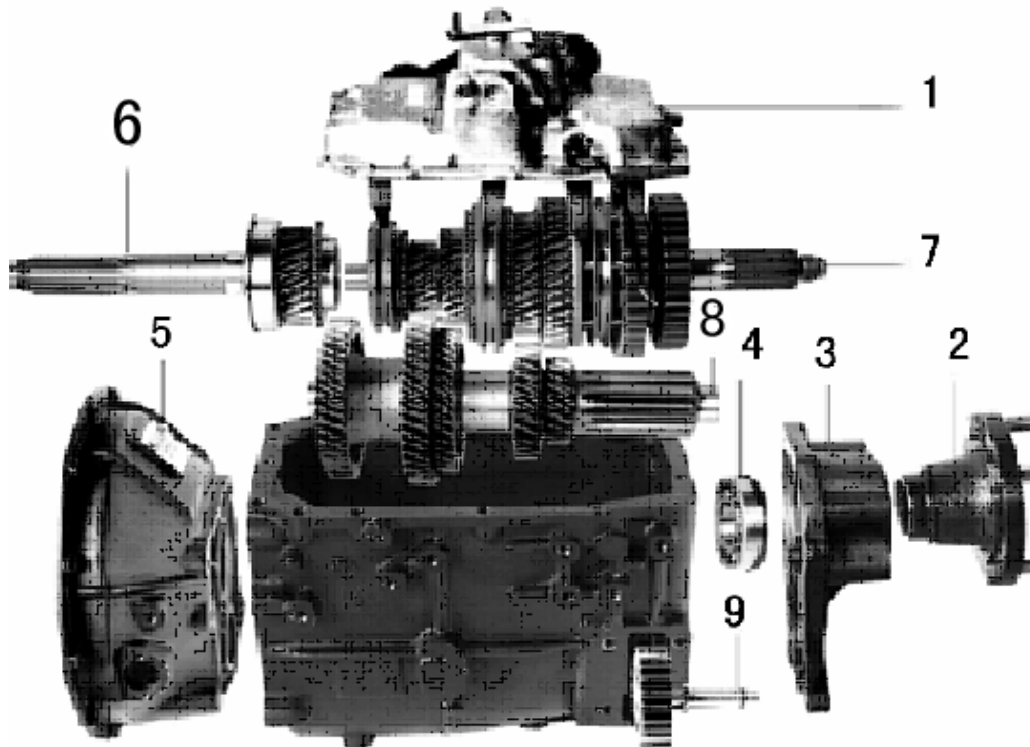
Unit : N·m(Kg·m)

Name	Torque	Name	Torque
Clutch housing bolt	57~75 (5.8~7.7)	Power take off bolt	57~76(5.8~7.7)
Top cover bolt	4.1~5.3(0.41~0.55)	Back cover bolt	33~42(3.3~4.3)
Upper cover bolt	33~42(3.3~4.3)	Reverse gear locking bolt	19~25(1.9~2.6)
Guiding board bolt	16~21(1.6~2.1)	Bolt	35~45(3.5~4.6)
Fork fixing bolt	16~21(1.6~2.1)	Bolt	89~118(9.1~12)
Light swift for backing	29~49(3.0~5.0)	Bolt	9~13(0.9~1.3)
Gap gear swift	110~127(11~13)	Nut	393~500(40~51)
Snail	16~21(1.6~2.1)	Bolt. Nut	84~98(8.6~10)
Drawing off-oil snail. input -oil snail	98~127(10~13)	Spring	55~75(5.6~7.6)
Bolt for cover side	35~45(3.5~4.6)		

TRANSMISSION

Dismantling

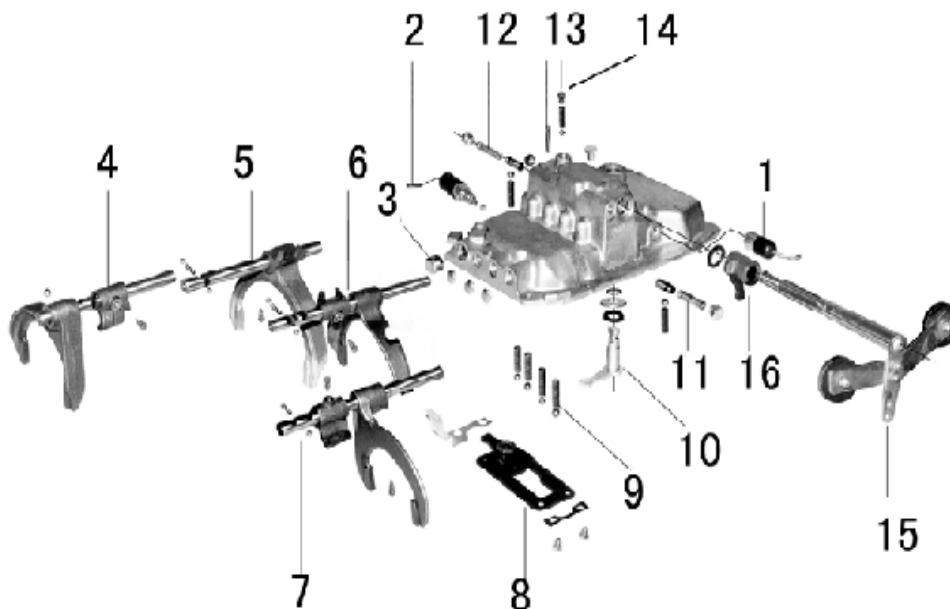
1. Dismantling order of transmission:



No.	Name	Memo
1	transmission cover assembly	
2	flange	
3	rear cover assembly	
4	radial ball bearing	
5	clutch housing assembly	
6	primary shaft assembly	
7	main shaft assembly	
8	counter shaft assembly	
9	reversing gear assembly	

TRANSMISSION

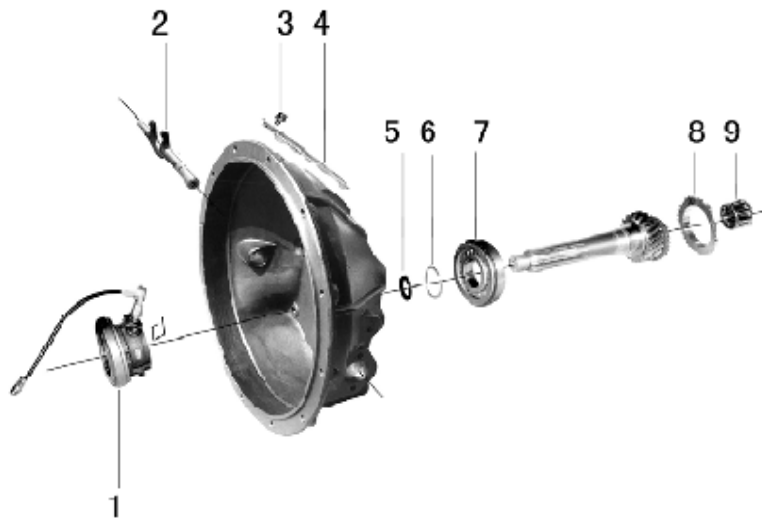
2. Dismantling order of transmission upper cover:



No.	Name	Memo
1	Backing light switch	
2	Neutral indicator switch	
3	Blocking cover	
4	5/6 shaft shift subassembly	
5	3/4 shaft shift subassembly	
6	1/2 shaft shift subassembly	
7	Backing and reversing shaft shift subassembly	
8	guide board assembly	
9	steel ball / lock ball spring	
10	gear selector assembly	
11	Left resistance pin subassembly	
12	Right resistance pin subassembly	
13	Straight pin	
14	plug	
15	Shift rocker arm subassembly	
16	Shift head	

TRANSMISSION

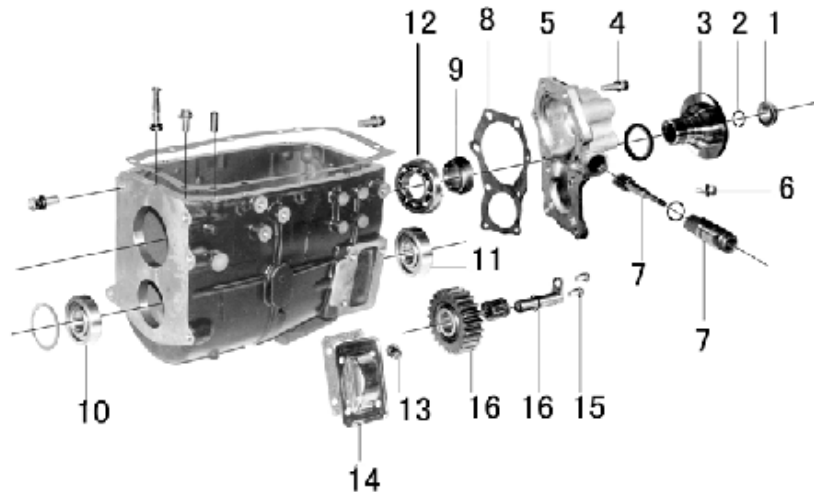
3. Housing clutch / primary shaft assembly:



No.	Name	Memo
1	Release bearing seat subassembly	
2	Release fork	
3	Bolt	
4	Upper cover	
5	Oil seal	
6	Bearing snap ring	
7	Roller bearing	
8	Synchronism ring	
9	Needle bearing	

TRANSMISSION

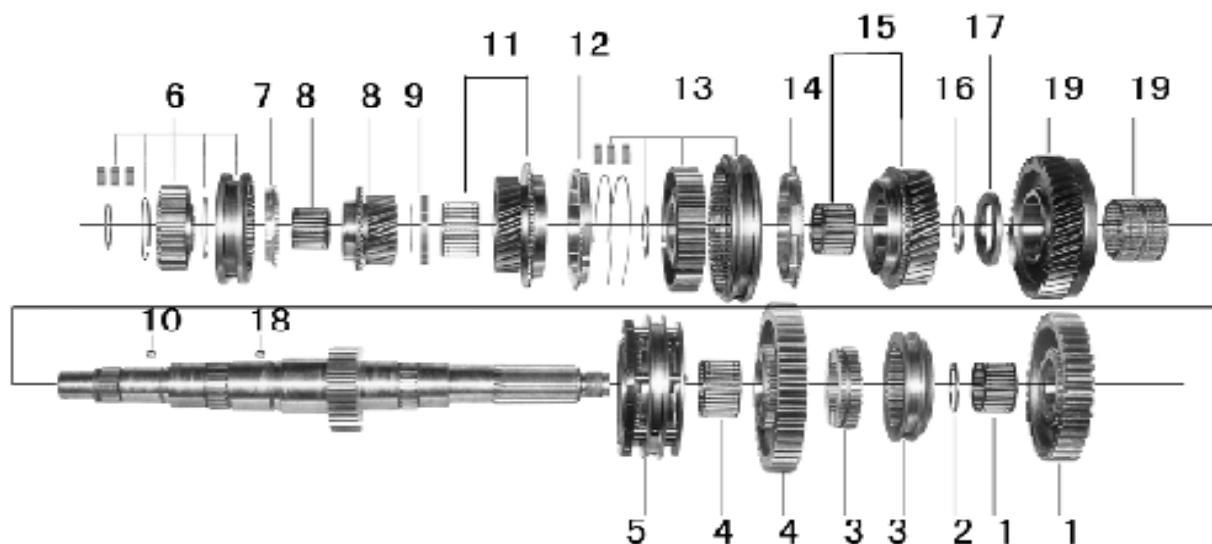
4. Dismantling order of housing and components:



No.	Name	Memo	No.	Name	Memo
1	Nut		10	Center shaft front bearing	
2	"O" Sealing ring		11	Center shaft rear bearing	
3	Flange plate		12	2nd shaft ball bearing	
4	bolt (rear cover)		13	bolt (side cover)	
5	Top plate		14	Side cover	
6	bolt (odometer)		15	bolt (backing shaft)	
7	The course table passive tooth and leads the wrap		16	Backing gear / axle	
8	Rear cover gasket				
9	odometer drive gear				

TRANSMISSION

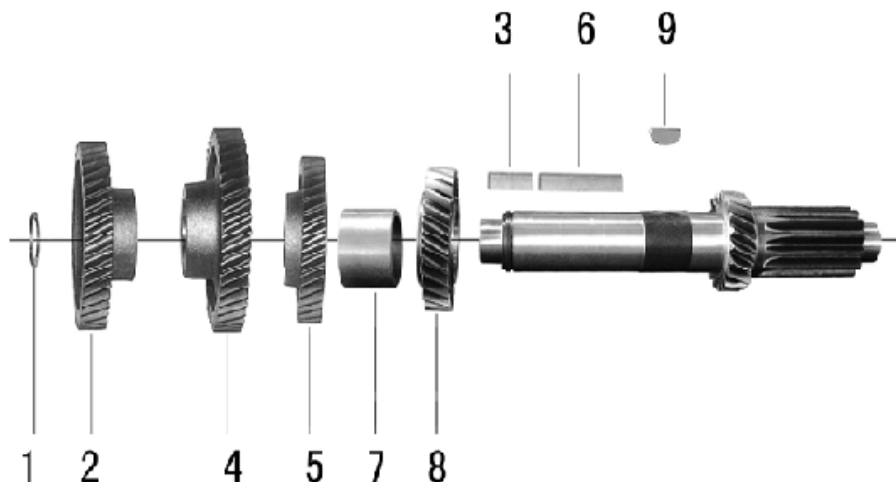
5. Dismantling order of 2nd shaft assembly:



No.	Name	Memo	No.	Name	Memo	No.	Name	Memo
1	Backing gear		8	6 th gear, main shaft		15	3 rd gear, main shaft	
2	Bearing snap ring		9	Bearing snap ring		16	Bearing snap ring	
3	Reverse hub/Sleeve		10	Steel Ball		17	2nd gear push washer	
4	1st gear		11	4th gear, main shaft		18	Steel Ball	
5	1/2 Synchrotron assembly		12	3/4 Synchrotron ring		19	2 nd gear, main shaft	
6	5/6 Synchrotron assembly		13	3/4 Synchrotron assembly		20		
7	5/6 Synchrotron gear ring		14	3/4 Synchrotron gear ring				

TRANSMISSION

6. Dismantling order of countershaft assembly:



No.	Name	Memo
1	Bearing snap ring	
2	Counter shaft constant engaging gear	
3	Flat key	
4	Center shaft 6th gear	
5	Center shaft 4th gear	
6	Flat key	
7	3/4 gear jacket	
8	3rd Gear	
9	Woodruff Key	

Installation of transmission

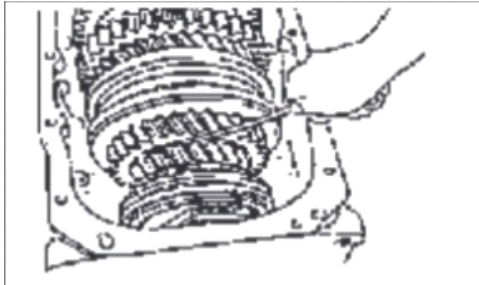
The Installation sequence of transmission is just the opposite of removal, so in transmission removing, you should make marks to indicate the sequences and directions for right and smooth reinstallation after maintenance.

Installation process of transmission assembly: Ellipsis.

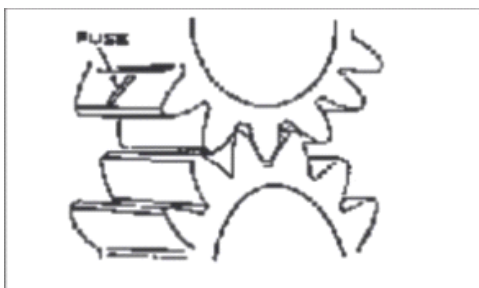
TRANSMISSION

Maintenance of transmission assembly

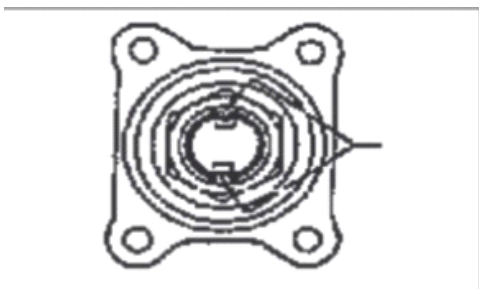
Items to notice in removing transmission assembly



Before removing the transmission assembly, place the transmission assembly on the work platform or other proper place and fix it reliably in case of sliding or falling.



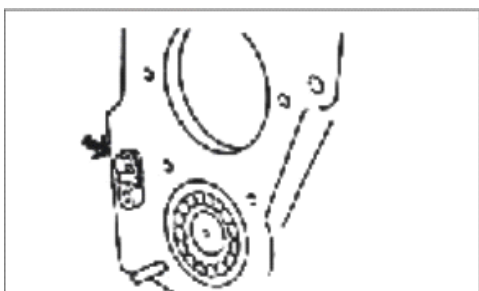
Put a 15mm-long and 1mm-in-diameter fuse on the gear surface by applying grease to the fuse. Rotate the gear for a round, Survey and record the side clearance of the gear flange.



Main shaft nut

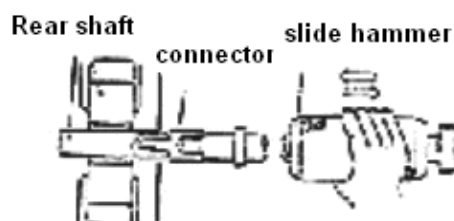
Fix the gearbox reliably and not let it move and then pry off the lock slice, release the Main shaft nut.

Note: The Main shaft nut can not be used again after dismantling.



Rear cover

Remove the rear cover only as oil leakage is found. Abandon the damaged oil sealing and replace it with new one.



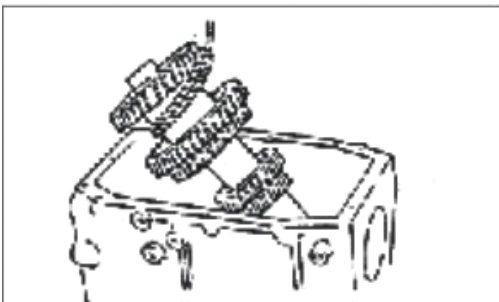
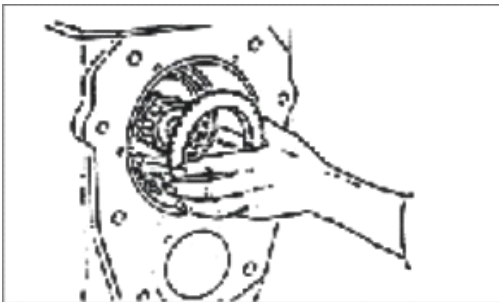
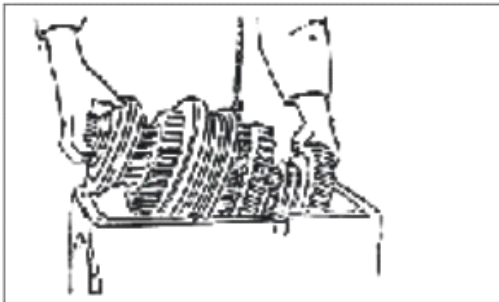
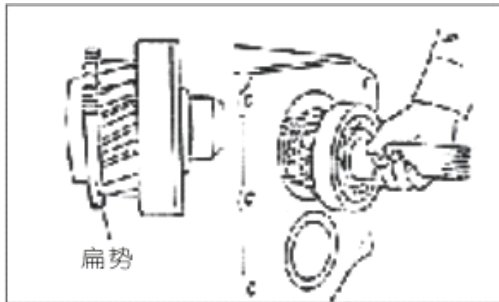
Small reverse gear assembly

Release and remove the lock slice, dismantle the backing gear with the adaptor and the slide hammer.

Primary shaft assembly

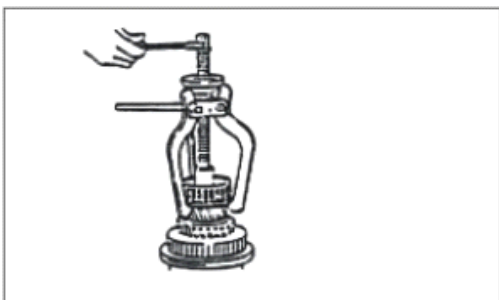
Make sure that the milling sides of the engaging gear ring face downwards. Dismantle the primary

TRANSMISSION



Key points of main shaft dismantling

TRANSMISSION



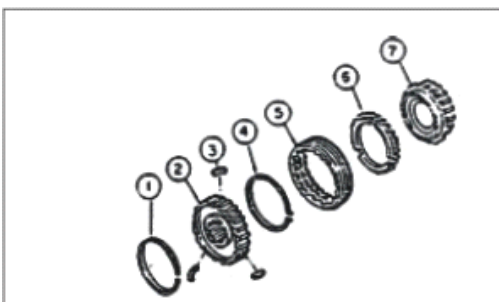
5/6 Synchrotron assembly

After dismantling 5/6 synchrotron sleeve and slide block, pull down the hub.

Don't lose the synchrotron slide block and spring when removing the sleeve.

1. 5/6 synchrotron spring
2. 5/6 synchrotron hub
3. Synchrotron slide block
4. 5/6 Synchrotron spring
5. 5/6 Synchrotron sleeve
6. 5/6 Synchrotron ring.
7. Main gears

Notes: Mark the synchrotron rings for distinguishing.

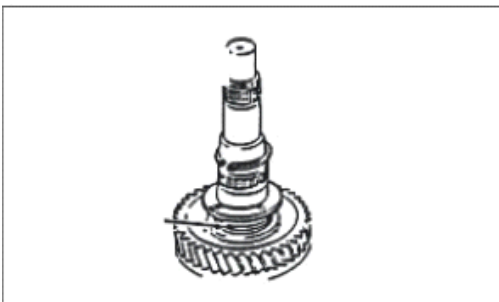


3/4 Synchrotron assembly

Be sure not to lose spring when it's disassembled

1. 3/4 Synchrotron ring
2. 3/4 Synchrotron spring
3. 3/4 synchrotron hub
4. Synchrotron slide block
5. 3/4 Synchrotron spring
6. 3/4 Synchrotron ring
7. 3/4 Synchrotron sleeve

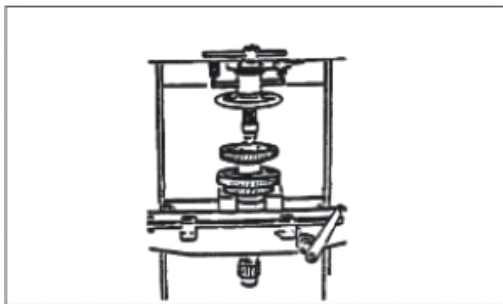
Notes: Mark the synchrotron rings with paper strips or other items for distinguishing.



Steel ball

Note: don't lose steel balls.

TRANSMISSION



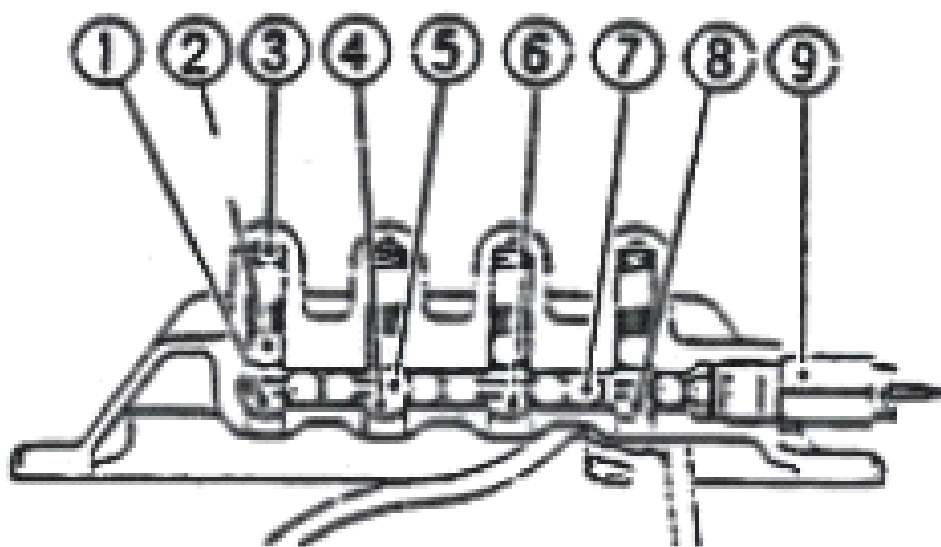
Key points of dismantling counter shaft

Don't remove the main shaft unless there is serious abrasion or gear breaking.

Counter drive Gear, counter 6th gear. counter 4th gear

Remove the counter shaft gears using the keys in common together

Note: Prevent the counter shaft from dropping.



Key points of dismantling the upper cover assembly.

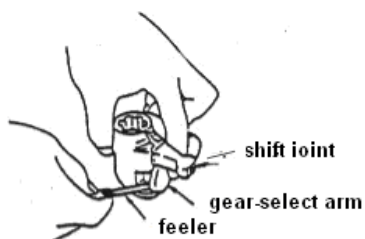
- All fork axles of 5/6 fork axle. 3/4 fork axle. 1/2 fork axle. Reverse fork axle can be removed in any order, but take notice that if the lock pin isn't in neutral position, the lock pin and steel balls will press upwards the upper cover, in which situation fork axles can not be taken apart.
- Note: be careful to stop the steel ball flying away

- | | | | |
|----------------------|------------------|----------------------------|------------------|
| 1. Reverse fork axle | 2. Steel ball | 3. lock ball spring | 4. 1/2 fork axle |
| 5. Lock pin | 6. 3/4 fork axle | | |
| 7. Steel ball | 8. 5/6 fork axle | 9. neutral-position switch | |

TRANSMISSION

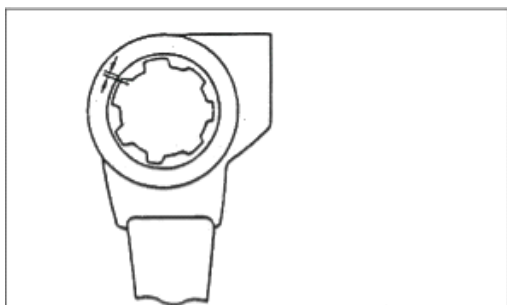
Inspection and Maintenance

- Clean up all the removed parts, check them carefully for scratches, cracking etc., and replace all of them.
- If the component can not be maintained, repair or replace it.



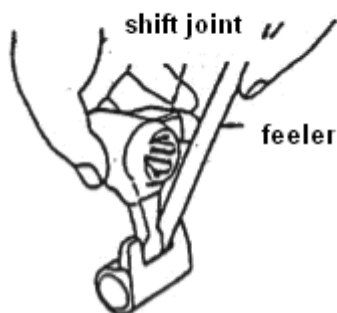
Space between gear-select and shift joint (mm)

Standard	Limit
0.1~0.4	0.8



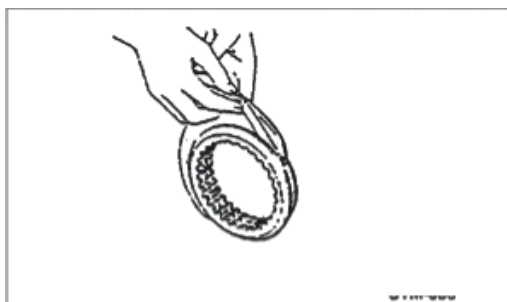
Space between shift joint and spline of gear-shift rearing (mm)

Standard	Limit
0.05~0.11	0.5



Space between shift joint and block (mm).

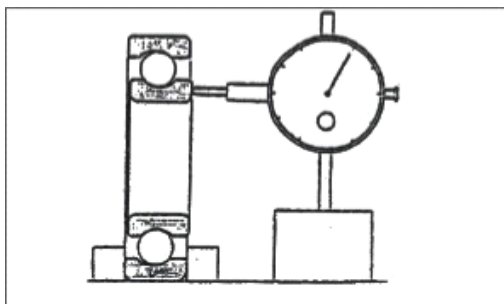
Standard	Limit
0.7~1.0	1.4



Space between gear-shift yoke and synchrotron sleeve (mm)

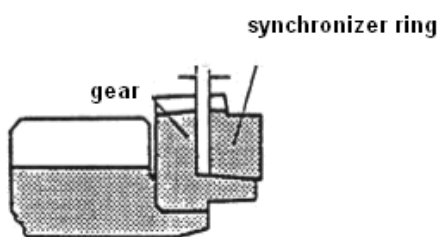
Standard	Limit
0.10~0.29	1.0

TRANSMISSION



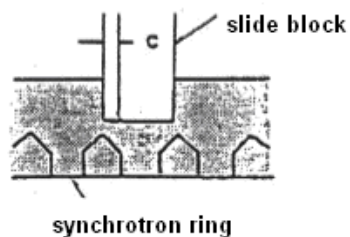
Radial play of ball bearing (mm)

Standard	Limit
	0.5



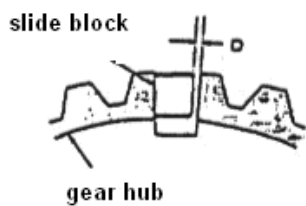
Space between synchrotron ring and the gears at each gear (mm)

Type	Standard	Limit
3/4 gear	1.05~2.25	0.5
5/6 gear	0.60~0.80	



Space between synchrotron slide block and synchrotron ring (mm)

Type	Standard	Limit
3/4 gear	4.49~4.85	—
5/6 gear	4.29~4.65	



Space between synchrotron hub and slide block (mm)

Standard	Limit
0.04~0.19	—

TRANSMISSION

Reinstallation

Installation

Pay attention to the direction of every gear and washer.

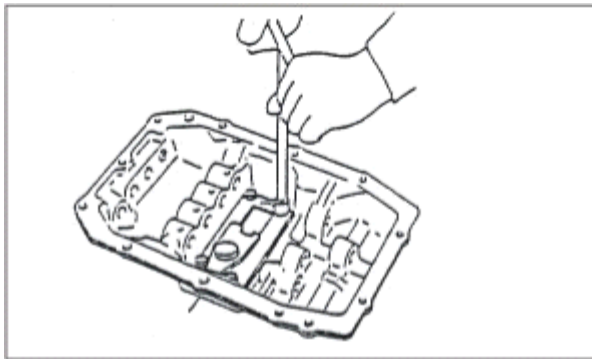
Don't mix the needle bearings and washers in different positions.

Apply clean gear oil on surfaces of rotating parts.

Rotate the gear by hand after installing to make sure that it's laid stably and there is no abnormal noise

Use new oil sealing and "O" washer.

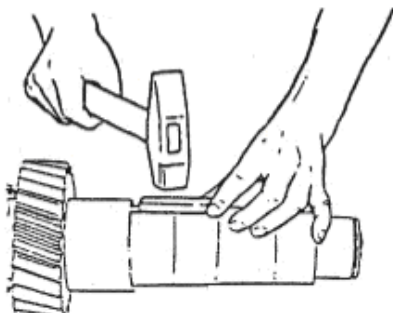
Key points of reinstalling the upper cover assembly



Safety slice Fold the four angles of the slice to avoid the bolt loosing after tightening the bolt up.	Yoke fixing bolt Screw the fixing bolts into each yoke and toggle block. Tighten the bolt up after making sure that it is in the shift fork axle hole; then tie it up with lock line in shape of "8" in case of loosing.	Stopper slice, cover Press centers of the stopper slice and the cover slightly to make them deform after installation to avoid oil leakage.
--	--	---

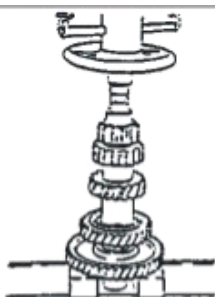
TRANSMISSION

Key points of reinstalling the counter shaft assembly



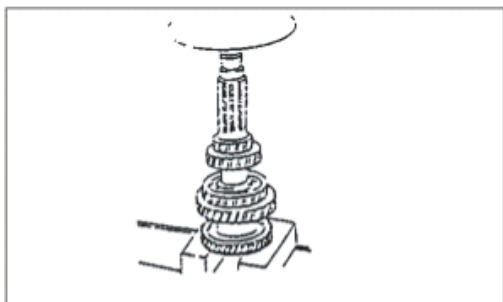
Flat key

Ensure the end with big chamfer to head the gear impressing end and press the key into the counter shaft.



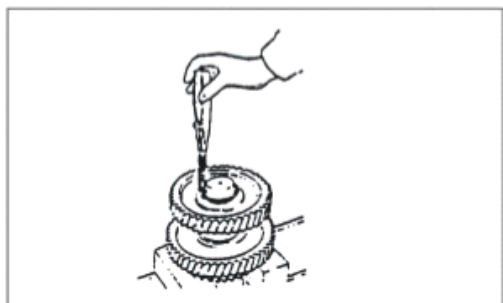
4th. 6th gear

Make the long-ledged ends of the gears head the front of the counter shaft and press them into it.



Counter drive gear

Make the long-ledged ends of the drive gears head the counter shaft and press them into it after laying the gears properly.



Snap ring

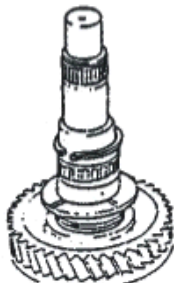
Choose a proper snap ring to make clearance of the counter shaft smallest.

Thicknesses of the snap ring are 2.00mm and 2.15mm.

TRANSMISSION

Key points of reinstalling the main shaft

Fix the main shaft in special fixture or table vice and make the front side of the main shaft upwards.



Gear washer

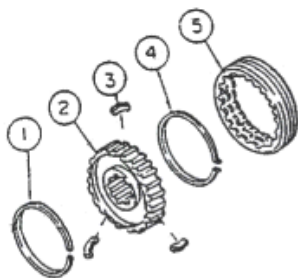
Make sure the side with a bigger chamfer of the interior hole faces the main shaft.

Snap ring

Choose proper snap ring to adjust the axial clearances between the gears and the synchrotron. Thicknesses can be adopted are as follows:

Location	2nd gear			3/4 synchrotron assembly		
Thickness	3.50	3.65	3.80	2.00	2.15	2.30

Location	4th gear			5/6 synchrotron assembly			Reverse hub		
Thickness	2.50	2.65	2.80	1.80	1.95	2.10	2.00	2.15	2.30



3/4 synchrotron assembly

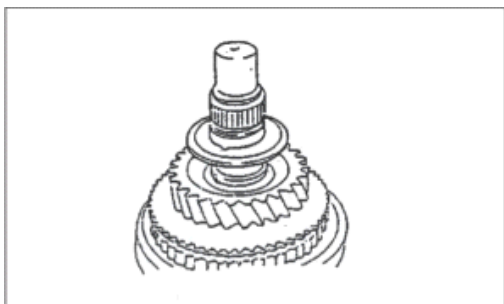
Install the synchrotron assembly according to above diagram.

- 1. Synchrotron spring 2. 3/4 hub
- 3. Slide block 4. Synchrotron spring
- 5. 3/4 sleeve



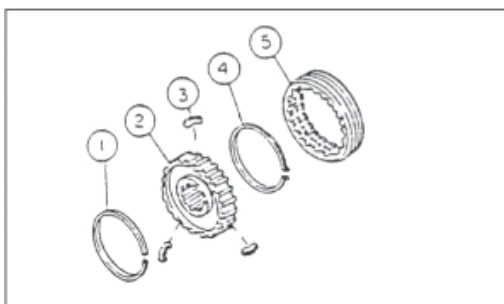
Note: When press 3/4 synchrotron assembly onto the main shaft, be sure not to lose parts such as sleeve, synchrotron spring, slide block etc.

TRANSMISSION



Main shaft 4th gear washer

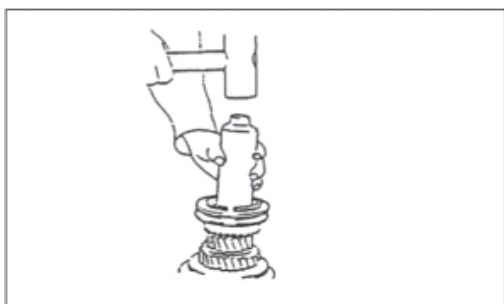
When install the main shaft 4th gear washer to the main shaft, keep the opening oil groove face the 4th gear.



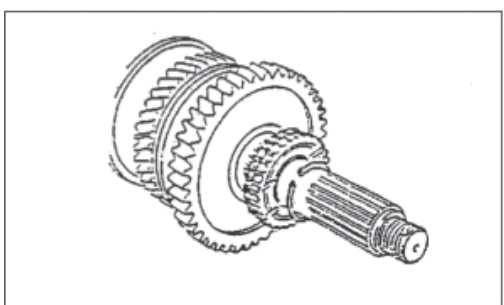
5/6 synchrotron assembly

Install the synchrotron assembly according to above diagram.

- 1. Synchrotron spring
- 2. 5/6 hub
- 3. Slide block
- 4. Synchrotron spring
- 5. 5/6 sleeve



Note: When press 5/6 synchrotron assembly onto the main shaft, be sure not to lose parts such as sleeve, synchrotron spring, slide block etc.



Reverse hub

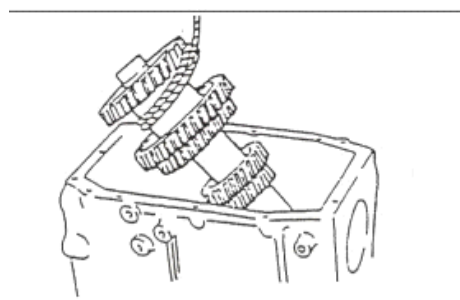
When install the reverse hub, make the outside circle cut groove face the main 1st gear.

TRANSMISSION

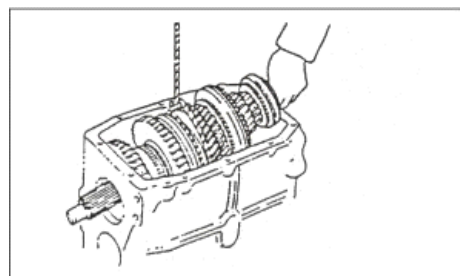
Measure the axial clearances among each gear of the main shaft. Standards are as follows

Type	Standard	Limit
1st. 2nd gear	0.28~0.70	0.8
3rd. 4th gear	0.26~0.70	0.8
6th gear	0.26~0.70	0.8
Reverse	0.28~0.42	0.8

Key points of installing the transmission assembly

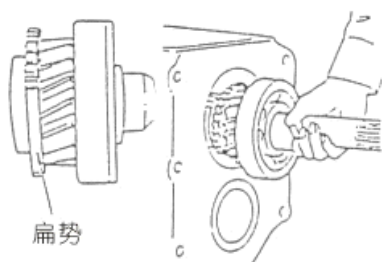


Counter shaft assembly



Main shaft assembly

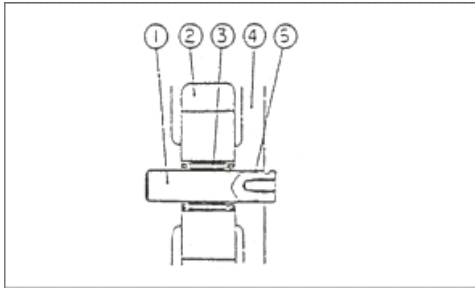
Notes: prevent the reverse needle bearing and sleeve from coming off.



Primary shaft assembly

Make sure that the milling side of the jointing gear faces downwards.

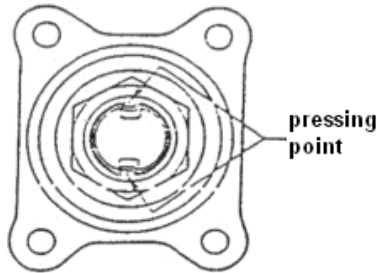
TRANSMISSION



Reverse gear lock slice

Be sure that the gear groove which the reverse lock slice faces and is pressed into faces upwards.

1. Reverse gear.
2. Small reverse gear
3. Needle bearing.
4. Transmission case
5. "O" seal



Flange disc nut

1. Fix the gearbox in case of sliding when tighten the flange disc nut.

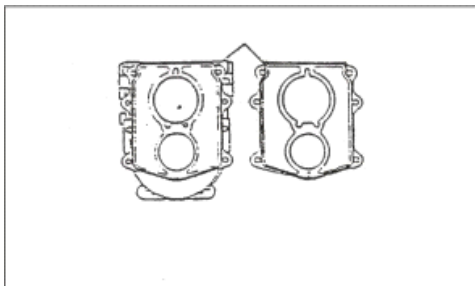
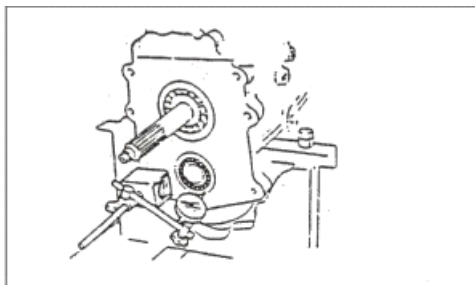
2. Press the reed of the flange disc nut into the main shaft groove to lock the nut.

3. Tightening torque of the nut: $392 \sim 500\text{N}\cdot\text{m}$
($40 \sim 51\text{Kgf}\cdot\text{m}$)

Adjusting shim

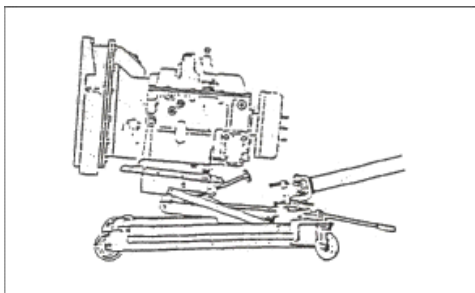
Install one or two adjusting shims and be sure that the clearance between the shim and the transmission shell surface is between 0.20 and 0.30mm.

Thicknesses of the adjusting shims are 0.1, 0.2, 0.3mm.



Transmission shell , cushion pad

Apply sealing liquid glue on the jointing surfaces of the transmission shell and the clutch shell.



Installation

- Use special-purpose jack for transmission or cable to install the transmission to the vehicle.

Adjust the primary shaft and make its keys come into keys of the clutch friction disc.

Install transmission shaft, pull rod, draw bench, cable and power take-off (if necessary), clutch separate components etc. according to the original locations.

DRIVE SHAFT

DRIVE SHAFT

General

Specifications

Maintenance

Disassembly sequences

Disassembly and assembly

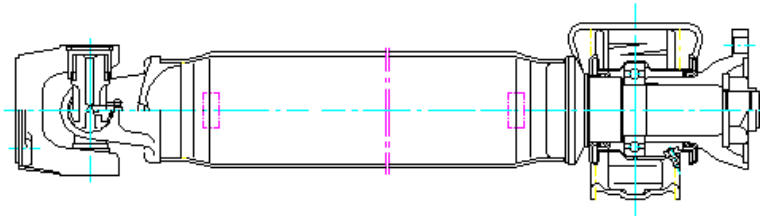
Disassembly

Check and repairs

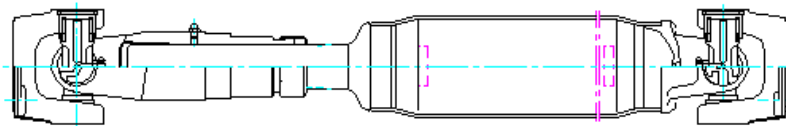
Re-installation

DRIVE SHAFT

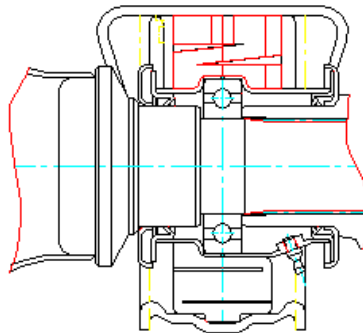
General



Intermediate drive shaft assembly



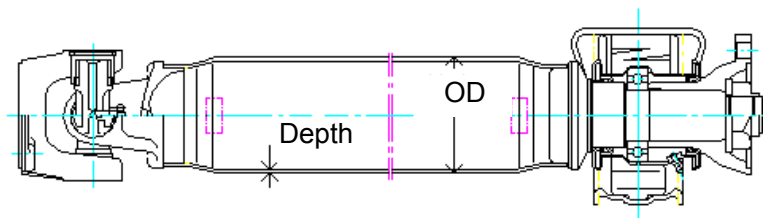
Rear drive shaft assembly



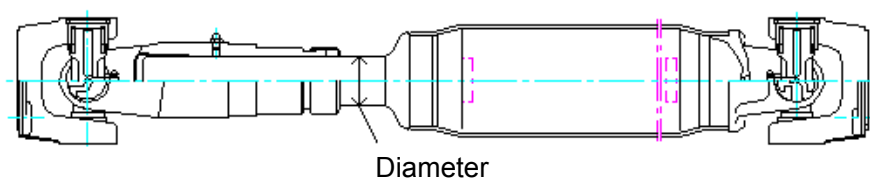
Intermediate supporting assembly

DRIVE SHAFT

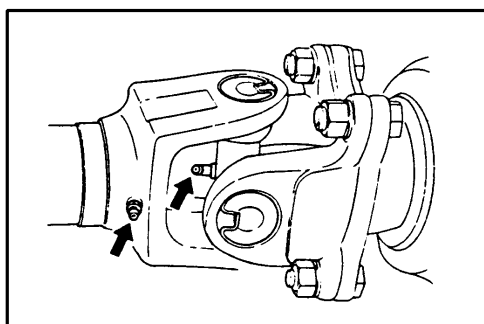
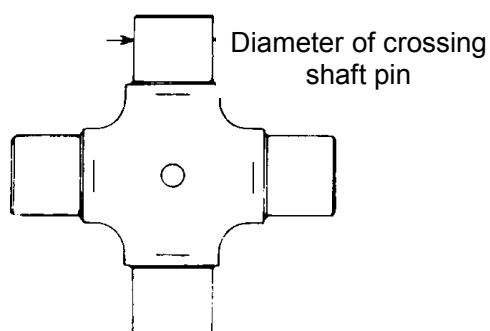
Intermediate drive shaft assembly



Rear drive shaft assembly



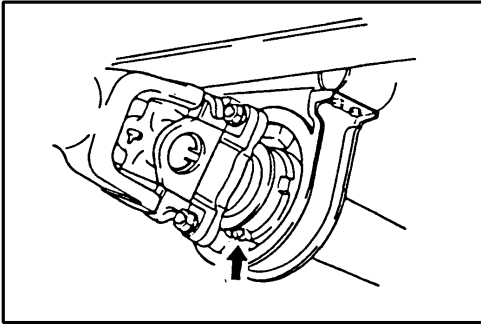
Crossing shaft



Maintenance

Apply the oil
Drive shaft universal joint and sliding
sleeve (GB49 2 calcium base grease)

DRIVE SHAFT



Drive shaft intermediate supporting bearing for lubricating grease

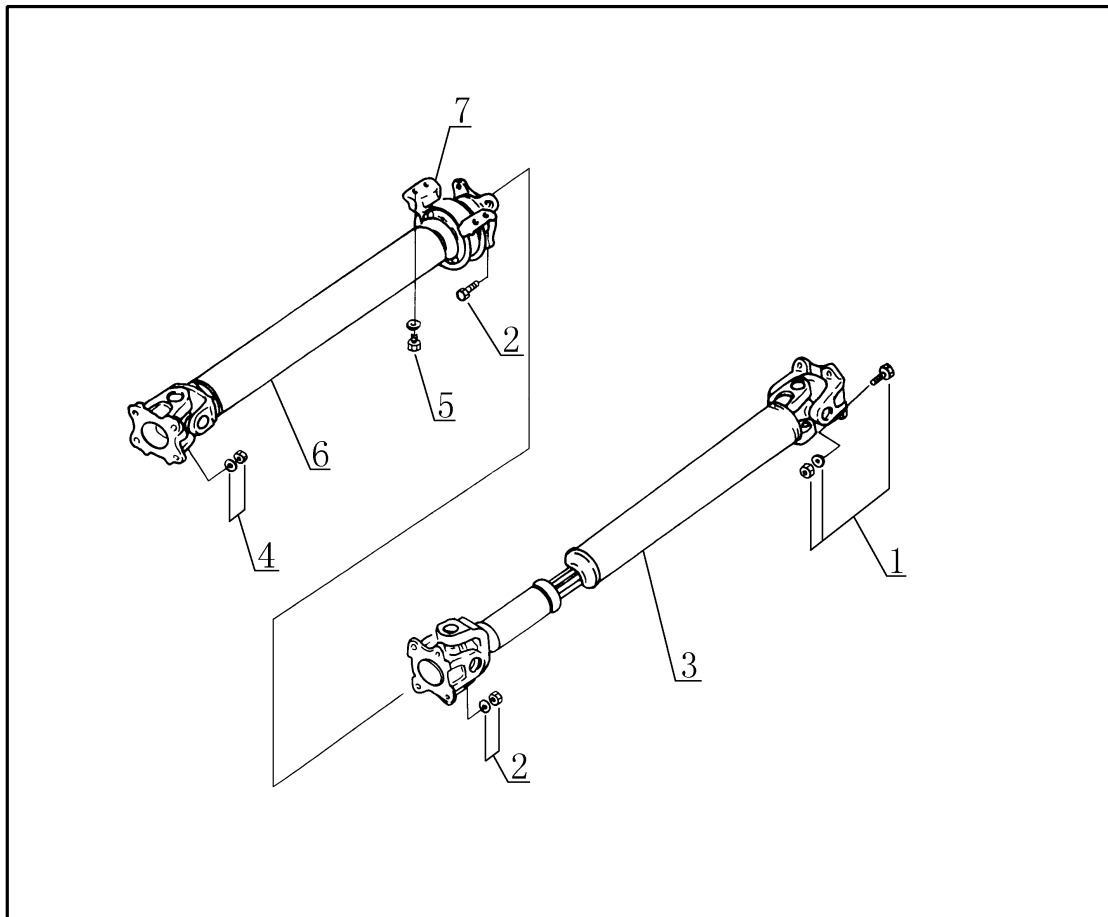
Remove the intermediate bearing, clean it, and then fill in No. GB49 2 calcium base grease. In case the vehicles are frequently used under harsh condition, fill in the lubricating grease frequently by grease nipple of the middle support.

DRIVE SHAFT



Disassembly and assembly

Before removing the drive shaft, support it with a crane or other metal lines for safety.



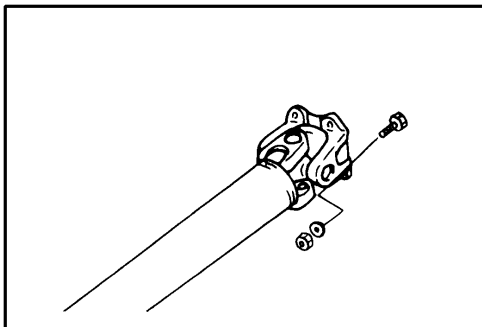
Disassembly sequences

1. Bolt, nut and spring washer, differential end
2. Bolt, nut and spring washer
3. Rear drive shaft assembly
4. Nut and spring washer, transmission end
5. Bolt, nut and washer
6. Intermediate drive shaft assembly
7. Intermediate bearing bracket

Assembly sequences

6. Intermediate drive shaft assembly
4. Nut and spring washer, transmission end
7. Intermediate bearing bracket
5. Bolt, nut and washer
3. Rear drive shaft assembly
1. Bolt, nut and spring washer, differential end
2. Bolt, nut and spring washer

DRIVE SHAFT

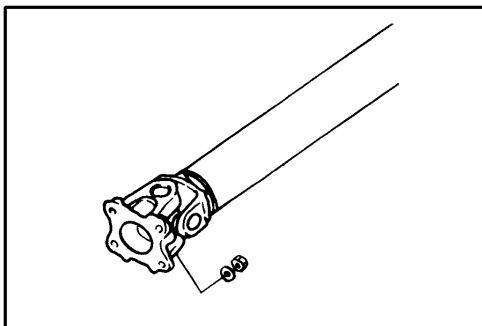


Important – assembly



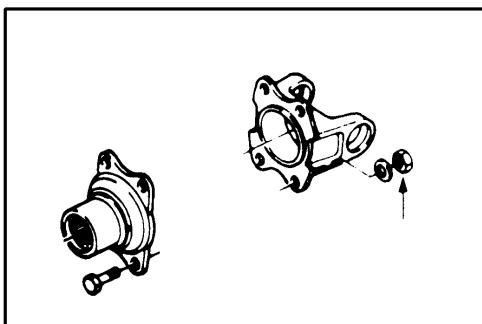
1. Nut and spring washer, transmission end

Torque (N • m)	46-62
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2. Bolt, nut and spring washer, differential end

Torque (N • m)	46-62
----------------	-------



3. Bolt, nut and spring washer

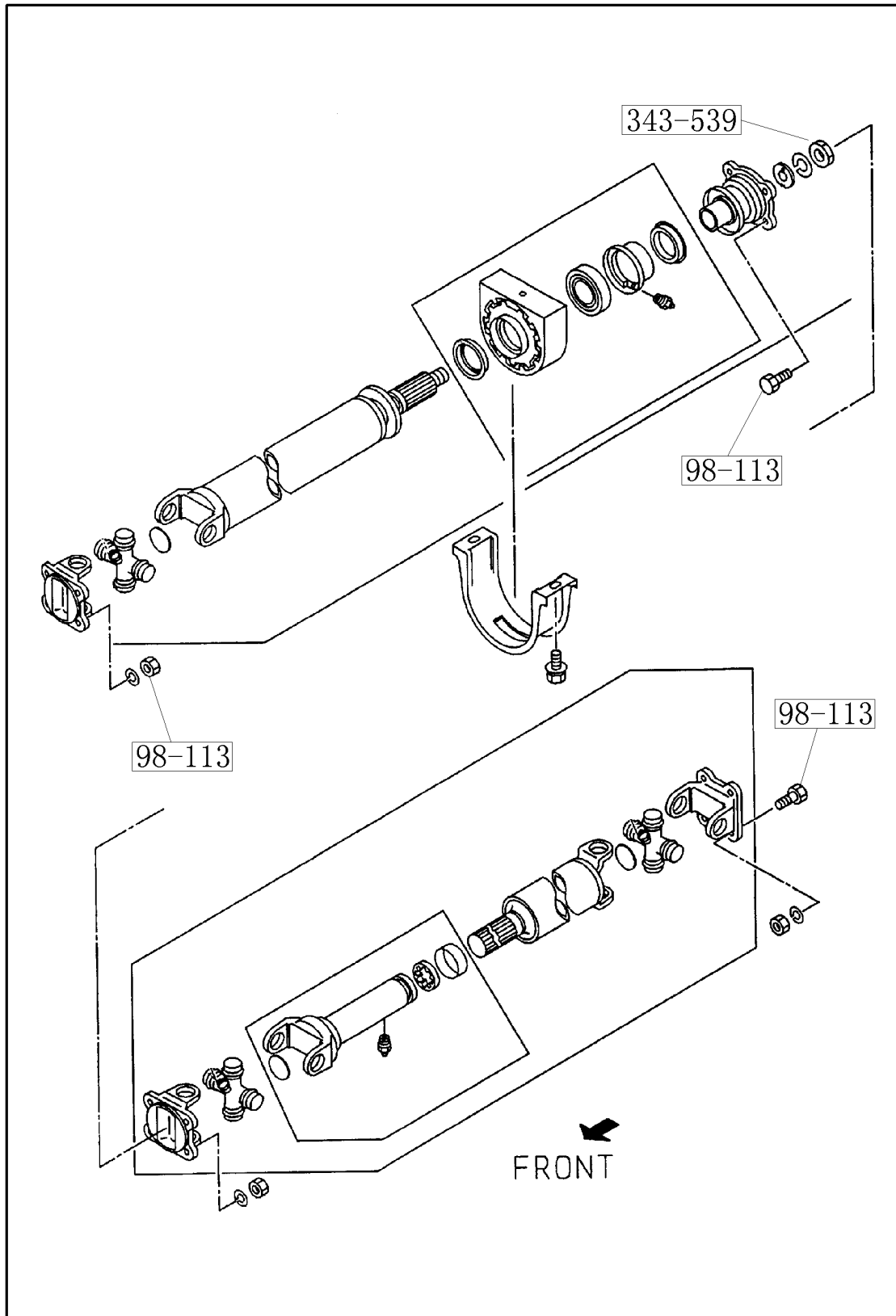
Torque (N • m)	46-62
----------------	-------

DRIVE SHAFT



Disassembly torques

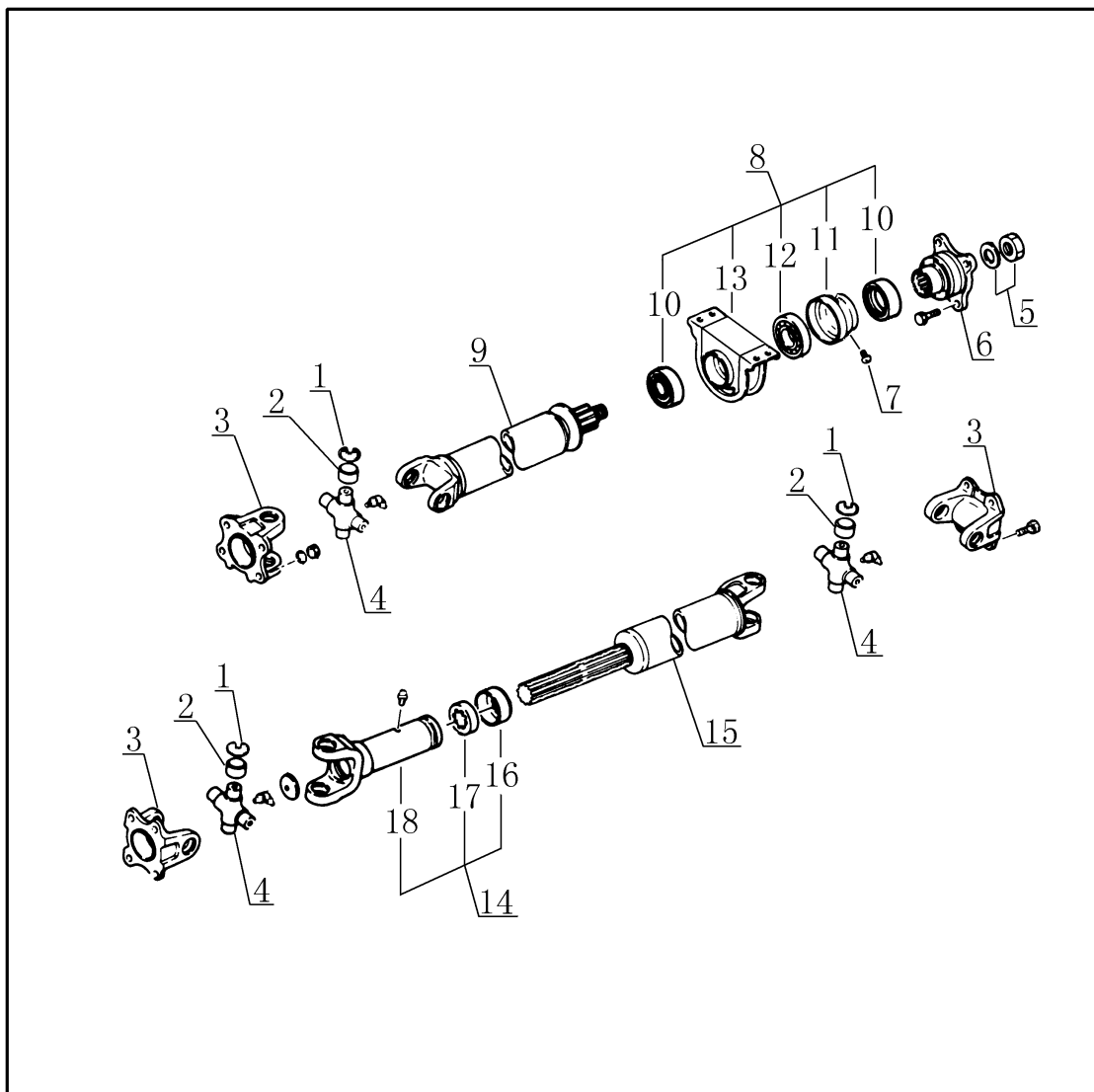
(N • m)



DRIVE SHAFT



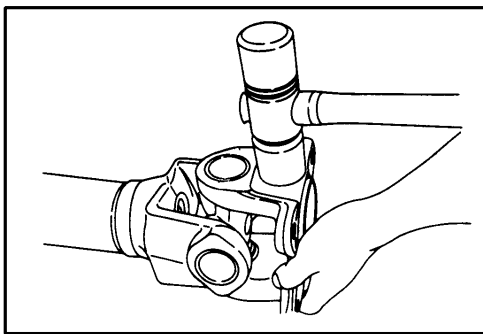
Disassembly



Disassembly Sequence

- | | |
|---|--|
| 1. Universal joint end ring | 10. Dust cover |
| 2. Needle bearing | 11. Retainer |
| 3. Flange yoke | 12. Bearing |
| 4. Crossing shaft | 13. Buffer rubber |
| 5. Washer and nut | 14. Sleeve spline pipe assembly |
| 6. Intermediate drive shaft flange assembly | 15. Rear axle drive shaft bearing assembly |
| 7. Grease nozzle | 16. Dust cover |
| 8. Middle supporting assembly | 17. Oil seal |
| 9. Intermediate drive shaft assembly | 18. Spline tube |

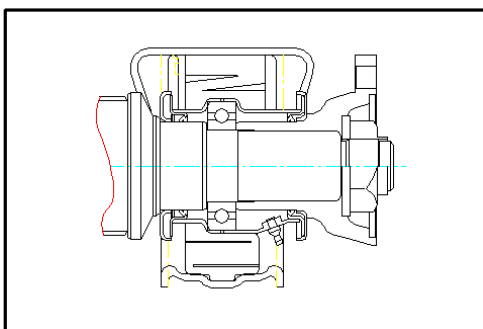
DRIVE SHAFT



Important --- disassembly

2. Needle bearing

Knock out the bearing by impacting the upper end of flange.



5. Washer and nut

Nut code: Q340B10

Wrench: 10mm



Check and repairs

In case of abrasion, damages or any other unusual conditions, make a necessary correction or replace parts.

Crossing shaft
Needle bearing
Buffer rubber
Spline tube assembly
Flange yoke
Bearing



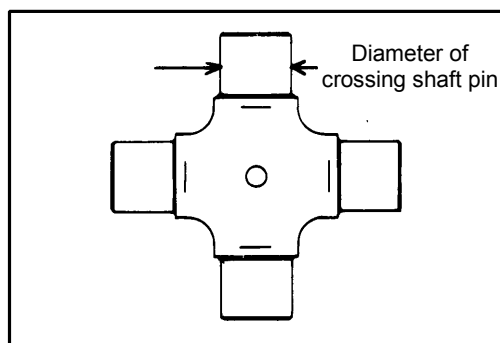
Visual check

Check the following parts for abrasion, damages or other unusual conditions.



Diameter of crossing shaft pin

(mm)	
Dimension	Limit
18.46	18.43



Check for maladjustment (only for reference)

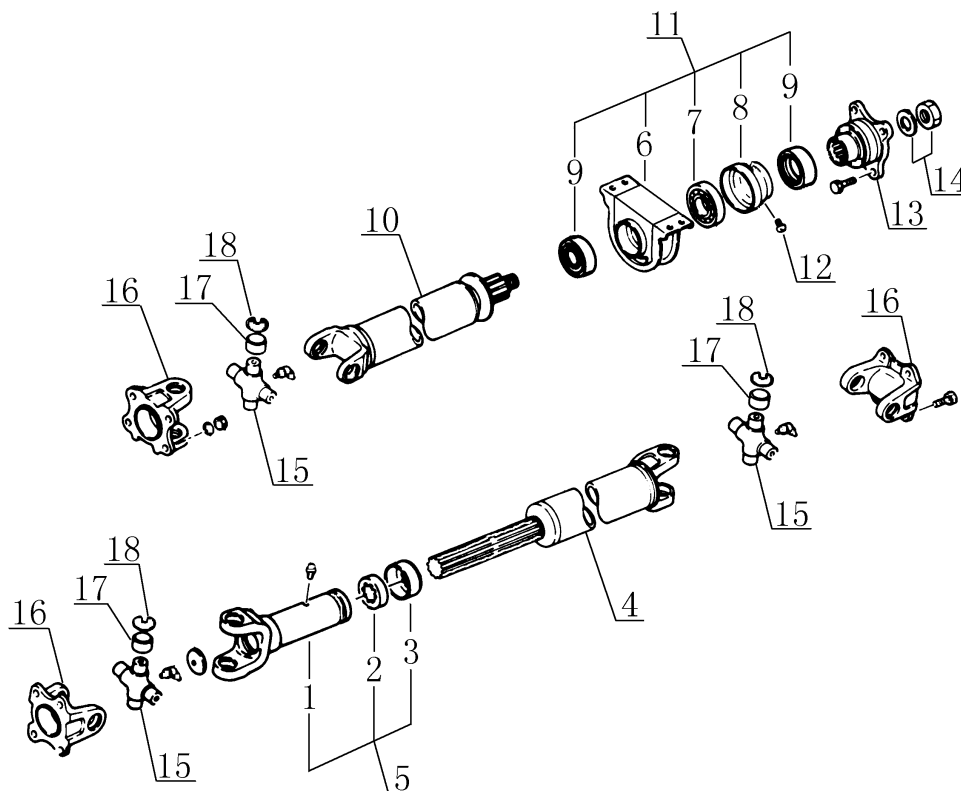
Measure an unbalance value between crossing shaft end.

Dimension (mm)	Tube (mm)	Rate of turning (rpm)	unbalance value (g · cm)
706 (intermediate shaft)	69	3200	40

DRIVE SHAFT



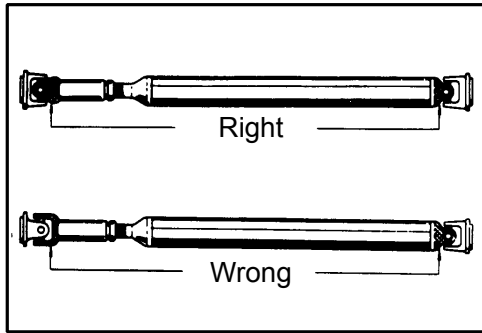
Re-installation



Disassembly sequences

- | | |
|---|--|
| 1. Spline tube | 10. Intermediate drive shaft assembly |
| 2. Oil seal | 11. Middle supporting assembly |
| 3. Dust cover | 12. Grease nozzle |
| 4. Rear axle drive shaft bearing assembly | 13. Intermediate drive shaft flange assembly |
| 5. Sleeve spline pipe assembly | 14. Washer and nut |
| 6. Buffer rubber | 15. Crossing shaft |
| 7. Bearing | 16. Flange yoke |
| 8. Retainer | 17. Needle bearing |
| 9. Dust cover | 18. Universal joint end ring |

DRIVE SHAFT



Important



4. Rear axle drive shaft bearing assembly
13 Intermediate drive shaft flange assembly
16. Flange yoke



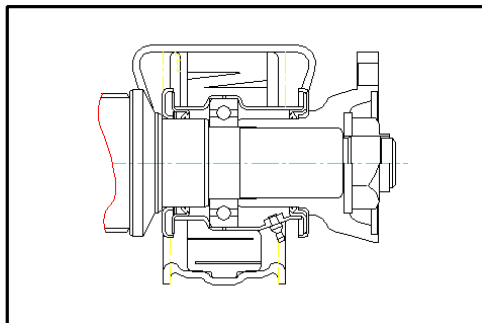
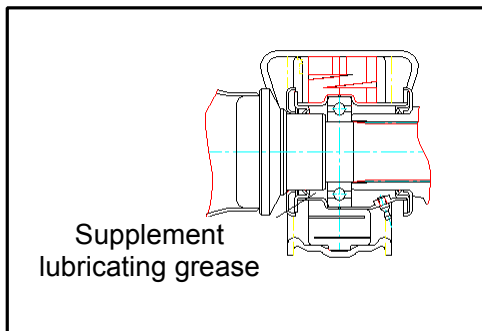
After applying the lubricating grease on the splilne, install the flange yoke.



7. Bearing
Supplement the lubricating grease.



After tightening flanges at two sides of drive shaft, please tighten the intermediate bearing bracket.

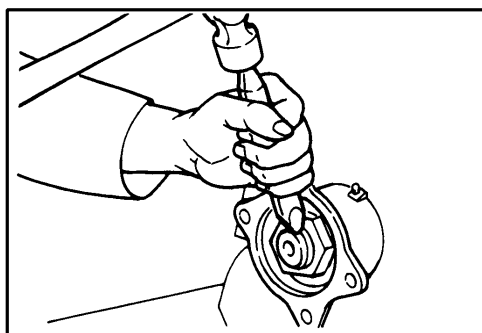


5. Washer and nut
Nut code: 2202042N
Wrench: 30mm



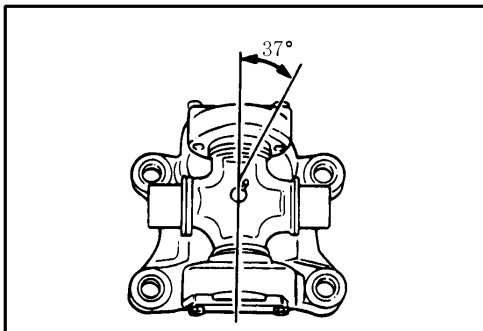
Torque (N • m)	343-539
----------------	---------

Use a new nut. Do not use the old one.



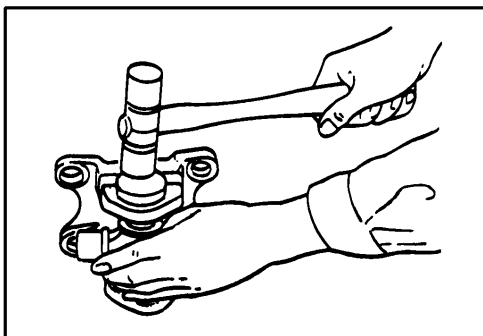
Make a marking stake on the nut.

DRIVE SHAFT



15. Crossing shaft

Install the lubricating grease nozzle according to the specified angle.



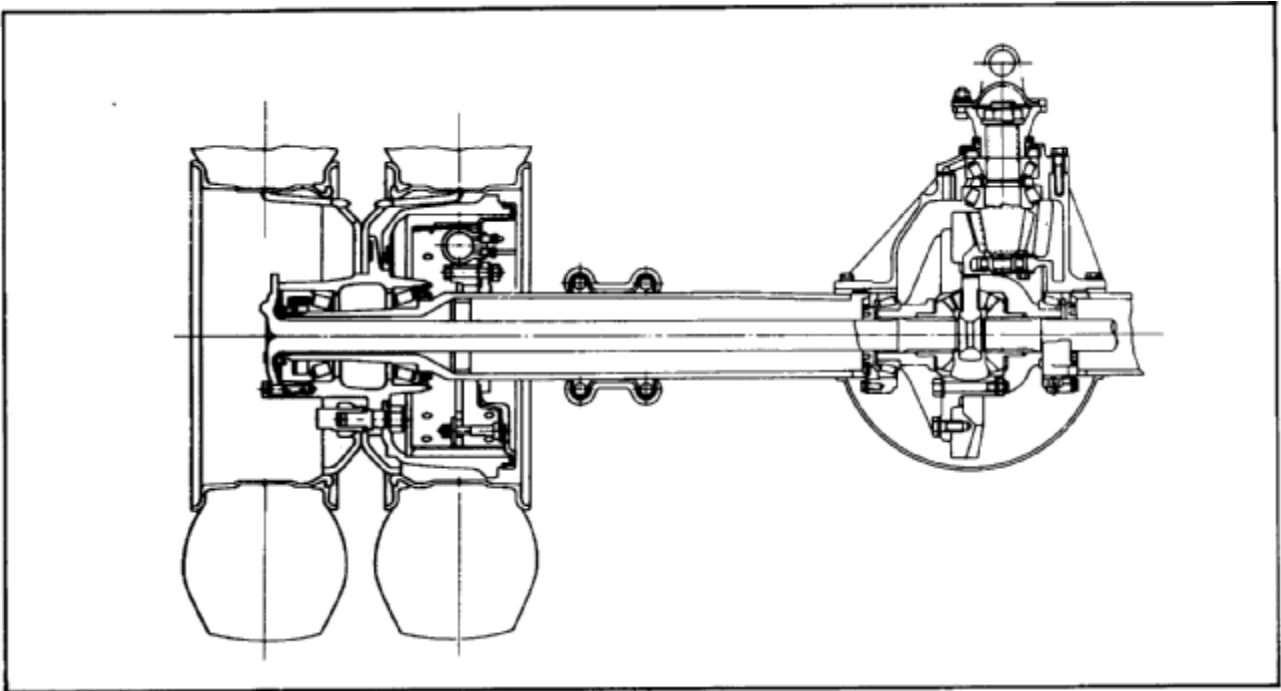
17. Needle bearing

Insert the crossing shaft into the flange yoke, and install the needle bearing to the yoke hole by using a wrench with soft surface.

- 1) Always use a new universal joint end ring
- 2) After installing end ring, check whether it is correctly placed.

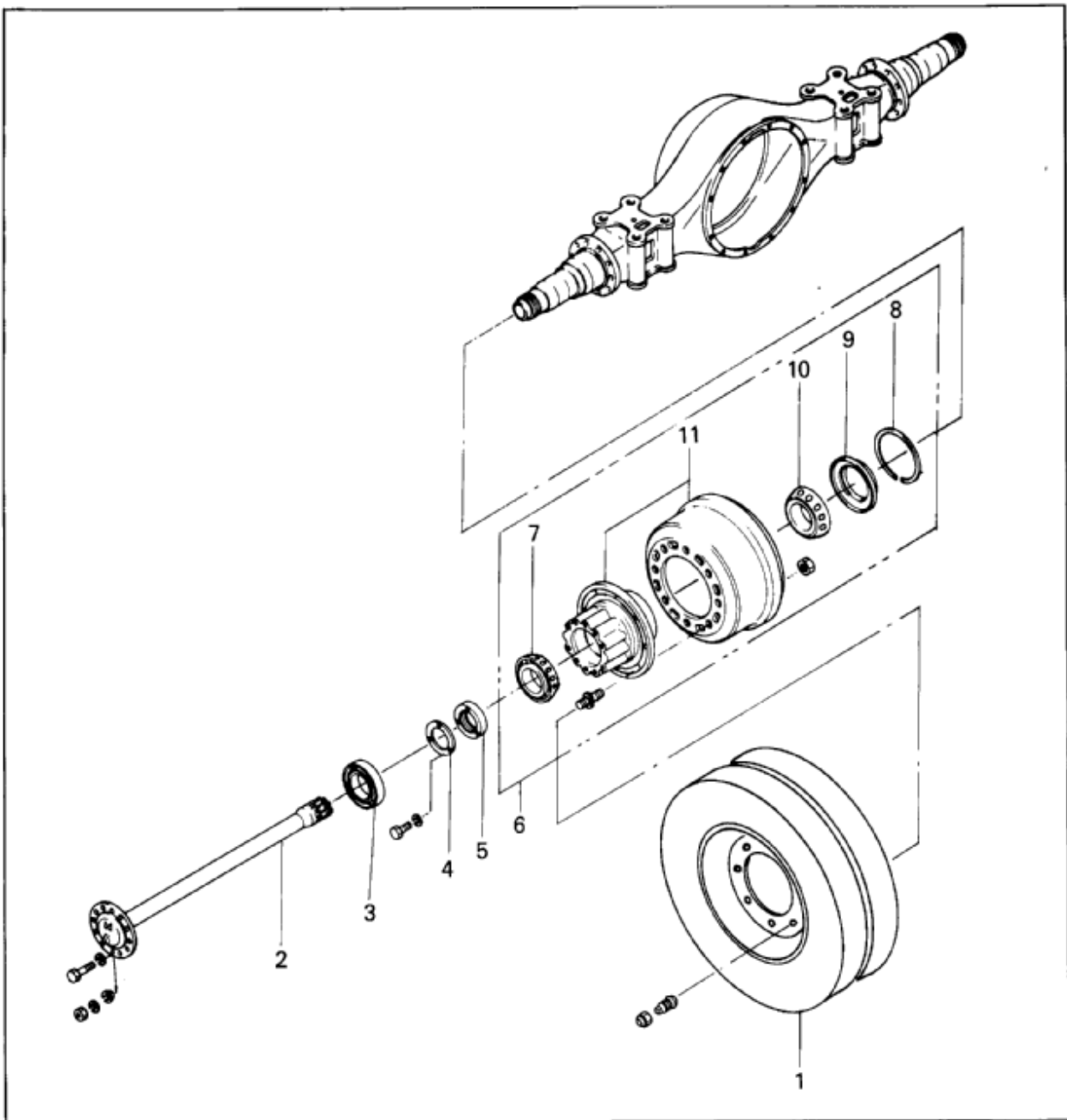
REAR AXLE

General



REAR AXLE

Disassembly and assembly of rear wheel hub



Disassembly steps:

1. Rear wheel
2. Half shaft
3. Exterior oil seal
4. Fixing plate
5. Bearing nut
6. Wheel hub and drum assembly

Disassembly steps of wheel hub and drum assembly:

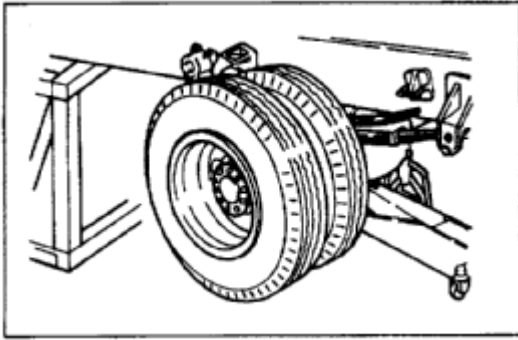
7. Exterior bearing
8. Elastic blocking ring
9. Interior oil seal
10. Interior bearing
11. Wheel hub and drum

Assembly steps:

Assembly steps are the opposite of disassembly steps

REAR AXLE

Disassembly

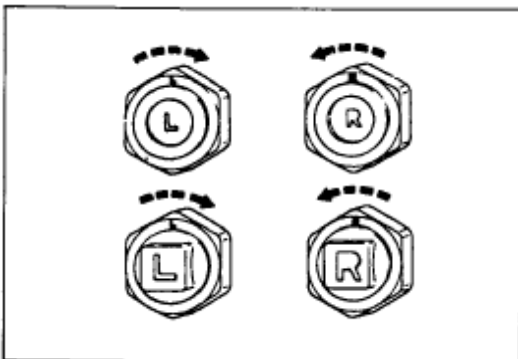


Preparing work:

Stop the front wheel with an arrester, jack up the rear axle to make the rear wheel off ground, and prop up the vehicle on the bracket.

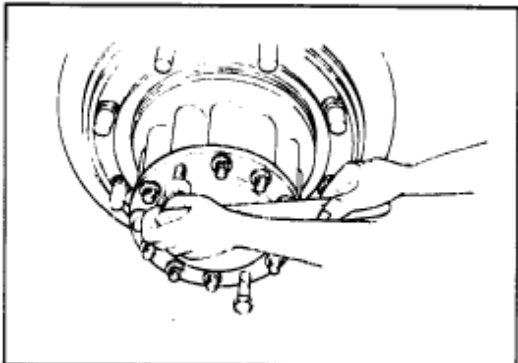
Disassembly steps:

Assembly steps are introduced as before.



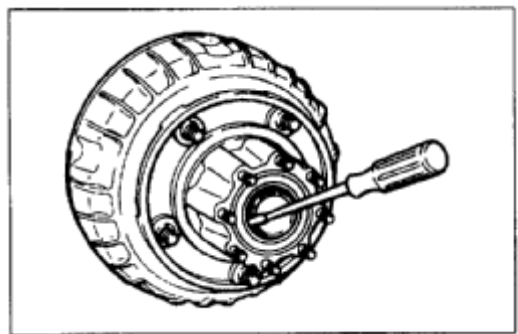
Nut of wheel:

Screw thread of nut on the right wheel is right-handed; while on the left wheel is left-handed.



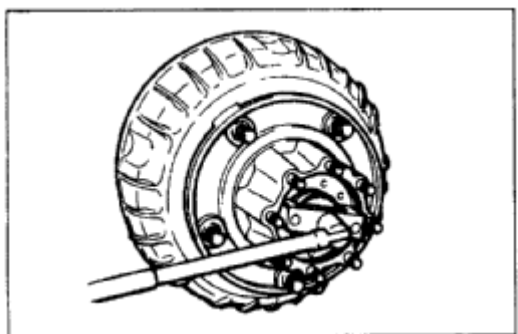
Disassembly of half shaft:

Turn the bolt to thread hole of flange disc until half shaft flange leave its original position.



Disassembly of exterior oil seal:

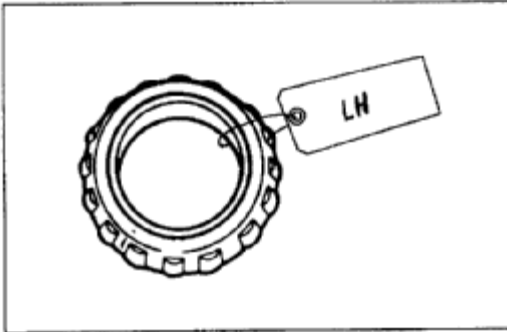
Disassemble it with screwdriver or oil seal remover.



Disassembly of bearing nut:

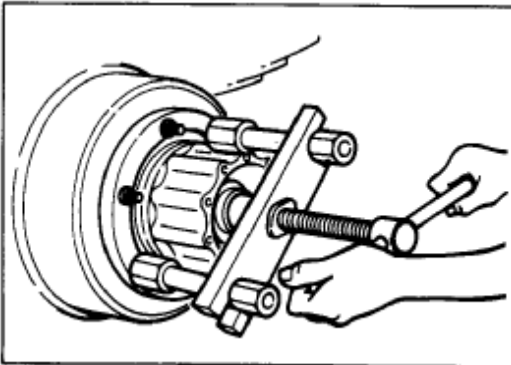
Disassemble it with special tools.

REAR AXLE



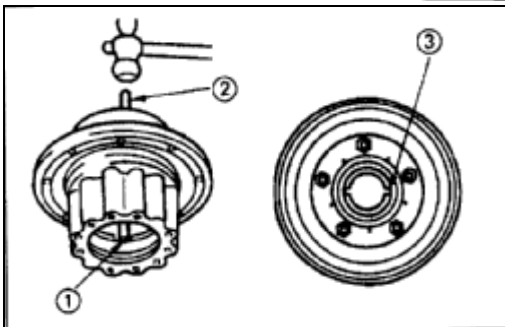
Exterior bearing:

If reuse the exterior bearing, you should hang scutcheons indicating positions in case of misuse.



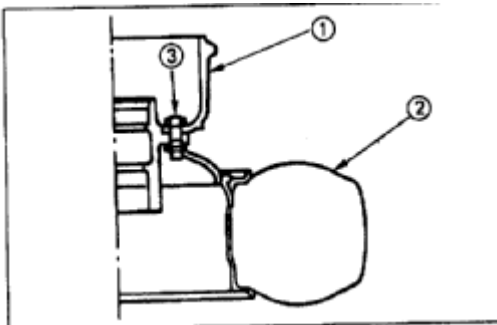
Disassembly of wheel hub and drum assembly:

Disassemble them with special tools.



Disassembly of exterior rings of the interior bearing and the exterior bearing:

Remove exterior rings of the wheel hub bearing with brass stick.



Disassembly of wheel bolt:

1. Dismantle wheel assembly first.
2. Remove connecting bolts and nuts of the wheel hub and brake drum by rotating in opposite direction.
3. Remove brake drum from wheel hub.

Attention: used wheel bolt and nut can not be reused, and must be replaced.

REAR AXLE

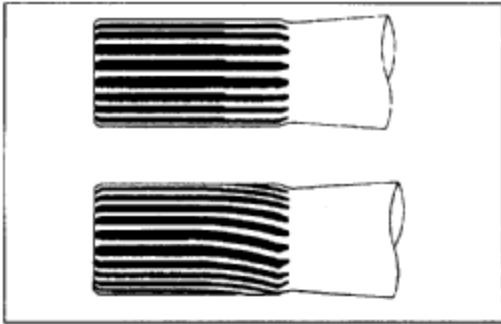
6. Half shaft
7. Wheel hub
8. Bearing
9. Lock plate
10. Bearing nut

Inspection and repair:

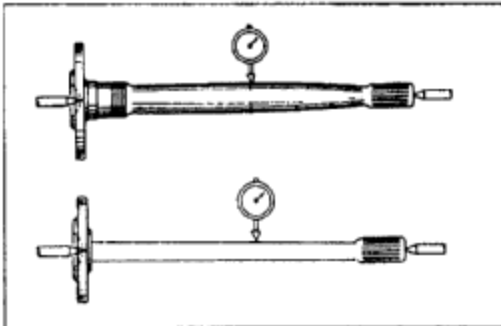
If there found abrasion, damage or any other abnormal situation in inspection, repair or replace the parts if necessary.

Visual inspection:

Check the parts listed in the left form for abrasion, damage or any other abnormal situation.

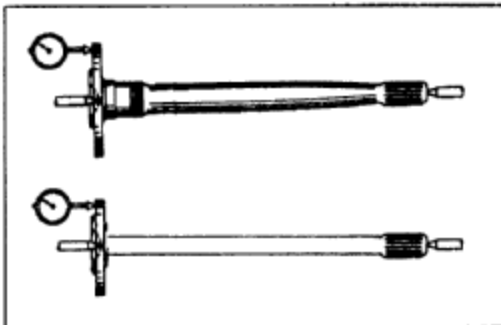


Check half shaft spline:



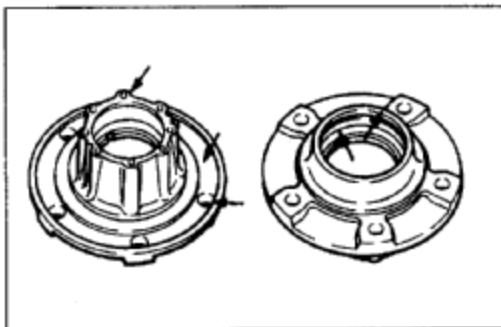
Concentricity of half shaft:

Limit point (mm)	1.0
------------------	-----



Jig degree of the half shaft flange:

Limit (mm)	0.05
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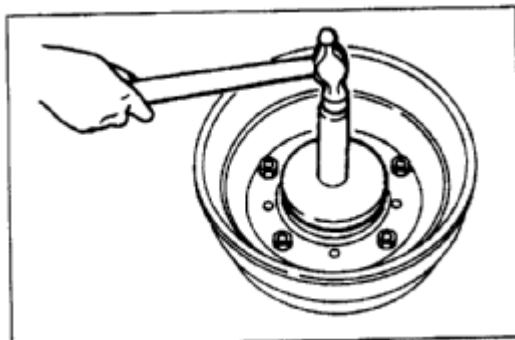
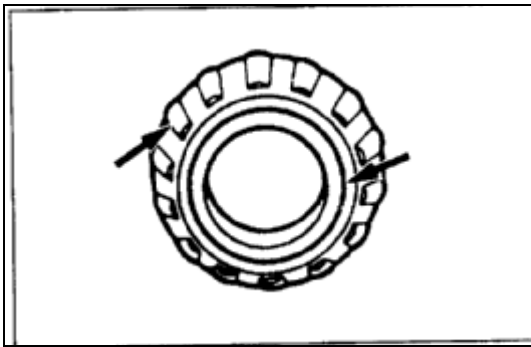
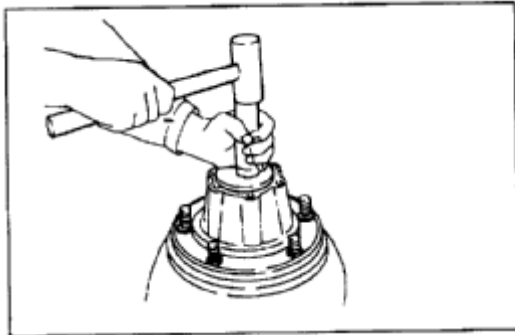
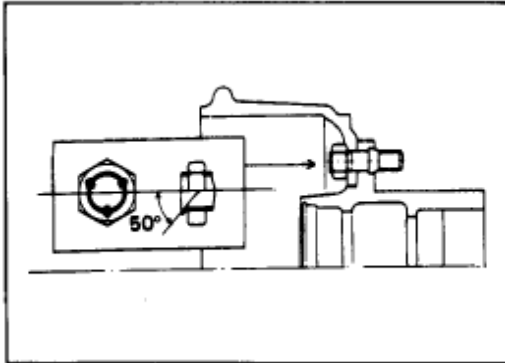
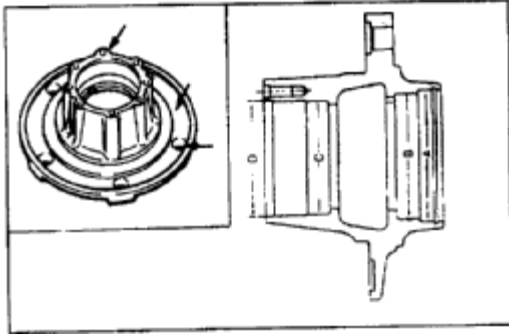


Inspect the wheel hub:

Inspect oil seal and mounting surface of bearing.
Inspect screw thread.

REAR AXLE

Reinstallation:



Steps of reassembly:

Steps of reassembly are introduced hereinbefore.

Assembly of wheel hub:

Clean the interior and the exterior surfaces of the wheel hub and fill lubricate grease before installing the wheel hub,.

Dosages of wheel hub lubricate grease to fill:

Dosage (g)	285
------------	-----

Assembly of wheel nut:

Tighten the wheel nut to specified tightening torque, and rivet three positions on every nut to avoid looseness.

Tightening torque of wheel nut:

Torque of nut (kg. m)	392
-----------------------	-----

Assembly of exterior ring of the wheel hub bearing:

Assemble it with special tools.

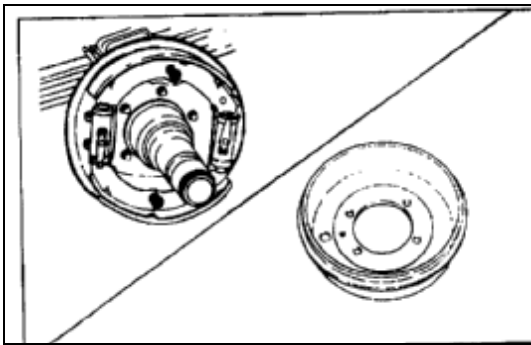
Assembly of bearing:

Apply sufficient bearing lubricate grease on space between interior ring and rolling shelf before installing the bearing.

Assembly of interior oil seal:

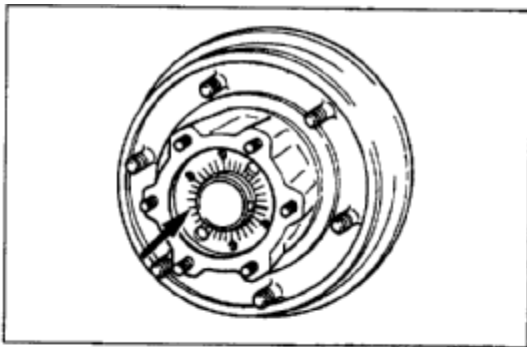
Apply lubricate grease in oil seal and skirt of the exterior circle, and then install the oil seal with special tools.

REAR AXLE



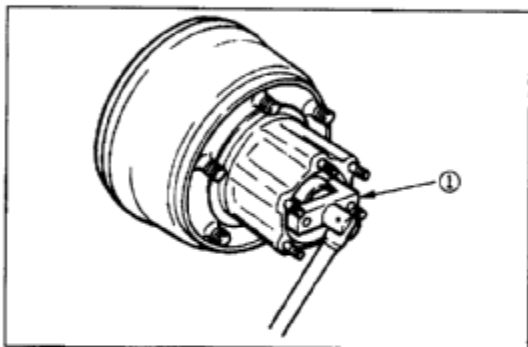
Assembly of wheel hub and braking drum:

1. Clean out oil and other dirt that inside the brake drum.
2. Clean head of the half shaft sleeve.
3. Assemble wheel hub assembly to half shaft sleeve.



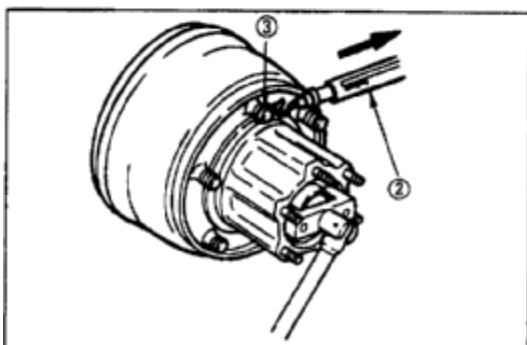
Assembly of bearing nut:

Assemble with special tools.



Measuring and adjustment of wheel hub bearing pre-tightening:

1. Turn the wheel hub around for several times and make the bearing locations accord.
2. Tighten the bearing nut with special tools until it can not be moved by hand.
3. Loose the bearing nut until wheel hub can turn easily.
4. Hitch spring balance on wheel bolt.(shown in the left diagram)
5. Measure pre-tightening of the bearing by pulling the spring balance carefully and pay attention to pull direction of the spring balance.



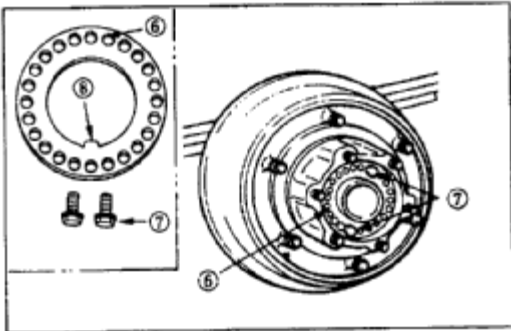
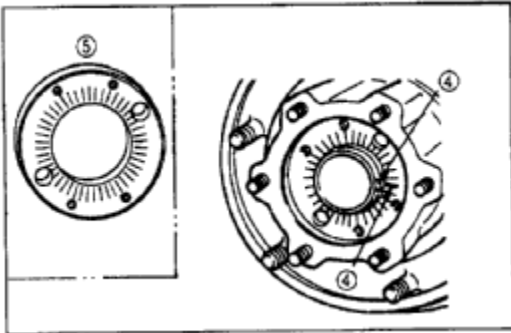
Pre-tightening of wheel hub bearing:

Pre-tightening (N)	38~48
--------------------	-------

6. Turn wheel hub around again for several times.
7. Measure pre-tightening of wheel hub bearing two times.
8. Align the nearest nut incision with the axle casing slot.

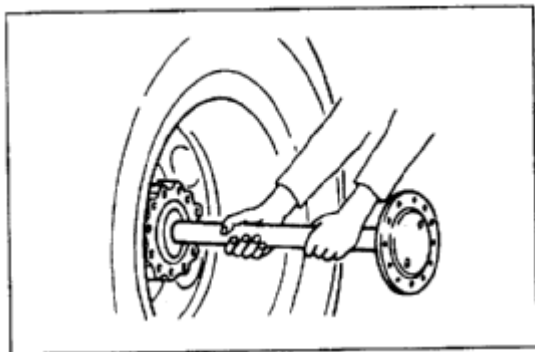
Notes: If it is difficult to align, tighten the bearing nut slightly.

REAR AXLE



Assembly of fixing plate:

1. Install sawteeth of fixing plate to the axle casing slot.
2. Assemble lock bolt to avoid bearing nut looseness.
3. Check whether sawteeth of the fixing plate have been inserted into the slot.

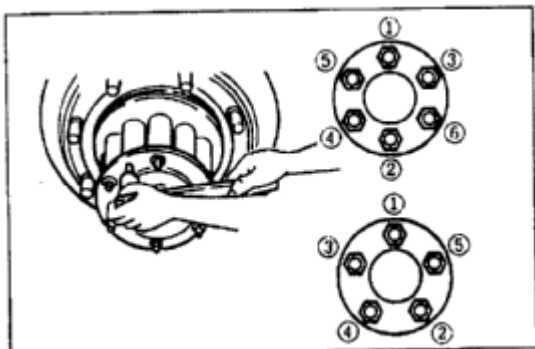


Assembly of half shaft:

1. Clean half shaft
2. Lubricate half shaft spline with gear oil.
3. Insert half shaft into sleeve, pay attention not to damage oil seal.
4. Tighten half shaft nut to specified tightening torque according to the left diagram.

Tightening torque of half shaft nut:

Tightening torque	54
-------------------	----

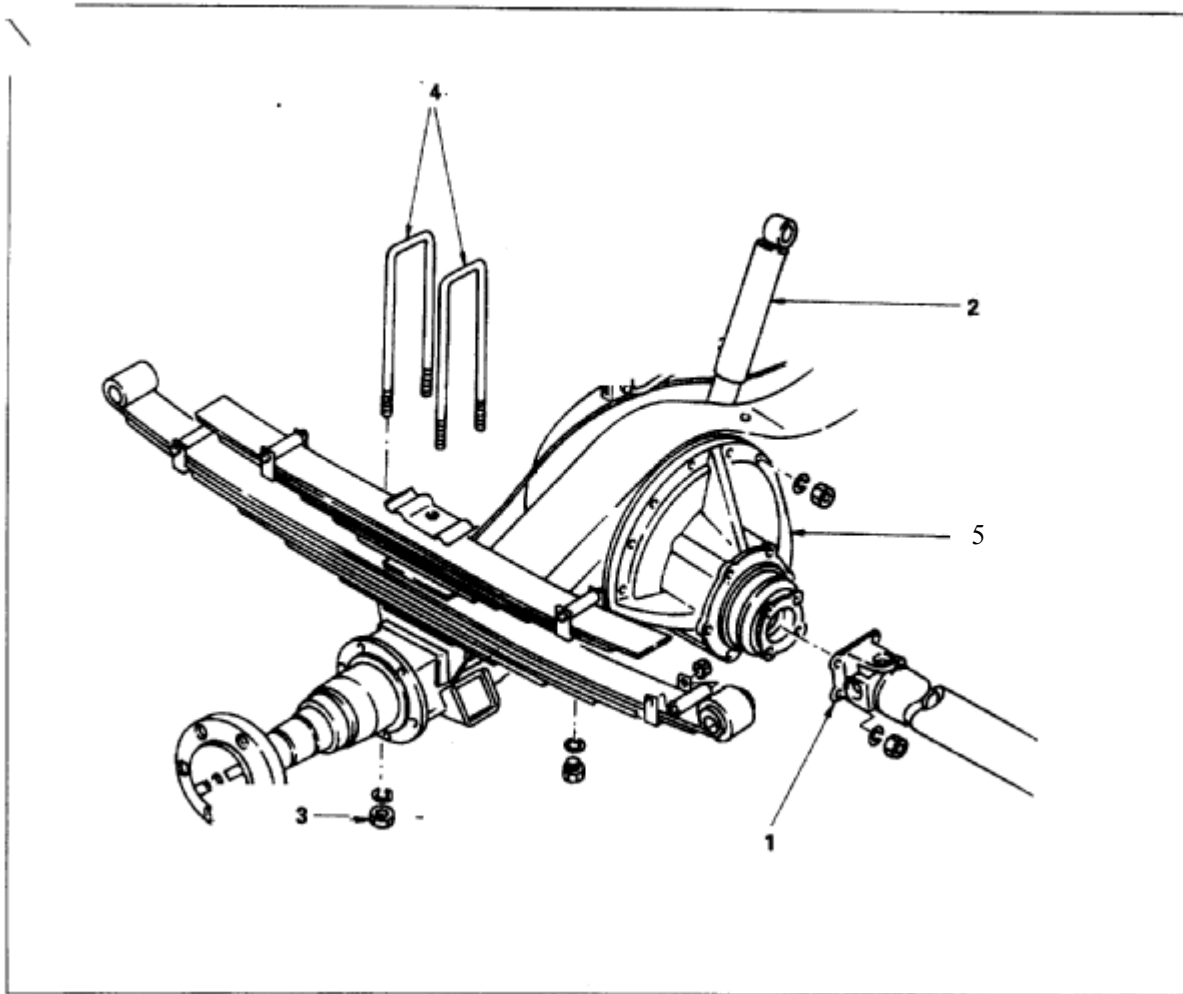


Tightening torque of wheel nut:

Tightening torque	441
-------------------	-----

REAR AXLE

Rear axle assembly



Disassembly steps:

1. Rear transmission shaft
2. Shock absorber
3. Nut and spring cushion
4. U-bolt
5. Rear axle assembly

Reassembly steps:

Reassembly steps is the athwart of disassembly steps

REAR AXLE

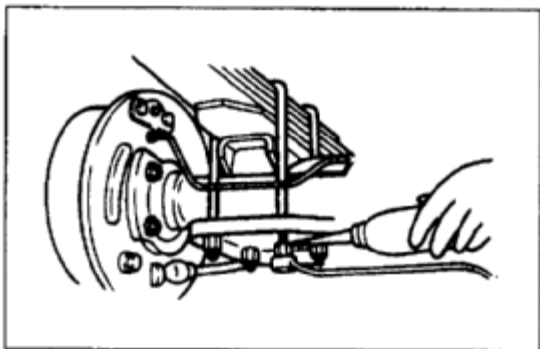
Disassembly

Preparing work:

Stop the front wheel with an arrester, jack up the rear axle and make the rear wheel off ground, and prop up the vehicle on the shelf.

Disassembly steps:

Disassembly steps are introduced as before.



Disassembly of U-bolt nut:

Lubricate screw thread with some oil before tightening U-bolts and U-nuts in case of screw thread damage.

Reassembly

Reassembly steps:

Reassembly steps are introduced as before.

Assembly of U-bolt nut:

When tightening U-bolt nut, must use some oil to lubricate screw thread for avoid damage screw thread.

Tightening torque of U-bolt:

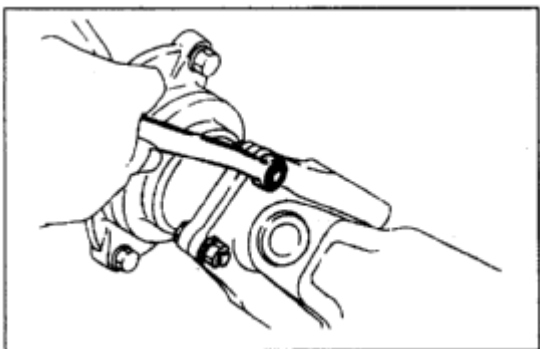
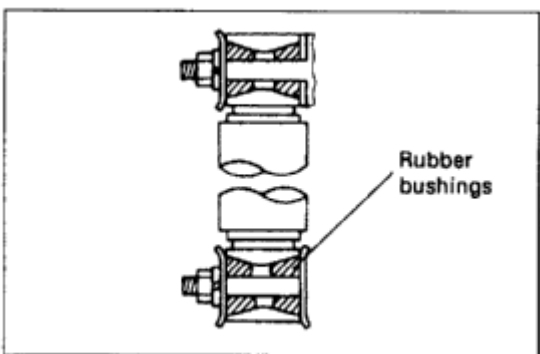
Tightening torque	177
-------------------	-----

Assembly of rear shock absorber:

Refer to the chapter of rear suspension:

Tightening torque of shock absorber lower nut:

Tightening torque	95
-------------------	----



Assembly of rear transmission shaft:

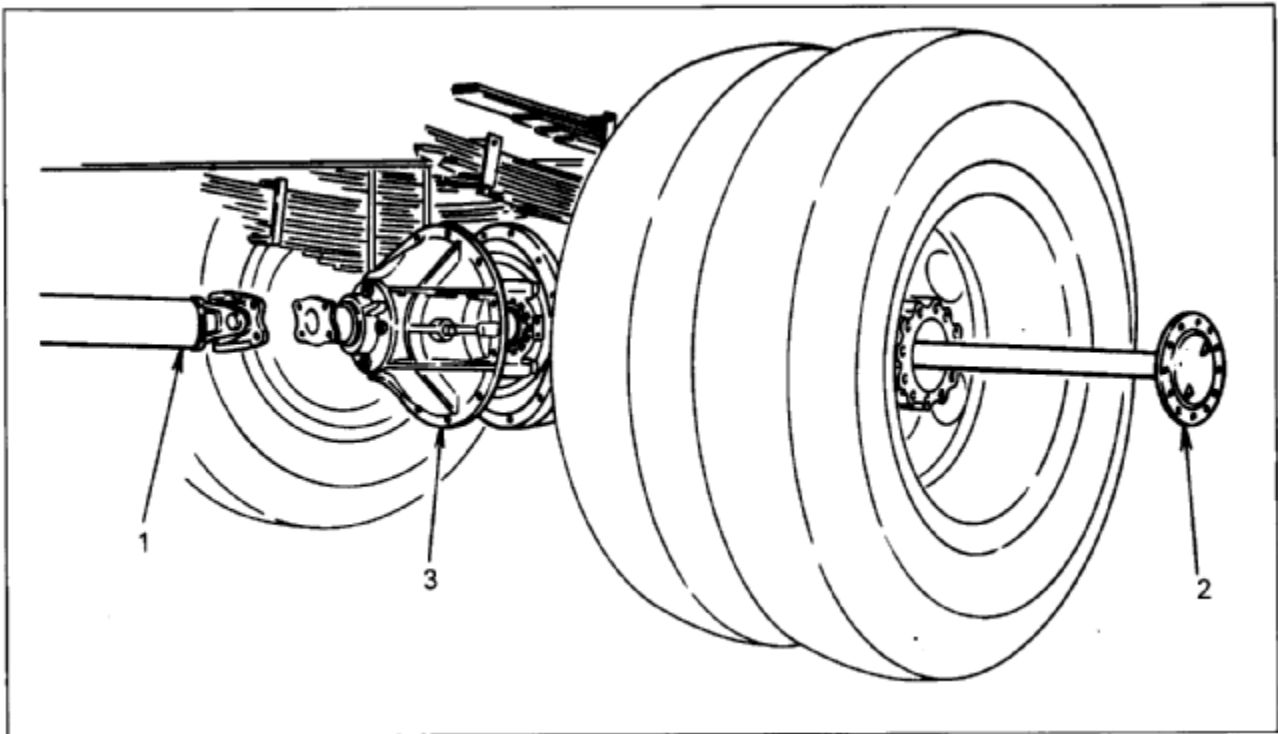
Refer to the chapter of transmission shaft:

Tightening torque of nut: (at the differential side):

Torque	103
--------	-----

REAR AXLE

Differential



Disassembly steps:

1. Transmission shaft
2. Half shaft
3. Differential housing assembly

Assembly steps:

3. Differential housing assembly
2. Half shaft
1. Transmission shaft

REAR AXLE

Disassembly

Preparing work:

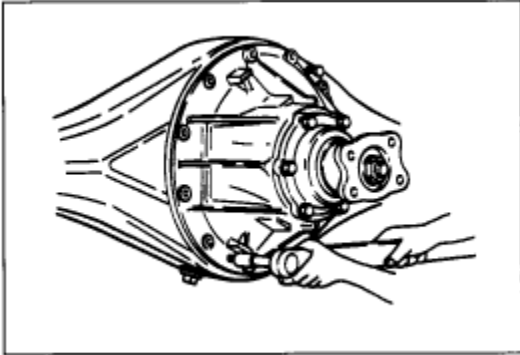
Drain gear oil in axle housing

Disassembly steps:

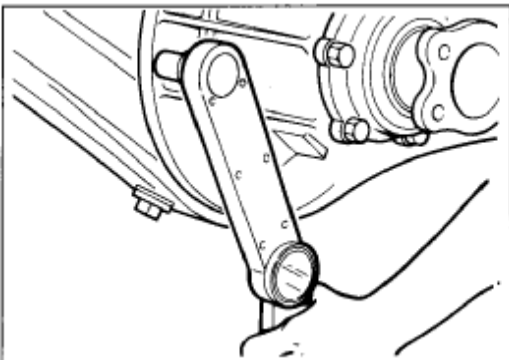
Disassembly steps are introduced hereinbefore:

Disassembly of differential assembly:

Rotate bolt to screw thread hole of differential housing assembly until differential housing assembly leaves its original position.



Reassembly



Assembly steps:

Assembly steps are same with above:

Tightening torque of differential assembly nut:

Torque	58
--------	----

Tightening torque of semi-shaft nut:

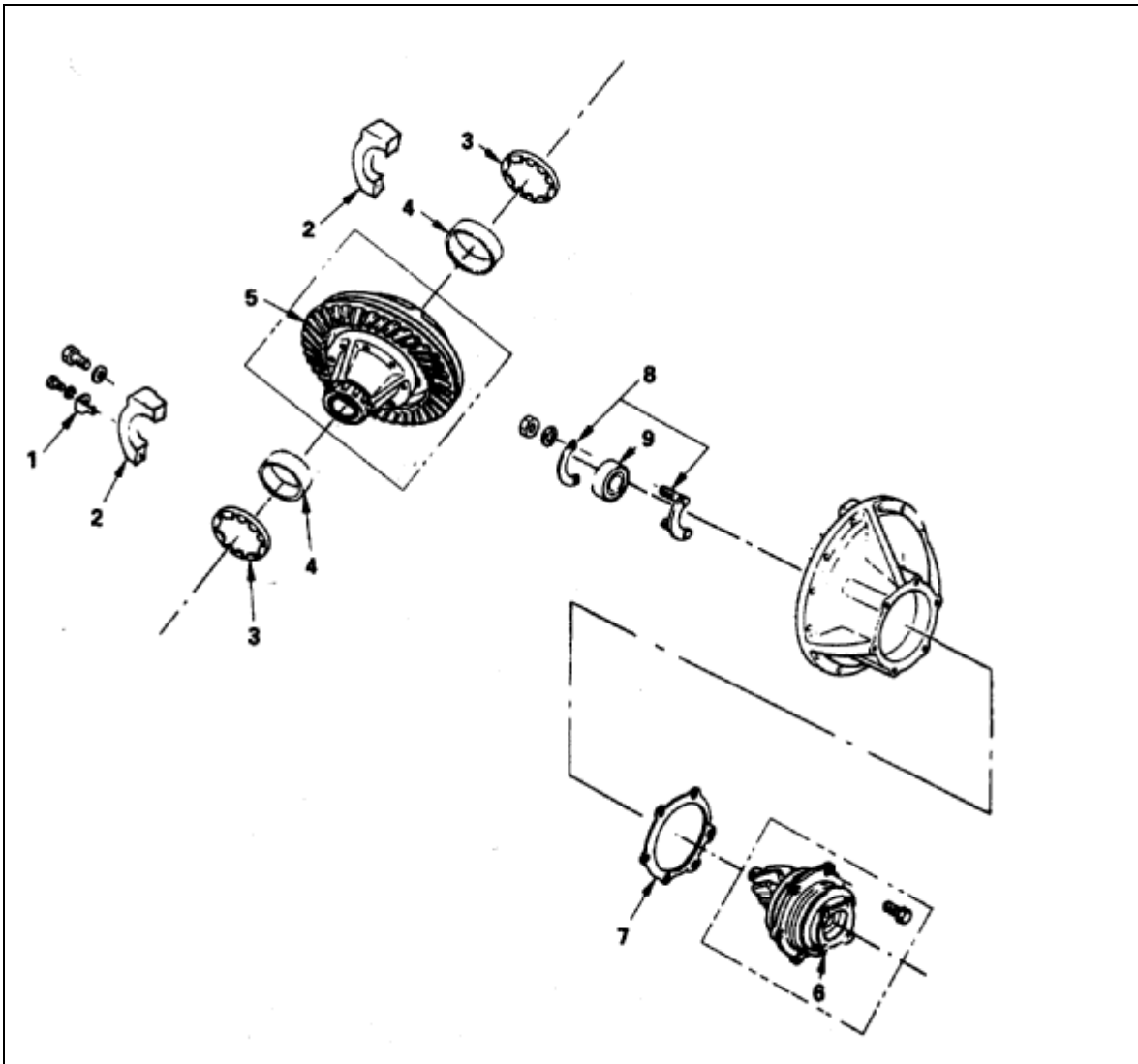
Torque	54
--------	----

Tightening torque of transmission shaft nut:

Torque	103
--------	-----

REAR AXLE

Unit maintenance



Disassembly steps:

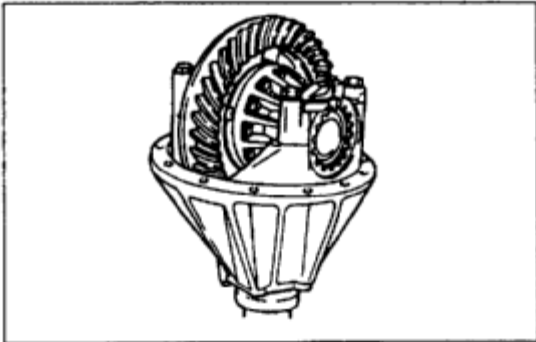
1. Lock plate
2. Bearing cover
3. Adjusting nut
4. Exterior race of side bearing
5. Differential housing assembly
6. Transmission small gear housing assembly
7. Sheet shim
8. Holder of lead bearing
9. Lead bearing

Assembly steps:

9. Lead bearing
8. Holder of lead bearing
5. Differential housing assembly
4. Outer race of side bearing
2. Bearing cover
3. Adjusting nut
7. Sheet shim
6. Transmission small gear housing assembly
1. Lock plate

REAR AXLE

Disassembly

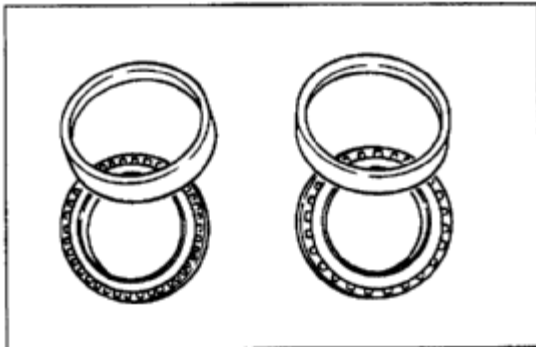


Disassembly steps:

Disassembly steps are introduced as before:

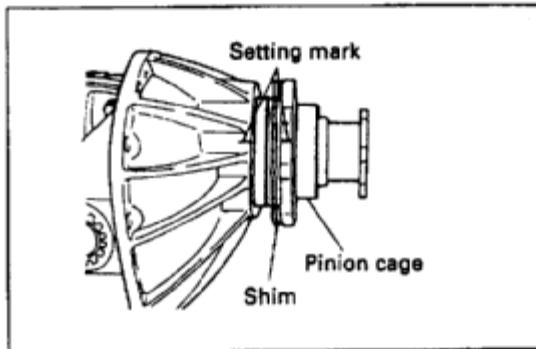
Disassembly of bearing cover:

Put differential assembly on special bracket for disassembly, mark on the left and right bearing cover before disassembly to avoid wrong reassembly.



Disassembly of exterior race of side bearing:

Separate the exterior races of side bearing after removing for correct reassembly.

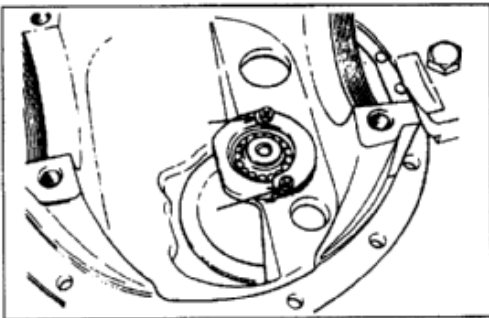


Disassembly of transmission small gear assembly:

Mark on the transmission small gear housing and differential housing before disassembly for correct reassembly.

REAR AXLE

Assembly

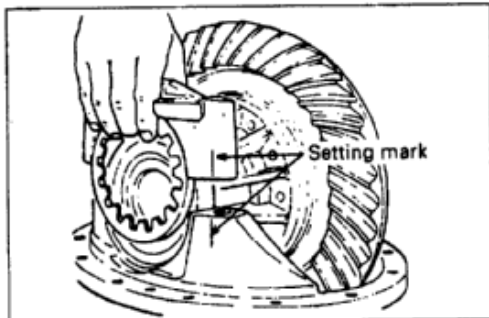


Assembly steps:

Assembly steps are introduced as before:

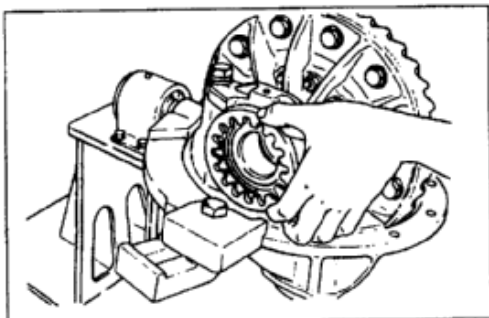
Assembly of lead bearing holder:

As shown in the left diagram, installation should be done inside the housing.



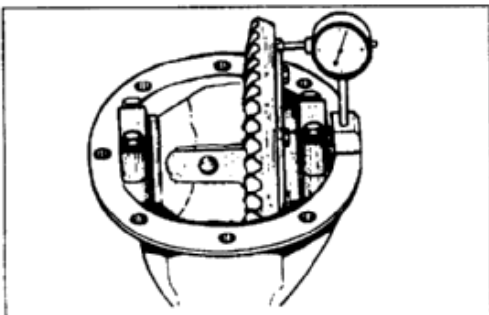
Assembly of bearing cover:

Assemble according to the marks made in disassembly, tighten the tightening bolt by half first so that the adjusting nut can rotate.



Assembly of adjusting nut:

Nut screw thread should mesh with housing side screw thread.



Check of jig degree of the big gear:

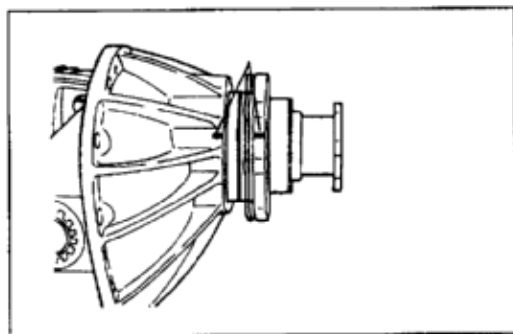
Model	Standard	Limit
	0.08	0.25

Assembly of transmission small gear assembly:

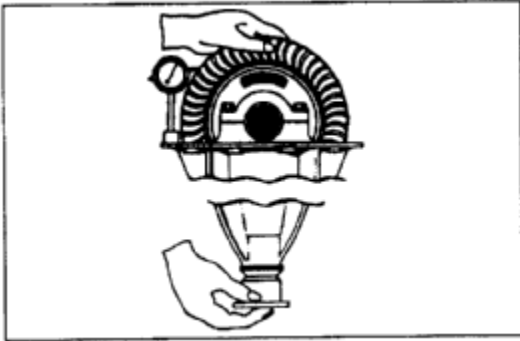
Assemble according to the marks made in disassembly.

Tightening torque of transmission small gear housing bolt:

Torque	72
--------	----

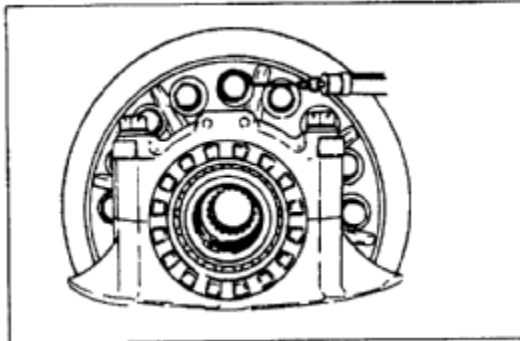


REAR AXLE



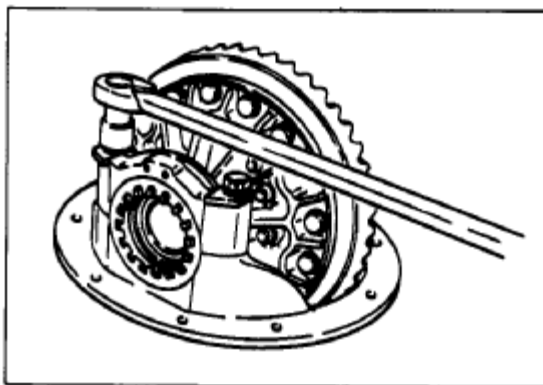
Measure of back clearance of transmission small gear and big gear:

Model	Standard
	0.19~0.29



Pre-tightening of the bearing:

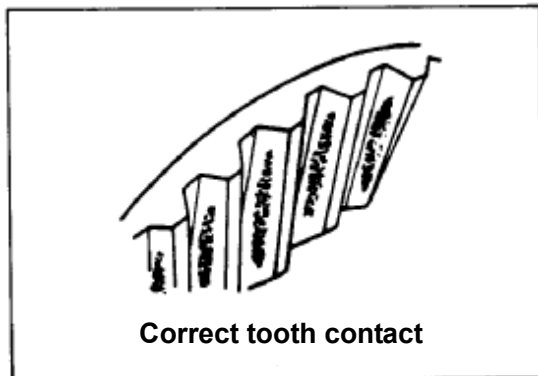
	5.7~13.0
--	----------



Tighten the bearing cover bolt completely:
After tightening the bearing cover bolt completely, check back clearance of small gear and big gear again, if it can not reach the standard, it must be readjusted.

Tightening torque of bearing cover bolt:

Torque	157
--------	-----

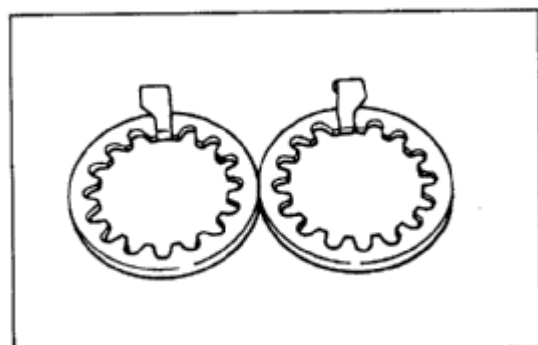


Contact inspection of transmission small and big gear tooth:

1. Apply thin red lead powder on 7-8 gears on big gear.
2. Rotate big gear, judge whether the interface is normal by checking impress on the big gear; if abnormal adjust according to the following method.

Adjust specification of shim thickness:

Thickness	0.10、0.12、0.14、0.16、0.18、0.20
-----------	-------------------------------



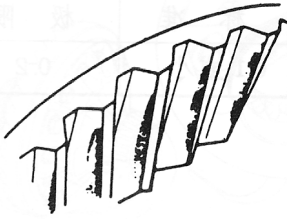
Assembly of lock plate:

Assembling the lock plate in the way shown in the left diagram is valid. 1/2 notch of the adjusting nut can be changed.

Tightening torque of lock plate bolt:

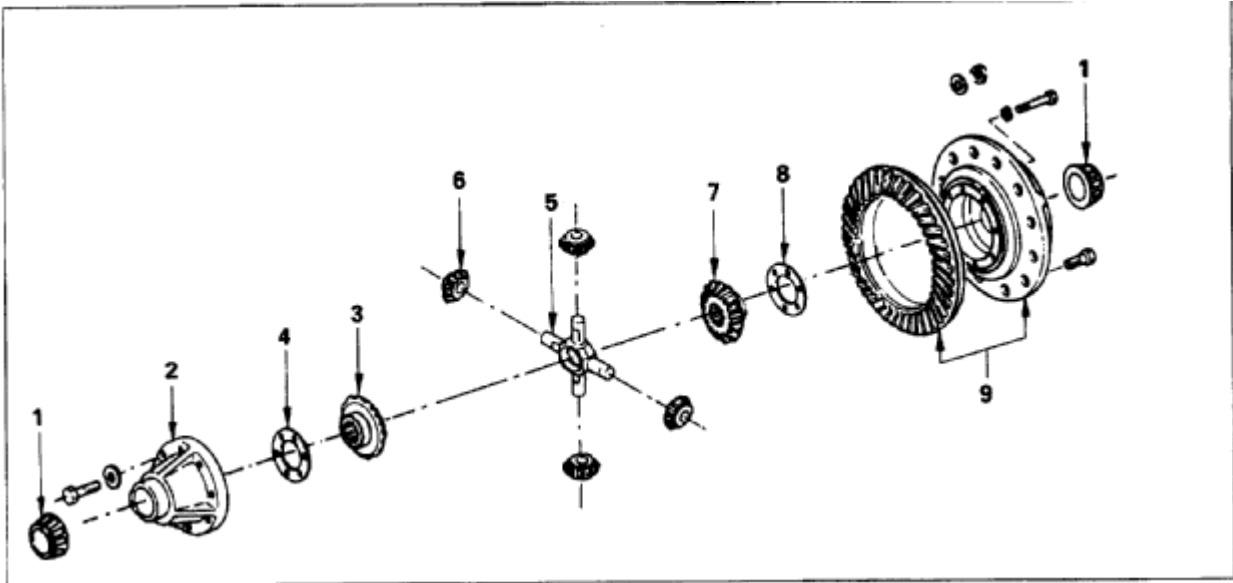
Torque	13
--------	----

REAR AXLE

Contacting mark of driven gear	Reason	Adjusting step
 Driven gear root	Driving gear is too close to driven gear	1. Adjust driven gear close to driving gear. 2. Adjust driving gear apart from driven gear (increase adjusting washers)
 Driven gear top	Driving gear is too apart from driven gear	1. Adjust driven gear apart from driving gear. 2. Adjust driving gear close to driven gear (decrease adjusting washers)
 Driven gear small end	Driven gear is too close to driving gear	1. Adjust driving gear apart from driven gear. (Increase adjusting washers) 2. Adjust driven gear apart from driving gear.
 Driven gear big end	Driven gear is too apart from driving gear	1. Adjust driving gear close to driven gear (decrease adjusting washers). 2. Adjust driven gear close to driving gear.

REAR AXLE

Differential



Disassembly steps:

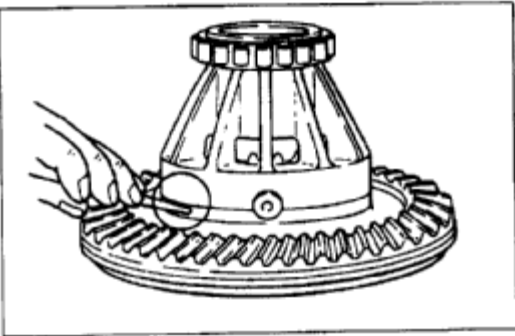
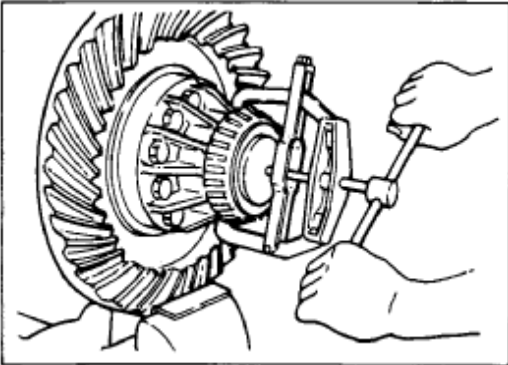
11. Side bearing
12. Differential housing B
13. Side gear
14. Thrust gasket of side gear
15. Cross shaft
16. Small gear of differential
17. Side gear
18. Thrust gasket of side gear
19. Differential housing A and big gear

Reassembly steps:

Reassembly steps is the opposite of disassembly steps

REAR AXLE

Disassembly



Disassembly steps:

Disassembly steps are same with above:

Disassembly of side bearing:

Disassemble with special tools

Disassembly of differential housing B:

Make adjusting marks before removing differential housing B so that the differential housing can be reinstalled to the original position reassembly.

Check and repair

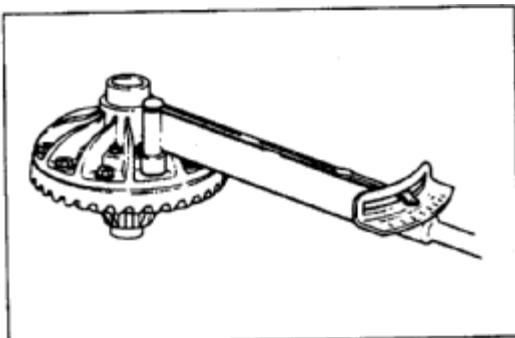
Check and repair:

If there is abrasion, damage or any other abnormal situation, repair or replace the parts if necessary.

Visual inspection:

Visually check the parts listed in the left form for abrasion, damage or any other abnormal situation.

1. Bearing
2. Gear
3. Oil seal
4. Differential housing
5. Transmission small gear



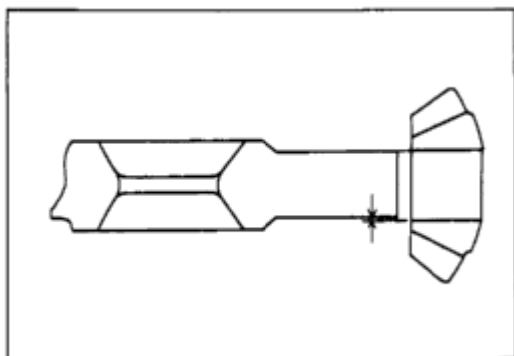
Replacement of big gear:

Replace the big gear and transmission small gear as a set at the same time.

Tightening torque of big gear bolt:

Torque	333
--------	-----

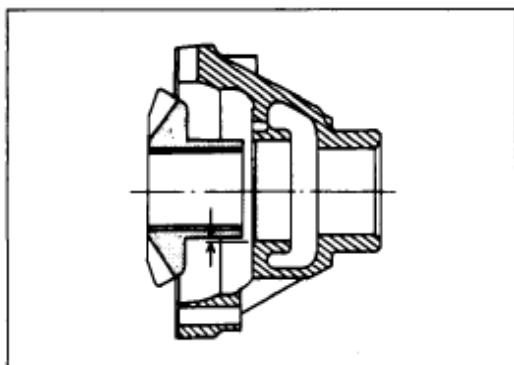
REAR AXLE



Clearance between cross shaft and differential small gear:

(mm)

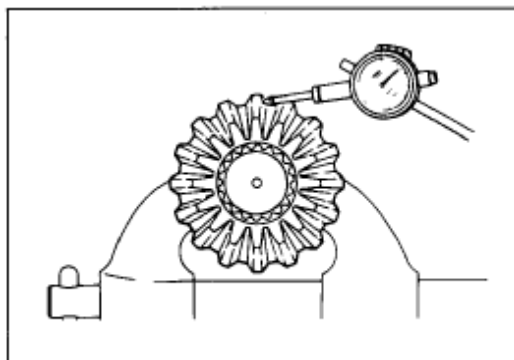
Model	Standard	Limit
	0.05~0.13	0.2



Clearance between side gear and differential housing:

(mm)

Model	Standard	Limit
	0.13~0.20	0.25



Clearance between side gear and semi-shaft spline:

(mm)

Model	Standard	Limit
	0.2	0.5

REAR AXLE

Assembly

Assembly steps:

Assembly steps are introduced as before:

Assembly of differential housing B:

1. Align with the marks made in disassembly.
2. Lubricate screw thread of bolt with oil before installing the bolt.

Tightening torque of differential housing nut:

Torque	108
--------	-----

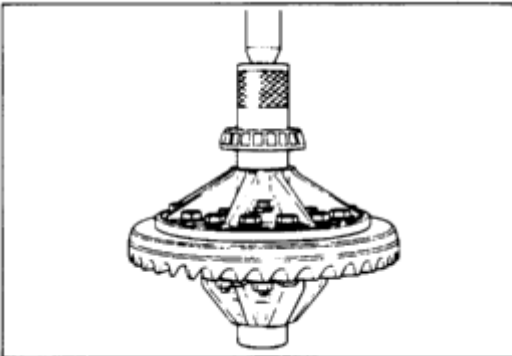
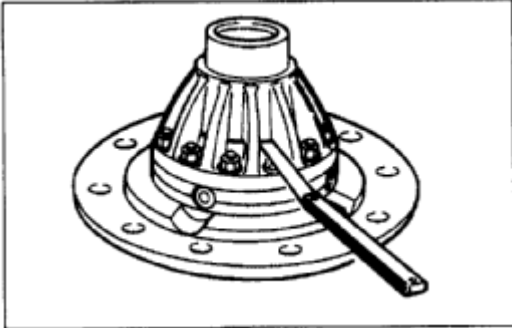
3. Insert plug gauge by the hole of differential housing B, measure clearance between side gear back and differential housing B. If the clearance is beyond the limit, replace the thrust gasket or the side gear

Clearance standard:

Clearance	0.10~0.38
-----------	-----------

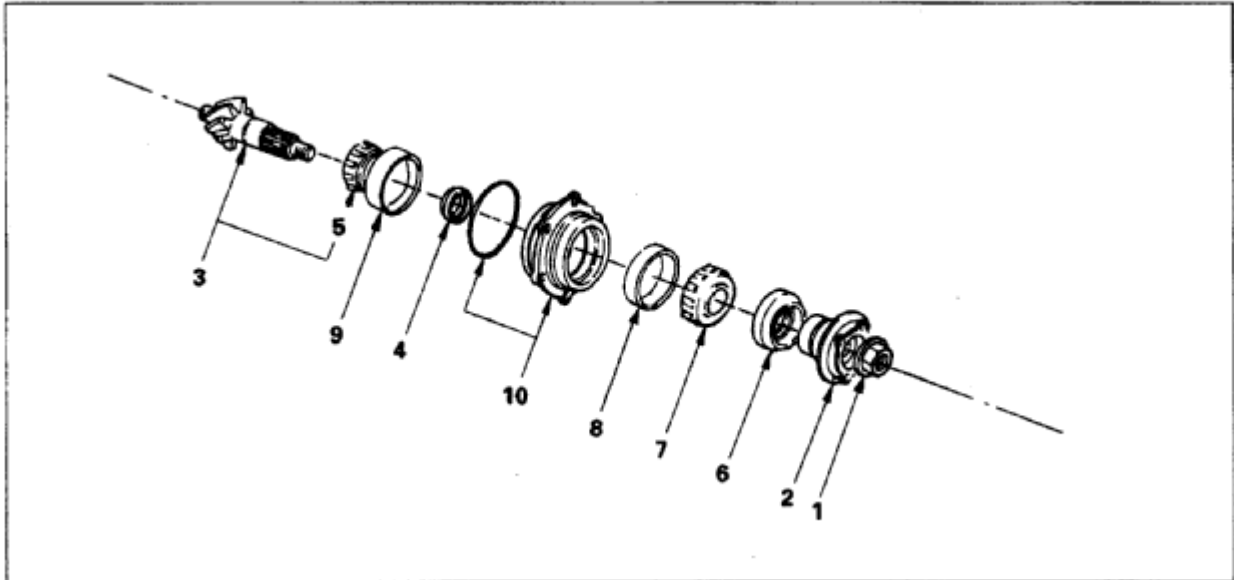
Assembly of side bearing:

Assemble with special tools



REAR AXLE

Drive gear



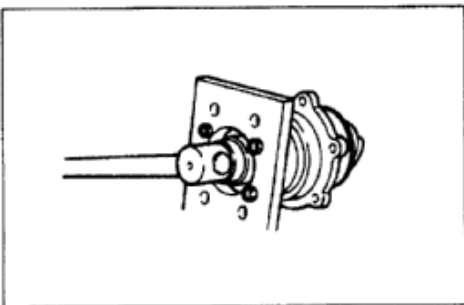
Disassembly steps:

1. Flange nut
2. Flange
3. Drive gear
4. Spacing ring
5. Interior bearing
6. Oil seal
7. Exterior bearing
8. Outer race of exterior bearing
9. Outer race of interior bearing
10. Drive gear housing and O-ring

Reassembly steps:

Reassembly steps are the reverse of disassembly steps

Disassembly

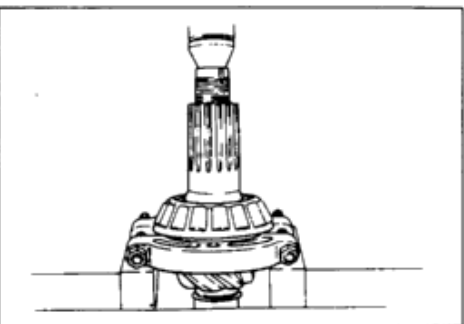


Disassembly steps:

Disassembly steps are introduced hereinbefore.

Disassembly of flange nuts:

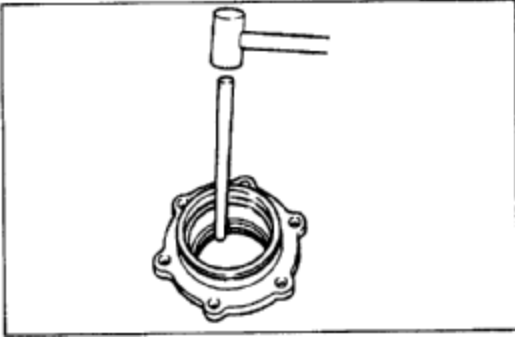
Fix the flange nuts on the bracket and disassemble them with special tools.



Disassembly of drive gear bearing:

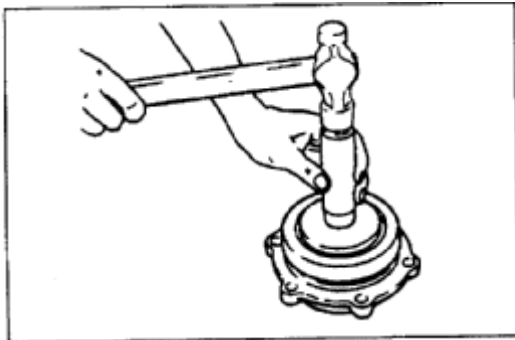
Disassemble with furcation special tool and bench press.

REAR AXLE



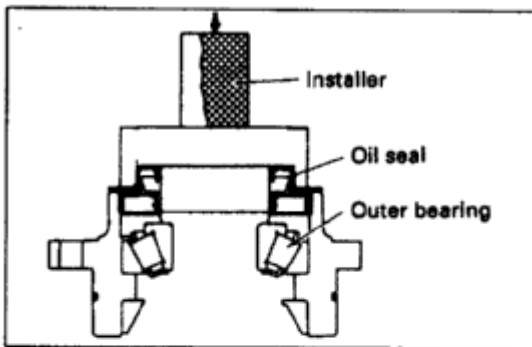
Disassembly of bearing outer race:
Disassemble outer race with a brass stick.

Assembly

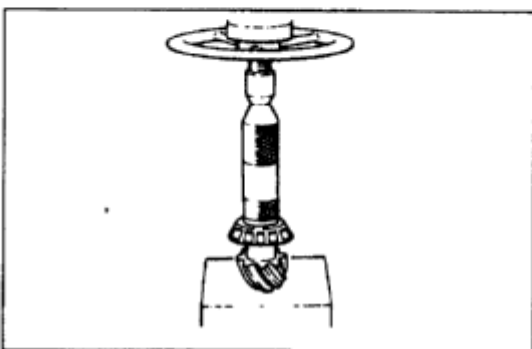


Assembly steps:
Assembly steps are same with above
Attention: Used O-ring, spacing ring and flange nut can not be reused and Must be replaced.

Assembly of bearing outer race:
Assemble with special tools.



Assembly of oil seal:
Assemble with special tools.



Assembly of bearing:
Assemble with special tools.

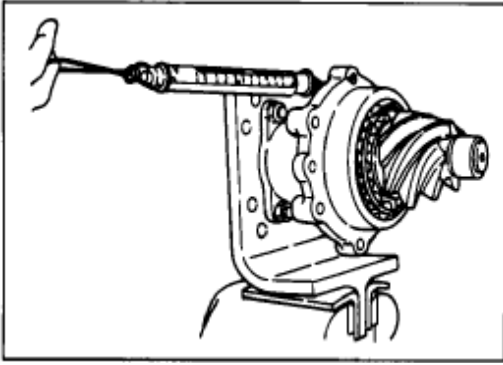
Assembly of flange nut:

1. Tightening flange nut to specified tightening torque of 245N.m
2. Then tighten pre-tightening distance of the adjusting bearing of the flange nut to specified value step by step. When pre-tightening distance of the bearing is in range of standard value, tightening torque of flange nut must in specified range.

Tightening torque of flange nut:

Torque	441~598
--------	---------

REAR AXLE



Pre-tightening distance of the bearing:

New bearing	26~38
Old bearing	13~19

Notes: The pre-tightening distance of the bearing is got as the oil seal dismantled and the spring balance hitched in the housing mounting hole. Lubricate the nut with oil when tighten the flange nut.

3. Make two marks on flange nut with special tools after tightening,

FRONT AXLE

FRONT AXLE

Adjusting of front wheel

Front axle

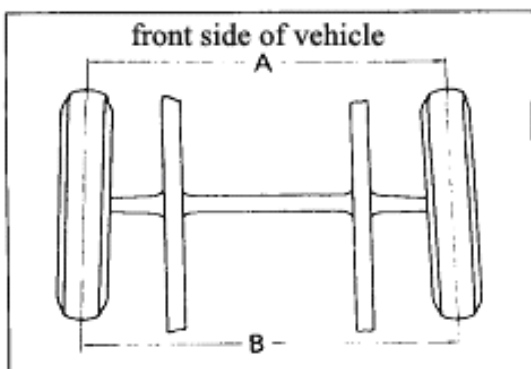
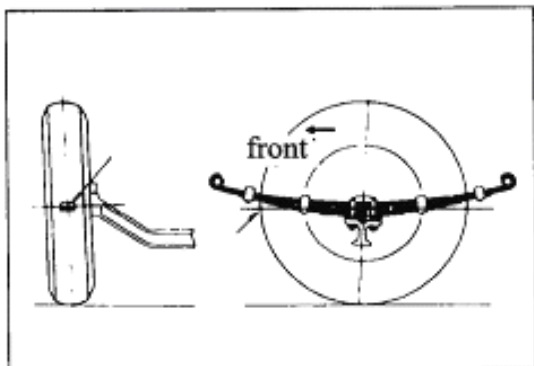
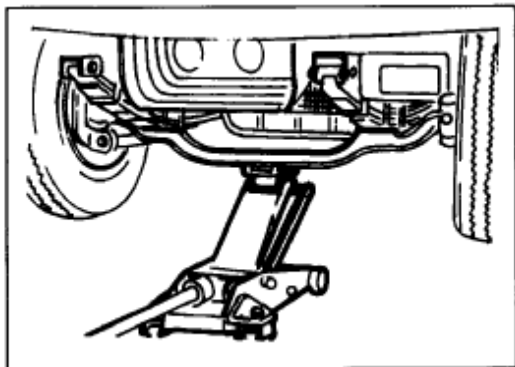
FRONT AXLE

Adjusting of front wheel

1. clearance of the front wheel hub bearing
2. clearance of the steering link connecting ball pin
3. tightening of the parts of the front suspension
4. clearance of the king pin bearing

Inspection:

Inspect whether the items listed in the left form are normal.



Measuring of the front wheel toe-in

- (1) Stop the front wheel on even ground.
- (2) Jack up the front axle.
- (3) Make marks on central part of the tire tread with a chalk.

- (4) Place toe-in measuring equipment on central position of the wheel.
- (5) Score tyre central line by turning wheel.

- (6) Let the vehicle fall on ground.
- (7) Adjust height of the toe-in measuring equipment pointing at the mark on tyre.

- (8) Measure the distance between tyre central lines (A).
- (9) Jack up the front axle again.
- (10) Turn each wheel by 180°.
- (11) Make the toe-in measuring equipment point at the mark on tyre.

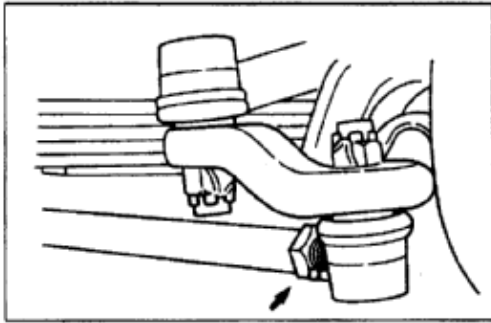
- (12) Measure the distance between tyre central lines on rear side of the front wheel (B).

The toe-in value equivalents: $B - A$

Toe-in value:

Diagonal tire	4~6
Radial tire	0~3

FRONT AXLE

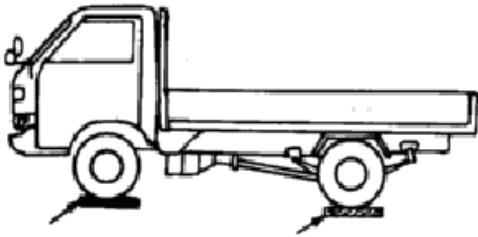


Toe-in adjustment:

1. Loose the tie rod connecting lock nut
2. Rotate the tie rod to adjust the toe-in.
3. Tighten the lock nut to specified torque

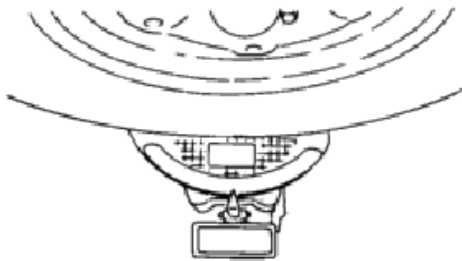
Tightening torque of the lock nut: :

Tightening torque	113
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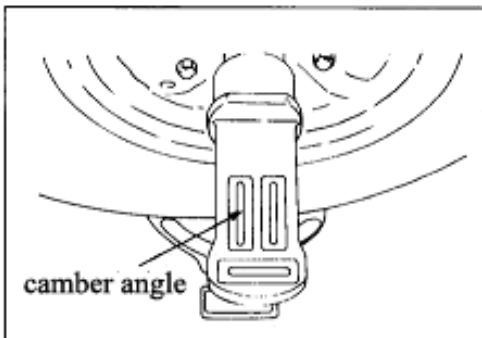


- (1) Put a cushion block of the same thickness with the steering angle measurer under each rear wheel.
- (2) Jack up the front wheel
- (3) Put each front wheel on a steering angle measurer.

Tire central line should align with the center of steering angle measurer.



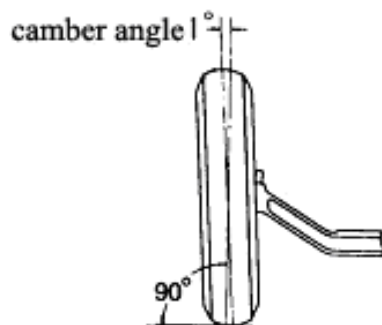
- (4) Let the front wheel fall.
- (5) Set the scale of the steering angler measurer to zero.
- (6) Remove the front wheel hub cover.
- (7) Wipe the steering knuckle ends and clean up all lubricating grease.
- (8) Install upper front wheel--king pin camber measurer and turn the steering knuckle left and right horizontally.



- (9) Read camber degree from the dial directly.
- (11) Repeat step (8) and step (9) on another steering knuckle.

If measured camber degree deviates the specification: Adjust toe-in

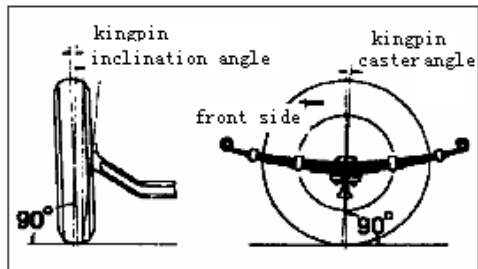
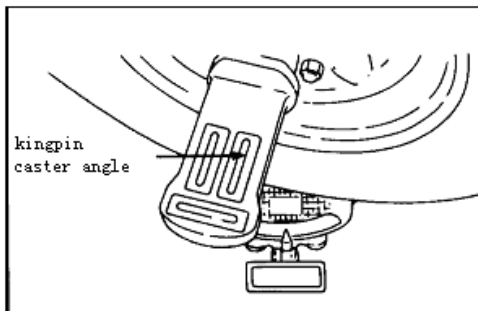
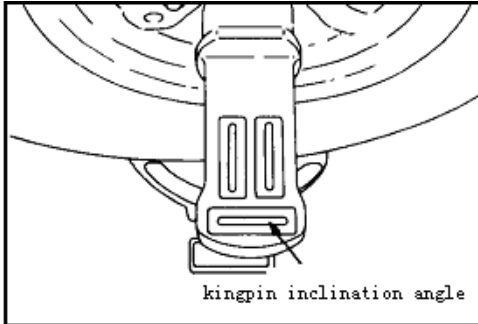
- (a) Check whether the steering swivel pin, bearing and the liner bushing have been abraded too much.
- (b) Check whether the front wheel hub bearing has loosed.
- (c) Check the torsion and extroversion of the front axle.



Camber degree of the front wheel:

	1°
--	----

FRONT AXLE



Measurement of the caster of the steering king pin and K.P.I.

The caster of the steering king pin and the K.P.I of the king pin can be measured by the front wheel king pin camber measurer at the same time.

(1) Adjust the scale of the steering angle measurer to zero (after finishing the camber measuring).

(2) Turn the steering wheel right until the front wheel has turned by 20° (measured by the steering semi diameter measurer).

(3) Adjust the scale of the right king pin caster and K.P.I of the front wheel to zero.

(4) Turn the steering wheel in opposite direction until the front wheel has turned left by 20° (measured by the steering angle measurer).

(5) Read the degree of the right king pin caster and K.P.I from the right scale directly.

(6) With the wheel turning left by 20° , adjust the scale of the left king pin caster and K.P.I of the front wheel king pin camber to zero.

(7) Turn steering plate in opposite direction until front wheel has turned left to 20° (measured by the steering angle measurer).

(8) Read the left king pin caster and K.P.I from the left scale directly.

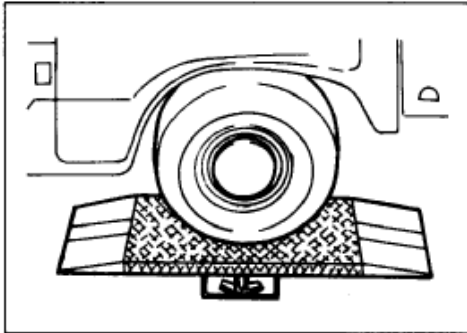
Caster angle and Inward inclination angle:

Caster angle	$1^\circ 30'$
Inward inclination angle	7.5°

If the degree of the king pin camber is measured to deviate the specification:

- Check whether the steering knuckle, the bearing and the liner bush have been abraded too much.
- Check the abrading situation of the front steel plate spring.
- Check torsion and camber of the front axle.

FRONT AXLE

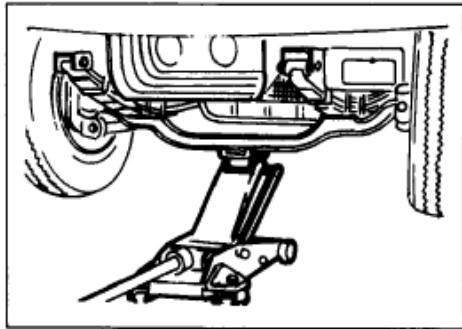


Measuring of sideslip

Measuring of sideslip should be made after the measuring and adjusting of the camber of toe-in and king pin

- (1) Roll the wheel across the sideslip measurer as slowly as possible.
- (2) Read out the reading indicating on the sideslip measurer.

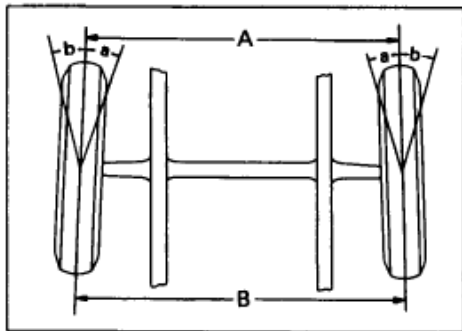
If sideslip value exceeds 5 mm per meter, it is necessary to adjust the wheel alignment again.



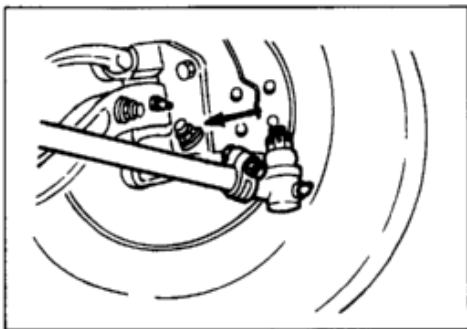
Measurement of the maximal steering angle

1. Stop the vehicle on even place.
2. Jack up the front wheel
- (3) Put each front wheel on a steering angle measurer.

Tire central line should align with the center of steering angle measurer.



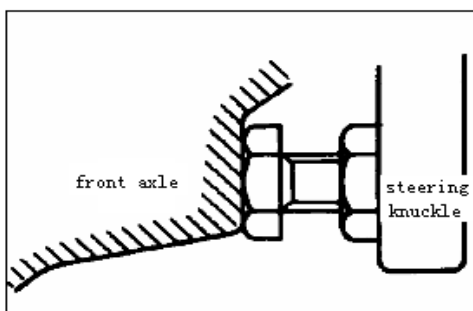
- (4) Let the front wheel fall.
- (5) Set the scale of the steering angle measurer to zero.
6. Turn the steering wheel right until it is blocked.
7. Measure the steering angle
a--- Maximal steering angle of exterior wheel
b--- Maximal steering angle of interior wheel
8. Turn steering wheel left until it is blocked.
9. Measure the steering angle
a--- Maximal steering angle of exterior wheel
b--- Maximal steering angle of interior wheel



interior wheel and exterior wheel:

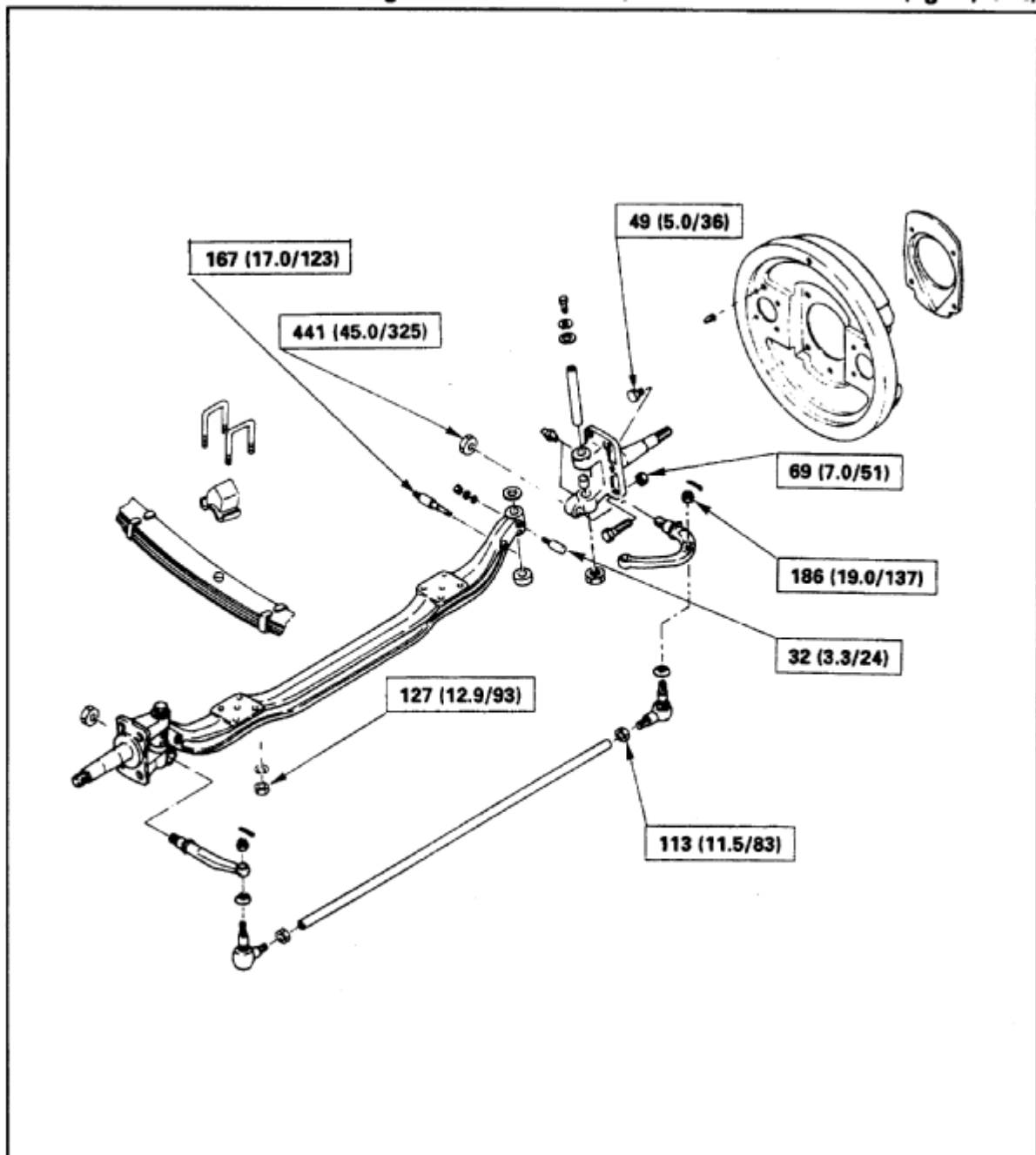
interior wheel	42°
exterior wheel	35°

If the steering angle is measured to deviate the specification, please adjust it with steering knuckle stop bolt.

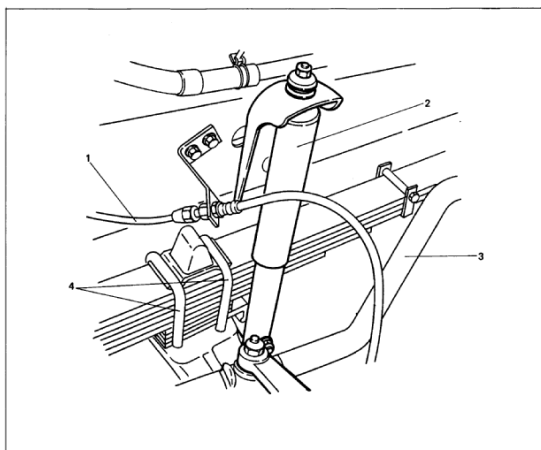
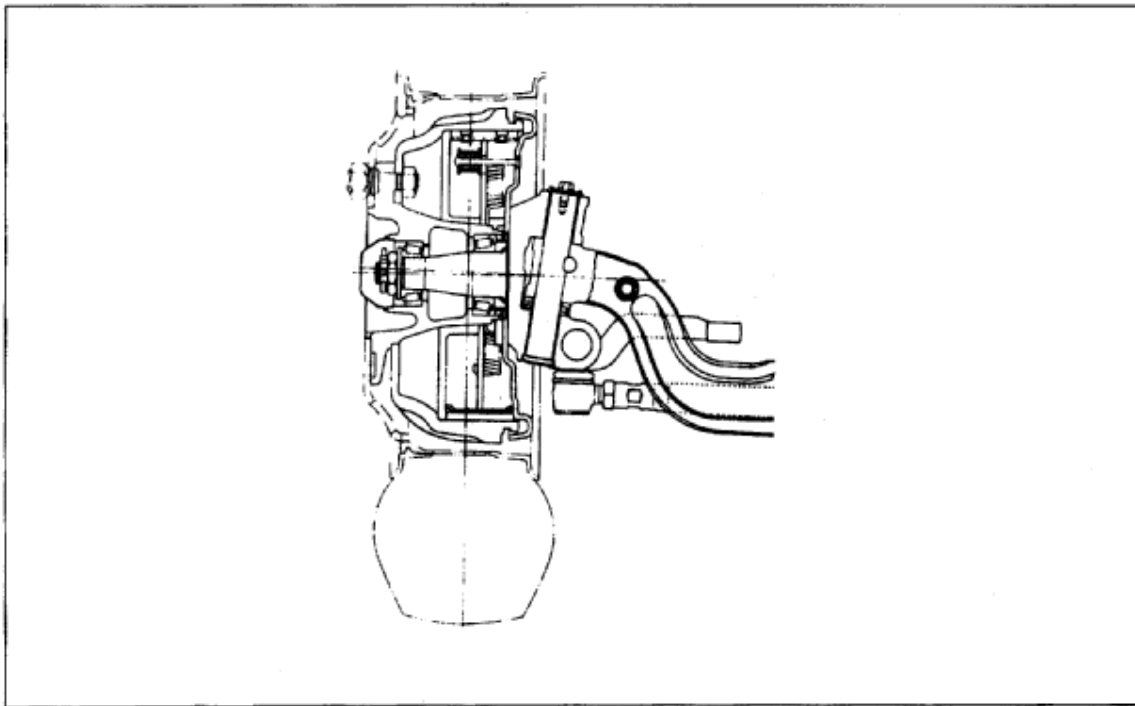


FRONT AXLE

Fixed torque



FRONT AXLE



Disassembly sequence:

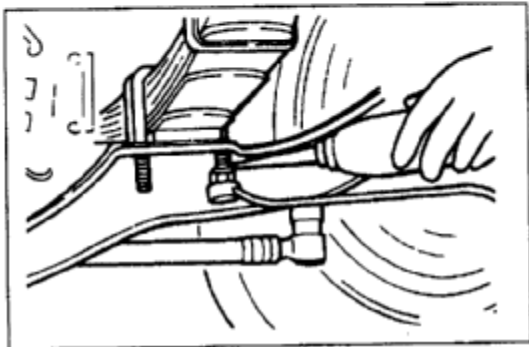
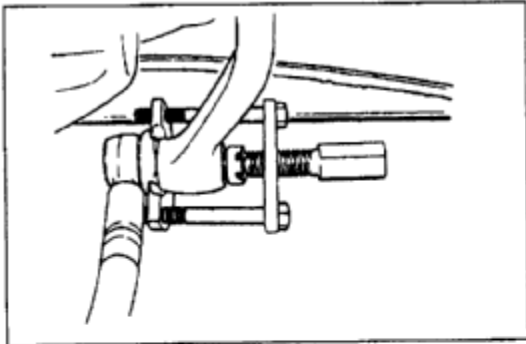
1. brake tube
2. shock absorber
3. drag link
4. steel spring U-bolt U-nut

Assembly sequence:

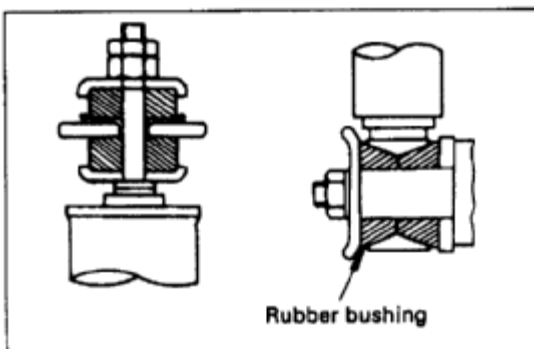
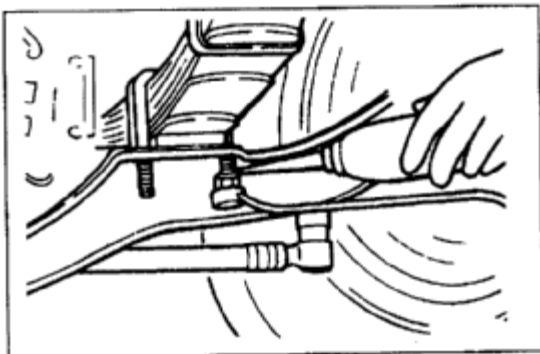
Just the opposite of the disassembly sequence

FRONT AXLE

Disassembly



Reinstallation



Re-assembly sequence:

As before mentioned

Removal of the drag link :

Use special tools

Removal of the U-bolt:

If corrosion of the U bolt is serious, lubricate the thread with certain quantity of oil, and then loose the nut in case of thread damage.

Reassembly sequence :

As mentioned before

Assembly of U nut and U bolt :

When tighten U bolt or U nut , lubricate the thread with certain quantity of oil in case of thread damage.

Tightening torque of U-bolt:

tightening torque	127Nm
-------------------	-------

Assembly of drag link :

Tighten the drag link nut to specified torque, if the nut opening does not align with the cotter hole, increase the torque slightly to adjust it.

Tightening torque of the drag link nut:

Tightening torque	167Nm
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Assembly of rear shock absorber :

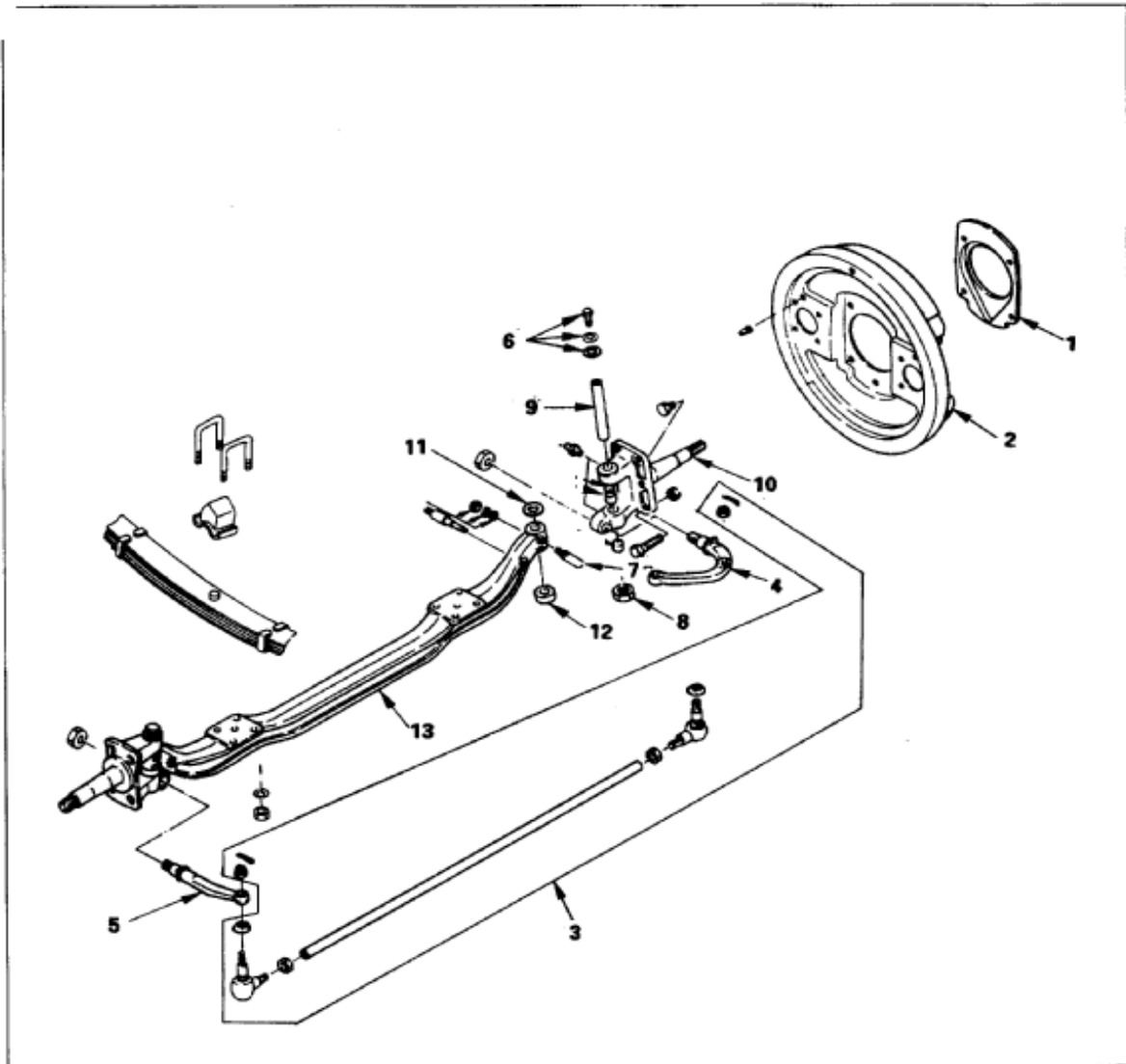
Install shock absorber nut, gasket and rubber liner bush according to the diagram.

Tightening torque of absorb nut :

Upper nut	
Lower nut	95Nm

FRONT AXLE

Knuckle and king pin



Disassembly sequence :

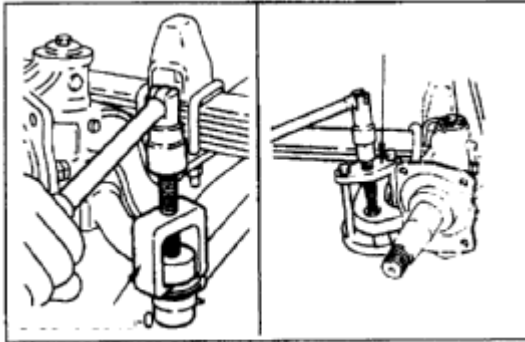
1. Oil retainer
2. Brake shield plate
3. Steering knuckle tie rod and tension bar attachment
4. Knuckle curved arm
5. Knuckle straight arm
6. King pin cap
7. Locking pin
8. Stops up the lid
9. Swivel pin
10. Knuckle
11. Adjusting shim
11. Thrust bearing
12. I-beam

Assembly step:

13. I-beam
10. Knuckle
12. Thrust bearing
11. Adjusting shim
9. Swivel pin
7. Locking pin
6. King pin cap
8. Stops up covers
5. Knuckle straight arm
4. Knuckle curved arm
3. Steering knuckle tie rod and tension bar attachment
2. Brake shield plate
1. Oil retainer

FRONT AXLE

Disassembly :



Preparation :

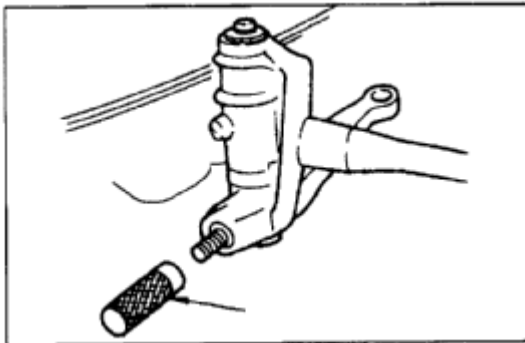
Jack the vehicle up and support it on the chassis platform

Steps of removal:

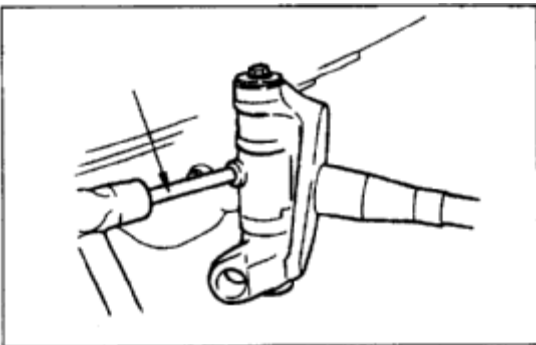
Steps of removal are introduced at before.

Removal of steering knuckle tie rod ball:

Remove with the special-purpose tool and the hammer impact

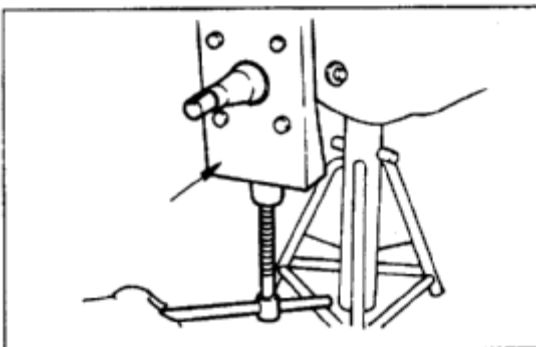


Removal of the knuckle drop arm and the curved arm:



Removal of lock pin:

Remove it with the special-purpose tool.



Removal of the swivel pin:

Remove it with the special-purpose tool.

FRONT AXLE

Inspection and repair :

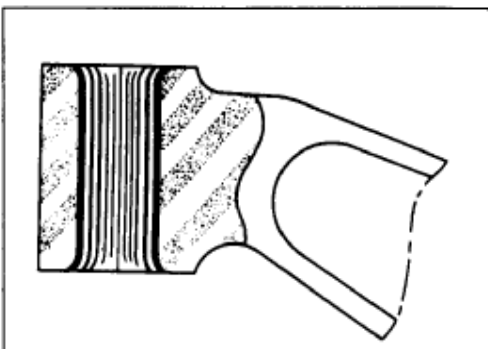
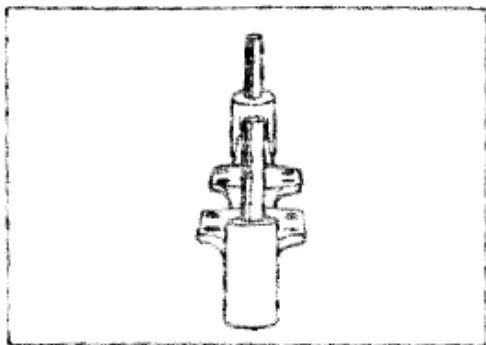
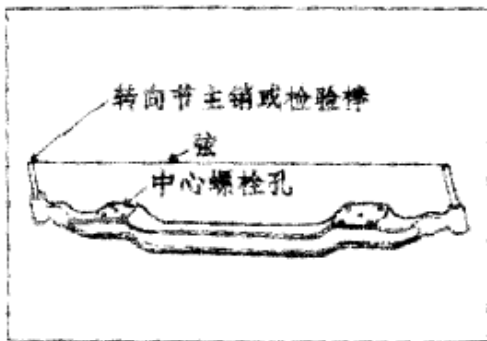
1. I-beam
2. Knuckle
3. Changes the drop arm and the curved arm
4. Steering knuckle tie rod and tension bar attachment
5. Swivel pin, bushing, thrust bearing and adjusting shim
6. Universal joint ball
7. Front wheel hub, bearing and oil seal
8. Brake drum
9. Brake facing

Inspection and repair:

When inspect, if find wearing, damage or any other abnormal situations, Repair or replace the parts if necessary.

Visual inspection:

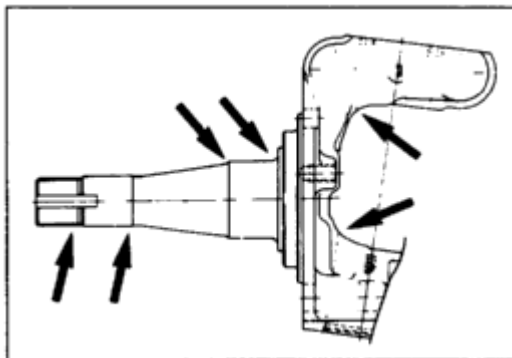
Check the parts listed in left form for wearing, damage or any other abnormal situations



I-beam inspection:

1. Put the steering swivel pin (or inspection stick) into the steering swivel pin hole.
2. Tighten a string (or inspection stick) between the steering swivel pins.
3. The string should be consistent with the spring holder center bolt hole as you look down from it.
4. From the side looked the swivel pin (or examines stick), the swivel pin (or examines stick) to be supposed to be at good vertical to the uneven condition
5. Inserts a new swivel pin into the pin hole and inspect the cooperation situation of the steering swivel pins in the steering swivel pin hole. If cooperation of the swivel pins becomes less compact, the front axle must replaced; if the upper of lower flange of the king pin mounting hole is excessively worn, the front axle must also be replaced.

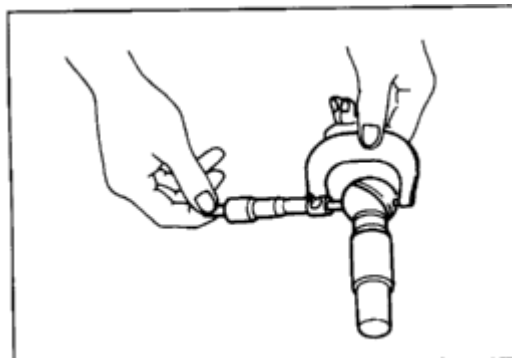
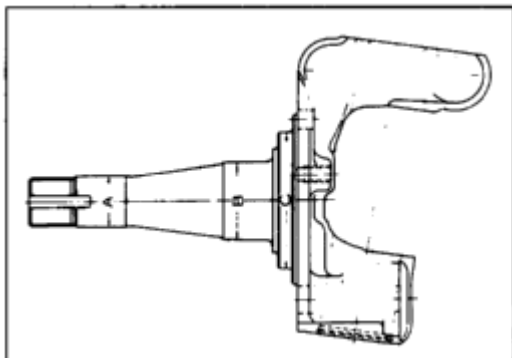
FRONT AXLE



Inspection of the steering knuckle:

1. Check the knuckle for cracking or other damages with the magnetic flaw detector
2. Surveys diameter of the bearing and oil seal assembly surfaces A, B

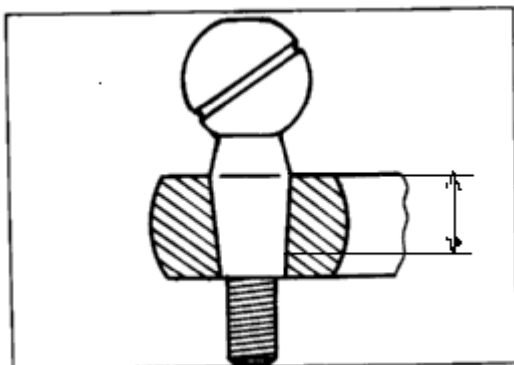
Model	A	B
	35mm	50mm



Inspection of the universal joint ball:

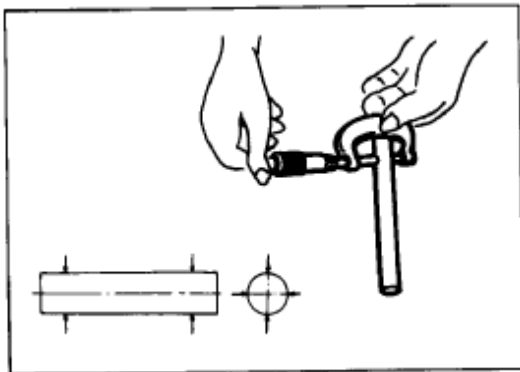
1. Outer diameter survey

Axle model	Standard	Limit
	39.0mm	38.5mm



1. Spreads light special mixture on the universal joint ball cone-shape spot (mixture of red lead and machine oil)
2. Installs the drop arm and the curved arm on the universal joint ball
3. Inspect whether the universal joint ball contacts well. The contacted area should not be shorter than 3/4 of the entire length.
4. If the universal joint ball does not contact well, it must be repaired or replaced.

FRONT AXLE



Diameter of the steering swivel pin:

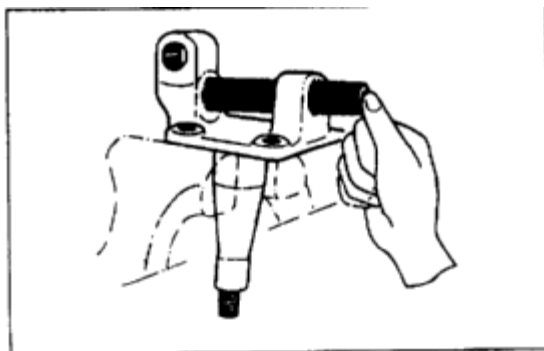
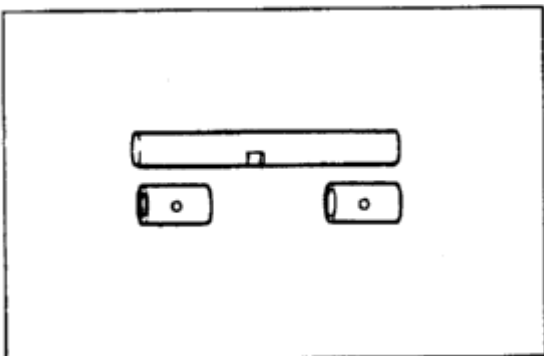
(mm)

Model	Standard	Limit
	30.0	29.9

Clearance between swivel pin and bushing:

Model	Standard	Limit
	0.06mm	0.15mm

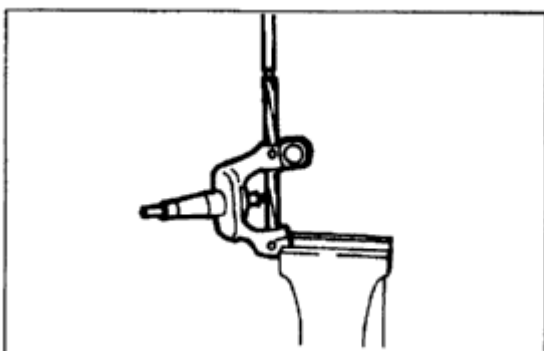
Notes: When install the bushing, its lubricant filler is supposed to align with the filler of the universal joint.



Inspection of cooperation of the steering swivel pin and king pin bushing:

Put the king pin into the king pin bushing, and inspect according to following method.

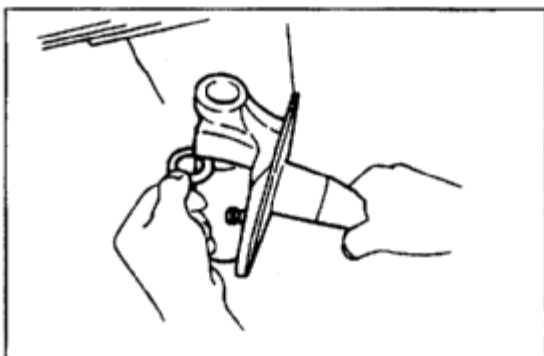
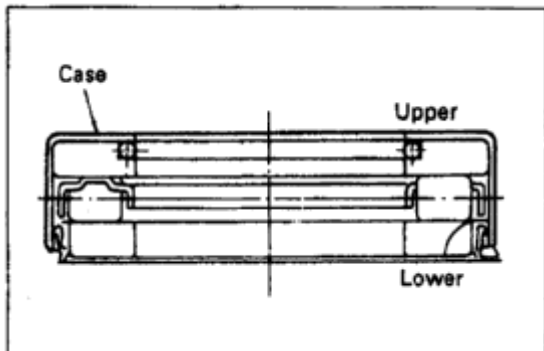
Along the king pin spool thread direction, bulldozes end of the king pin with fingers, and inspect whether the fingers can move smoothly.



If the king pin bushing is excessively tight, ream the bushing with a reamer to ensure the concentricity of the upper cotter hole and lower cotter hole of the steering knuckle.

FRONT AXLE

Assembly



Steps of installation:

Steps of installation are introduced at before.

Installation of the thrust bearing:

4. Spreads lubricating grease on the thrust bearing
5. Keep the dust cover surface upward.
6. Install the thrust bearing

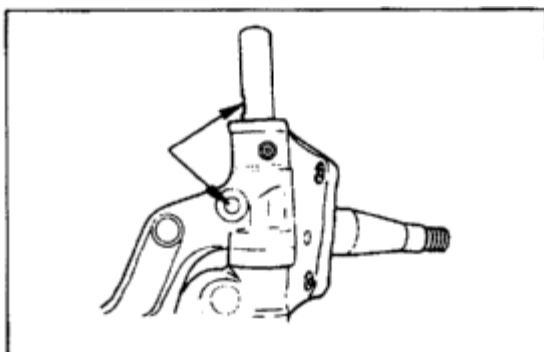
Installation of the adjusting shim:

After installing the adjusting shim, inspect the clearance between the steering knuckle and the front axle.

Model	Standard	Limit
	0~0.10mm	0.20mm

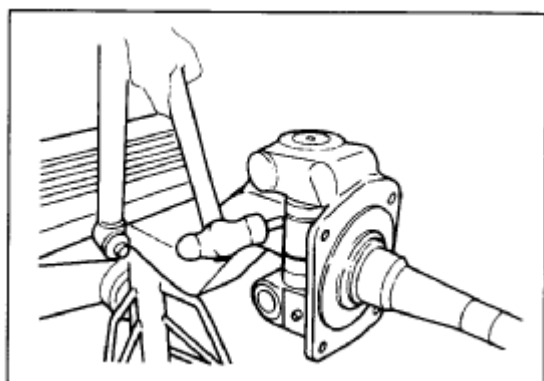
: Adjust specification of the shim: (mm)

Thickness	0.50、0.55、0.60、0.65、0.70、0.80、0.90
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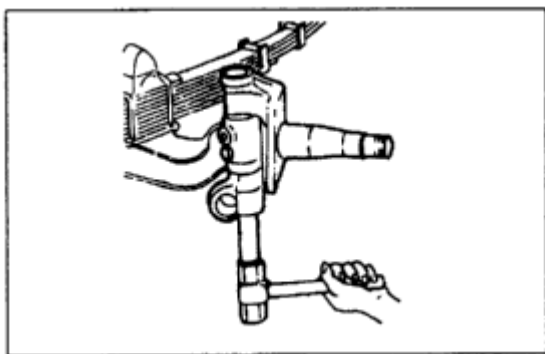


Installation of king pin:

1. Apply the lubricating grease on the king pin and the bushing
2. Align lock dowel slot of the king pin and lock dowel hole of the front axle
3. Install the steering swivel pin, and inspect whether the knuckle turns smoothly.



FRONT AXLE

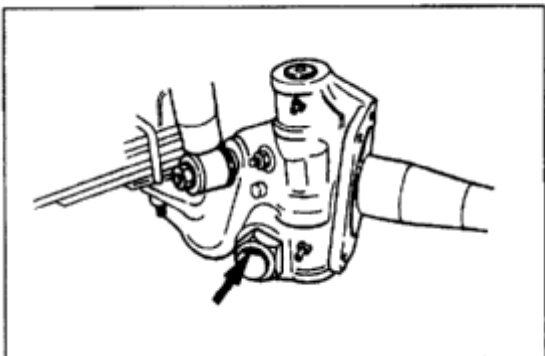


Tightening torque of the lock dowel: :

	32Nm
--	------

Specification of adjusting shim:

Thickness	0.50、0.55、0.60、0.65、0.70、0.80、0.90
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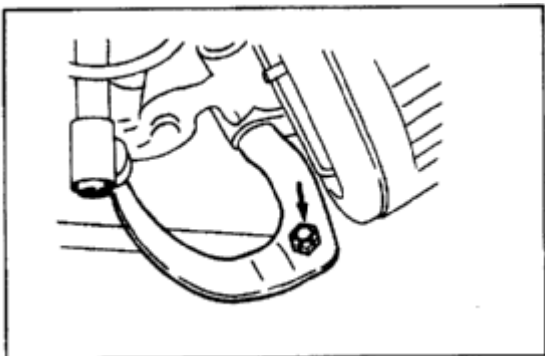


Installation of blocking cap:

Install the blocking cap upwardly with an appropriate stick.

Installation of the drop arm and the curved arm:

Tighten the nut to specified tightening torque, caulk the nut.

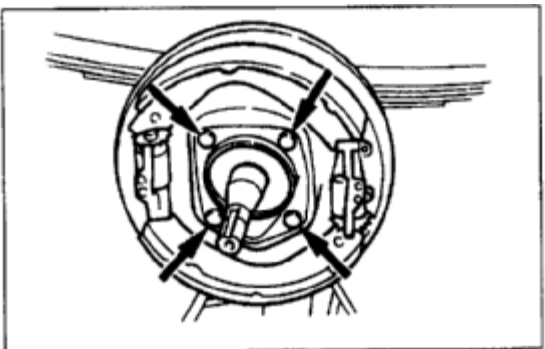


Tightening torque of the nut:

	441Nm
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Tightening torque of the tie rod jointing nut:

	186Nm
--	-------



Tightening torque of the brake shield plate bolt

	69Nm
--	------

Fault diagnose

Clutch skid

No.	Reason	Measure
1	The pedal doesn't return well	Repair the spring or apply lubricate
2	The clutch facing blocks on transmission first shaft	Replace transmission first shaft
3	Elasticity of the diaphragm spring weakens or damages	Replace
4	Clutch gasket adheres oil	Replace
5	Clutch gasket abrades	Replace
6	Clutch gasket burns	Replace
7	There is no clearance between release bearing and release lever	Adjust free stroke
8	Diaphragm spring has cracks	Replace
9	Pressure plate and the flywheel distort	Replace, repair or adjust
10	Putting foot on the pedal in driving	Avoid semi-clutching

Clutch can not separate completely

NO.	Reason	Measure
1	Free stroke of the clutch is too long (pedal stroke is insufficient)	Adjust the free stroke
2	Clearance between release bearing and release-lever is too wide	Adjust the clearance
3	Pontes of transmission rod abrade	Replace
4	Elasticity of the diaphragm spring weakens or the front side of it abrades	Replace
5	Height of the diaphragm spring release finger is disaccord	Replace
6	Clutch facing is installed in opposite direction	Replace
7	Gasket becomes flexible or damage	Replace
8	Surface of gasket is uneven	Replace
9	Spline hub of clutch facing blocks on first shaft of transmission	Replacing, repair or adjustment
10	Damping device fragment popes out of clutch spline hub	Change clutch-facing
11	First shaft of transmission bends	Replace
12	Guide bearing of transmission first shaft in flywheel is damaged	Replace
13	Rubber cup of master cylinder and clutch disconnecting cylinder is damage	Replace
14	Hose and pipeline are damaged, there leaks oil in jointing points	Replace
15	Air comes Into master cylinder or pipeline	Remove
16	The diaphragm spring is damaged	Replace

Clutch rush (when starts, in semi-clutching state, clutch facing combines with drive patch suddenly which

causes the vehicle scurry forward.)

No.	Reason	Measure
1	Gasket of clutch adheres grease or oil	Replace gasket
2	Gasket of the clutch is abraded or rivet becomes flexible, head of rivet protrudes	Replacing gasket
3	Incompetent gasket is used	Replace gasket
4	Elasticity of the diaphragm spring is too hard	Replace
5	First shaft of transmission abrades out of steps	Replace
6	Driver rod blocks instantaneously	Replace
7	Pressure plate and flywheel distort	Repair and adjust or replace

Clutch dithering

No.	Reason	Measure
1	Elasticity of vibration-damping spring weakens or damages	Replace
2	Gasket contact is not good or the jointing surface swings	Replace
3	Surface of gasket hardens	Replace
4	Abutment of engine becomes flexible	Tighten
5	Pressure plate and flywheel distorts that leads to surface coarseness	Repair, adjustment or replacing
6	Elasticity of the diaphragm spring weakens or has cracks	Replace
7	Height of diaphragm spring release finger is disaccord or conglutinated	Replace
8	spline hub of clutch damages	Replace
9	First shaft of transmission crooks	Replace

Pedal of clutch pulsation

No.	Reason	Measure
1	Supporting seat of engine becomes flexible	Replace
2	Guide bearing of transmission first shaft damages or is lubricated well	Replace bearing
3	Front bearing of transmission damages or is not lubricated well	Replace bearing

There are abnormal noises when the clutch pedal is stepped on

No.	Reason	Measure
1	Release bearing is damaged, squalid or not lubricated well	Replace bearing
2	Guide bearing of transmission first shaft damages or is not lubricated well	Replace bearing

3	Front bearing of transmission damages or is not lubricated well	Replace bearing
---	---	-----------------

There are abnormal noises when the clutch returns

No.	Reason	Measure
1	The pedal doesn't have free stroke	Adjust
2	Elasticity of the pedal return spring is too weak or damaged	Replace spring
3	Diaphragm spring damages	Replace
4	Driver rod blocks	Repair and adjust
5	Pedal block	Repair and adjust
6	Release sleeve of clutch blocks	Repair and adjust
7	Release fork blocks	Repair and adjust
8	Crankshaft center and transmission center is not concentric.	Adjust
9	Vibration-damping spring of clutch facing abrades	Replace spring
10	spline hub of clutch facing becomes flexible	Replace

Transmission

There are abnormal noises as the manual transmission is at some gears

No.	Reason	Measure
1	Gear lubricant is insufficient or of bad quality	Add or change gear lubricant
2	Guide bearing of second shaft of transmission abrades or damages	Replace
3	Bearing of second shaft of transmission abrades or damages	Replace
4	Bearing of countershaft abrades or damages	Replace
5	Tooth face of primary driver gear abrades	Replace
6	Tooth face of middle gear erodes	Replace
7	Spring and ring of synchronizer damage, surface of taper damage	Replace
8	Mounting bolt of transmission becomes flexible	Tighten
9	Gears of speedometer damage	Replace
10	Tooth face of other gears abrasion	Replace
11	Toggle fork, shifter shaft or aperture of toggle fork abrades	Replace
12	Elasticity of spring of self-locking mechanism weakens	Replace
13	Crankshaft center and transmission center is not concentric.	Repair and adjust

Notes: If every gear has abnormal noises, the constant mesh gear or bearing maybe be damaged

Shifting of the manual transmission is difficult

No.	Reason	Measure
1	bad adjustment of gear changing mechanism	Adjust
2	Toggle fork or shifting arm damages	Replace
3	Use gear oil not satisfying the standard	Replace

4	Gear oil is insufficient or too much	Inspect
5	Stroke shortage of clutch pedal	Adjust free stroke
6	Bad adjustment of clutch transmission mechanism	Adjust
7	Spline of second shaft of transmission damages or crooks	Replace
8	Synchronizing ring abrades	Replace
9	Synchronizer blocks	Inspect

Lose gear position when driving

No.	Reason	Measure
1	Anchor bolt of transmission becomes flexible (especially at direct gear and 2 gear)	Tighten
2	Crankshaft center and transmission center is not concentric.	Repair and adjust
3	Bad adjustment of shifting mechanism	Adjust
4	Gears and guide bearing of second shaft of transmission abrade or damage	Replace
5	Front and rear thrust rings of middle gear abrade	Replace
6	Ball slot of every toggle fork shaft or self-locking mechanism abrasion	Replace
7	Balls of every toggle fork shaft or self-locking mechanism abrade, elasticity of the spring weakens	Replace
8	Front or rear bearing of transmission abrades and damages	Replace
9	Bearing retainer ring of transmission damage	Replace
10	Second shaft of transmission and countershaft are not in parallel	Replace transmission
11	Tooth face of every gear abrade	Replace gear

Oil leakage

No.	Reason	Measure
1	Fill too much oil	Fill oil up to the filler
2	Use gear lubrication not conformed to the standard (viscosity is too low)	Change lubrication
3	Blowhole jams	Clean
4	Airproof of the front bearing retainer ring of transmission is bad.	Replace
5	Front bearing retainer ring has cracks	Replace
6	Oil seal of shifter shaft is bad	Replace
7	Bolt of transmission cover becomes flexible	Tighten
8	Seal of transmission cover gasket is bad	Replace
9	Oil seal of countershaft becomes flexible	Replace
10	Shaft or bearing abrades	Replace

Transmission shaft

Vibration of transmission shaft

No.	Reason	Measure
1	Universal joint needle bearing abrades or damages	Replace bearing
2	Transmission shaft crooks	Replace
3	Middle supporting bearing of the transmission shaft abrades or damages	Replace
4	Flange yoke connect bolt of the transmission becomes flexible	Tighten
5	Transmission shaft tube is depressed, which breaches dynamic balance	Replace
6	Balance block falls off which breaches dynamic balance	Replace
7	spline hub becomes flexible	Replace

Noise of Transmission shaft

No.	Reason	Measure
1	Universal joint abrades or damages	Replace
2	Spline hub abrades	Replace
3	Middle supporting becomes flexible	Tighten
4	Connection of flange yoke becomes flexible	Tighten

Rear axle

Abnormal noise on straight running

No.	Reason	Measure
1	Gear oil is insufficient	Add
2	Viscosity of gear oil is too low	Replace
3	Bad quality of gear	Replace
4	Meshing clearance between driving gear and driven gear is too wide	Adjust
5	Tooth faces of driving gear and driven gear abrade or damage	Replace
6	Bearing of driving gear abrades or installation becomes flexible	Replace and adjust
7	Clearance of driving gear shaft is too wide	Adjust packing sheet
8	Axle housing crooks	Replace
9	Differential gear case crooks	Replace
10	Side bearing abrades or installation becomes flexible	Replace and adjust
11	Driven gear crooks	Replace
12	Wrong mesh between driving gear and driven gear	Readjust

Abnormal noise in swerving

No.	Reason	Measure
1	Pre-tightening force of driving gear installation is insufficient	Adjust packing sheet

2	Bearing of driving gear abrades or damages	Replace
3	Tooth face of final drive abrasion	Replace
4	Gear side clearance of final drive is too narrow	Adjust

Abnormal noises in rounding

No.	Reason	Measure
1	Tooth face of planetary gear or axle shaft gear abrades or damages	Replace
2	Planetary axle is abraded out of steps	Replace
3	Planetary axle or bush abrades	Replace
4	Side clearance between planetary wheel and axle shaft gear is too wide	Replace
5	Axial clearance is too wide	Adjust
6	Interface of axle shaft gear differential gear case is rough	Replace
7	Axle casing has cracks	Replace
8	Oil seal retainer ring of driving gear of final drive distort or installed badly	Replacing
9	Flanges of universal joint and main reducer are not concentric	Repair and adjust

Knocking sound

No.	Reason	Measure
1	Driving or driven gear of the main reducer is abraded or damaged	Replace
2	Differential bearing is abraded	Replace
3	Half shaft spline is loose	Replace
4	Differential cross shaft hole is abraded or damaged	Replace
5	Something abnormal in axle housing	Take abnormal things out

Front wheel and steering device

Big free stroke of the steering wheel

No.	Reason	Measure
1	The pre-tightening force of steering gear worm lever is too small (big bearing clearance)	Adjust
2	Meshing side clearance of steering ball nut and gear segment is too big	Adjust
3	Gear segment axial play of steering gear is too big.	Adjust
4	The steering device is installed loosely	Tighten
5	Connecting joints of the tie rod and drag link of the steering connection rods are abraded	Replace
6	Front wheel axes is not adjusted well or abraded	adjust、Replace
7	Front wheel nut is loose	Tighten
8	Main bush is abraded	Replace

9	King pin thrust bearing is abraded	Replace
10	Steering axle spline is loose or abraded	Replace

Steering wheel is heavy

Num.	Reason	Measure
1	Tire pressure is too low	Adjust
2	Steering device or other connecting parts are adjusted too tight	Readjust
3	Lubricant of the steering device is insufficient or of low quality	add lubricant、replace
4	King pin rear chamber is too big	Adjust front wheel position
5	Elasticity of the front leaf spring is weak	Replace
6	Framework distorts	Repair

7	King pin is abraded	Replace
8	Steering drive rod distorts	Replace
9	Front wheel axes is not adjusted well or abraded	adjust、change
10	Steering joint distorts or crooks	Replace
11	Pre-tightening force of worm bearing's is too big	Adjust
12	King pin thrust bearing is abraded or damaged	Replace

Steering wheel is loose or stroke

Num.	Reason	Measure
1	Clearance between steering ball nut and gear segment is too big	Adjust
2	Steering axle bearing is damaged	Replace
3	Tire pressure is too high	Adjust
4	Tire is side abraded	Replace
5	Tire is imbalanced	Repair
6	Wheel nut is loose	Tighten
7	Front leaf spring is ageing	Replace、tighten
8	U bolt of front leaf spring is loose and central bolt is cut off	Replace and tighten U bolt
9	Framework deformation	Repair
10	Steering knuckle axle distorts	Replace
11	Shock-absorber is not good	Replace
12	Toe-in is not suitable	Adjust
13	Steering drive rod is loose or damaged	adjust、change
14	Steering gear assistant wheel is not adjusted well	Adjust

Steering wheel swings greatly

Num.	Reason	Measure
1	Clearance between steering ball nut and gear segment is too big or too small	Adjust
2	Steering system rigidity is too big	Adjust
3	Tire pressure is too low or right and left is different	Adjust

	from each other	
4	Wheel alignment is not suitable	Adjust
5	Steering knuckle axle distorts	Replace
6	Steering knuckle king pin bends	Replace
7	U bolt of front armor plate spring is loose and central bolt is cut off	Replace and tighten U bolt
8	Steering knuckle king pin does not matches the bush well	Repair

Front wheel flashes

Num.	Reason	Measure
1	Tire pressure is too low or right and left is different from each other	Adjust
2	Eccentricity of wheel or tire is too big	Adjust
3	Shock-absorber is not good	Replace
4	Steering device is not adjusted well	Readjust
5	Front wheel bearing is not mounted and adjusted well	Adjust
6	Rear chambers of king pins of the left and right wheels are different from each other	Adjust
7	Toe-in is not suitable	Adjust
8	Steering drive pole pieces are loose or damaged	adjust、 Replace
9	Elasticity of the front leaf spring weakens	Replace

Front wheels jump up and down

Num.	Reason	Measure
1	The wheel is of imbalance	Adjust`
2	Wheel and tire are not concentric	Adjust
3	Shock-absorber is not good	Replace

Power steering equipment

Steering wheel is heavy

Num.	Reason	Measure
1	Tire pressure is too low	Adjust
2	Wheel alignment is not suitable	Adjust
3	King pin thrust bearing is adjusted too tight	Adjust
4	Redirector or other connecting parts are adjusted too tighten	Readjust
5	Suspension distorts	Repair
6	Steering drive rod pieces bend or become blocked	Repair
7	Pre-tightening force of the worm bearing is too big	Adjust
8	Strap of the oil pump skids or is damaged	Replace
9	Oil pump leaks oil or oil pressure is too low	Replace spare parts
10	Hydraulic pressure oil is insufficient or mixed with air	Add or repair

11	Oil pipe of the power equipment is blocked or the valve is adhered	Clear
12	Parts of the power equipment are damaged (oil pressure is low or the output power is insufficient)	Replace
13	Valve spool is adhered	Clear
14	Valve spool is not adjusted suitably	Adjust

Steering returns hard

Num.	Reason	Measure
1	Tire pressure is too low	Adjust
2	Wheel alignment is not suitable	Adjust
3	Suspension distorts	Repair
4	King pin thrust bearing is adjusted too tighten	Adjust
5	Redirector and other connect parts are adjusted too tighten	Readjust
6	Steering drive rod pieces bend or become blocked	Repair
7	Pre-tightening force of the worm bearing is too big	Adjust
8	Valve spool is adhered	Clear
9	Valve spool is not adjusted suitably	Adjust

Steering wheel is too sensitive

Num.	Reason	Measure
1	Tire pressure is too high	Adjust
2	Oil pump pressure is too high	Adjust
3	Oil flux is too much	Adjust

Power assist effects only when the steering wheel is turned quickly

Num.	Reason	Measure
1	Hydraulic oil is insufficient	Add
2	Strap of the oil pump skids or damages	Repair
3	Interior oil leakage	Repair

Abnormal noise in steering

Num.	Reason	Measure
1	Hydraulic oil is insufficient	Add
2	Strap of the oil pump is loose or damaged	Repair
3	Oil pipe is blocked	Clear
4	Pipeline connection is loose	Tighten
5	Oil seal of the pump axle is damaged	Replace
6	Oil pump is too hot	Repair
7	Vent hole of the oil can is blocked	Clear

Exterior oil leakage

Num.	Reason	Measure
1	Pipe fitting is loose	Tighten

2	Pipe is damaged	Replace
3	Oil seal is damaged	Replace

Service brake (drum type)

Brake deviates

Num.	Reason	Measure
1	Clearance between brake shoe and brake drum is abnormal	Adjust
2	Wheel axle is not adjusted well or damaged	adjust、replace
3	Brake shoe distorts	Replace
4	Gasket and brake drum do not contact well	Repair
5	Brake drum is abraded unevenly	Repair
6	Return spring is weak or damaged	Replace
7	Brake footboard is mounted loosely	Repair
8	Brake pipe jams	Replace
9	Gasket is dirty or deteriorates	Replace
10	Air comes into the brake liquid	Exhaust
11	Brake shoe is blocked	Repair
12	Rubber cup of wheel cylinder is not good	Replace
13	Camshaft is blocked or abraded	repair、replace
14	Position of the front wheel is not adjusted well	Readjust
15	Tire pressure is not the same	Readjust
16	Gasket floats	Repair

Brake power is insufficient

Num.	Reason	Measure
1	Oil or air leaks	Repair
2	Air comes into brake liquid	Exhaust
3	Clearance between brake shoe and brake drum is too big	Adjust
4	Gasket and brake drum do not contact well	Repair
5	Gasket is dirty, surface is vulcanized and adhered	Replace
6	Wheel axle is not adjusted well or abraded	Repair
7	Gasket is abraded	Replace
8	Brake pipe jams	Replace

Brake is bitten

Num.	Reason	Measure
1	Pedal is blocked	Repair
2	Brake shoe return spring is weak	Replace
3	Brake pipeline jams	Replace
4	Clearance between brake shoe and brake drum is	Adjust

	too small	
5	Pedal has no free stroke	Adjust
6	Rubber cup of the wheel cylinder expands	Replace
7	Brake shoe and brake motherboard block	Repair
8	Air valve of vacuum assist equipment is not good	Repair
9	Air brake camshaft block	Repair

Wheels vibrate while braking

Num.	Reason	Measure
1	Brake drum is not abraded evenly or has an eccentricity	Repair
2	Gasket is dirty and the surface is vulcanized or damaged	Replace
3	Brake motherboard is loose	Tighten
4	Part of the gasket is pelt off	Replace
5	Gasket contact is not good	Replace
6	Front suspension is loose	Repair

Stroke of brake pedal is too long

Num.	Reason	Measure
1	Brake liquid is insufficient or leaks	Add or repair
2	Brake shoe distorts	Replace
3	Gasket is abraded	Adjust or Replace
4	Brake drum cracks	Replace
5	Rubber cup and check valve of the master cylinder leak oil	Replace
6	Air comes into brake liquid	Exhaust

Abnormal noise in braking

Num.	Reason	Measure
1	Gasket surface is vulcanized or burnt; rivet bassets	Replace
2	Gasket is abraded	Replace
3	Part of the gasket is pelt off	Replace
4	Brake drum is abraded and sidesteps appear	Replace
5	Brake motherboard distorts or becomes loose	Replace or tighten
6	Supporting pin is loose	Replace
7	Wheel bearing is not well adjusted or is abraded	Repair or replace

Parking brake

Central drum brake has a weak brake power

Num.	Reason	Measure
1	Gasket is dirty or rivet bassets	Replace
2	Clearance between gasket and brake drum is too big	Adjust
3	Surface of the brake plate is rough	Repair

4	Length of the brake draw bench is not suitable	Adjust
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Electrical system

Accumulator

Accumulator discharges too much

Num.	Reason	Measure
1	Strap of the generator is loose	Adjust
2	Collecting ring of the generator is dirty or adhered	Repair
3	Connection between ignition switch and adjuster is cut off or the tie-in don't contact well	Repair
4	Connection between terminal F of the alternator and the adjuster is cut off or the terminal does not contact well	Repair
5	Silicon diode of the alternator is damaged	Repair
6	Terminal of the accumulator is eroded, loose or oxidized and dirty	Repair
7	Accumulator panel has an inside short circuit, activity materials fall off or the clapboard is not good	Replace accumulator
8	Accumulator panel is vulcanized	Replace accumulator
9	Rotor winding of the alternator is cut off or grounding	Repair
10	Stator winding of the alternator is cut off or grounding	Repair
11	Adjusting voltage of the voltage regulator is too low	Adjust
12	Low speed contact point of the Voltage regulator doesn't contact well (without excitation current)	Repair the contact point
13	High speed contact point of the Voltage regulator doesn't contact well (without excitation current)	Repair the contact point
14	contact point of the Voltage regulator is dirty 、hardened or burnt	Repair the contact point
15	Load current is too strong	Restrict load

Current consumption of the accumulator is too big

Num.	Reason	Measure
1	Use the starter too often	Check the start equipment for failures
2	Drive at night for a too long time	Adjust time
3	There are some failures of the taillight and the brake light	Check
4	Lighting wire leaks electricity	Repair

Accumulator self-discharges

Num.	Reason	Measure
1	Pole plate is vulcanized	Repair

2	Accumulator shell has cracks or is not sealed well	Repair
3	Electrolyte is insufficient	Add
4	Clapboard is not good, which causes pole plates to contact	Repair
5	Electrolyte is not pure	Replace electrolyte

Alternator

Accumulator charges too much

Num.	Reason	Measure
1	Adjusting voltage of voltage regulator is too high	Adjust
2	Terminal E of the alternator doesn't contact well (out of control at high speed)	Repair
3	Voltage winding of the voltage regulator is cut off (excitation current is too strong)	Replace
4	Low speed contact points of the voltage regulator melt and are adhered together (excitation current is too strong)	Replace
5	High speed contact points of the voltage regulator don't contact well (excitation current is too strong)	Replace
6	Connection between alternator and regulator is not good (regulator doesn't work)	Repair

Accumulator doesn't charge

Num.	Reason	Measure
1	Strap is loose	Adjust
2	Carbon brush doesn't contact well and slip ring is dirty or abraded	Repair
3	Connection between ignition switch and regulator is cut off or doesn't contact well (without excitation current)	Repair
4	Terminal F of the alternator and the regulator contact weakly or the terminal does not contact well (without excitation current)	Repair
5	Stator winding is cut off	Repair
6	Rotor winding is cut off	Repair
7	Diode of the alternator is not good	Replace
8	Adjusting voltage of the voltage regulator is too low	Adjust
9	Low speed contact points of the voltage regulator don't connect well (without excitation current)	Repair the touch point
10	High speed contact points of the voltage regulator melt and are adhered together (without excitation current)	Replace adjuster
11	Regulator contact points are dirty 、 oxidized or burnt	Repair

12	Voltage regulator does not ground well	Repair
13	Output terminal is out of welding	Repair
14	Fuse is fused	Replace

Charging current is small and voltage is unstable

Num.	Reason	Measure
1	Strap is loose	Adjust
2	Generator does not ground well	Repair
3	Loop of the stator is cut off	Repair

Abnormal noise of alternator

Num.	Reason	Measure
1	Diode is in short circuit	Replace
2	Bearing is abraded	Replace
3	Rotor axle bends	Replace rotor
4	Stator winding grounds or is lightly in short circuit	Replace stator
5	Strap is loose	Adjust

Start equipment

Starter doesn't work or the rotate speed is too low

Num	Reason	Measure
1	There is no power in accumulator	Charge
2	Accumulator stakes are loose、oxidized or eroded	Repair
3	Accumulator does not ground well	Repair
4	Terminal post of the starter switch is mounted loosely、dirty or adhered	Repair
5	Starter relay doesn't work	Replace

6	Starter winding is burned or has a short circuit or open circuit	Replace armature
7	Armature winding or down-lead of the starter has a short circuit	Replace
8	magnetic winding of the starter is burnt 、in short circuit、 grounds、 or the down-lead breaks.	Replace
9	Electrical brush and commutator of the starter do not contact well	Fix
10	Down-lead of the starter electrical brush is loose or damaged	Replace
11	Electrical brush of the starter adheres to oil or cracks	Replace
12	electrical brush support of the starter inflects 、 does not slide well and elasticity of its spring is weak or damaged	Replace
13	Commutator of the starter is out of welding or its	Repair

	isinglass is popped out	
14	Surface of the starter commutator is burnt, oxidized or rough	Replace
15	ignition switch does not contact well, or is installed loosely or the fuse melts	Replace

Starter runs but small gear does not mesh with the gear ring

Num	Reason	Measure
1	Small driving gear is dirty or the axle bends	Replace
2	Starter housing is broken	Replace
3	Axle keys are damaged	Replace
4	Gear of the small driving gear is broken	Replace
5	Slide gear linkage does not work well	Replace
6	Driving spring of the slide gear is broken	Replace
7	One-way adapter is adhered	Replace
8	Small gear of one-way adapter is abraded	Replace
9	Armature shaft is broken or inflected	Replace
10	Gag bit in the loop of magnetic switch is wrongly adjusted	Adjust

Small start gear returns slowly

Num	Reason	Measure
1	Small driving gear is dirty or the axle is inflected	Replace
2	Slide gear linkage is adhered	Repair
3	Loops of the magnetic switch don't work well	Replace
4	Contact points of the magnetic switch are melt or sintered.	Replace

Abnormal noise in starter

Num	Reason	Measure
1	Gear rings of the small driving gear and the flywheel damage	Replace
2	Starter housing is installed loosely	Tighten
3	Pole palm of the magnetic field is installed loosely	Tighten
4	Mounting board of the commutator is loose	Tighten
5	Armature shaft is inflected	Replace
6	Armature shaft bush is abraded	Replace

Lighting and signal equipments

Lighting failure

Num	Reason	Measure
1	fuse is broken	Replace
2	Conducting wire comes off or does not contact well	Repair
3	Switch does not work well	Replace

4	Bulb filament is broken	Replace
5	Bulb does not grounds well	Replace

Brake lights don't work

Num.	Reason	Measure
1	One brake light doesn't work	Replace bulb or repair conducting wire
2	Neither brake lights work	Replace fuse or switch
3	Brake lights keep on lighting as the brake pedal returns	Adjust free stroke of the pedal or replace the switch

Steering lights are abnormal

Num.	Reason	Measure
1	Neither the left nor the right steering lights work	Replace fuse or flasher
2	Front steering light works but the rear one doesn't work	Replace bulb
3	One steering light doesn't work	Replace bulb
4	The steering lights don't work while bulb, conducting wire, grounding do work normally	Replace flasher

SUSPENSION

SUSPENSION

Front suspension

General

Disassembly

Re-installation

Rear suspension

General

Disassembly

Check and repair

Re-installation

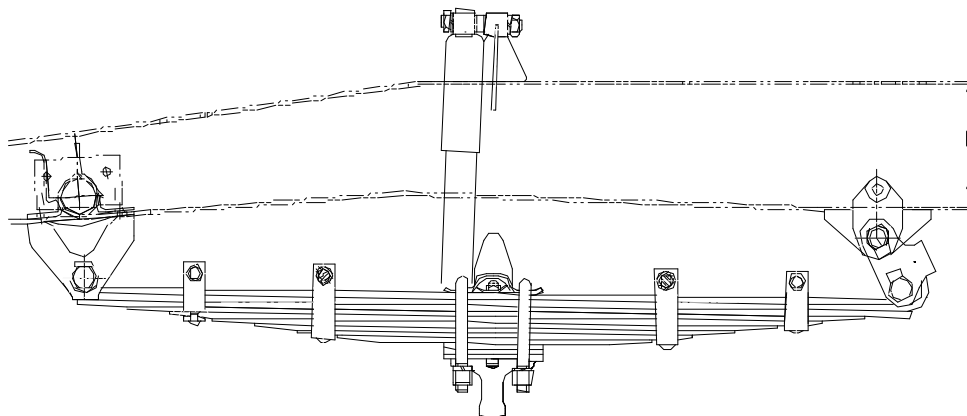
Tightening torque

Shock absorber assembly

SUSPENSION

FRONT SUSPENSION

General

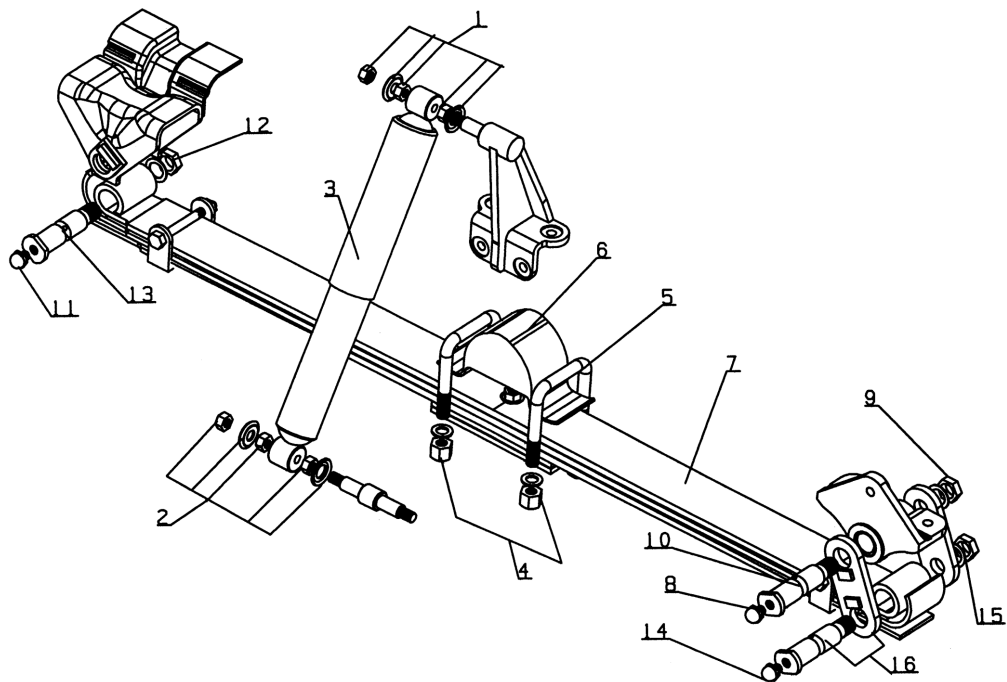


SUSPENSION

Shock absorber assembly



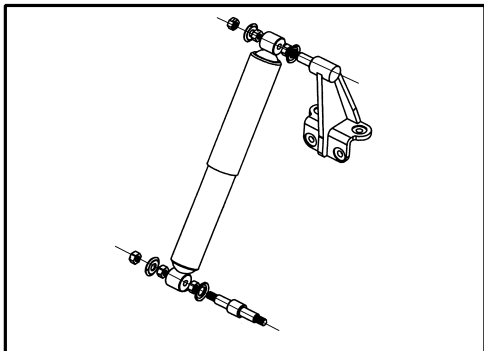
Disassembly



Disassembly sequences

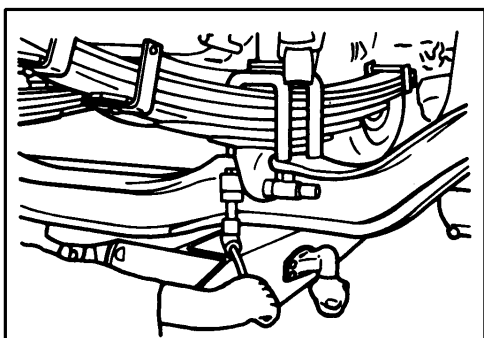
1. Rubber mat, washer and nut
- ▲ 2. Nut, washer and rubber bearing shell
3. Shock absorber assembly
- ▲ 4. Nut
- ▲ 5. U-bolt
6. Front buffer block assembly
7. Leaf spring assembly
8. Grease nipple
9. Spring washer and nut
10. Leaf spring cotter
11. Grease nipple
12. Spring washer and nut
13. Leaf spring cotter
14. Grease nipple
15. Spring washer and nut
16. Front spring lug and lug cotter

SUSPENSION

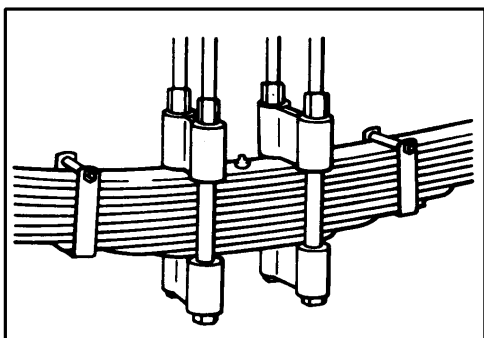


Important --- Disassembly

2. Nut, washer and rubber bearing shell
Disassemble the vibration absorber assembly, nut, washer and bearing shell as shown.



4. Nut
5. U-bolt
 - (1) Release (do not remove) U-bolt and nut
 - (2) Lift the vehicle and support it on the chassis bracket.
 - (3) Remove the U-bolt and nut



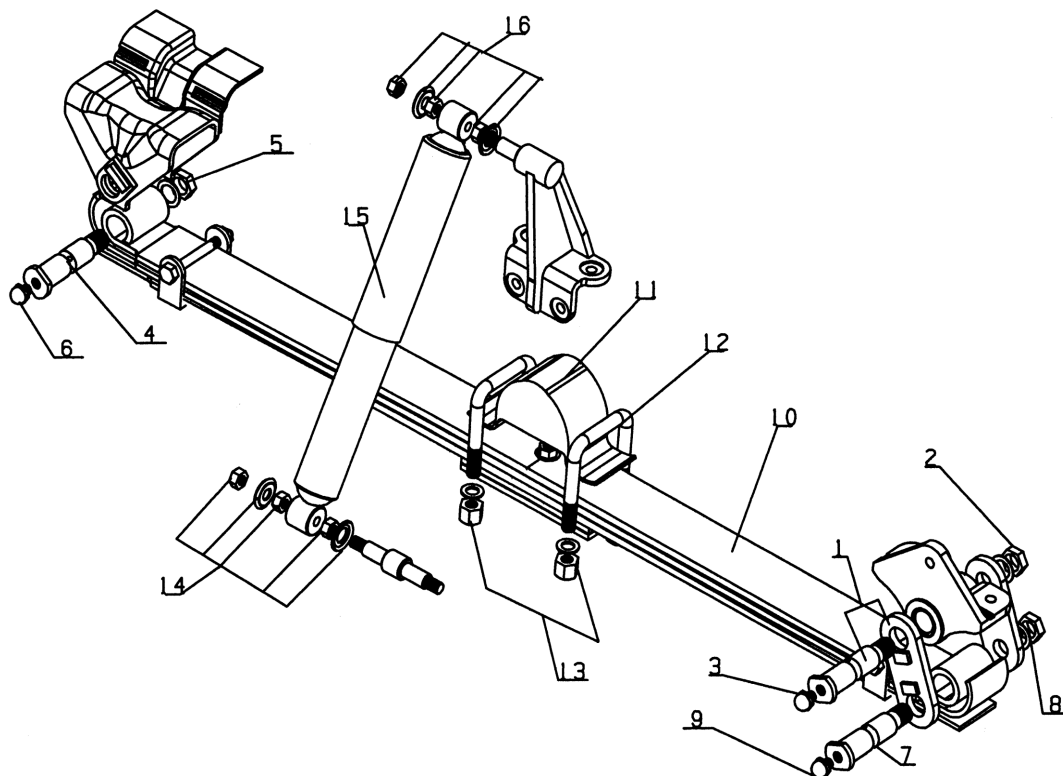
Check and repairs

In case of abrasion, damages or any other unusual conditions, make a necessary correction or replace parts.

SUSPENSION



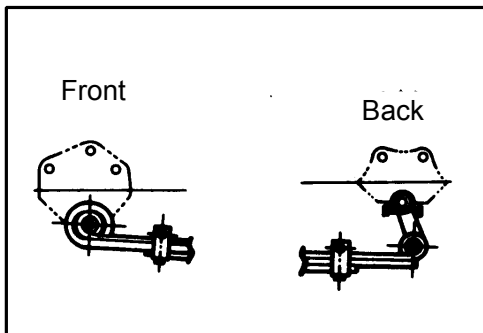
Re-installation



Re-installation sequences

1. Front spring lug and lug cotter
2. Spring washer and nut
3. Grease nipple
4. Leaf spring cotter
5. Spring washer and nut
6. Grease nipple
7. Leaf spring cotter
8. Spring washer and nut
9. Grease nipple
- ▲ 10. Leaf spring assembly
11. Front buffer block assembly
- ▲ 12. U-bolt
- ▲ 13. Nut
- ▲ 14. Nut, washer and rubber bearing shell
- ▲ 15. Vibration absorber assembly
16. Rubber mat, washer and nut

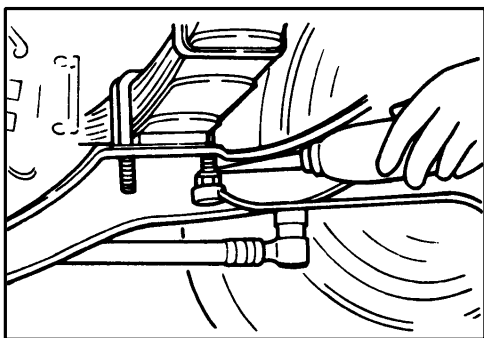
SUSPENSION



Important --- assembly

10. Leaf spring assembly

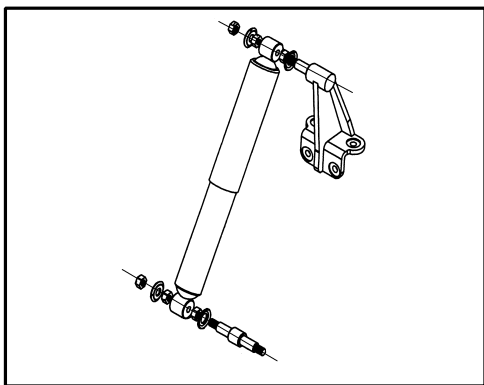
Install the leaf spring assembly by double wrapping end of left steering side



12. U-bolt

13. Nut

- (1) Place the vehicle at a horizontal plane and install U-bolt to a corresponding position of the leaf spring.
- (2) Lift the vehicle.
- (3) Align with the front axle hole and U-bolt.
- (4) Apply the engine oil on the nut before tightening them to prevent damages of thread.
- (5) Tightening nuts.



14. Nut, washer and rubber bearing shell

15. Front vibration absorber assembly

Disassemble the vibration absorber assembly, nut, washer and bearing shell as shown.

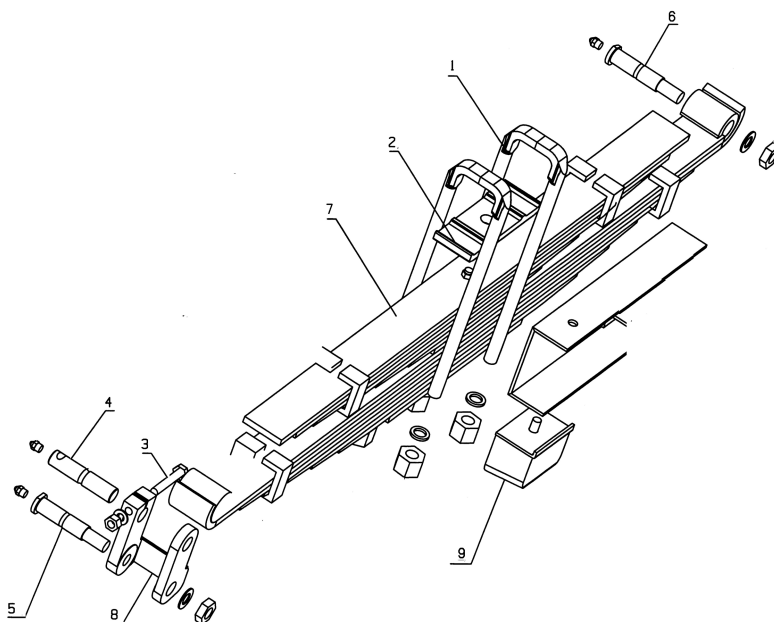
Tighten the nut till the washer contacts with fitting face of bearing end.

SUSPENSION

REAR SUSPENSION

General

Disassembly

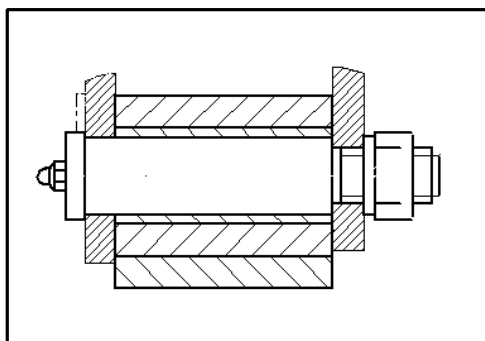


Disassembly sequences

- ▲ 1.U-bolt and nut
- 2. Rear spring plate
- 3.Leaf spring cotter, locking bolt and nut
- 4.Leaf spring cotter and grease nipple
- 5.Leaf spring cotter and grease nipple
- ▲ 6.Leaf spring cotter and grease nipple
- 7.Leaf spring
- 8. Rear leaf spring lug
- 9. Buffer block



Important

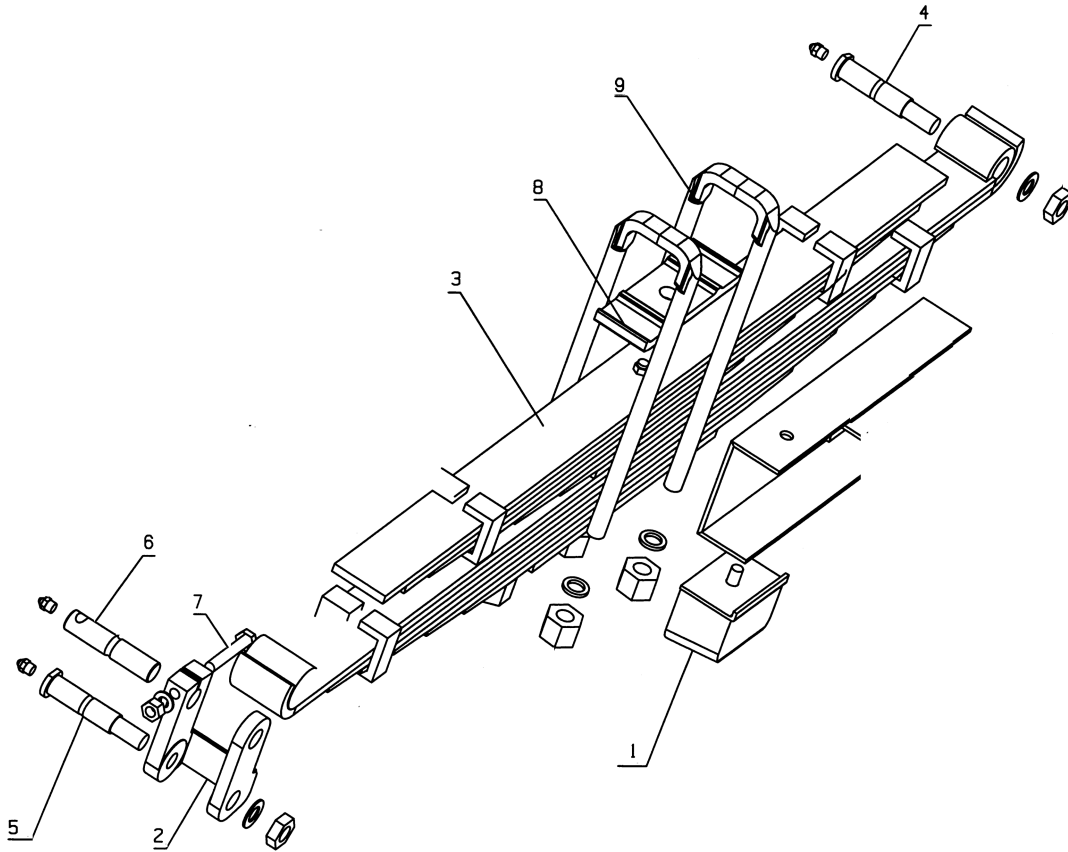


- 1. U-bolt and nut
After loosening the nut, lift the vehicle, and support it by chassis platform. Remove U-bolt and move the front axle assembly.
- 4. Leaf spring pin
Lift the leaf spring assembly by a jack, remove the nut and eject the bolt outwards.

SUSPENSION



Re-installation



Disassembly sequences

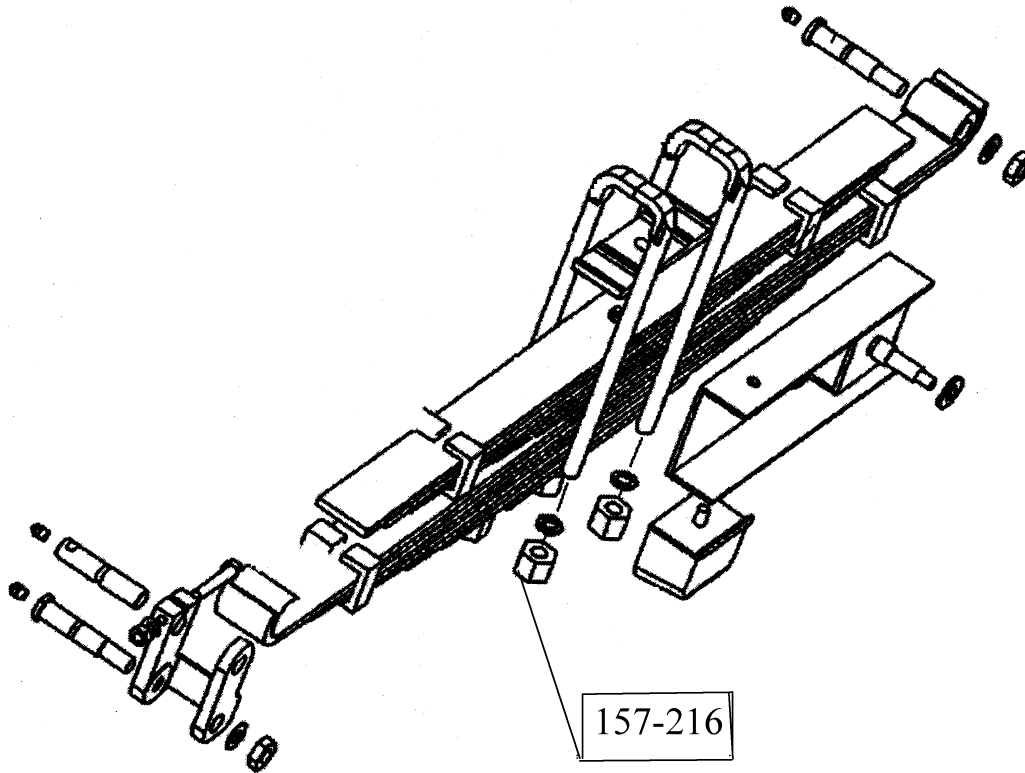
1. Buffer block
2. Rear leaf spring lug
3. Rear leaf spring assembly
4. Leaf spring cotter
5. Leaf spring cotter
6. Leaf spring cotter
7. Leaf spring cotter, locking bolt and nut
8. Washer
9. Rear spring plate
10. U-bolt and nut

SUSPENSION



Tightening torque

(Unit: N • m)



Steering gear

General

Main data and specifications

Maintenance

Steering column and shaft

Disassembly and assembly

Check and repairs

Steering gear assembly

Disassembly and assembly

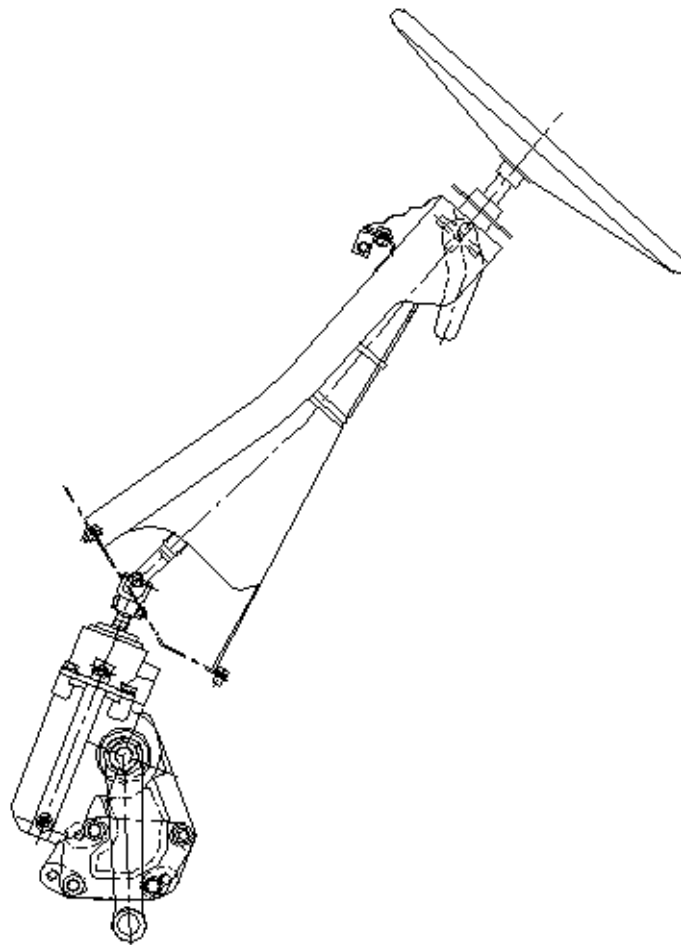
Power steering device

Disassembly

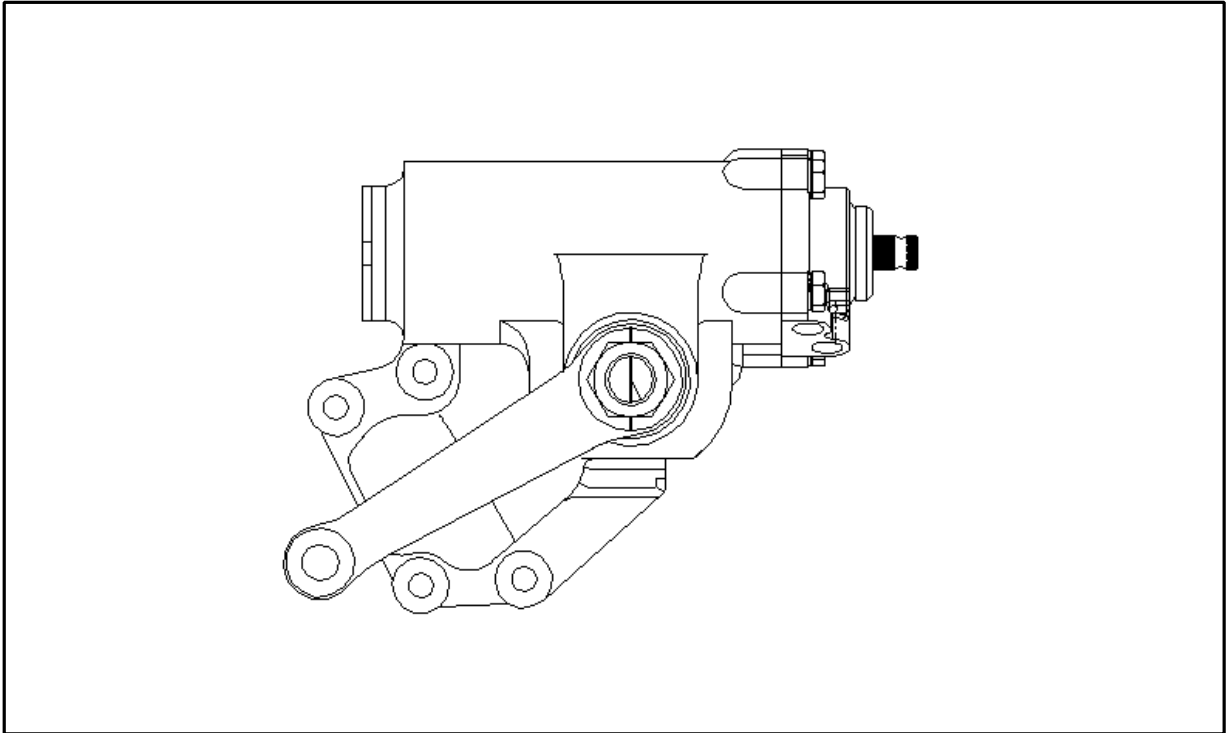
Re-installation

General

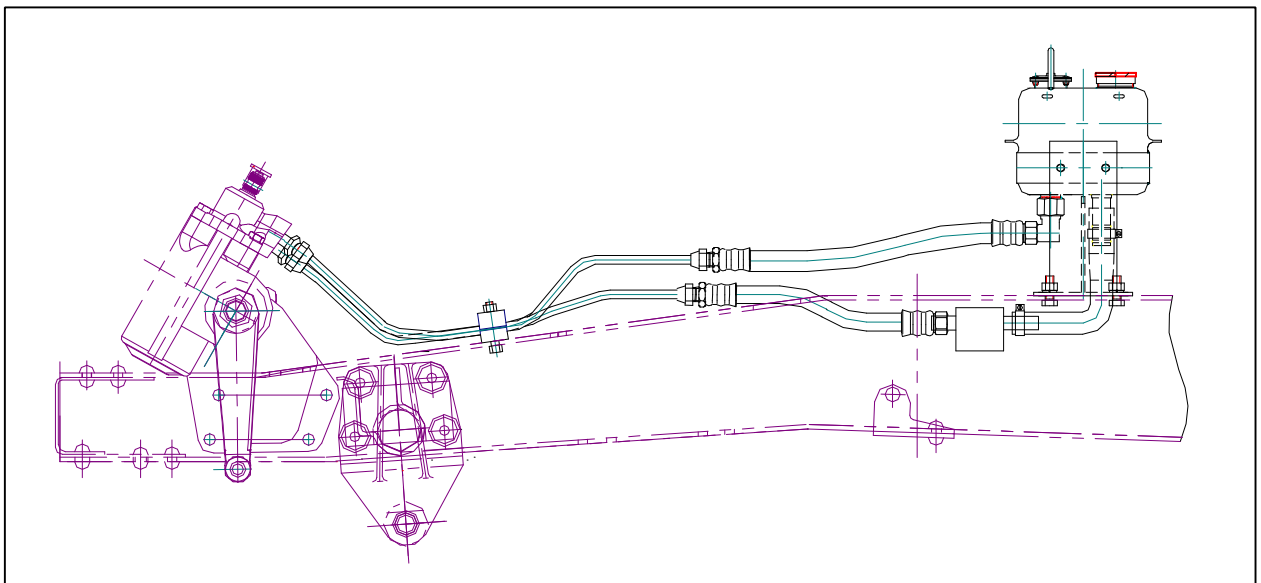
Steering mechanism

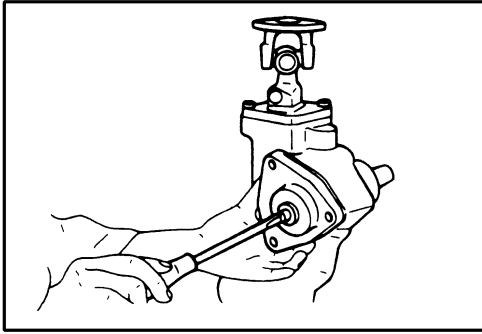


Power steering device



Power steering pipe

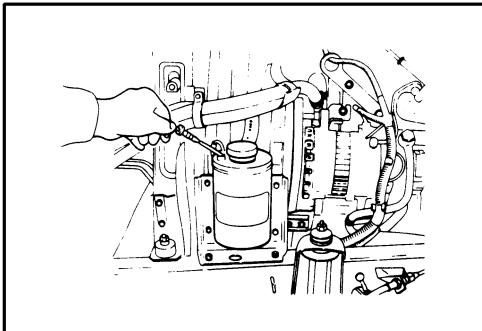




Maintenance

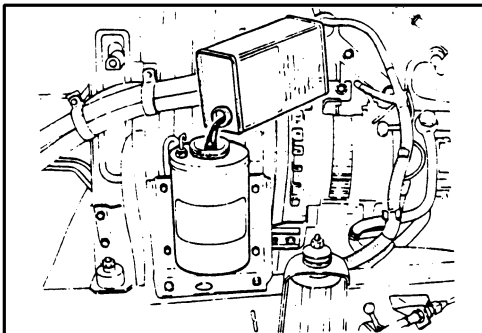
Adjustment of free stroke of steering wheel

In case of too large free stroke of steering wheel, check whether steering shaft, universal joint has clearance. If these parts are normal, then adjust it by an adjusting screw of device. Rotate the adjusting screw clockwise, the free stroke will reduce; rotate it anticlockwise, it will increase.



Oil level check (for power steering)

Remove a level meter rod from the oil tank and check the oil level of the meter rod.



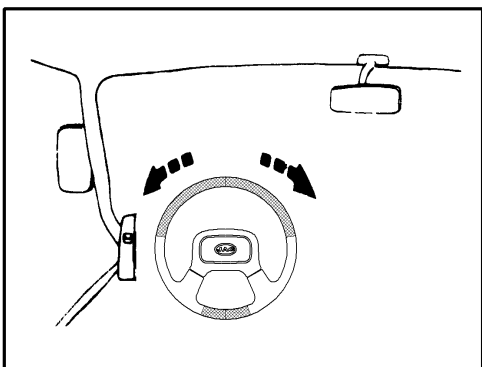
Exhaust of power steering pipe

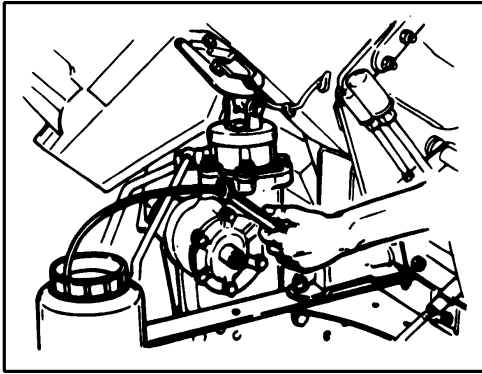
- (1) Fill steering oil into the power steering oil reservoir (use the specified one), separate the front wheel and the ground by lifting the front axle, and turn the steering wheel to the limit position by two sides several times.

Note: During exhaust, check the liquid level in the power steering oil reservoir frequently, and fill up in case of insufficiency

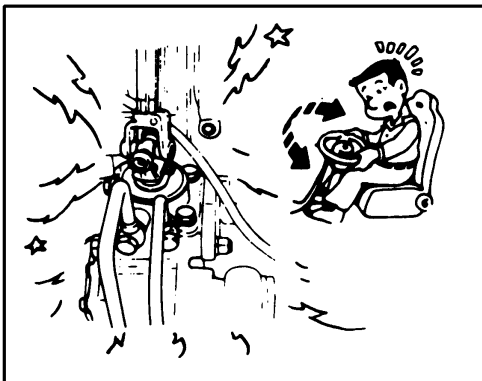
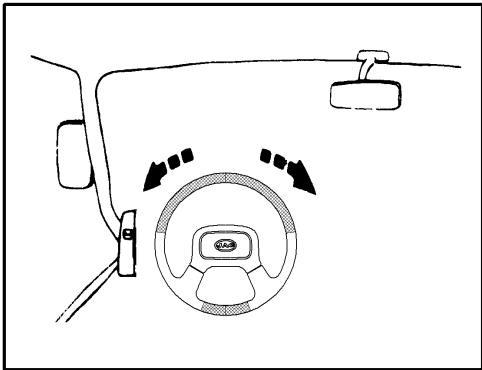
- (2) Start up the engine, and turn the steering wheel to the limit position by two sides several times while it is idle running.

- (3) During expelling of air, fill up the steering oil liquid continuously to the oil reservoir to ensure it not empty. In case of no air out, it indicates air in the steering system has been expelled.





- (4) Lower the front wheel and rotate the steering wheel by double directions while the engine is running at medium speed. In case of no unusual noises for steering operation, it indicates air has been expelled.

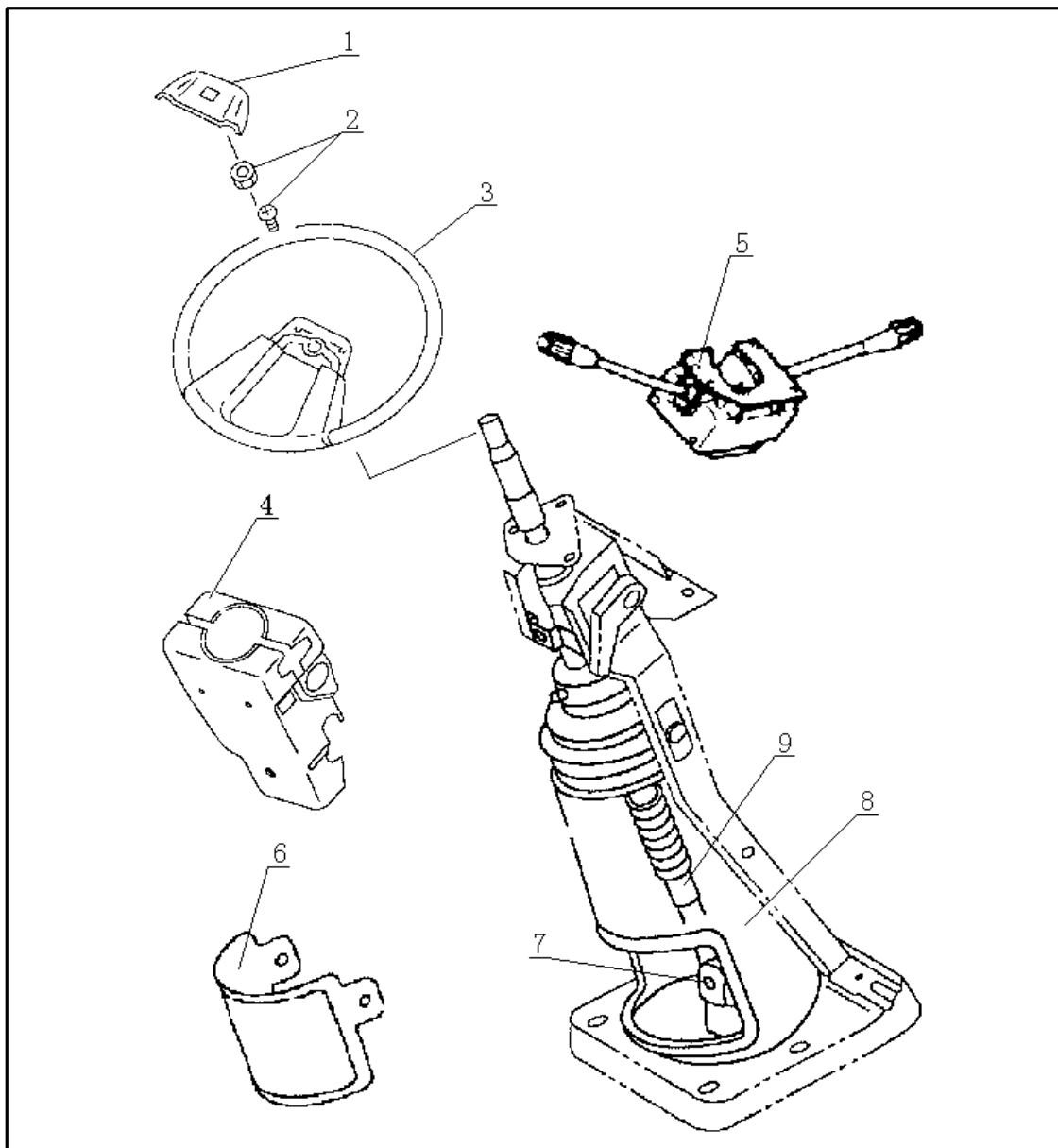


- (5) In case of unusual noises, continue the above-mentioned exhaust operations.
- (6) After exhaust operations, check whether steering device and pipes are oil leaking.

Steering column and shaft



Disassembly and assembly

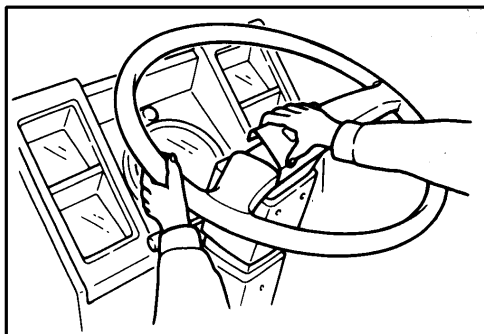


Disassembly sequences

- ▲ 1. Horn button
- 2. Nut and spring washer of steering wheel
- ▲ 3. Steering wheel
- 4. Steering shaft cover
- 5. Combination switch assembly
- 6. Steering shaft sleeve cover assembly
- ▲ 7. Bolt: fixing worm shaft and steering yoke
- 8. Steering column sleeve cover assembly
- 9. Steering column and shaft assembly

Assembly sequences

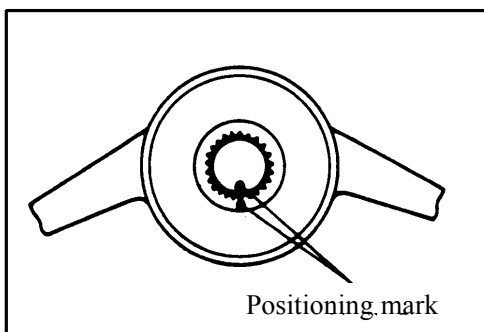
- 9. Steering column and shaft assembly
- 8. Steering column sleeve cover assembly
- ▲ 7. Bolt: fixing worm shaft and steering yoke
- 6. Steering shaft sleeve cover assembly
- 5. Combination switch assembly
- 4. Steering shaft cover
- ▲ 3. Steering wheel
- 2. Nut and spring washer of steering wheel
- 1. Horn button



Important – disassembly

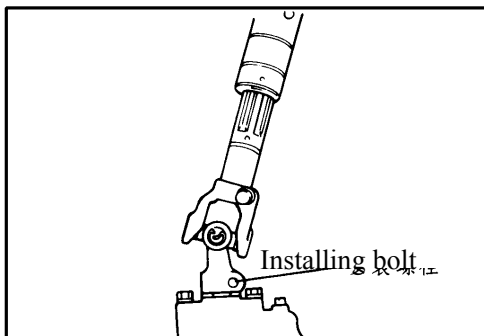
1. Horn button

Pull out the horn button by hands



3. Steering wheel

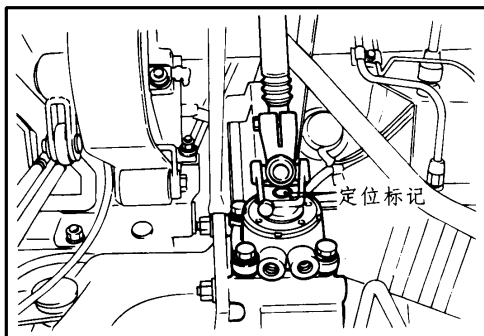
Make a mark by crossing the steering wheel and steering shaft to ensure the parts could be at the original position while assembling.



7. Bolt: fixing worm shaft and steering yoke

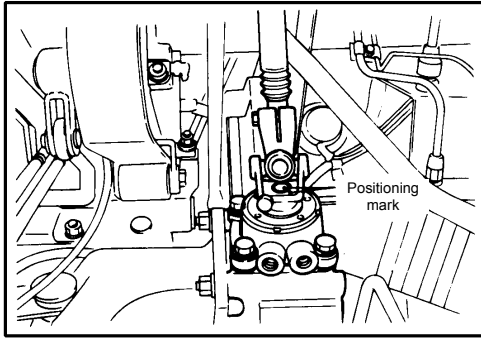
(1) Incline the cab upwards and support it by a supporting rod.

(2) Mark a positioning mark at the steering yoke and worm.



(3) Remove the installation bolt by pneumatic wrench or open-end wrench, and then pull the flange yoke out of the shaft.

(4) Put down the cab gradually.



Important --- assembly

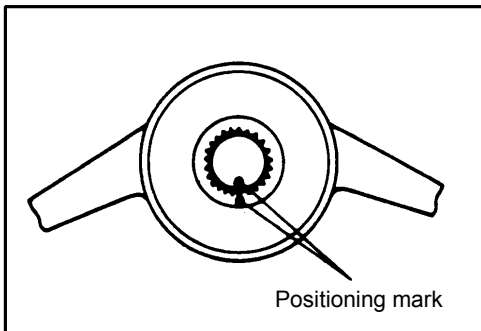


7. Bolt: fixing worm shaft and steering yoke
While installing, align with the positioning mark made for the disassembly.



Range of locking torque:

Torque (N • m)	37-75
----------------	-------



3. Steering wheel

Make a mark by crossing the steering wheel and steering shaft to ensure the parts could be at the original position while assembling.



Range of locking torque:

Torque (N • m)	54-68.6
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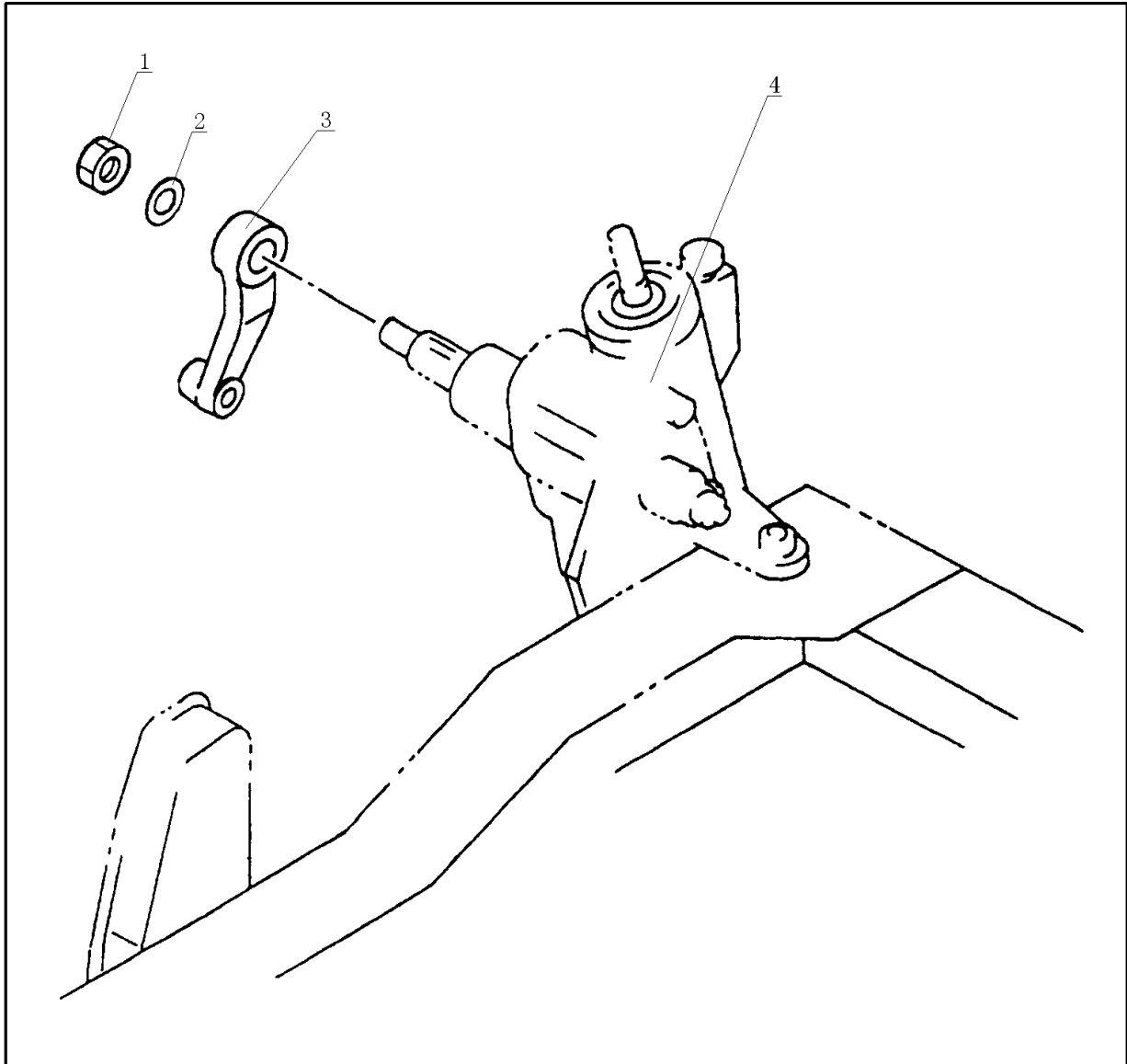
Check and repairs

In case of abrasion, damages or any other unusual conditions, make a necessary correction or replace parts.

Steering gear assembly



Disassembly and assembly



Disassembly sequences

1. Locking nut
2. Spring washer
3. Steering vertical arm
4. Steering gear

Assembly sequences

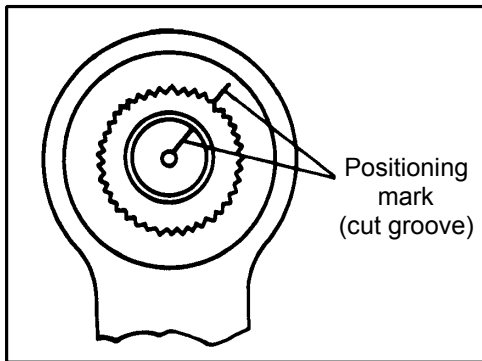
4. Steering gear
- ▲ 3. Steering vertical arm
2. Spring washer
1. Locking nut



Important – disassembly



Note: Disassemble the input, output oil hoses of power steering pipe parts before removing the steering gear assembly. Pay special attention to those areas around the connection and plug, or seal the oil port after removing the oil pipe to prevent entry of dust or other foreign substances.



Important — assembly



3. Steering vertical arm
Align with the positioning mark.



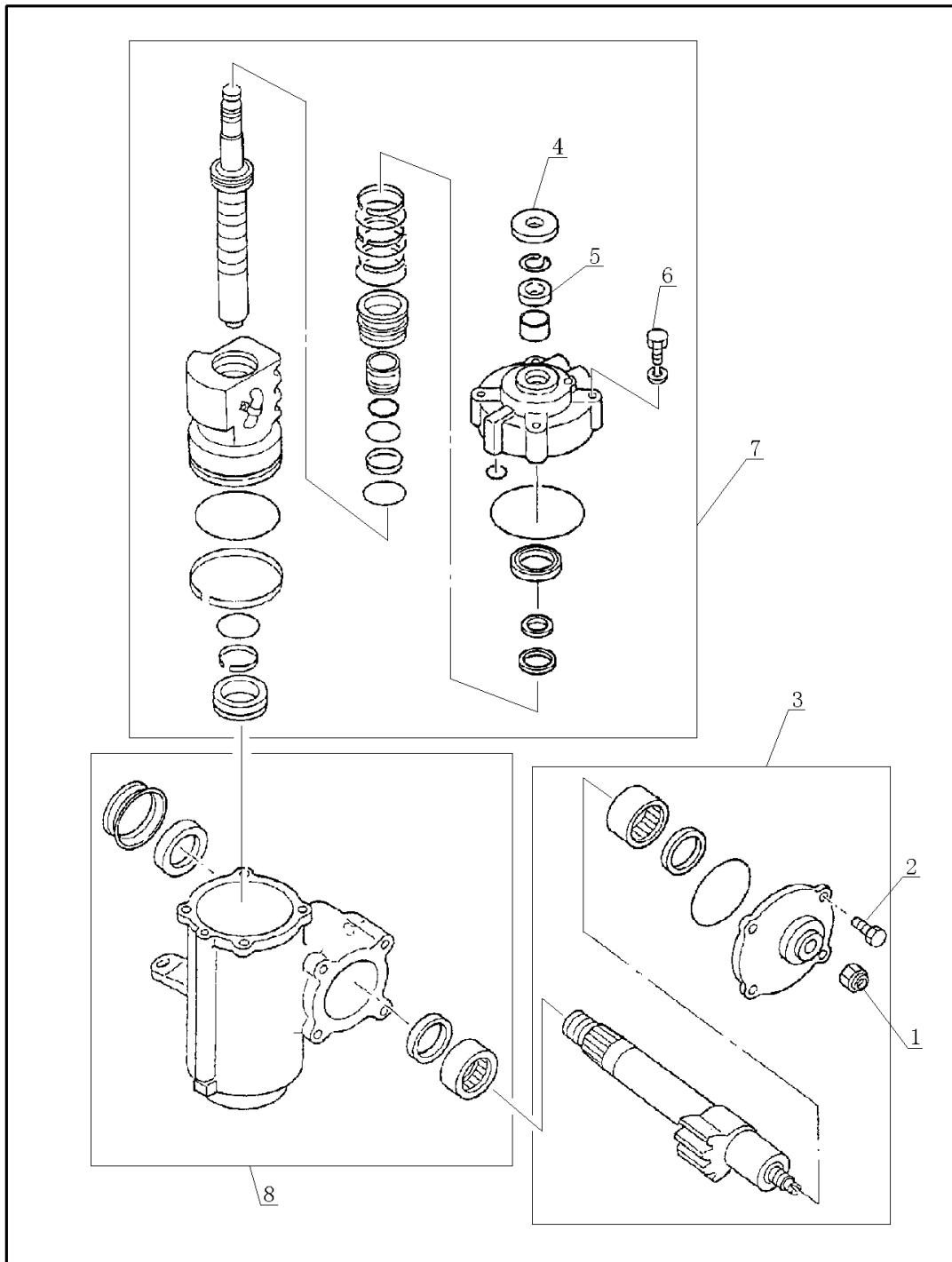
Range of locking torque:

Torque (N • m)	196-250
----------------	---------

Power steering device

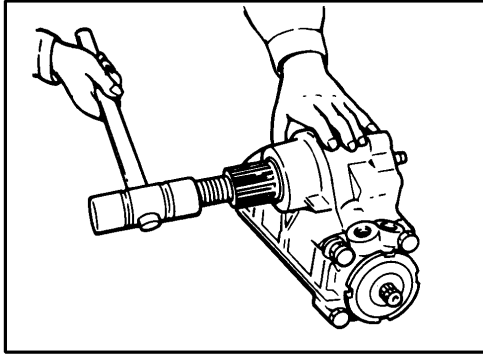


Disassembly



Sequences

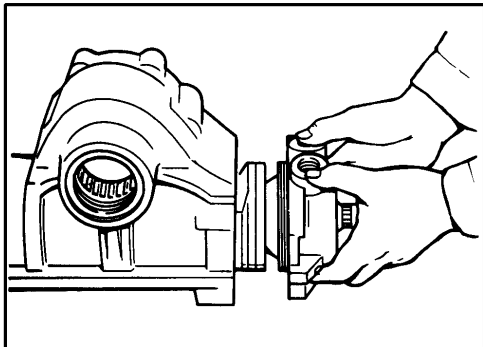
1. Locking nut
2. Bolt
- ▲ 3. Side cover assembly and steering arm shaft assembly
4. Dust cover
5. Sealing ring
6. Bolt
- ▲ 7. Valve body assembly
- ▲ 8. Shell assembly



Important

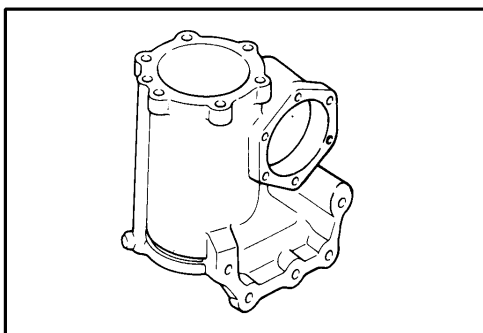
3. Side cover assembly and steering arm shaft assembly

Do not damage tooth face, thread and oil seal while disassembling.



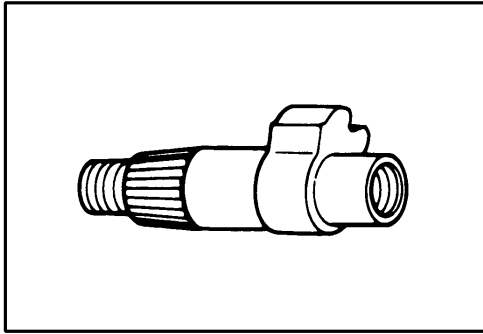
7.Valve body assembly

Disassemble valve body together with piston assembly.

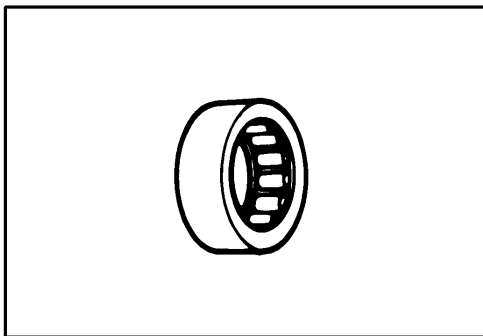


8.Shell assembly

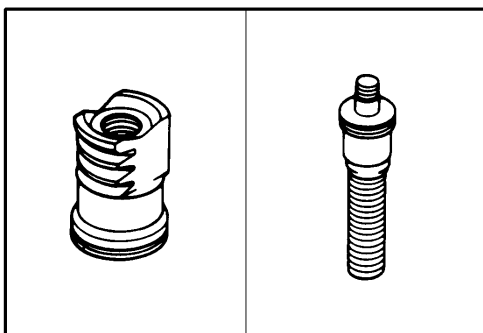
(1) Check whether the shell has cracks, whether there are scratches on the surface in the shell and sliding surface of the piston.



- (2) Check the steering arm shaft. In case of abrasion, bending, scratches, or partial abrasion, replace it for a new one.



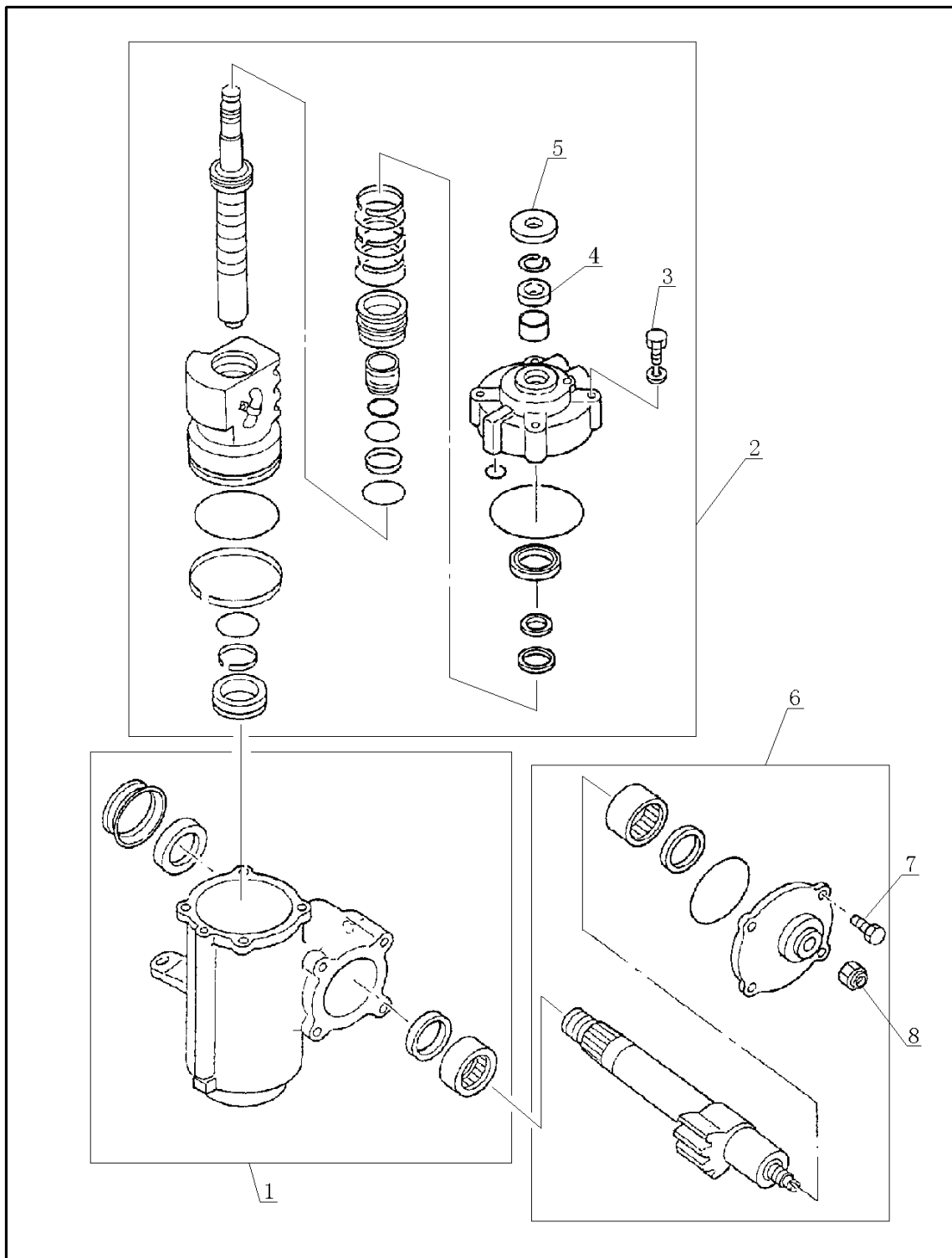
- (3) Check the bearing. In case of abrasion, scratches of the surface or jamming, replace it for a new one.



- (4) Check the piston and worm shaft. In case of abrasion or too large clearance, replace it.

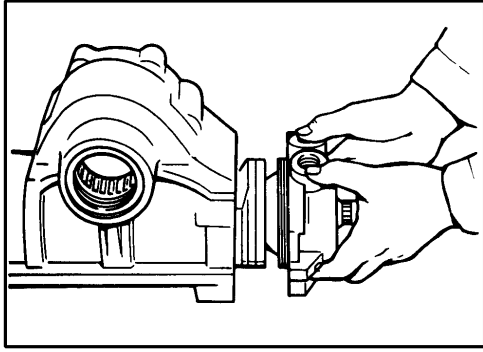


Re-installation



Sequences

- | | |
|-------------------------|--|
| 1.Shell assembly | 5. Dust cover |
| ▲ 2.Valve body assembly | ▲ 6. Side cover assembly and steering arm shaft assembly |
| 3. Bolt | 7. Bolt |
| 4. Sealing ring | ▲ 8. Locking nut |

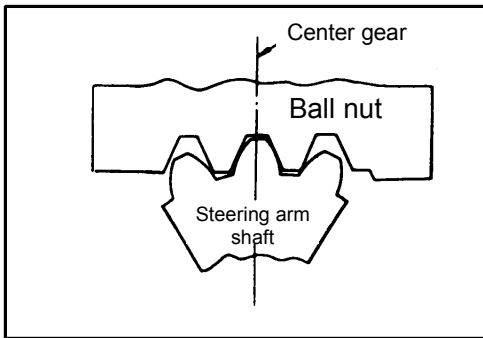


Important



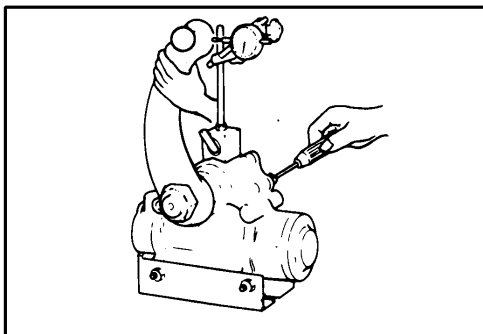
2. Valve body assembly

For parts with valve body assembly, make the worm gear of the piston face the fanshaped gear. Apply the liquid on the contacting surface of the valve body.



6. Side cover assembly and steering arm shaft assembly

Align the center gear of the piston with that of steering arm shaft.



8. Locking nut

- (1) Assemble the steering vertical arm.
- (2) Keep the steering vertical arm upward and vertical.
- (3) Tighten the nut after adjusting the clearance.

BRAKE

BRAKE SYSTEM

General

Main data and specifications of brake

Screwing moment of main bolts and nuts of brake

Disassembly

Inspection and repair

Re-assembly

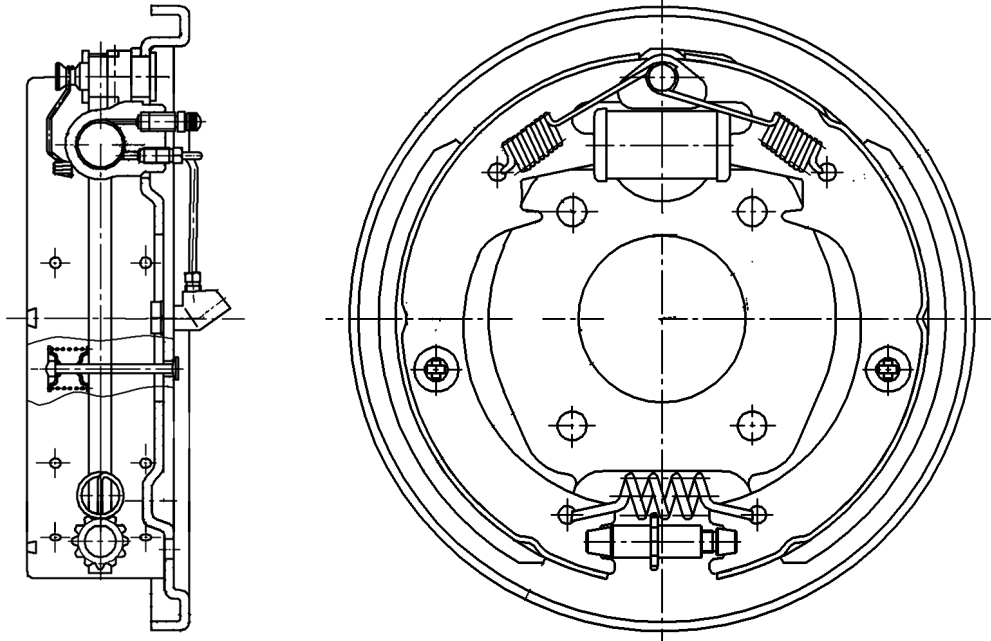
Brake main cylinder assembly

Parking brake

BRAKE

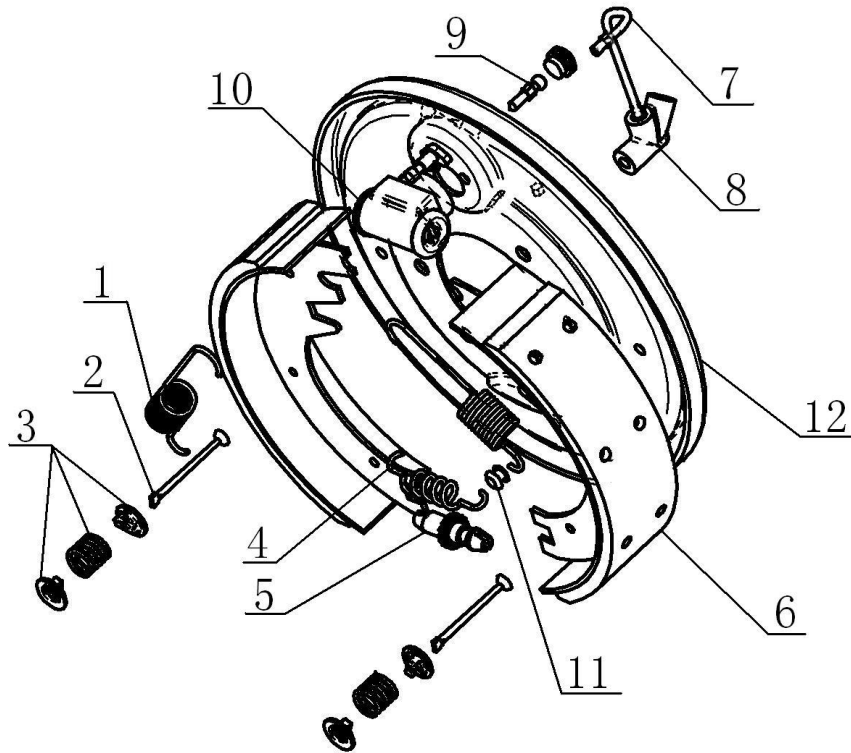
General

Brake



BRAKE

Front brake (dual self-servo type) Disassembly

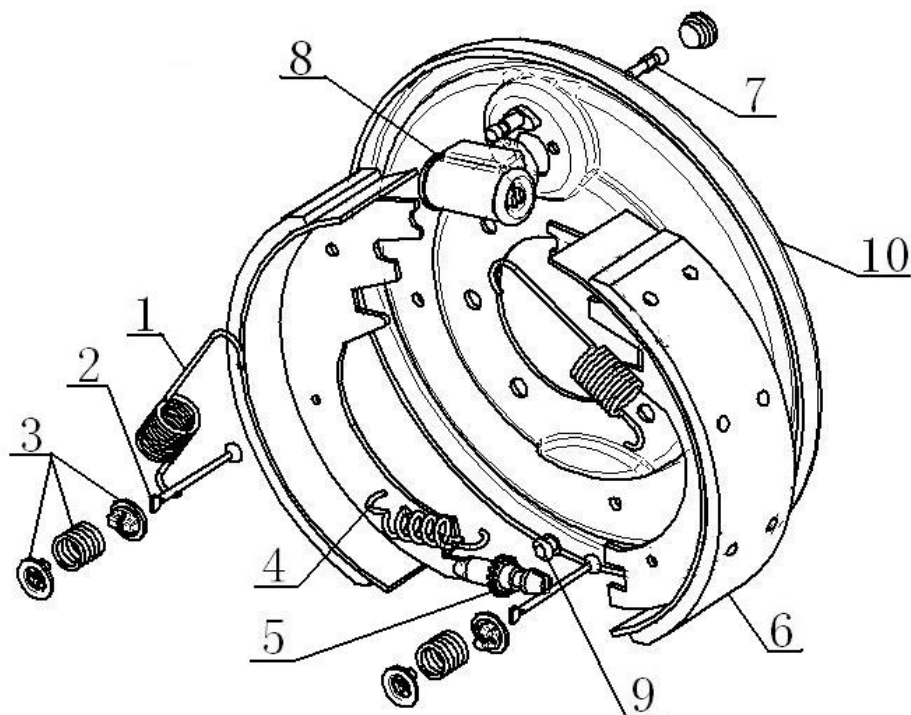


Disassembly sequence

- | | |
|---|-------------------------------|
| 1. Return spring of brake | 7 . Brake pipe adjusting hole |
| 2. Link lever of brake hoof | 8 .Tie-in |
| 3. Pressure spring assemblies of brake hoof | 9 . Deflation screw |
| 4. Brake hoof spring | 10 .Brake cylinder |
| 5. Adjusting bolt | 11 . Jam of |
| 6. Brake cylinder assembly of brake hoof | 12 . Bottom plate of brake |

BRAKE

Rear brake (dual self-servo type) Disassembly



Disassembly sequence

1. Return spring of brake
2. Link lever of brake hoof
3. Pressure spring assemblies of brake hoof
4. Brake hoof spring
5. Adjusting bolt
6. Brake hoof assembly
7. Exhaust screw
8. Tie-in
9. 10. Brake cylinder
11. Jam of adjusting hole
12. Bottom plate of brake

Inspection and repair

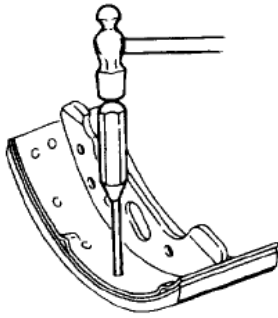
Brake friction sheet	Brake hoof sheet
Return spring	Brake drum
Brake soft pipe	Brake pipe
Brake cylinder	

If there is any abrasion, damage or any other similar situation in checking process, it is necessary to repair or change the parts by requirement.

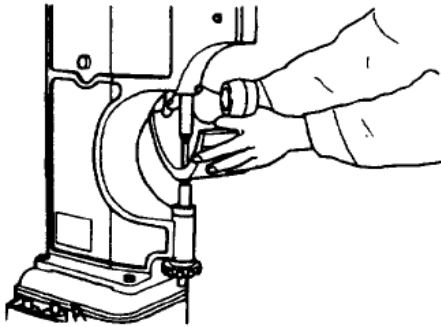
Visual inspection

Check whether there is any abrasion, damage or any other abnormal situation about those parts in left part.

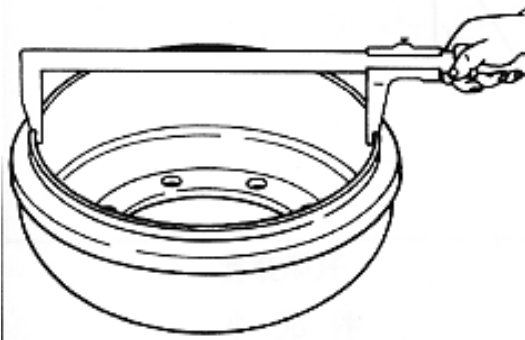
BRAKE



Dismantle old friction liner sheet.



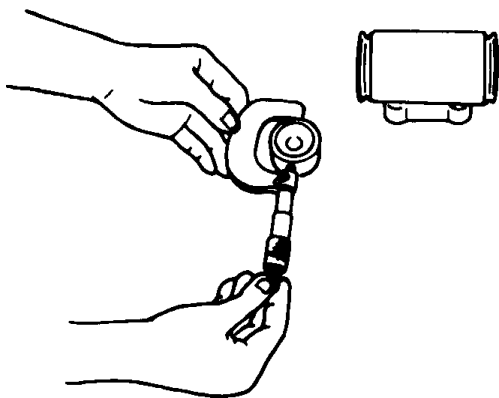
Rivet new friction liner sheet



Brake drum
(mm)

Note: if inner diameter of brake drum has been increased for the abrasion or milling, it is necessary to adopt size-added brake friction sheet.

Inner diameter using limit 311.5



Brake cylinder

Clearance between brake cylinder piston and cylinder body

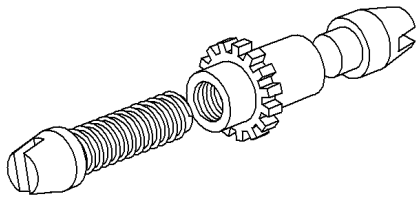
Clearance using limit 0.25

Re-assembly of brake

Assembly sequence is opposite with disassembly sequence

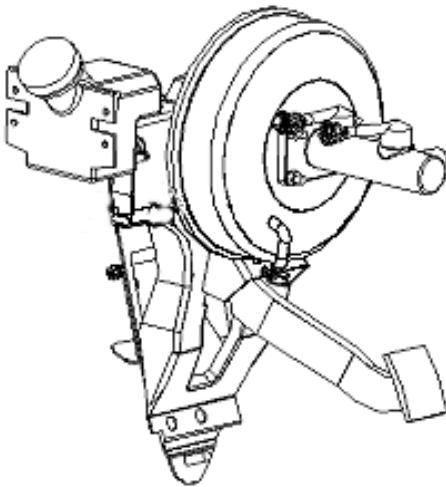
BRAKE

Important works



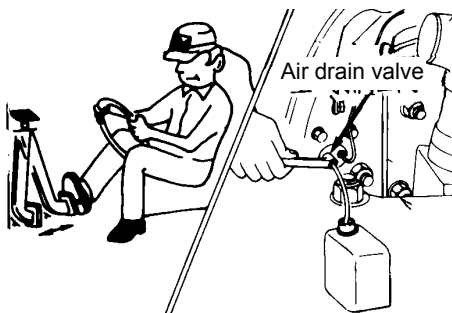
Adjusting screw

1. Spread lubricating grease on adjusting screw.
2. Brake cylinder assembly
3. Screw adjusting screw to end.



Adjustment of brake panel

Adjust the height of brake panel with adjusting bolt, then adjust free travel of panel to 5---8mm by turning vacuum booster handspike. Forbid dismantling return spring in adjusting process.



Deflation

Notes in deflation

Liquid level in oil storage pot should keep some quantity in deflation process.

Deflation step

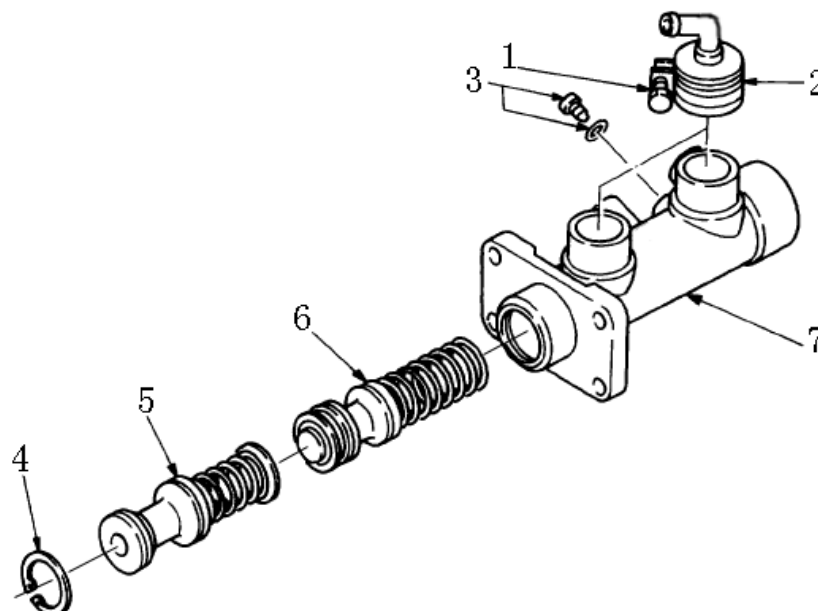
2. After moving brake panel up and down several times, some resistance will be felt, at this time, step on panel and unscrew vent screw on brake to deflate, then screw the vent screw.
3. Repeat those operations above until no air bubble discharge from pipeline.
4. Intake brake liquid in oil storage pot to the mark "MAX".

Note: it is necessary to use brake liquid according with related requirements, and brake liquids with different types produced by different factories could not mix.

BRAKE

Brake main cylinder assembly

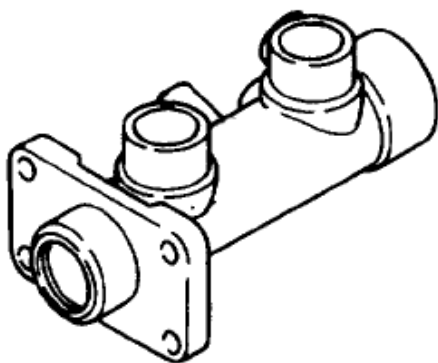
Disassembly



Disassembly sequence

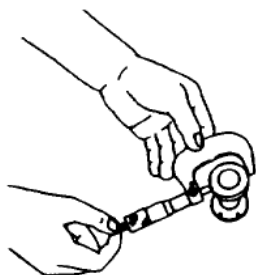
1.Clamp 2. Oil-intake tie-in 3. Limit screw 4.Clamp loop 5.Rear piston 6. Front piston

Inspection and repair



If there is any abrasion, damage or any other similar situation in checking process, it is necessary to repair or change the parts by requirement.

Check the diameter of brake main pump with eyes, if there is any screape, it is necessary to change.



Use micro-meter and bore gauge to measure the diameter of piston and inner diameter of cylinder body independently, and gain the clearance of piston and cylinder body by calculation.

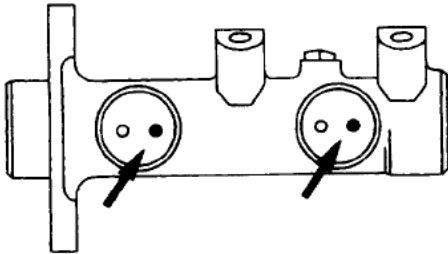
Clearance using limit 0.22

BRAKE

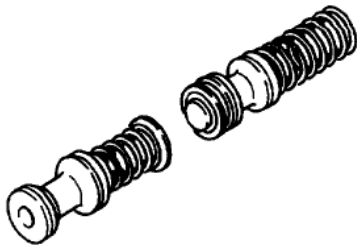
Re-assembly

Re-assembly sequence is opposite with disassembly sequence

Important works



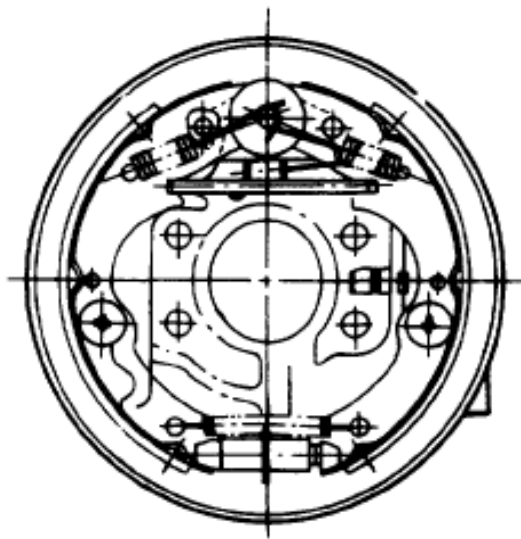
Clean cylinder body with compressed air before assembly, especially note cleaning the small oil-return hole on cylinder body.



Dip front and rear piston with clean brake liquid before installation, then install them in cylinder body.

BRAKE

Parking brake

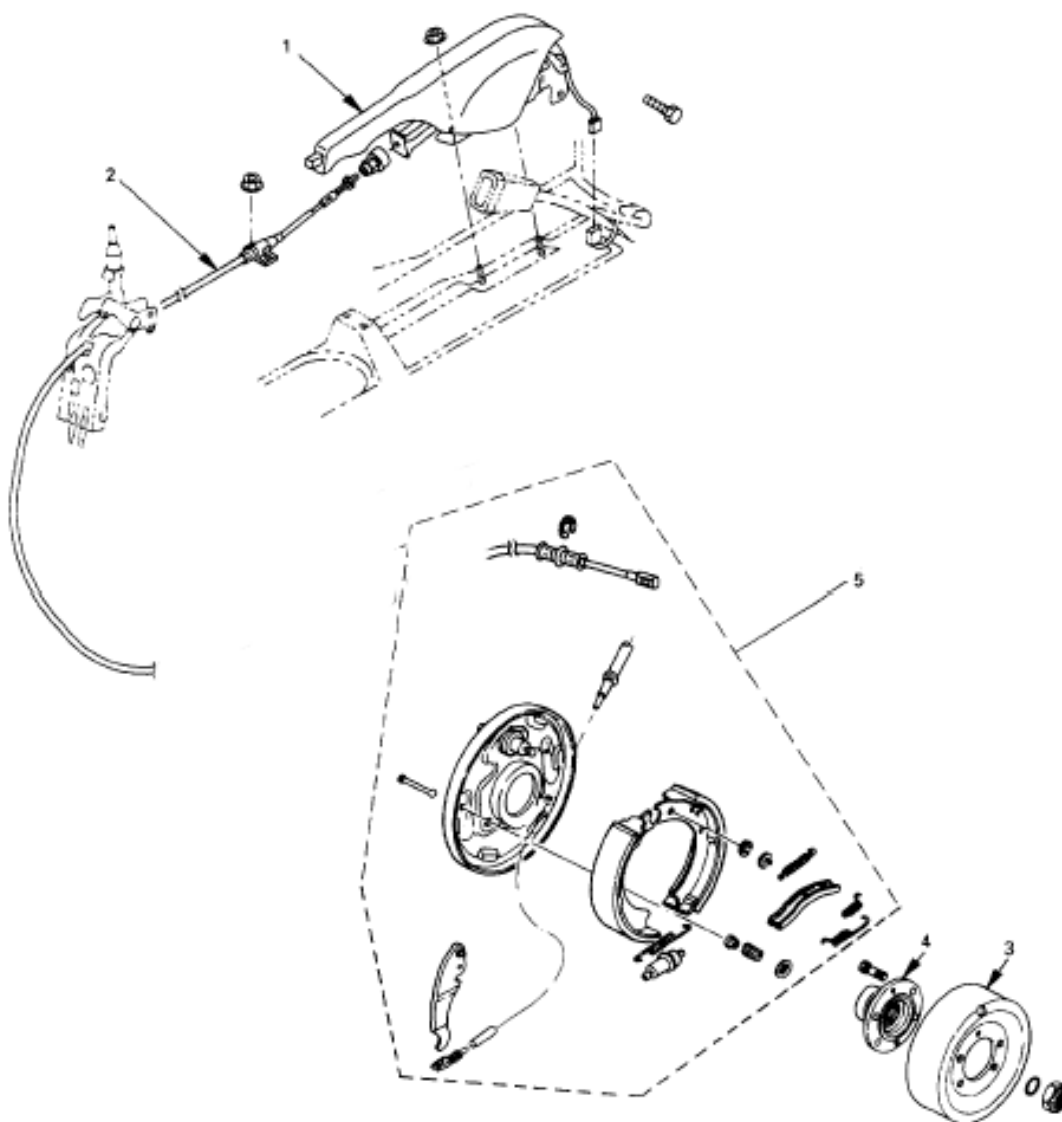


Parking brake is a kind of in-stretch type brake operated by machine, it is installed in rear part of gearbox shell body. Parking brake operation draw thread connects with parking brake operation handle in cab.

BRAKE

Disassembly

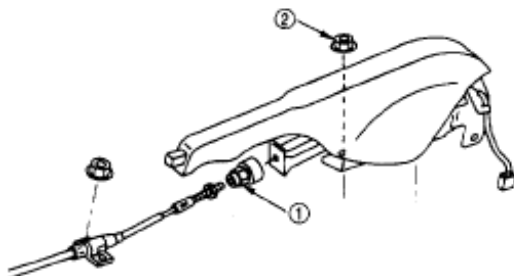
Disassembly of parking brake system



Disassembly sequence

1. Parking brake operation handle
2. Parking brake operation draw thread
3. Parking brake drum
4. Flange
5. Parking brake

BRAKE



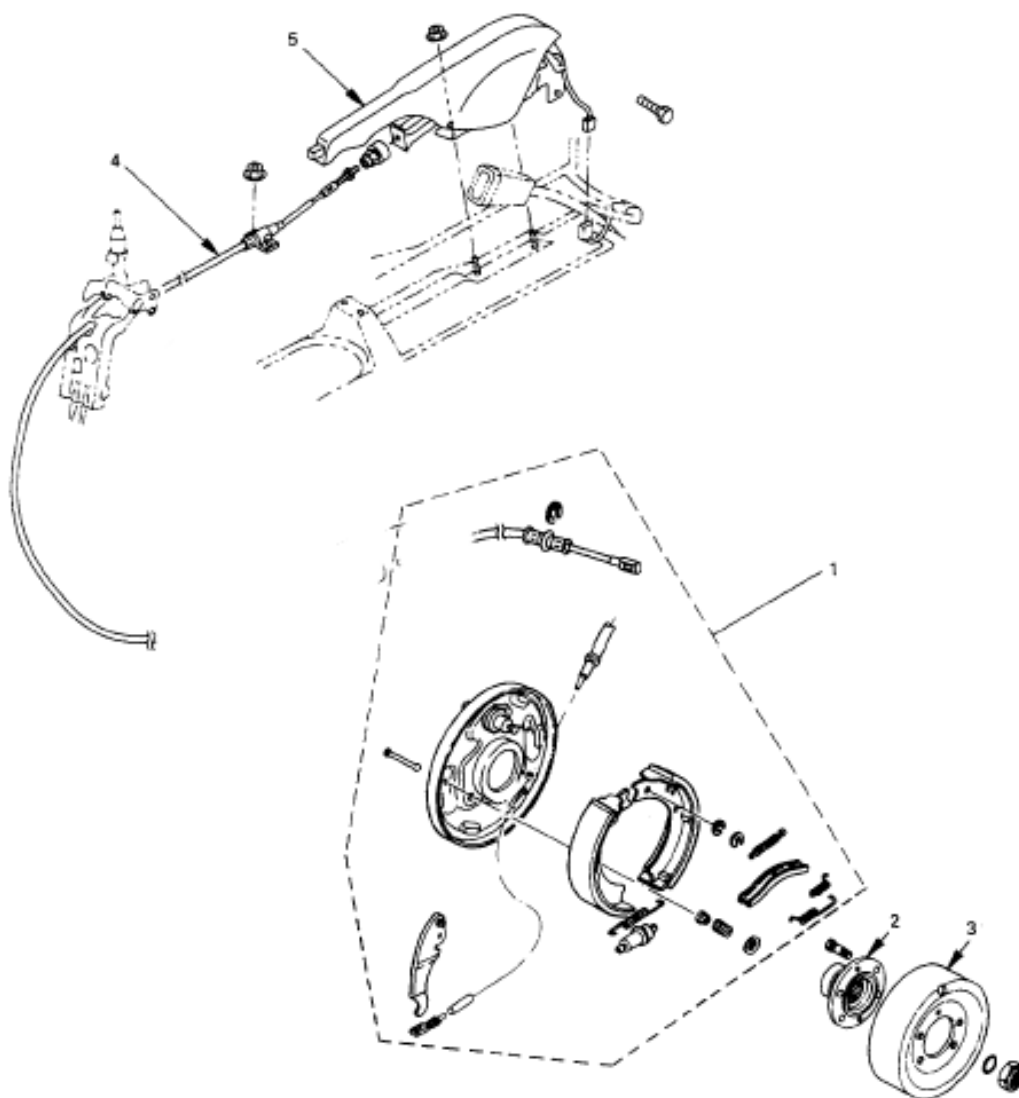
Disassembly step

Unscrew adjusting nut 1 to dismantle operation
draw thread from handle.

Unscrew nut 2 dismantle handle.

BRAKE

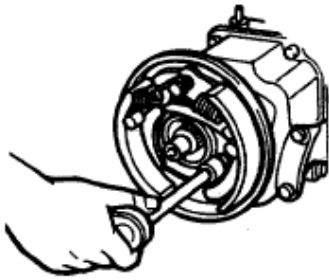
Re-assembly



Re-assembly sequence

1. Parking brake
2. Flange
3. Parking brake drum
4. Parking brake operation draw thread
5. Parking brake operation handle

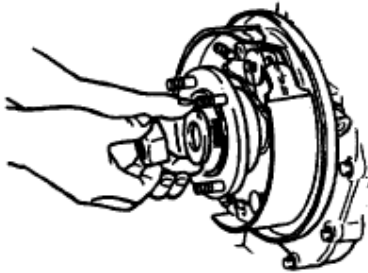
BRAKE



Re-assembly step

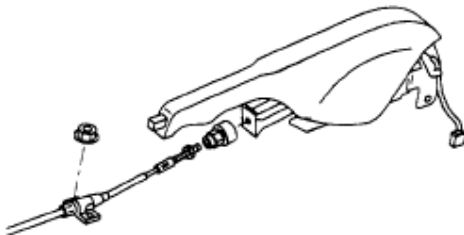
1. Parking brake assembly

Tightening torque of the nut on parking arrester is 8.5 kgf.m

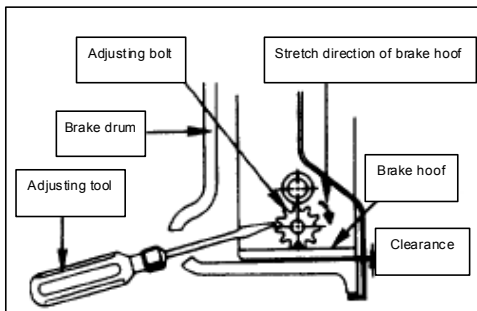


2. Flange

Tightening torque of flange nut is 23 kgf.m



3. Connect parking brake operation draw thread with handle.



4. Adjustment of parking brake

Adjustment of the clearance of brake drum

Draw back and put down parking brake handle for 3 to 4 times continually.

Dial adjusting bolt with adjusting tool (screwdriver) until brake drum has been locked.

Dial it in opposite direction for 26 gears, at this time, the clearance of brake drum is about 0.6mm.

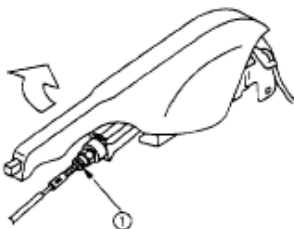
5. Adjustment of parking brake operation handle

Draw back and put down parking brake operation for several times completely.

2. Unscrew locking nut of draw thread.

Adjust the adjusting nut to following requirement:

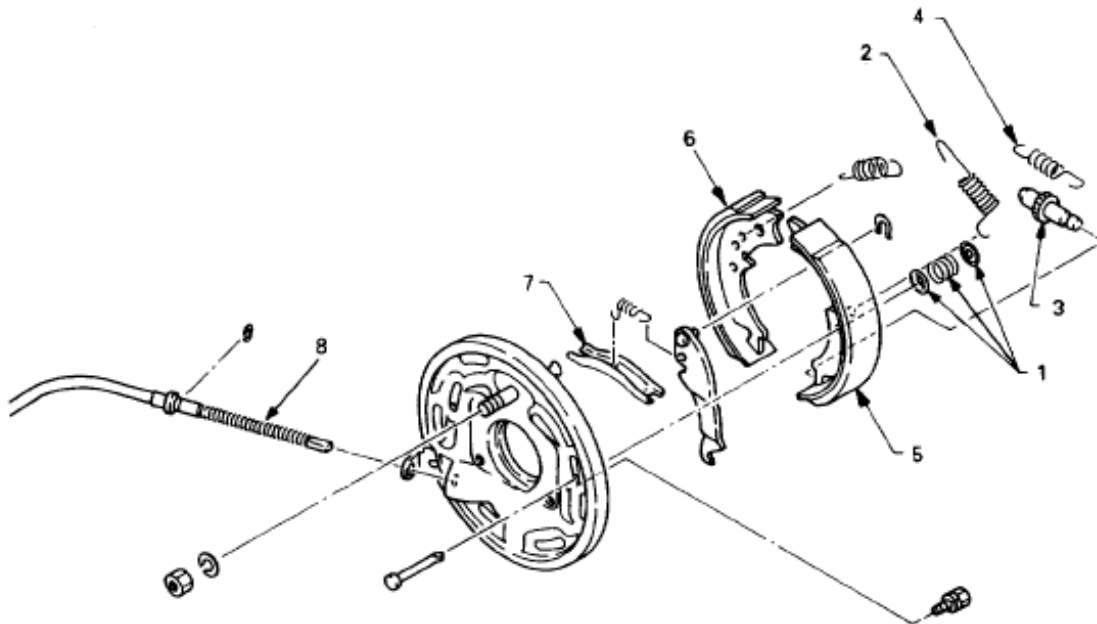
Draw back the handle with 15 kg strength, and move the handle for 5—8 gears.



BRAKE

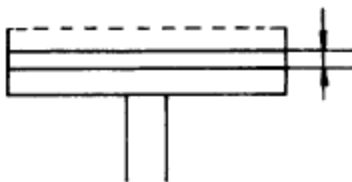
Parking brake

Disassembly



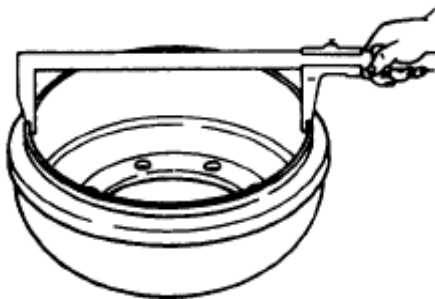
Disassembly sequence

1. Tension rod spring
2. Return spring
3. Adjusting equipment
4. Adjusting spring
5. Second brake hoof and lever assembly
6. Main brake shoe assembly
7. Strut bar
8. Operation draw thread assembly



Measure the thickness of brake liner sheet with vernier.

If the thickness is less than 1 mm, it is necessary to change brake liner sheet assembly.

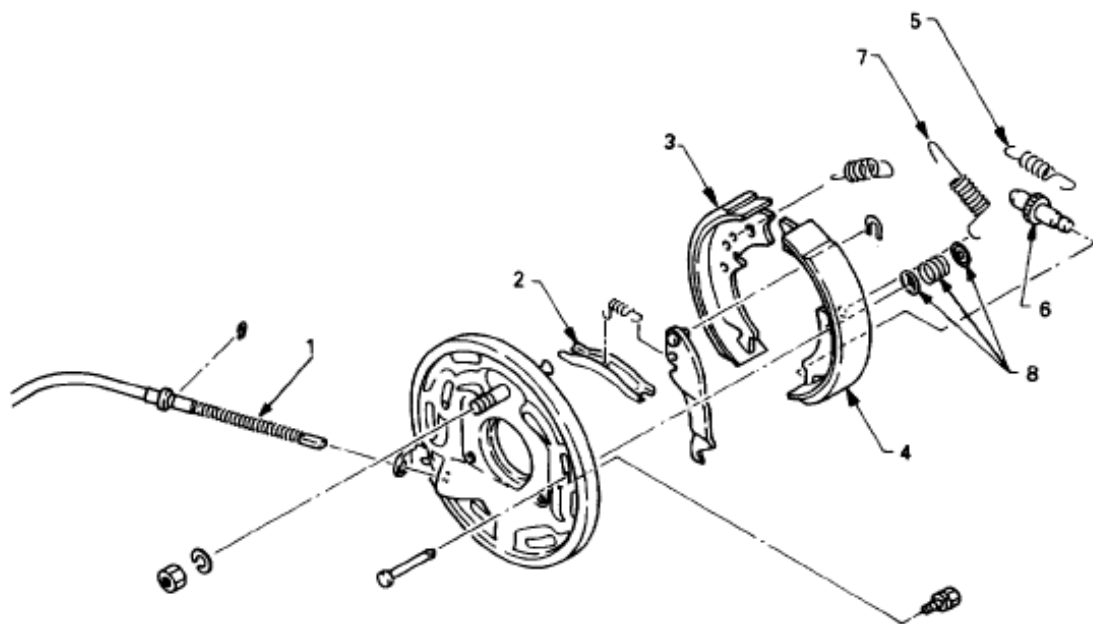


Measure inner diameter of brake drum with vernier.

If inner diameter exceeds **191 mm**, it is necessary to change brake drum.

BRAKE

Re-assembly



Re-assembly sequence:

1. Operation draw thread assembly 2. Strut bar 3. Main brake hoof assembly 4. Second brake hoof and lever assembly 5. Adjusting spring 6. Adjusting equipment 7. Return spring 8. Drag rod spring

BRAKE

Brake and control system

General

Main data and specifications of brake

Screwing moment of main bolts and nuts of brake

Disassembly

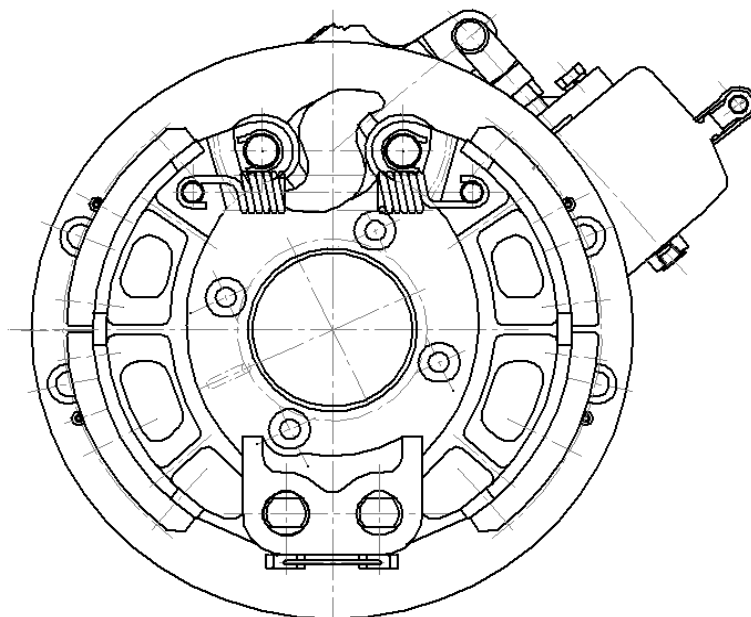
Inspection and repair

Reassembly

BRAKE

General

The structure of air brake:

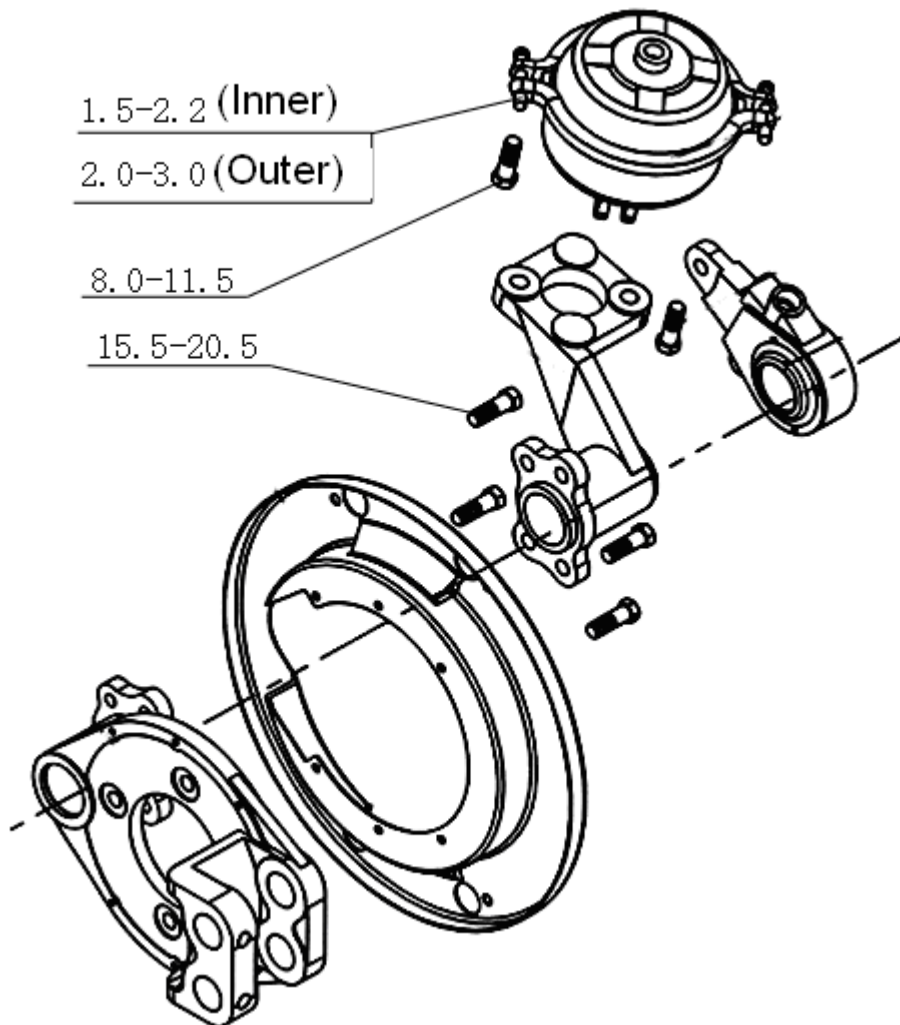


Main data and specifications

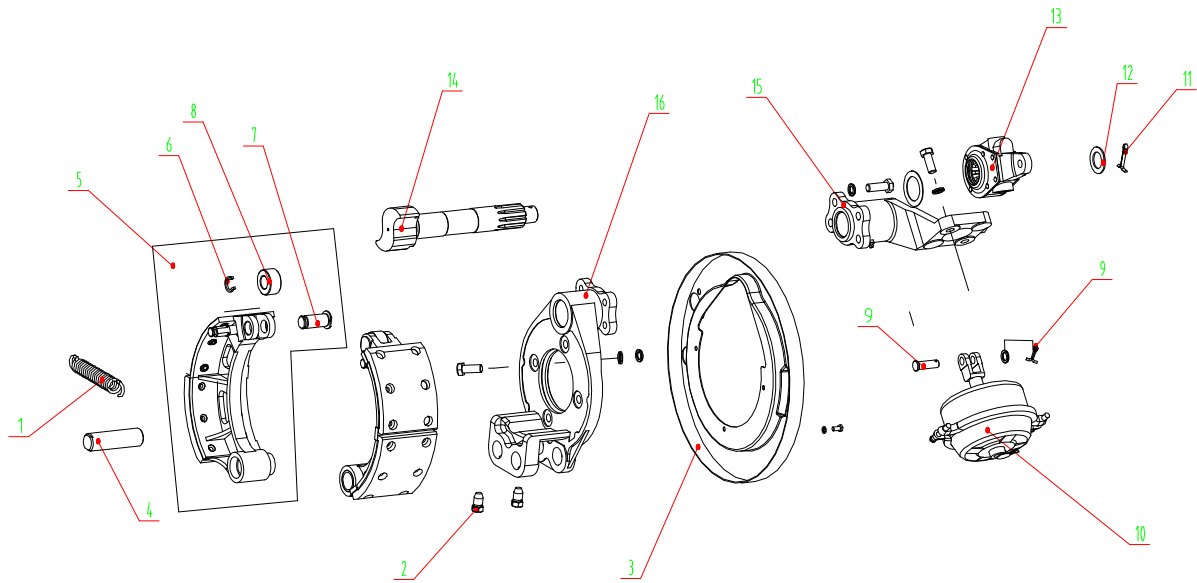
Item	Parameters
Type	leading trailing shoe brake
Inner diameter of brake drum (mm)	320
: Front	320
: Rear	85
Width of brake shoe slice (mm)	0.25-0.4
Clearance of the brake shoe (mm)	Dual serial pipe
Brake valve	0.7-0.8
Work pressure (Mpa)	1.0
Open pressure of the safe valve (Mpa)	0.45
Open pressure of the lower pressure valve (Mpa)	5-8
Free play of the pedal (mm)	

BRAKE

Tightening torque of main bolts and nuts of brake (kgf.m)



RAKE



Disassembly sequence

- | | | | |
|-----------------------------|-----------------------|-----------------------|-------------------------|
| 1. Brake shoe return spring | 2 . Screw | 3 . Dust cover | 4 . Shoe shaft |
| 5 . Brake shoe assembly | 6 . Snap ring | 7. idller wheel shaft | 8 . idller wheel |
| 9.cotter pin, slim, shaft | 10 .brake air chamber | 11 . cotter pin | |
| 12 . washer | 13. adjusting arm | 14. camshaft | 15. air chamber bracket |
| 16. brake base board | | | |

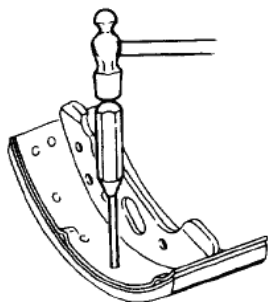
BRAKE

Checks and repair

If there is any abrasion, damage or any other similar situation in checking process, it is necessary to repair or change the parts by requirement.

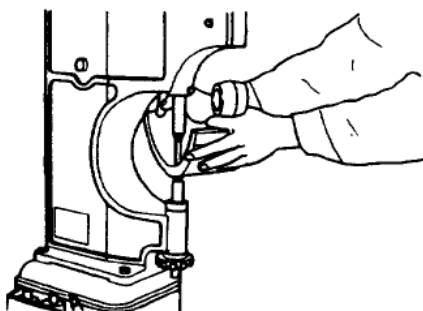
Visual inspection

Check whether there is any abrasion, damage or any other abnormal situation, if find, repair or replace the parts if necessary.



Dismantle old friction liner sheet.

- (1) Remove the riveted edge with a hammer and a chisel
- (2) beat the rivet off with a hammer and a chisel



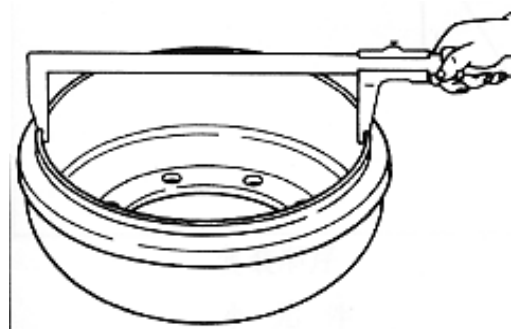
Rivet new friction liner sheet

- (1). Put liner sheet and rivet on the brake shoe slice
- (2) Put the brake shoe assembly on the riveting machine
- (3) Rivet brake shoe slice to liner sheet on riveting machine

Brake drum (mm)

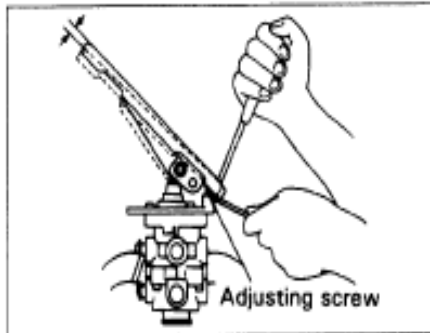
If diameter of brake drum increases resulting from abrasion or rubbing, friction disc with larger diameter should be used

Internal diameter: limit of use



BRAKE

Brake Pedal Free Play and Adjustment

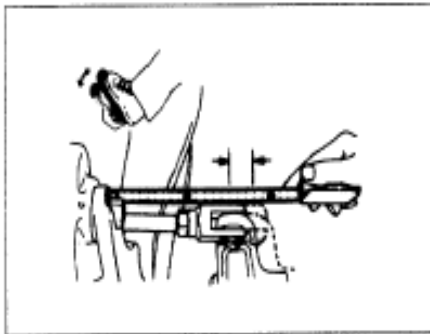


Brake Pedal (RHD)

Turn the adjusting screw all the way out, then turn it in just enough, so that brake pedal free play (stroke of pedal until a resistance is felt) is adjusted to 12 – 23 mm. Fully tighten the lock nut when a correct adjustment is obtained.

Pedal Free Play mm (in)

RHD	10 – 14 (0.39 – 0.55)
LHD	9 – 14 (0.35 – 0.55) (Reference)



Lining Clearance Adjustment and Wear

Push Rod

Push Rod Stroke: mm (in)

	Standard	Limit
Front brake	25 – 30 (0.98 – 1.18)	40 (1.57)
Forward rear Rearward rear	25 – 30 (0.98 – 1.18)	45 (1.77)

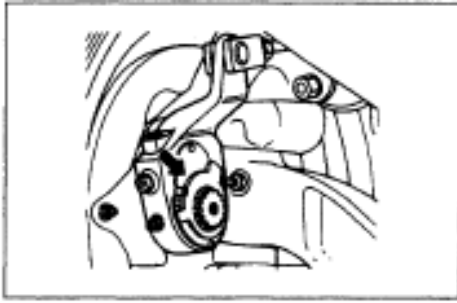


Lining Clearance

Lining clearance: 0.3 mm (0.01 in)

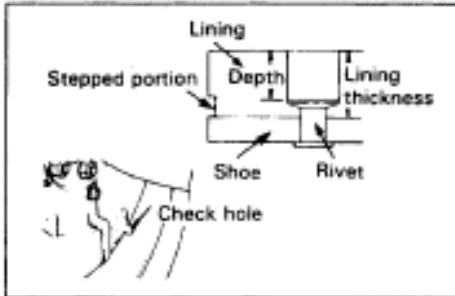
By adjusting the push rod stroke, the specified lining clearance can be obtained.

BRAKE



Lining Wear

The brake lining clearance is adjusted to approximately 0.3 mm when the standard push-rod travel is obtained. If the projected portion of the indicator comes into contact with the stopper when the worm shaft is turned for adjustment, it is an indication that the linings have been worn to the limit and lining replacement should be made.

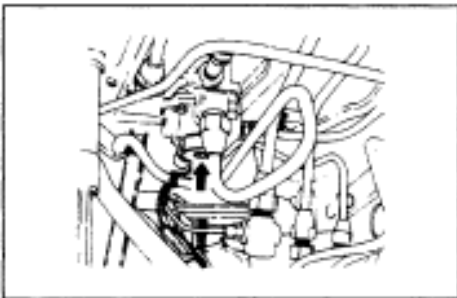


Remove the check hole rubber cap on the brake backing plate, and check the brake linings for wear through the check hole.

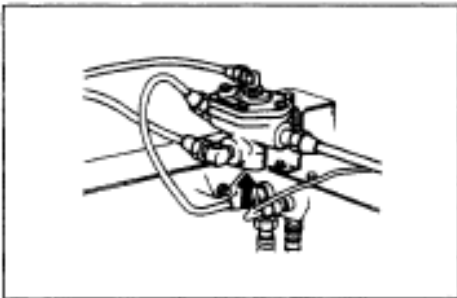
If the brake linings are completely worn at their projected ends, it shows the time to replace them.



Cleaning of Exhaust Port

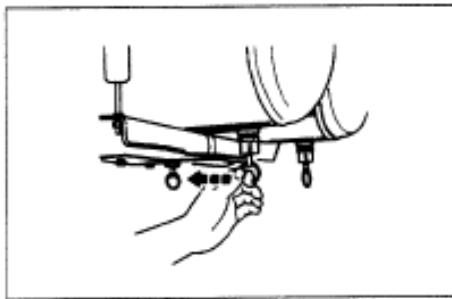


Brake Valve



Relay Valve

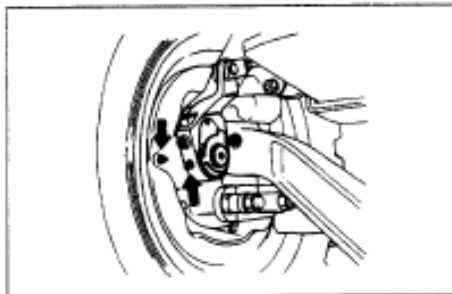
BRAKE



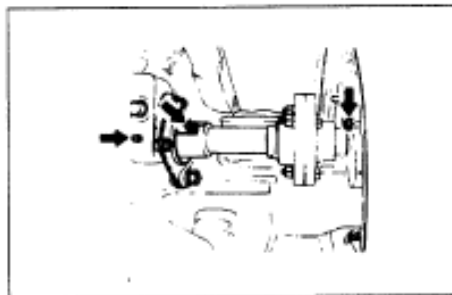
Water Drain
Air Tank



Greasing Up for Camshaft and Slack Adjuster



Front Wheel Brake
Each wheel 2 points.



Rearward Rear Axle
Each wheel 2 points.

ELECTRICAL SYSTEM

Electrical system

General

Installation diagram of chassis electric

Right-hand cab wiring harness assembly

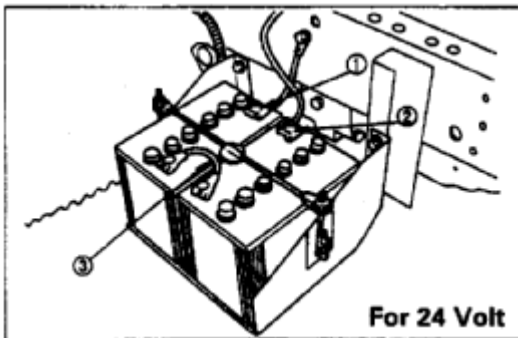
Chassis wiring harness assembly

Sign of fuse installation

ELECTRICAL SYSTEM

General

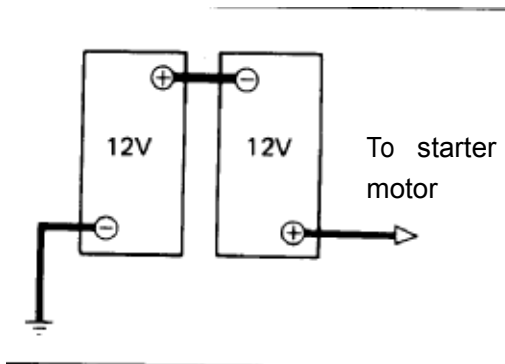
Electric maintenance



Removing of the battery cable

1. All switches must be in "OFF" position
2. Remove earth cable of the battery (negative pole)
3. Remove anode cable of the battery.
4. Remove jumper cable ③

Notes : Don't cut off the anode cable first , otherwise it will cause short circuit of the anode cable

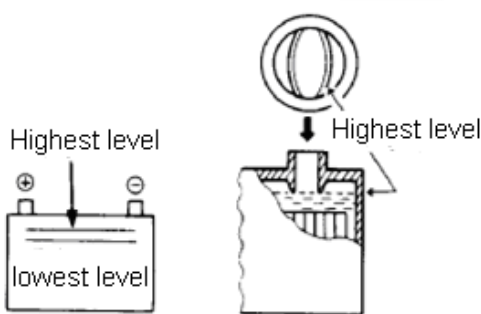


Circuit:

Voltage (volt)	24
Ground	cathode

Check of the battery:

1. Check the terminal for looseness and, keep reliable connection of the connector, wipe off any trace of eroding to keep the connector clean all the time.
2. Check of the electrolyte level of the battery
If find the electrolyte level is too low, please add distilled water to the maximal level.



Measure of electrolyte proportion of the battery:

The data measured at 20°C(Celsius scale) is usually used as the standard because the electrolyte proportion will change with the temperature. So the following formula should be used for emendation in measuring.

$$S_{20}=S_t+0.0007 (t-20)$$

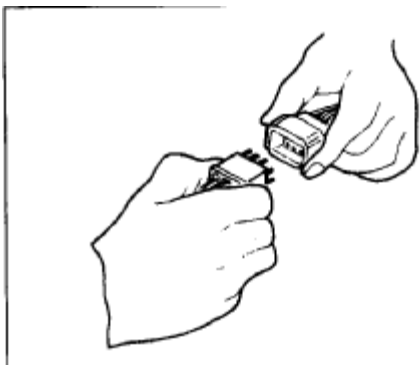
S_{20} : Proportion at 20°C

S_t : Measured proportion

t : Temperature of the electrolyte in measuring,
If the measured proportion is lower than 1.23 (20°C), you must add or replace the electrolyte.



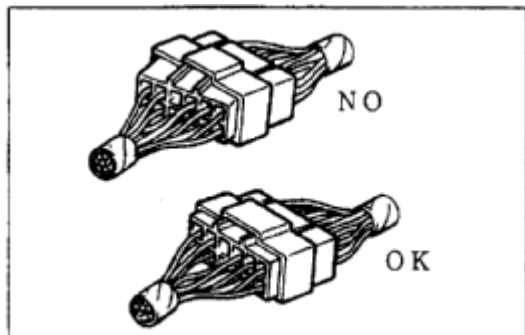
ELECTRICAL SYSTEM



Removing of the wire harness connector:

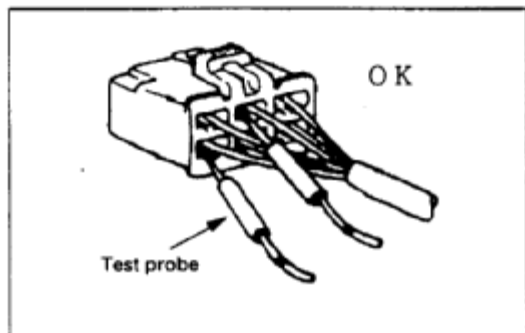
Please always cut off the connector with both hands. Pulling out the connector with one hand only will lead to wire connector rupture.

Notes: Press the lock plate at both sides, and then pull out the plug to cut off the connector.



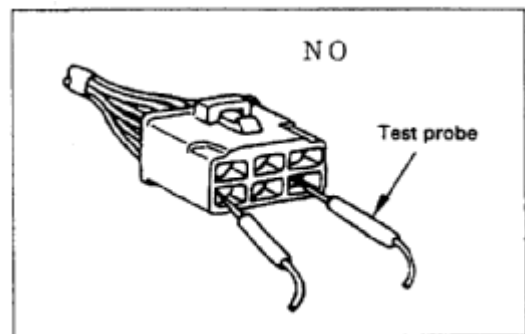
Connecting of the wire harness connector:

Clench both sides of the wire harness connector (male and female). Ensure that connector stitch and stitch hole matching and tidiness, press two sides of the wire harness connector carefully until you hear silvery sound of bayonet catch.



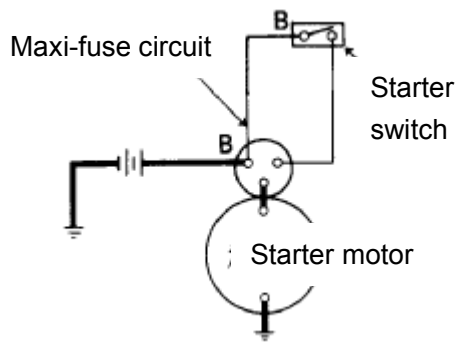
Checking of the wire harness connector:

Use circuit check implement to check the continuity of connector, insert test probe at lead side of the wire harness connector.



Don't insert test probe into outset of wire harness connector.

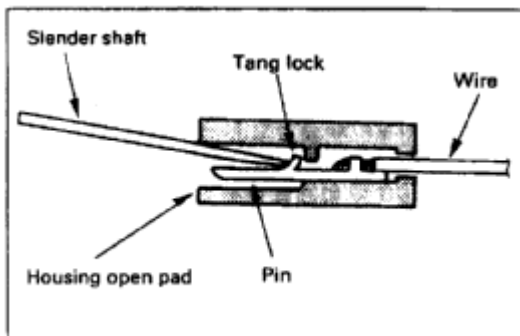
ELECTRICAL SYSTEM



Inspection of fuse circuitry

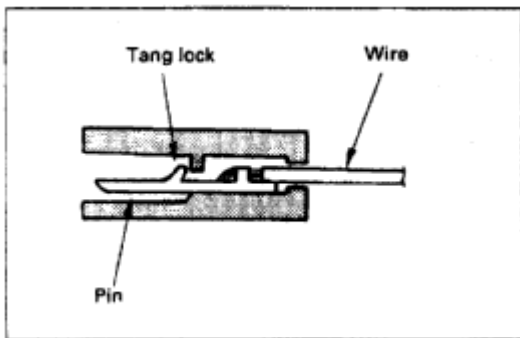
Install fuses on anode pole of the accumulator and starter switch pole B.

If excessive current flows into the circuitry, the fuse will melt to prevent the main power supply from excessive load. Check continuity of the tie-in circuitry with multimeter.



Removing of lead stitch:

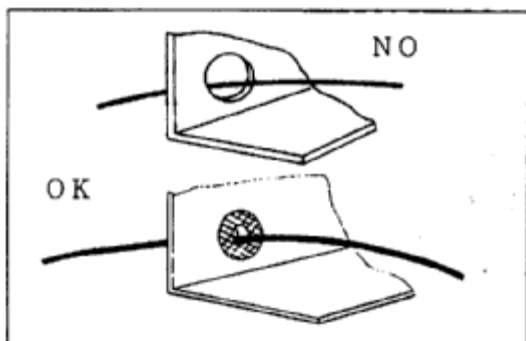
1. Insert slender shaft into outset of wire connector.
2. Press agnail (towards side of the wire connector) and pull the lead at the side of the wire connector lead.



Lead stitch inserts:

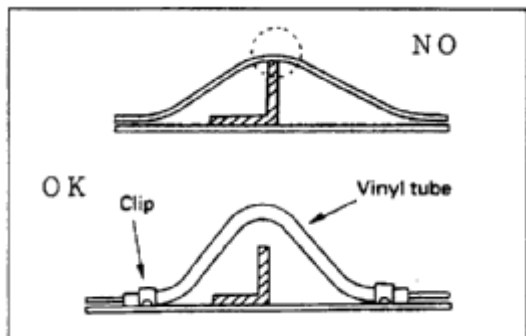
1. Check whether the stitch outspreads completely.
2. Insert stitch at wire connector lead side, press stitch until agnail of stitch fasten compactly.
3. Pull lead lightly to make stitch return.

ELECTRICAL SYSTEM

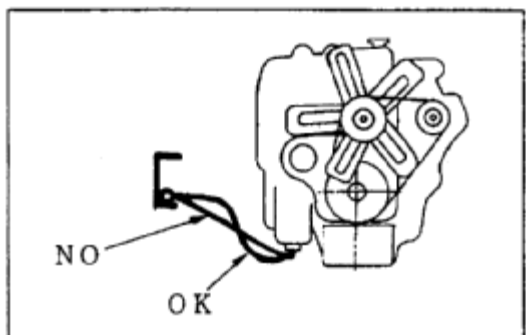


Items to notice in wire harness laying.

Use protecting jacket or thimble to protect wiring harness to avoid the wire harness to contact sharp boarder or surface directly.



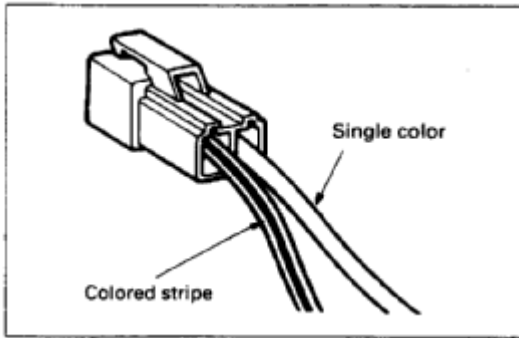
There must be enough clearance between wire harness and bracket or other things, use vinyl thimble and clamp to protect wire harness to avoid direct contact.



Wire harness between engine and chassis must be long enough to avoid wire harness scratch or damage resulting from vibration

ELECTRICAL SYSTEM

Circuit parts



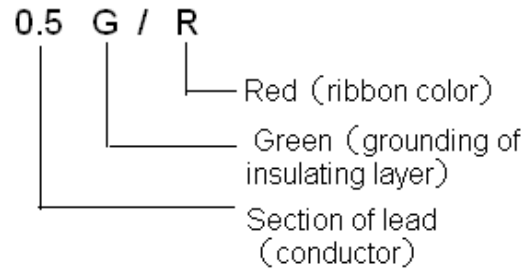
Color of lead:

There are color symbols for insulating layer of leads.

Main circuit use single color lead, subordinate circuit use colored stripe lead.

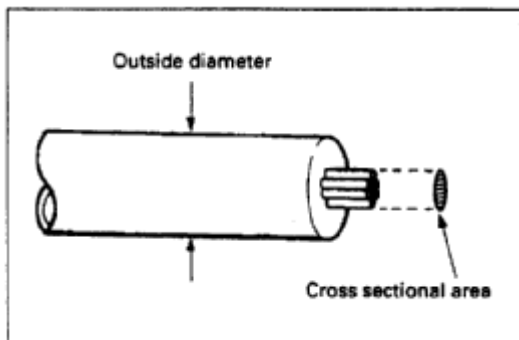
Colored stripe lead use following symbols to show lead dimension and color

For example:



In circuit diagram, abbreviations are used to show lead color. Refer to the left form.

Color Symbol	Meaning	Color Symbol	Meaning
B	Black	BR	Brown
W	White	LG	Light green
R	Red	GR	Grey
G	Green	P	Pink
Y	Yellow	LB	Light blue
L	Blue	V	Violet
O	Orange		

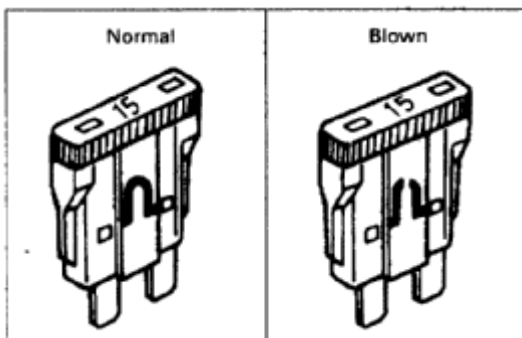


Lead Dimension:

Dimension of lead which used in circuit is decided by passed current, length of circuit and allowable voltage drop.

Dimension of lead and rated capacity are listed in the following form

Lead section (mm ²)	0.3	0.5	0.85	1.25	2	3	5	8	15	20
Rated capacity (ampere)	9	12	16	21	28	37.5	53	67	75	97

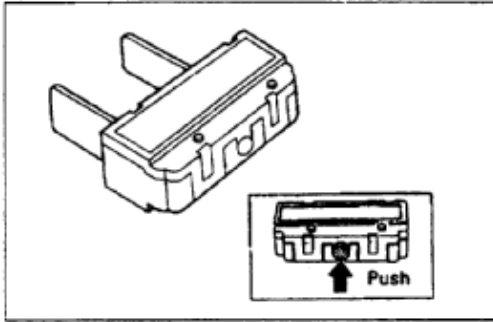


Fuse:

Fuse is most usually used for circuit protection in vehicle circuit. When there is overload current passing the circuit, fuse melts to avoid powerful current destroy the other parts in circuit

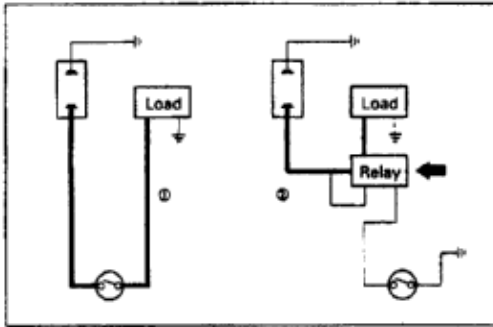
Before changing the fuse, you must find out the reasons that cause overload current and resolve them first. New fuse must have the same amperage with the original one; otherwise it will cause circuit burned or other serious damage to circuit.

ELECTRICAL SYSTEM



Circuit breaker:

Circuit breaker is protection equipment designed for open circuit. When load current exceeds rated capacity of circuit breaker, circuit breaker will work. If there is short circuit or other form of overload in circuit, overload current will open circuit of both sides of the circuit breaker. When the circuit is open, button of the circuit breaker rises. Before resetting the button, you must check and repair the circuit.

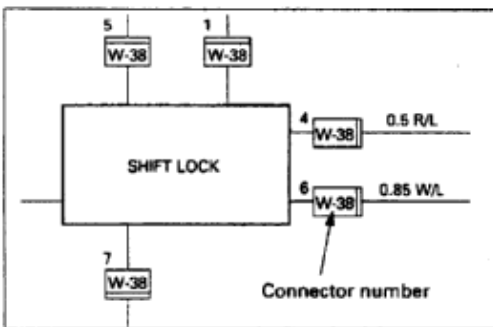


Relay:

If set a switch directly in some position between accumulator and load, and then the longer lead has higher voltage drop as circuit ①:

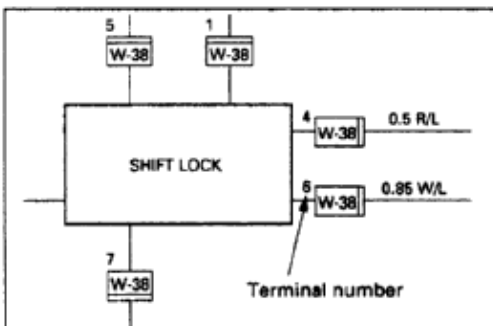
Install a relay between accumulator and load for decreasing voltage drop as circuit ②:

The current passing the switch reduces because the switch controls the relay.

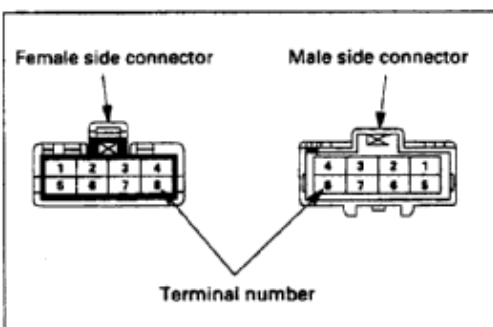


Identify wire connector:

In circuit diagram, number identifies wire connector.



Applicable terminal number was marked on every wire connector.



Terminal number that can be used is marked clearly on wire connector. The terminal number orders on anode side of wire connector are from right up to left below, and the order of terminal number on negative side of wire connector is from left up to right below.

ELECTRICAL SYSTEM

Introduction of composite repair

How to use this manual

Maintenance schedule

Recommendatory lubricants and diesel oil

Table of oil viscosity

Specification of torque

Introduction of composite repair

1. To ensure safety, the vehicle should be parked on flat ground. When the vehicle is jacked up, the front or rear wheel should be warded off.
2. The vehicle should be jacked up on its axle or framework and then be propped on the chassis deck for repair.
3. Ground cable of the accumulator should be cut off before repairing to prevent the cable from damage or burnout resulting from short circuit.
4. The bodywork, seats and carpets should be covered carefully to avoid damage and dirt.
5. Brake fluid and antifreeze must be managed properly, for they eroding the paint.
6. For the purpose of effective and reliable repair, it's very important to use proper tools and specified special tools.
7. Authentic parts of JAC brand should be used.
8. Used split pins, gaskets, O-rings, oil sealants, spring washers and self-locking nuts can not be used again, which should be replaced by new ones in installation. Because these used parts can not surely work normally, if used again.
9. Dismantled parts should be put away by groups for finding conveniently, which ensures the reassembly in an orderly way.
10. The parts should be cleaned before inspection or reassembly as well as the oil holes should be scavenged by compressed air and checked for cleanness.

11. Drive parts and slide parts of all components should be lubricated by lubricants and grease before installation.
12. Gaskets should be smeared by sealants to avoid leaking, if necessary.
13. Specification of tightening torque of the bolts and nuts should be implemented seriously.
14. Final inspection should be done after finishing the repair to make sure that there are no risks at all.

How to use this manual

1. Look up to the needed contents by referring to the index.
2. The chapter of “composite information” in this manual consists of maintenance data, maintenance items and specifications of tightening torque.
3. Each chapter consists of disassembly, installation, dismantling, inspection, repair and reassembly. When several devices or components are under repair, there is a note: “Refer to maintenance manual of other devices or components” in the illustration.
4. In chapters on disassembly and installation, Items that are clear at a glance for example to dismantle a single part from a device are overleaped. While the specification of the tightening torque will be given.

5. Exploded views of devices and components shown in the beginning of each chapter are given to find the parts, maintenance proceedings and maintenance tools etc.
6. “Notes”, “use of special tools”, “maintenance data” etc. are also included in each chapter.
7. The following symbols are used to show the maintenance items in this manual:



8. Maintenance standard is shown by “Standard” and “Limit”. “Standard” means assembly standard and standard coverage. Parts covered in standard can be used. “Limit” means the max. or min. value. (When the measured value is beyond the limit, the part should be repaired or replaced for a new one)
9. All diagrams of components and parts in this manual are printed independently.

Maintenance schedule

When do the following inspection, you should also inspect the standard ones, and abbreviations are used in this manual.

I: Inspect, clean, correct or replace if necessary.

A: Adjust

R: Replace

T: Tighten to specified torque

L: Lubricate

Notes----when run in rigid condition, regular maintenance is required. Refer to “maintenance schedule of running in rigid condition”

Maintenance schedule (№1)

According to the reading of the odometer and months from the month to start using:

Intervals:	Initial	Every other						
×1000 kilometers	1	4	8	12	16	24	40	48
Or months	—	1	2	3	4	6	10	12
Engine								
Engine starting and abnormal noise		I						
Idle speed and accelerate speed	T	I						R
*Filter element of the air cleaner (dry)	A							T A I
Inlet and exhaust manifold								
Valve clearance		I						
Compressed pressure in each cylinder				R R				I
Oil pollution								
*Filter element of the oil cleaner				I		I		I
Filter element of the fuel cleaner								
Injection pressure and		I						

condition of the oil nozzle	I	I						
Injection timing		I						
Function of air compression, pressure control valve and fowl valve								
Function of the radiator tank cover								
Belt of the fan fails								
* Exhaust pipe and the fixation								
Turbocharger								
Connection seal of air duct		I						
All sealants and o rings								R
Clutch								
Function of clutch system		I						
Free idle trip and trip of the clutch pedal		I						
Transmission								
Looseness of the gear control mechanism								I
Transmission shaft								
Flexible joint						I		
*Universal joint and slide								I

shleeve								I
Looseness of the bearing and relevant parts								
Rear axle								
Damage and distortion of the axle shell								I
Front axle								
Damage and distortion								I
Suspension								
*Leaf spring, U-bolt and U-nut	T	I						T
Spring damage								
Imbalance caused by spring attenuation					I			I
Looseness or damage of the fixing support					I			I
Misalignment degree of spring					I			
Leakage and damage of the shock absorber								
Looseness of fixing of the shock absorber								
Wheel								

Existence of the exotic		I						
Looseness of the wheel nuts	T	T						
Looseness of the bearing of the front wheel hub				I		I		
Looseness of the bearing of the rear wheel hub								
Steering								
Looseness of fixation				I				
Bearing clearance is too large	I			I				I
* Damage, looseness and large clearance of the steering transmission shaft								I
Clearance between the steering knuckle and the front axle								I
Alignment degree of the wheel								
Turn angle of the front wheel								
Clearance between master pin of the universal joint and the liner								
Service brake								

* Wearing of the brake shoe				I				
*Wearing and damage of the brake drum								I
Brake hose								I
Joint looseness, leakage, damage and connection		I						I
looseness of hoses and pipes								
Leakage and damage of the brake chamber								
Parking brake								
Wearing of the brake shoe								I
Wearing and damage of the brake drum				I				I
Looseness of fixed parts		I						
Damage and connection								
looseness of the lever and the tight wire								
Electric apparatus								
Electrolyte proportion				I				
Function of the start motor				I				
Wearing of the brush of the start motor		I						I
Function of generator								I

Wearing of the generator brush		I						
Damage and connection looseness of the electric wiring terminal								

maintenance schedule of lubricating (№2)

According to the reading of the odometer and months from the month to start using:

interval:	initial	Every other						
×1000kilometers	1 4	4	8	12	16	24	40	48
Or months	— 1	1	2	3	4	6	10	12
*Engine oil	R		R					
* Turbo- engine oil	R			R				
Clutch and brake fluid								R
* Gear oil of gear box	R							R
* Gear oil of differential	R							R
Steering gear oil								R

Power steering fluid								R
Lubricating grease of the middle bearing of the transmission shaft								R
Lubricating grease of the rear hub bearing								R
Lubricating grease of the front hub bearing								R
Separate sleeve of the clutch		L						
Universal joints of the transmission shaft and slide sleeve		L						
Master pins of the steering knuckle		L						
Steering tie-rod ball		L						
Steering drag rod		L						
Spring pin of the front steel plate		L						
Shackle pin of the front steel plate		L						
Spring pin of the rear steel plate		L						
Shackle pin of the rear steel		L						

plate								
Steering shaft gimbals and slide liner		L						
Brake cam axle		L						

maintenance schedule in rigid running condition (№3)

Rigid running condition:

A: Repeatable short-trip driving

B: Driving on rough and uneven road

C: Driving on dirty road

Item	Interval	Condition		
		A	B	C
*Engine oil	Replace it every 4000Km			●
* Turbo-charging engine oil	Replace it every 6000Km			●
Filter of oil cleaner	Replace it every 6000Km			●
Filter of air cleaner (dry)	replace it every 24000Km 6r repeat cleaning it more than 6 times)			●
Wearing of the universal joint liner	Check them every 24000Km		●	
Gear oil of the transmission	Replace it every 24000Km		●	
Gear oil of differential	Replace it every 24000Km		●	
Front brake shoe and brake drum	Check it every 6000Km Drum: check it every	●	●	●

	24000Km			
Damage, looseness and large clearance of the steering transmission lever system	Check it every 6000Km		●	
U bolts and nuts of the steel plate	check it every 24000Km		●	

Recommended lubricants and diesel engine oil

To make your vehicle of JAC brand perform the best performance and durable, you should use lubricants and diesel oil according to the following table.

Recommended lubricants and diesel oil are shown as follows:

Lubricants

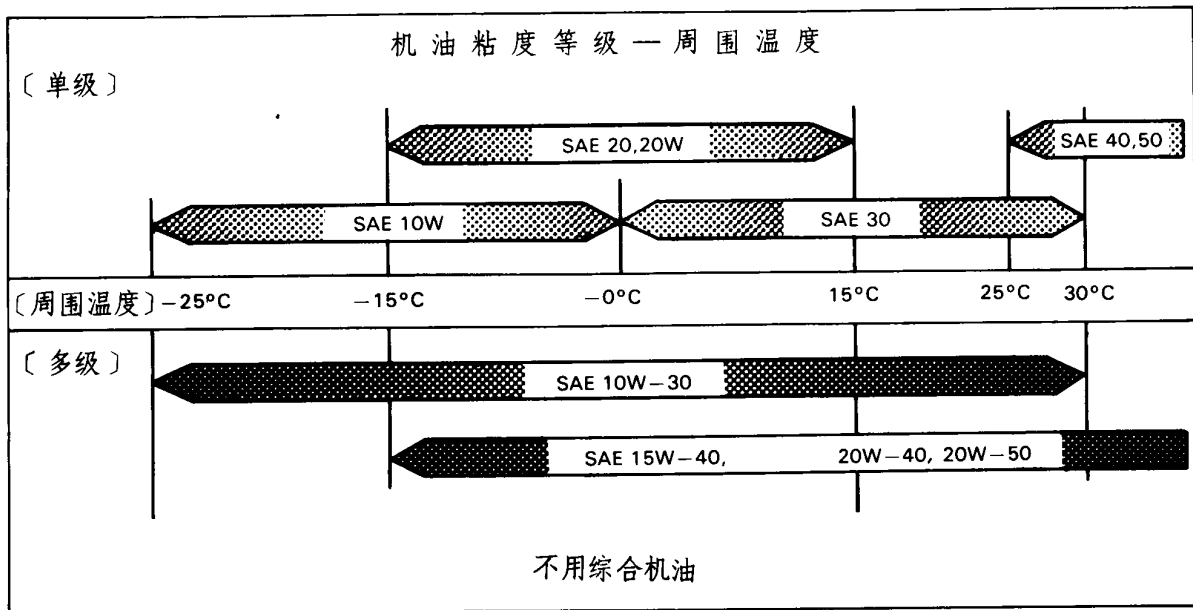
Parts to Lubricate	Type of the Lubricant
Crankshaft tank of the diesel engine	Diesel engine oil API CC or CD standard (*), viscosity grades are shown in the viscosity table
Transmission	Gear oil of level API GL-5, viscosity grades are shown in the viscosity table
Differential	Gear oil of level API GL-5, viscosity grades are shown in the viscosity table
Power steering	
Steering	Gear oil of level API GL-3 or GL-4. Viscosity grades are shown in the viscosity table
Accumulator of clutch and	Hydraulic brake fluid of level SAE J1703 FMVSS

brake fluid	116 DOT.3
Wheel bearing	Lubricate grease NLGI No.2 or No.3
Butter nozzle	Lubricate grease NLGI No.2 or No.3
Engine cooling system	Glycol antifreeze fluid
(*) oil of level CA、CB and refined oil should not be used	

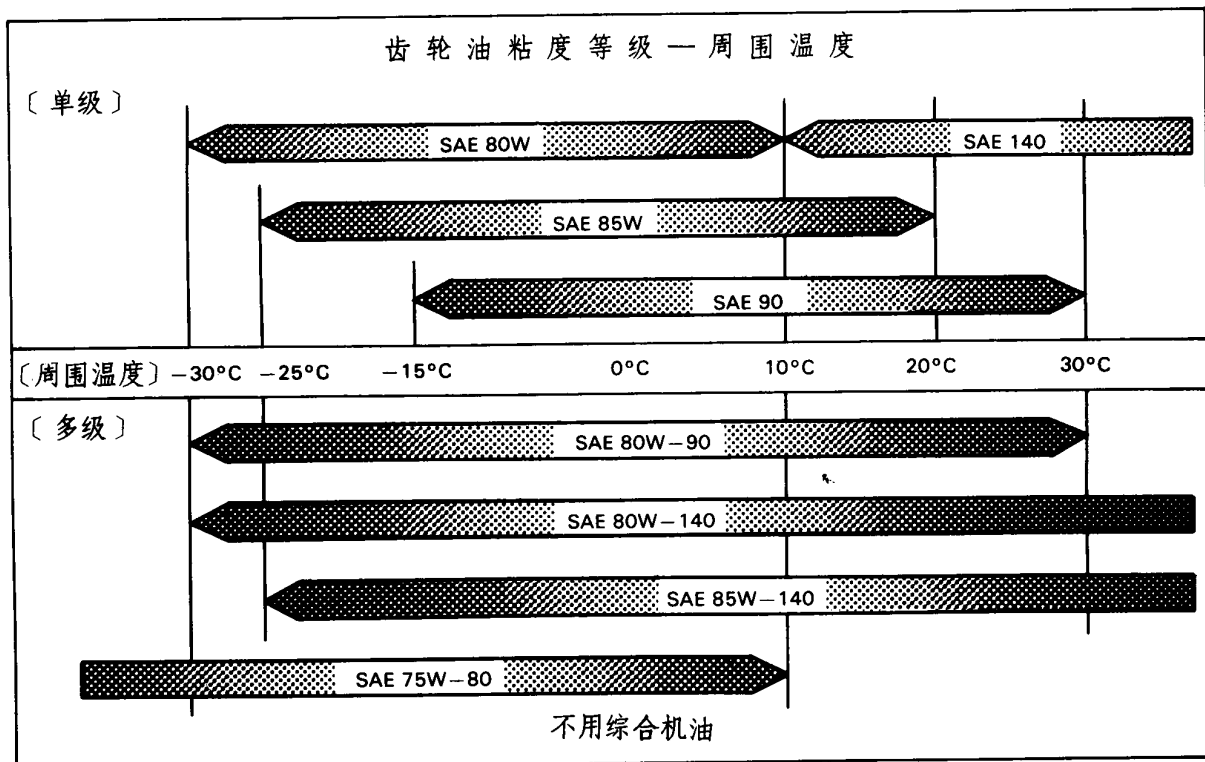
Diesel oil

Criterion	Recommended brands
ASTM (American stuff testing mechanism	D 975
BS (Britain standard) according to BS/2869-1970	No.1-D or No.2-D engine oil American A-1

机油粘度表



齿轮油粘度表



Specification of the torque

Specification of tightening torque of auto worm tightening parts

Table 1 (mechanical performance of tightening torque of bolts、nails and studs of level 4.6)

Diameter of thread×pitch of thread (mm×mm)	Tightening torque		
	standard (N·m)	Max. (N·m)	Min. (N·m)
6×1	4.0	5.5	2.5
8×1.25	8.0	11.0	5.0
8×1	8.5	11.5	5.5
10×1.5	19.7	24.7	14.3
10×1.25	20.8	25.8	16.7
10×1	21.8	26.5	17.0
12×1.75	37.3	43.3	28.0
12×1.5	38.5	45.0	29.0
12×1.25	39.6	48.0	30.0
14×2	61.2	75.0	46.8
14×1.5	74.6	92.0	56.0
16×2	95.0	115.0	73.0
16×1.5	105.0	133.0	76.0
18×2.5	142.9	178.0	107.4
18×1.5	157.6	190.0	124.5

20×2.5	188.0	230.0	135.0
20×1.5	203.7	243.0	149.0

Table 2 (mechanical performance of tightening torque of bolts、nails and studs of level 5.6)

Diameter of thread×pitch of thread (mm×mm)	Tightening torque		
	Standard (N·m)	Max. (N·m)	Min. (N·m)
6×1	4.5	6.0	3.0
8×1.25	10.6	14.0	7.0
8×1	11.0	15.0	8.0
10×1.5	26.0	33.0	19.0
10×1.25	28.0	34.0	22.0
10×1	29.0	35.0	23.0
12×1.75	45.0	53.0	37.0
12×1.5	47.0	56.0	38.0
12×1.25	50.0	60.0	40.0
14×2	81.0	95.0	62.0
14×1.5	90.0	105.0	68.0
16×2	124.0	150.0	98.0
16×1.5	132.0	160.0	101.0
18×2.5	190.0	220.0	161.0

18×1.5	200.0	230.0	165.0
20×2.5	231.6	272.0	190.0
20×1.5	246.6	285.0	197.3

Table 3 (mechanical performance of tightening torque of bolts、nails and studs of level 8.8)

Diameter of thread×pitch of thread (mm×mm)	Tightening torque		
	standard (N·m)	Max. (N·m)	Min. (N·m)
6×1	9	12	6
8×1.25	23	26	16
8×1	25	28	17
10×1.5	59	75	37
10×1.25	63	79	45
10×1	64	80	46
12×1.75	95	111	73
12×1.5	97	113	75
12×1.25	99	115	78
14×2	160	185	122
14×1.5	180	205	146
16×2	215	245	182
16×1.5	240	270	199

18×2.5	268	298	229
18×1.5	316	346	287
20×2.5	430	470	389
20×1.5	440	480	396

Table 4 (mechanical performance of tightening torque of bolts、nails and studs of level10.9)

Diameter of thread ×Thread pitch (mm×mm)	Tightening torque		
	Standard (N·m)	Max. (N·m)	Min. (N·m)
10×1.5	74	90	52
10×1.25	78	93	63
10×1	80	95	65
12×1.75	140	156	105
12×1.5	142	158	106
12×1.25	145	161	108
14×2	175	200	141
14×1.5	210	235	178
16×2	280	310	200
16×1.5	305	335	240
18×2.5	437	467	380
18×1.5	467	507	397

20×2.5	528	568	450
20×1.5	558	598	475