

TOYOTA

LAND CRUISER

REPAIR MANUAL

FJ4-6_, BJ4-6_, HJ4-6_ Series Aug., 1980

CHASSIS & BODY

TOYOTA MOTOR CORPORATION

Pub. No. 36044E

FOREWORD

This repair manual has been prepared to provide information covering general service repairs for the chassis and body of the TOYOTA LAND CRUISER.

*Applicable models: FJ40, 43, 45, 60 series
BJ40, 42, 43, 45, 46, 60 series
HJ47, 60 series*

For service of the TOYOTA LAND CRUISER, refer to the following repair manuals.

*2F Engine Repair Manual (Pub. No. 98126 or 98126E)
B Series Engine Repair Manual (Pub. No. 36047 or 36047E)
2H Engine Repair Manual (Pub. No. 36048 or 36048E)*

*For instructions on how to use this manual, please refer to page 1-4.
All information contained in this manual is the most up-to-date at the time of publication.
However, specifications and procedures are subject to change without notice.*

TOYOTA MOTOR CORPORATION

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GENERAL REPAIR INSTRUCTIONS

1. Use fender, seat and floor covers to keep the car clean and prevent damage.
2. During disassembly, keep parts in order to facilitate reassembly.
3. Before performing electrical work, disconnect the cable from the battery terminal.
4. Always replace cotter pins, gaskets and O rings with new ones.
5. When necessary, use a sealer on gaskets to prevent leaks.
6. Carefully observe all specifications for bolt tightening torques. Always use a torque wrench.
7. Use genuine Toyota parts.
8. When replacing fuses, be sure the new fuse is the correct amperage rating. DO NOT exceed the fuse amp rating or use one of a lower rating.
9. If the vehicle is to be jacked up only at the front or rear end, be sure to block the wheels in order to ensure safety.
10. After the vehicle is jacked up, be sure to support it on stands. It is extremely dangerous to do any work on the vehicle raised on a jack alone, even for a small job that can be finished quickly.
11. Use of a special service tool (SST) may be required, depending on the nature of the repair. Be sure to use SST where specified and follow the proper work procedure. A list of SST can be found at the back of this manual.

ABBREVIATIONS USED IN TOYOTA REPAIR MANUALS

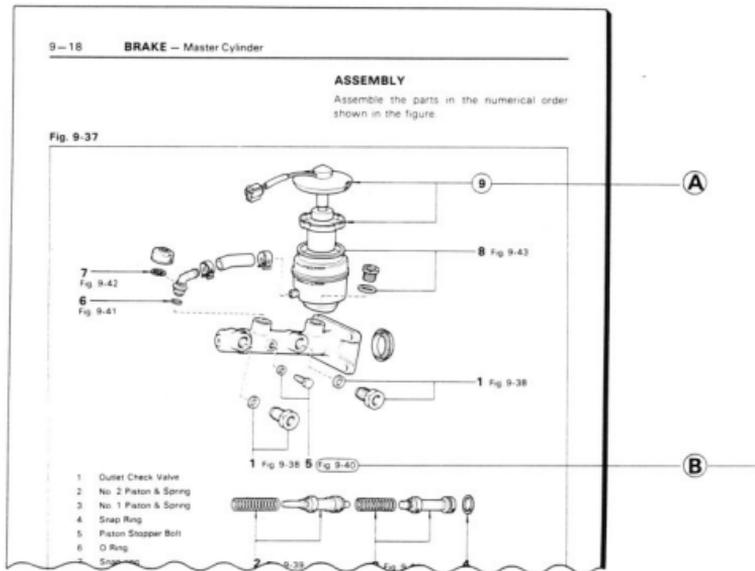
For convenience, the following abbreviations are used in Toyota repair manuals.

Abbreviation	Term	Abbreviation	Term
A/T	Automatic Transmission	O/S	Oversize
BDC	Bottom Dead Center	RH	Right-hand
BTDC	Before Top Dead Center	RHD	Right-hand Drive
EX	Exhaust	SST	Special Service Tool
IN	Intake	STD	Standard
LH	Left-hand	T	Tightening Torque
LHD	Left-hand Drive	TDC	Top Dead Center
MP	Multipurpose	U/S	Undersize
M/T	Manual Transmission	W/	With
OPT	Option	W/O	Without

HOW TO USE THIS MANUAL

1. OVERVIEW ILLUSTRATION

Many service operations begin with an overview illustration as a general guide.



A : The bold numbers show the order in which the work is to be done.

B : The figure numbers refer you to more detailed instructions and specifications.

2. ILLUSTRATED INSTRUCTIONS

All important steps in every service job are illustrated. Obvious steps are omitted to save space. Experienced technicians may only need to glance at the overview illustrations and/or specifications.

BRAKE — Master Cylinder 9—19

Fig. 9-39

Rubber Grease



Fig. 9-40



Fig. 9-41

Rubber Grease



⚠ — Note —
Before assembly, coat rubber grease on the parts indicated by arrows.

🔧 Install the piston stopper bolt with pistons pushed in all the way.
Tightening torque: 0.8 – 1.5 kg-m (70 – 130 in.-lb)

⚠ Apply rubber grease to the O ring and install the O ring to the elbow.

C

D

E

F

- C** : The pictures give basic information on what to do in each step.
- D** : A symbol is often used to explain the action required.
- E** : The text explains how to perform the step.
- F** : Specifications, Notes and Cautions are given in bold type so you won't miss them.

VEHICLE SUPPORT LOCATIONS

JACK UP POINTS

Fig. 1-1 Front

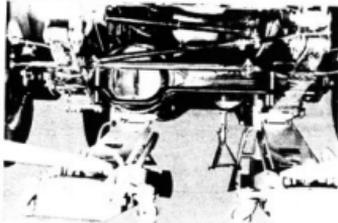
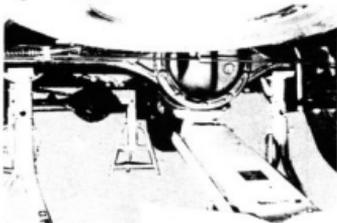
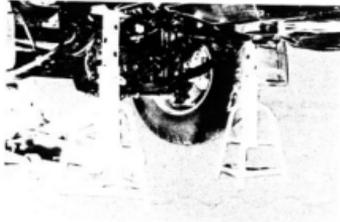


Fig. 1-2 Rear



STAND LOCATIONS

Fig. 1-3 Front



SYMBOLS

The following symbols have been adopted for simplicity and for easy comprehension.



REMOVE or DISASSEMBLE



INSTALL or ASSEMBLE



INSPECT



MEASURE



TIGHTEN



CLEAN



IMPORTANT

CLUTCH

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ADJUSTMENT	2-2
AIR BLEEDING	2-3
CLUTCH PEDAL	2-4
CLUTCH MASTER CYLINDER	2-6
CLUTCH RELEASE CYLINDER	2-12
CLUTCH UNIT & RELEASE BEARING	2-16

Fig. 2-3



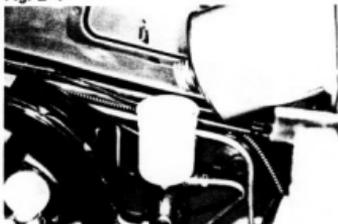
AIR BLEEDING

If any work is performed on the clutch system or air enters in the clutch line, bleed the air.

— Note —

Be careful not to allow any fluid to get on painted surfaces.

Fig. 2-4

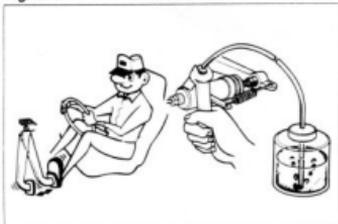


1. Fill the master cylinder reservoir with clean brake fluid.

— Note —

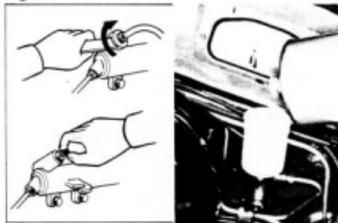
When bleeding, do not allow the fluid in the master cylinder reservoir to become depleted.

Fig. 2-5



2. Attach a vinyl tube to the release cylinder bleeder plug, and insert the other end into a container.
3. Depress the clutch pedal several times, and then while holding it depressed, loosen the bleeder plug about one-third to one-half turn. When the fluid pressure in the cylinder is almost depleted retighten the plug. Repeat this operation until there are no more air bubbles in the system.

Fig. 2-6



4. When there are no more bubbles, hold the clutch pedal depressed and tighten the bleeder plug. Then install the bleeder plug cap.
5. After completing the bleeding operation, apply fluid pressure onto the pipe line and check for leakage.
6. Replenish the fluid in the reservoir to the specified level.

CLUTCH PEDAL**REMOVAL**

Remove the parts in the numerical order shown in the figure.

Fig. 2-7

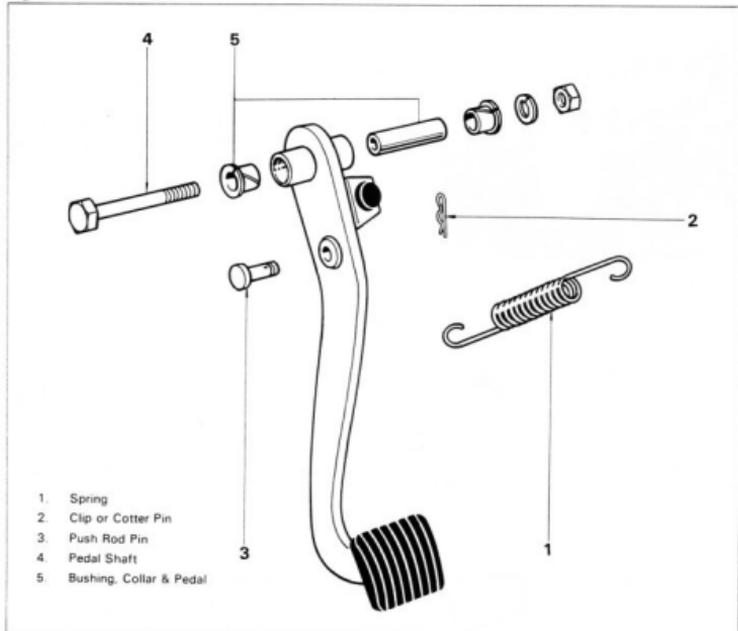


Fig. 2-8

**INSPECTION**

Inspect the parts for wear or damage.



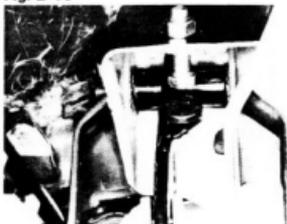
Fig. 2-9

**INSTALLATION**

Install in the reverse sequence of removal.

— Note —
Coat MP grease onto the bushings and the collar.

Fig. 2-10



Tighten the pedal shaft.

Tightening torque: 3.0 — 4.5 kg-m
(22 — 32 ft-lb)

CLUTCH MASTER CYLINDER

REMOVAL

Remove the parts in the numerical order shown in the figure.

Fig. 2-11

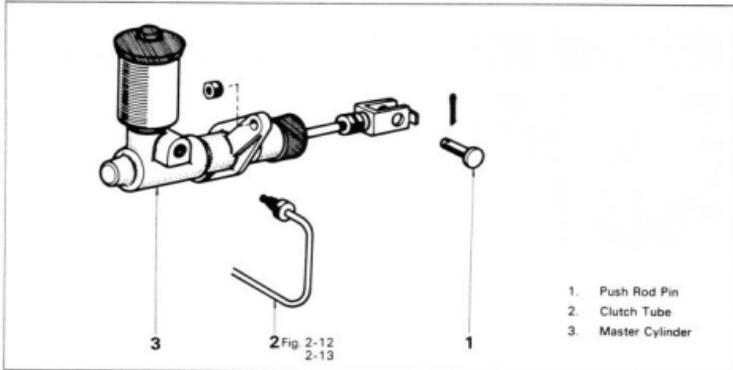
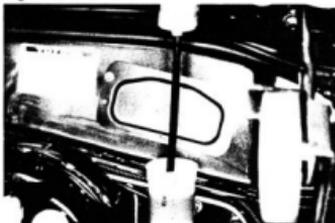


Fig. 2-12



Take out fluid with a syringe or such.

Fig. 2-13



Disconnect the clutch tube with SST.
SST [09751-36011]

— Note —

Do not allow any brake fluid to get on painted surfaces.

DISASSEMBLY

Disassemble the parts in the numerical order shown in the figure.

Fig. 2-14

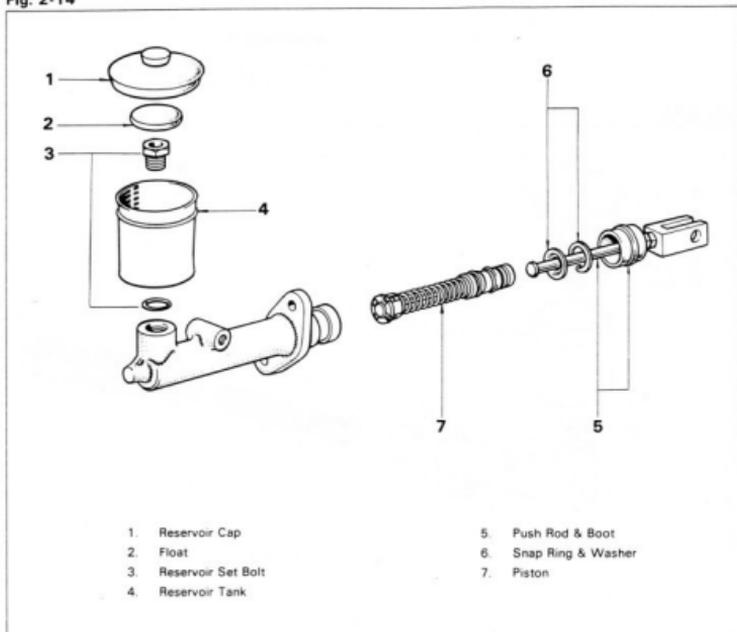


Fig. 2-15

**INSPECTION**

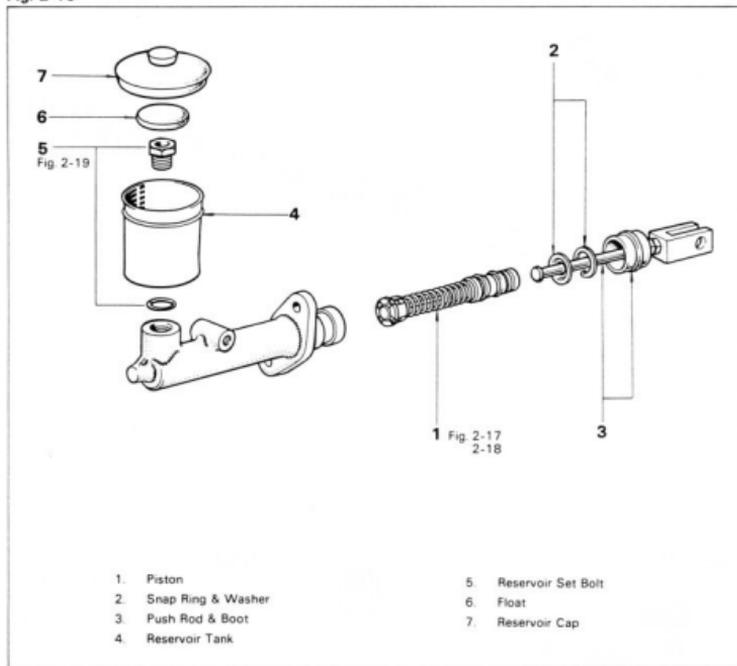
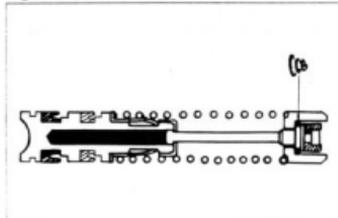
1. Inspect the master cylinder bore for rust and scoring.
2. Inspect the piston and the cylinder cups for wear, scoring, cracks or swelling.

— Note —

1. Wash the disassembled parts with brake fluid.
2. If either one requires replacement, use the cylinder kit.

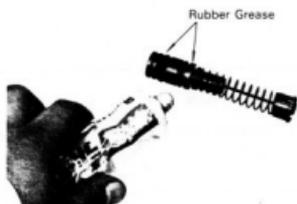
ASSEMBLY

Assemble the parts in the numerical order shown in the figure.

Fig. 2-16**Fig. 2-17**

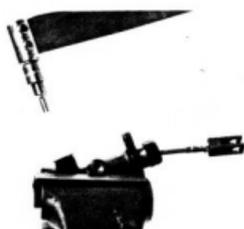
Conical spring and cylinder cups are parts with directionality.

Fig. 2-18



Apply rubber grease to the cylinder cups.

Fig. 2-19



Install the reservoir tank.

Tightening torque: 2.0 – 3.0 kg-m
(15 – 21 ft-lb)

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 2-20

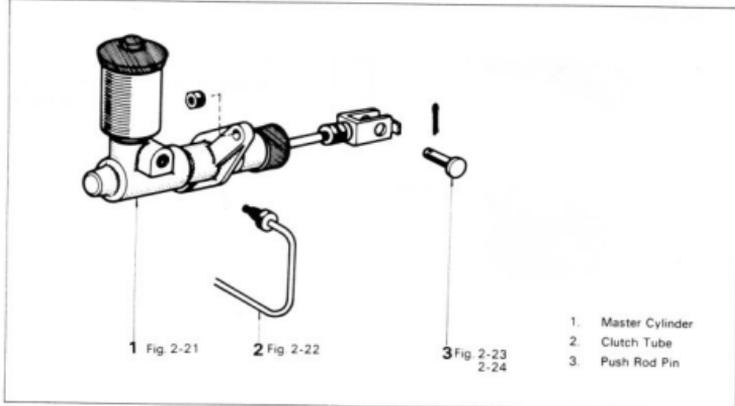


Fig. 2-21



Tighten the mounting nuts.

Tightening torque: 1.0 – 1.6 kg-m
(8 – 11 ft-lb)

Fig. 2-22



Connect the clutch tube with SST.
SST[09751-36011]

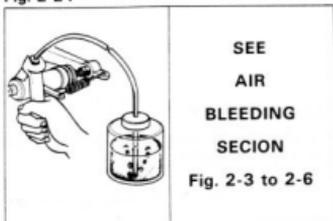
Tightening torque: 1.3 – 1.8 kg-m
(10 – 13 ft-lb)

Fig. 2-23

SEE
CLUTCH PEDAL
ADJUSTMENT
SECTION
Fig. 2-1

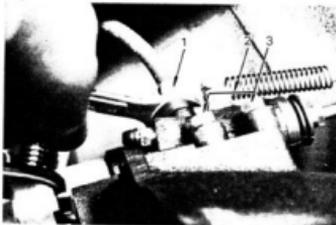
Adjust the pedal height and play.

Fig. 2-24



Bleed the air from clutch line.

Fig. 2-25



CLUTCH RELEASE CYLINDER



REMOVAL

Remove the following parts.

1. Pipe union
2. Return spring
3. Release cylinder set bolt

DISASSEMBLY

Disassemble the parts in the numerical order shown in the figure.

Fig. 2-26

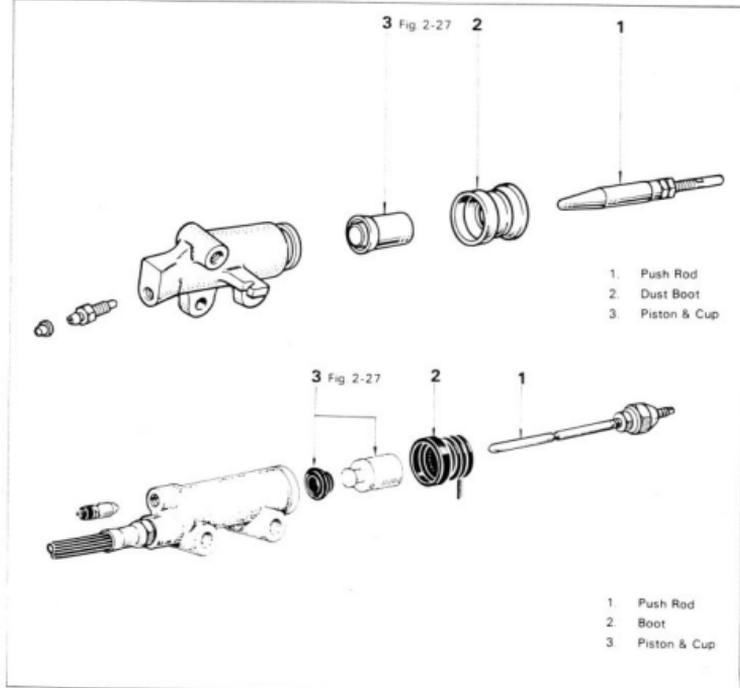


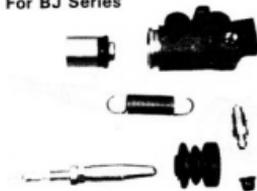
Fig. 2-27



Remove the piston by blowing compressed air in the outlet hole.

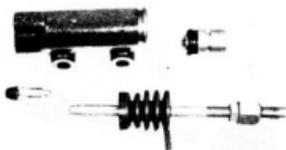
Fig. 2-28

For BJ Series

**INSPECTION**

Inspect the disassembled parts for wear or damage.

For FJ, HJ Series



ASSEMBLY

Assemble the parts in the numerical order shown in the figure.

Fig. 2-29

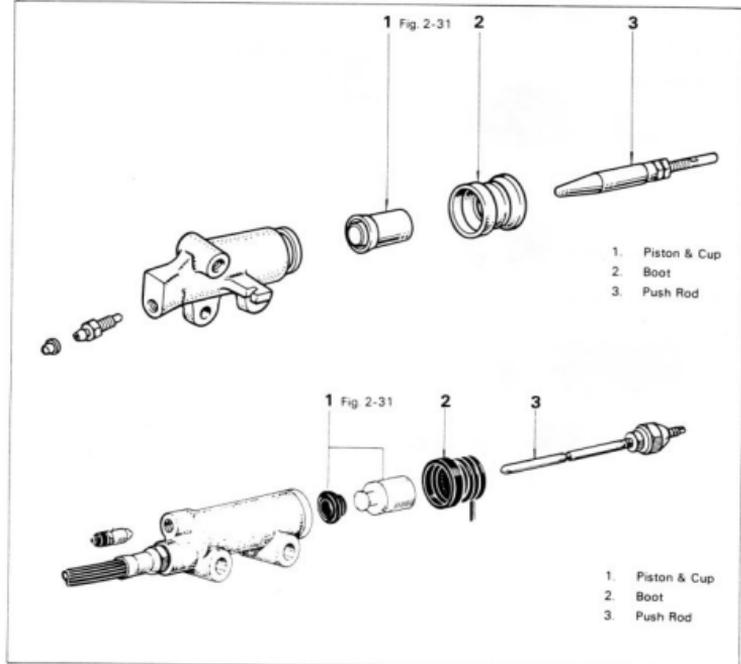


Fig. 2-30



Clean all parts in fresh brake fluid before assembling.

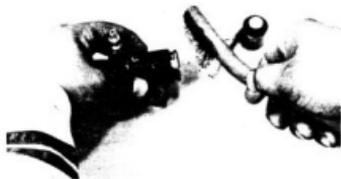


Fig. 2-31

For BJ, Series



Apply rubber grease to the piston cup.

Rubber Grease



For FJ, HJ Series

Rubber Grease

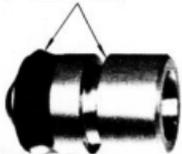


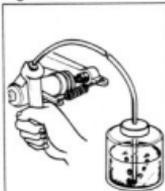
Fig. 2-32

SEE
CLUTCH RELEASE
CYLINDER ADJUSTMENT
SECTION
Fig. 2-2

INSTALLATION

1. Install in the reverse sequence of removal.
2. Adjust the play at the release fork tip.

Fig. 2-33



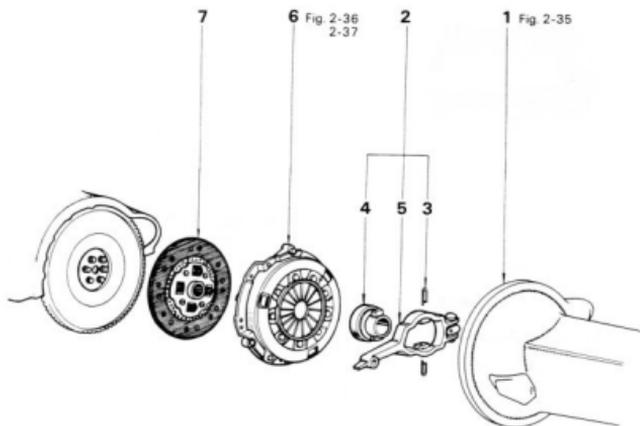
SEE
AIR
BLEEDING
SECTION
Fig. 2-3 to 2-6

3. Remove the air from clutch line.

CLUTCH UNIT & RELEASE BEARING**REMOVAL**

Remove the parts in the numerical order shown in the figure.

Fig. 2-34



1. Transmission
2. Release Bearing, Hub & Fork
3. Clip
4. Release Bearing & Hub
5. Release Fork
6. Clutch Cover
7. Clutch Disc

Fig. 2-35

SEE
TRANSMISSION
REMOVAL
SECTION
Fig. 3-2 to 3-5

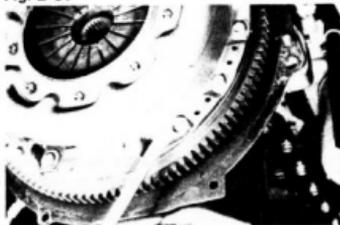
Remove the transmission.

Fig. 2-36



Place matchmarks on the clutch cover and the flywheel.

Fig. 2-37

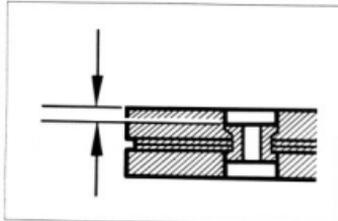


Loosen the set bolts one turn at a time until the spring pressure is released.

— Note —

Do not allow oil or grease to get on the clutch disc linings, or on the pressure plate and flywheel surfaces.

Fig. 2-38

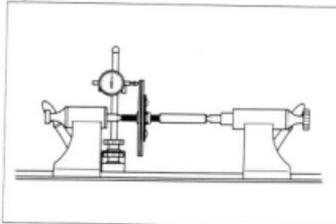
**INSPECTION****Clutch Disc**

Inspect the disc, and repair or replace if any part of it is found defective.

Rivet head depth:

Limit 0.3 mm
(0.012 in.)

Fig. 2-39



Inspect the disc for runout.

Runout:

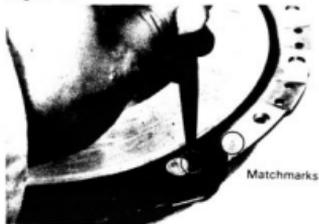
Limit 1.0 mm
(0.039 in.)

Fig. 2-40

**Clutch Cover**

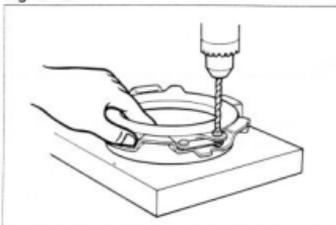
Inspect the clutch cover and pressure plate for wear and burning, and repair or replace if found defective.

Fig. 2-41

**Replace The Clutch Pressure Plate**

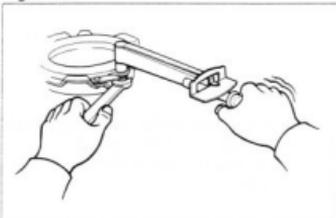
1. Place matchmarks on the clutch cover and pressure plate.

Fig. 2-42



2. Remove the rivet heads by drill and punch out the rivets.

Fig. 2-43



3. Assemble the pressure plate and clutch cover by using servicepurpose bolts and nuts.

**Tightening torque: 2.0 – 3.0 kg-m
(15 – 21 ft-lb)**

– Note –
Stake the nuts after tightening.

Fig. 2-44

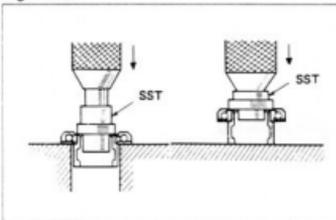


Bearing, Hub & Fork

Inspect for wear or damage.

– Note –
This ball bearing is permanently lubricated and does not require repacking or cleaning.

Fig. 2-45

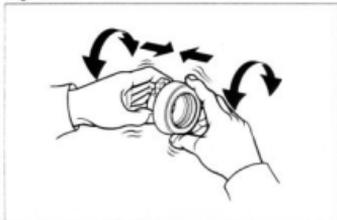


Replace The Release Bearing

1. Remove the bearing with SST. SST[09315-00021]
2. Install the bearing with SST. SST[09315-00021]

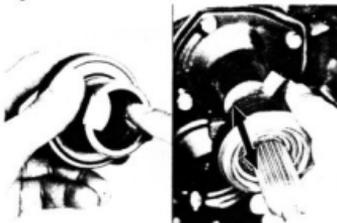


Fig. 2-46



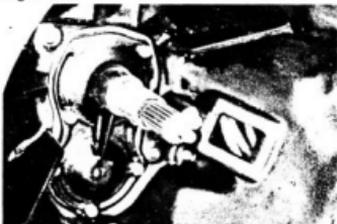
3. After assembling the bearing to the hub, insure that it rotates smoothly.

Fig. 2-47



4. Coat the hub groove with molybdenum disulphide lithium base grease.
5. Insure that the hub and bearing retainer slide smoothly.

Fig. 2-48

**Front Bearing Retainer**

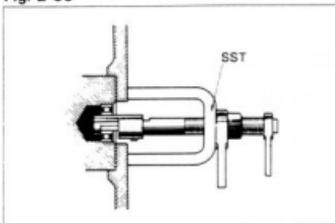
Inspect for wear on the release bearing sliding surface.

Fig. 2-49

**Pilot Bearing**

Inspect the bearing for damage or sticking.

Fig. 2-50

**Pilot Bearing**

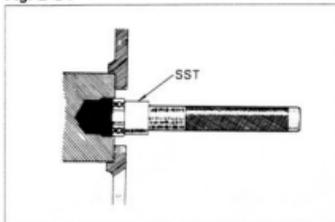
With the bearing still installed on the crankshaft, inspect it for excessive wear, sticking, and abnormal noise.

Replace the bearing if found defective.

1. Remove the bearing from the crankshaft with SST.

SST [09303-55010] FJ & HJ series
[09303-35010] BJ series

Fig. 2-51



2. Coat the new bearing with MP grease, and drive the bearing into the crankshaft with SST.

SST [09304-47010] FJ & HJ series
[09304-30012] BJ series

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 2-52

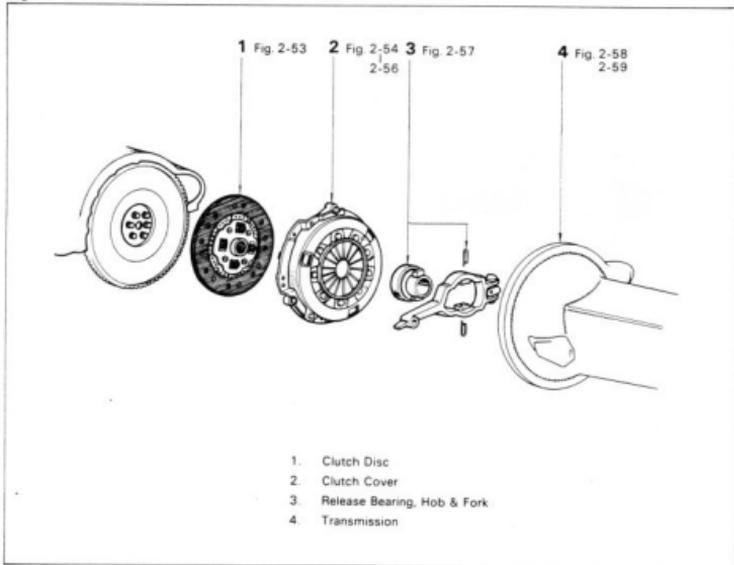
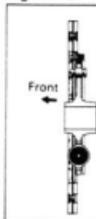


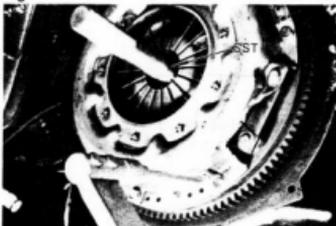
Fig. 2-53



Install the clutch disc onto the flywheel with SST.

SST [09301-20020] BJ series
[09301-55022] FJ & HJ series

Fig. 2-54

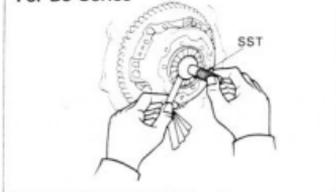


Tighten the bolts uniformly, a little at a time
SST [09301-20020] BJ series
[09301-55022] HJ & FJ series

Tightening torque: 1.5–2.2 kg·m
(11–15 ft·lb)

Fig. 2-55

For BJ Series



Check the diaphragm spring tips for alignment
with a thickness gauge and SST.

SST [09301-00012]

Limit of non-alignment: 0.5mm
(0.020 in.)

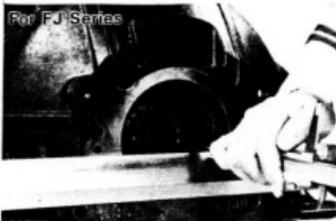
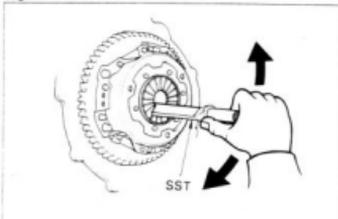


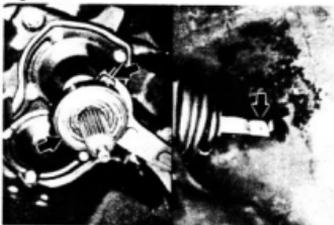
Fig. 2-56



If over the limit of non-alignment, correct with
SST.

SST [09301-00012]

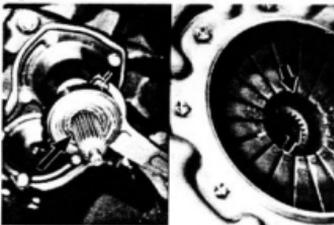
Fig. 2-57



Apply molybdenum disulphide lithium base grease to fork tip and release hub contact surfaces.

JWN

Fig. 2-58



Coat molybdenum disulphide lithium base grease on the spline in the disc, diaphragm spring and the input shaft splines.

Fig. 2-59

SEE
TRANSMISSION
INSTALLATION
SECTION

Fig. 3-102 to 3-108

Install the transmission.

rel with

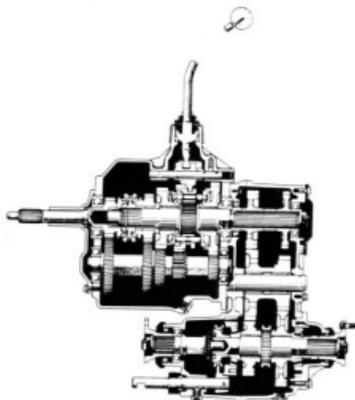
TRANSMISSION

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3-SPEED TRANSMISSION (J30)	3-42

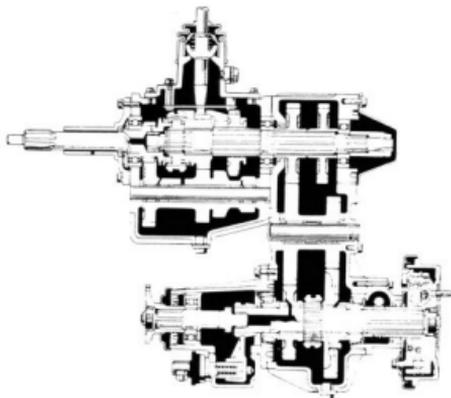
CUTAWAY VIEW

Fig. 3-1

4-Speed Manual Transmission (H41 & H42) & Transfer



3-Speed Manual Transmission (J30) & Transfer



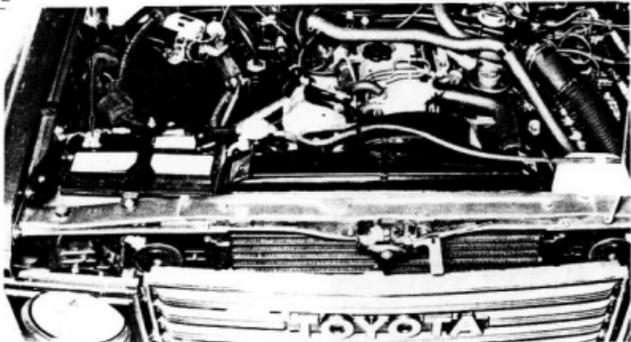
4-SPEED TRANSMISSION (H41 & H42)

REMOVAL

Remove From Vehicle

1. Drain the transmission and transfer oil.
2. Remove the parts in the numerical order shown in the figure.

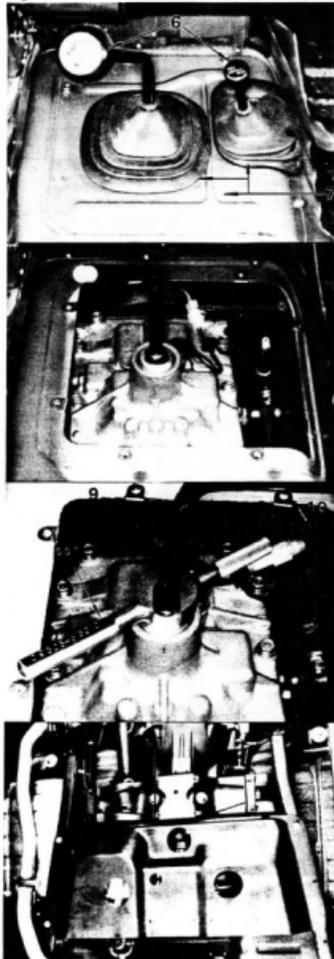
Fig. 3-2



1. Battery Terminal
2. Scuff Plate
3. Cowl Side Trim

4. Heater Duct
5. Carpet or Mat

Fig. 3-3



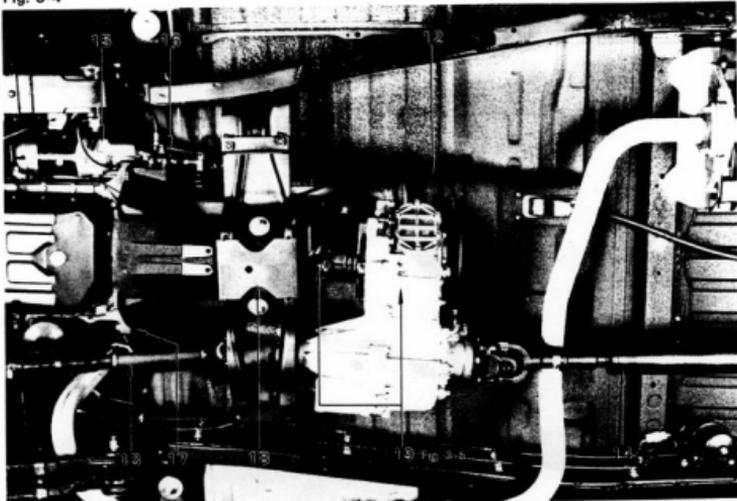
- 6. Shift Lever Knob & Transfer Knob
- 7. Service Hole Cover with boot

- 8. Back-up Light Switch Connector

- 9. Shift Lever
SST [09305-55010]
- 10. Transfer Shift Lever

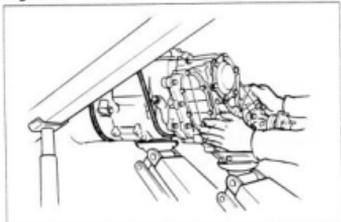
- 11. Under Guard

Fig. 3-4



- | | |
|-----------------------------------|---|
| 12. Speedometer Cable | 16. Clutch Release Cylinder (For BJ Series) |
| 13. Front Propeller Shaft | 17. Tachometer Sensor (For BJ, HJ Series) |
| 14. Rear Propeller Shaft | 18. Engine Rear Supportmember |
| 15. Starter Motor (For BJ Series) | 19. Transmission & Transfer |

Fig. 3-5

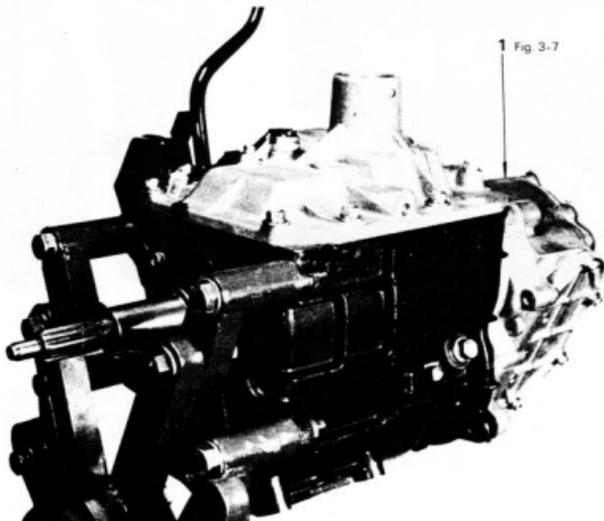


Support the transmission and transfer assembly with jacks and a rope, and remove.

**TRANSMISSION GEAR &
CASE****REMOVAL**

1. Remove the parts in the numerical order shown in the figure.

Fig. 3-6



1. Transfer

Fig. 3-7

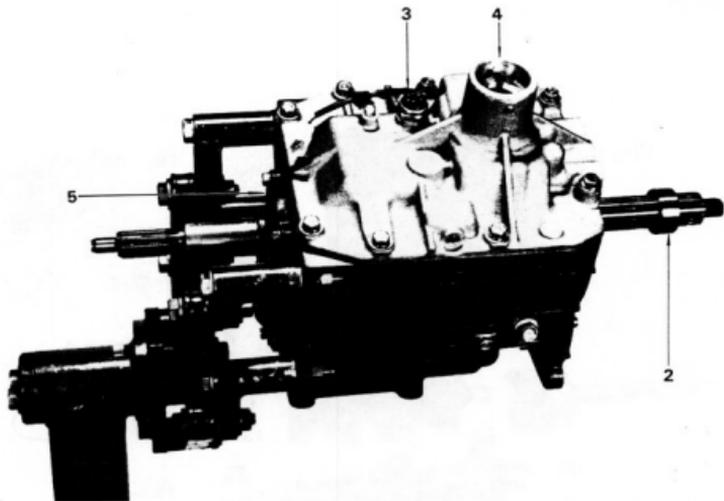
SEE
TRANSFER DISASSEMBLY
SECTION

Fig. 4-1 to 4-24

Separate the transfer from the transmission.

2. Disassemble the parts in the numerical order shown in the figure.

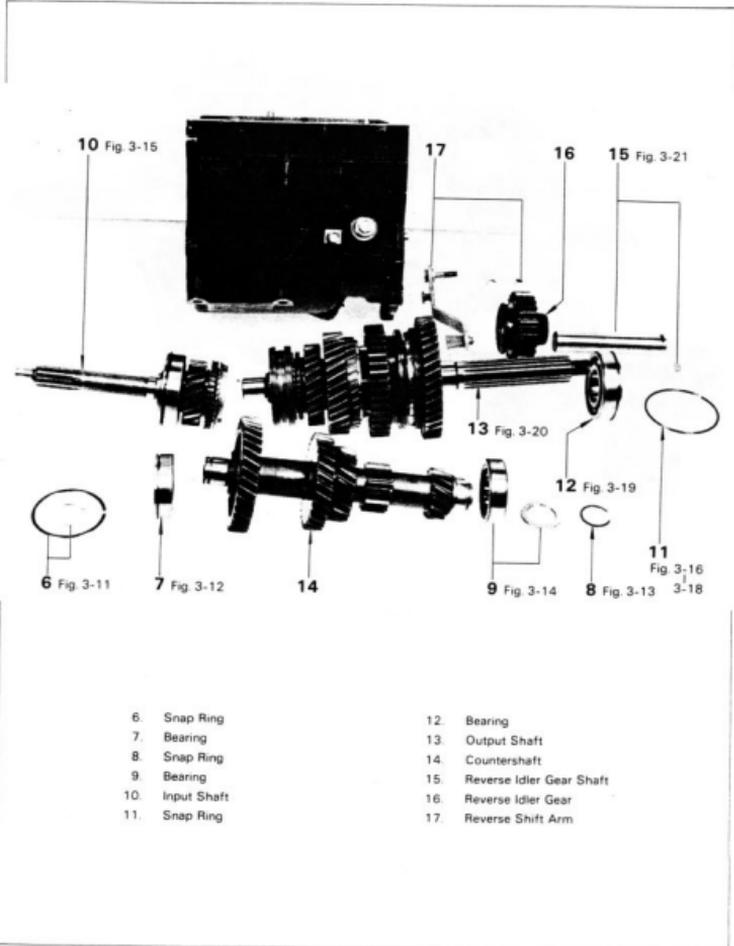
Fig. 3-8



2. Spacer
3. Back-up Light Switch
4. Case Cover
5. Front Bearing Retainer

3. Disassemble the parts in the numerical order shown in the figure.

Fig. 3-9

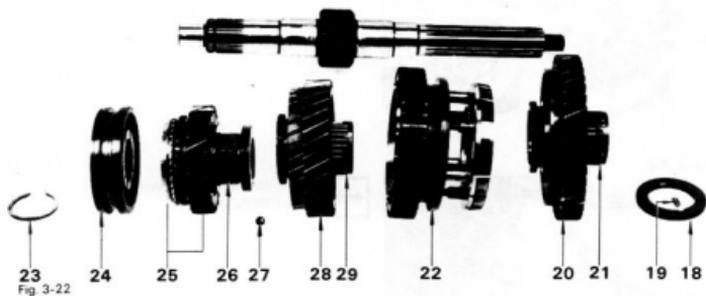


- 6 Snap Ring
7 Bearing
8 Snap Ring
9 Bearing
10 Input Shaft
11 Snap Ring

- 12 Bearing
13 Output Shaft
14 Countershaft
15 Reverse Idler Gear Shaft
16 Reverse Idler Gear
17 Reverse Shift Arm

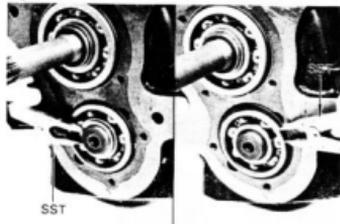
4. Disassemble the parts in the numerical order shown in the figure.

Fig. 3-10



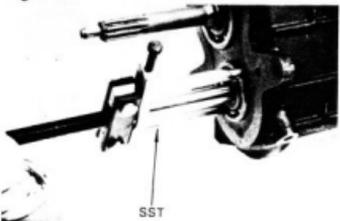
- | | |
|-----------------------|--|
| 18. Thrust Washer | 24. No. 2 Clutch Hub, Sleeve & Synchronizer Ring |
| 19. Pin | 25. 3rd Gear |
| 20. 1st Gear | 26. Bushing |
| 21. Bearing | 27. Ball |
| 22. Synchronizer Ring | 28. 2nd Gear |
| 23. Snap Ring | 29. Bearing |

Fig. 3-11



Remove the snap ring with SST.
SST [09905-00012]

Fig. 3-12



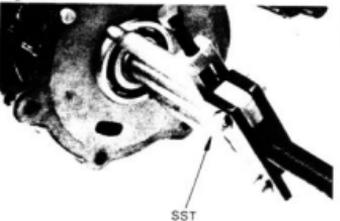
Remove the bearing with SST.
SST [09950-20014]

Fig. 3-13



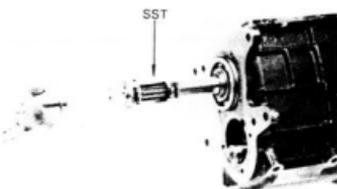
Remove the snap ring with SST.
SST [09905-00012]

Fig. 3-14



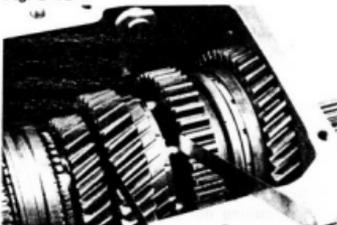
Remove the bearing with SST.
SST [09950-20014]

Fig. 3-15



-  Remove the input shaft assembly from the case with SST.
SST [09910-00014]

Fig. 3-16



-  Measure the 3rd and 2nd gear thrust clearance.

Thrust clearance:

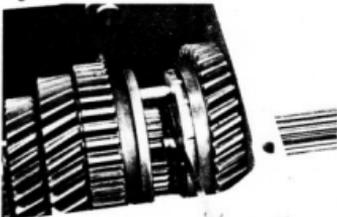
2nd STD 0.175 – 0.325 mm
(0.0069 – 0.0128 in.)

Limit 0.35 mm
(0.0138 in.)

3rd STD 0.125 – 0.275 mm
(0.0049 – 0.0108 in.)

Limit 0.35 mm
(0.0138 in.)

Fig. 3-17



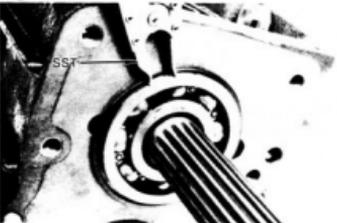
-  Measure the 1st gear and sleeve thrust clearance.

Thrust clearance:

STD 0.175 – 0.320 mm
(0.0069 – 0.0126 in.)

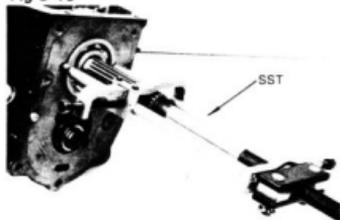
Limit 0.32 mm
(0.0126)

Fig. 3-18



-  Remove the snap ring with SST.
SST [09905-00012]

Fig 3-19



Remove the bearing with SST.
SST [09950-20014]

Fig. 3-20



Hold the 1st gear tightly against the other gears and pull out the output shaft assembly from the case.

— Note —

When pulling out the assembly, hold the gears in place to keep them from sliding off the shaft.

Fig. 3-21



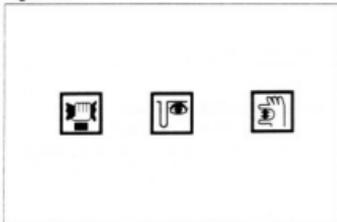
Drive out the reverse idler gear shaft toward the rear.

Fig. 3-22



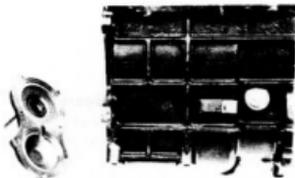
Remove the snap ring with SST.
SST [09905-00012]

Fig. 3-23

**INSPECTION**

Wash the disassembled parts and inspect them as described below. Replace any part found defective.

Fig. 3-24

**Transmission Case & Front Bearing Retainer**

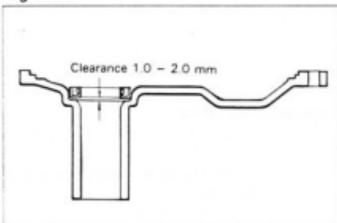
Inspect for wear or damage.

Fig. 3-25

**Replace The Front Bearing Retainer Oil Seal**

1. Remove the oil seal by prying with a driver.
2. Tap in the oil seal with SST.
SST [09316-60010]

Fig. 3-26



— Note —

Check the clearance between the oil seal front end and retainer.

Clearance: 1.0 - 2.0 mm
(0.039 - 0.079 in)

Fig. 3-27

**Output Shaft & Bushing**

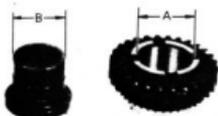
1. Inspect the shaft surfaces contacting the bearings and gears for wear or damage.
2. Inspect the bushing for wear or damage.

Fig. 3-28

**1st, 2nd, 3rd Gear & Bearing**

1. Inspect the gears for wear or damage at the teeth, thrust faces, inside diameter, and coned surfaces.
2. Inspect the output shaft rear bearing and the roller bearings for wear or damage.

Fig. 3-29



3. Measure the oil clearance.

3rd gear oil clearance (A - B):

STD 0.065 - 0.115 mm
(0.0026 - 0.0045 in.)

Limit 0.115 mm
(0.0045 in.)

Fig. 3-30

**Synchronizer Ring**

1. Fit the synchronizer ring on the gear and measure the clearance.

3rd & 4th gear synchronizer ring clearance:

Limit 0.8 mm
(0.031 in.)

Fig. 3-31



2. Measure the No.1 synchronizer ring dimension.

Dimension:**Limit**

1st gear	2.8 mm (0.110 in.)
2nd gear	1.8 mm (0.0110 in.)

Fig. 3-32

**Clutch Hub Sleeve, Clutch Hub, Shifting Key & Shifting Key Spring**

1. Disassemble the clutch hub and sleeve.
2. Inspect the splines of hub and hub sleeve for wear or damage.
3. Inspect the center humped part of keys for wear or damage.
4. Inspect the key springs for weakening or damage.

Fig. 3-33

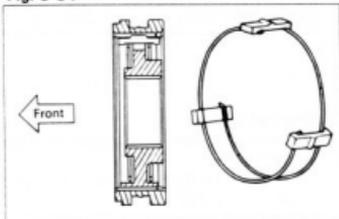


5. Check the clearance between the sleeve and shift fork.

Shift fork to hub sleeve clearance:

Limit	0.8 mm (0.031 in.)
--------------	-------------------------------------

Fig. 3-34



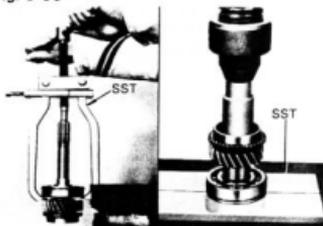
6. Hub and hub sleeve are parts having directionality. Install the key springs positioned so that their end gaps will not be in line.

Fig. 3-35

**Input Shaft**

1. Inspect the gear teeth, splines, coned surfaces, and bearing for wear or damage.
2. Inspect the shaft inner surface that contact on the needle roller bearing for wear or damage.

Fig. 3-36

**Replace The Input Shaft Bearing**

1. Remove the snap ring with SST.
2. Remove the bearing with SST.
3. Install the new bearing with a press.



Fig. 3-37



4. Select a snap ring of the thickness that will allow minimum axial play, and install it on the shaft.

Snap ring size

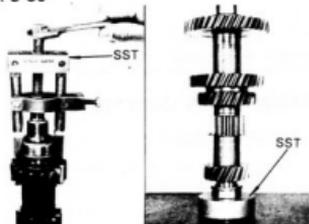
Part No.	Thickness mm (in.)
90520-36015	3.31 - 3.42 (0.1303 - 0.1346)
90520-36016	3.20 - 3.31 (0.1260 - 0.1303)

Fig. 3-38

**Counter Gear**

1. Inspect the counter gear teeth for wear or damage.
2. Inspect the front and rear bearings for wear or damage.

Fig. 3-39



3. Rear bearing inner race replacement.
- (1) Remove the inner race with SST. SST [09602-10010]
 - (2) Install the new inner race with SST. SST [09515-21010]

— Note —

Make sure to position the inner race so that its flanged side will be directed toward the front.

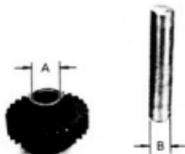
Fig. 3-40



Reverse Idler Gear, bushing & Shaft

1. Inspect the gear, bushing, and shaft for wear or damage.

Fig. 3-41

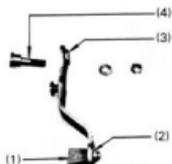


2. Measure the reverse idler gear gear bushing and shaft oil clearance.

Oil clearance:

**Limit 0.16 mm
(0.0063 in.)**

Fig. 3-42



Reverse Shift Arm

1. Inspect the shift arm shoe(1) for wear or damage.

Shoe thickness:

**Limit 8.1 mm
(0.319 in.)**

2. Inspect the shift arm at the shoe mounting(2) and pivot mounting(3) for wear or damage.
3. Inspect the pivot(4) for wear or damage.
4. Inspect the clearance between the shoe and reverse idler gear slot.

Clearance:

**Limit 0.7 mm
(0.028 in.)**

TRANSMISSION CASE COVER

DISASSEMBLY

Disassemble the parts in the numerical order shown in the figure.

Fig. 3-43

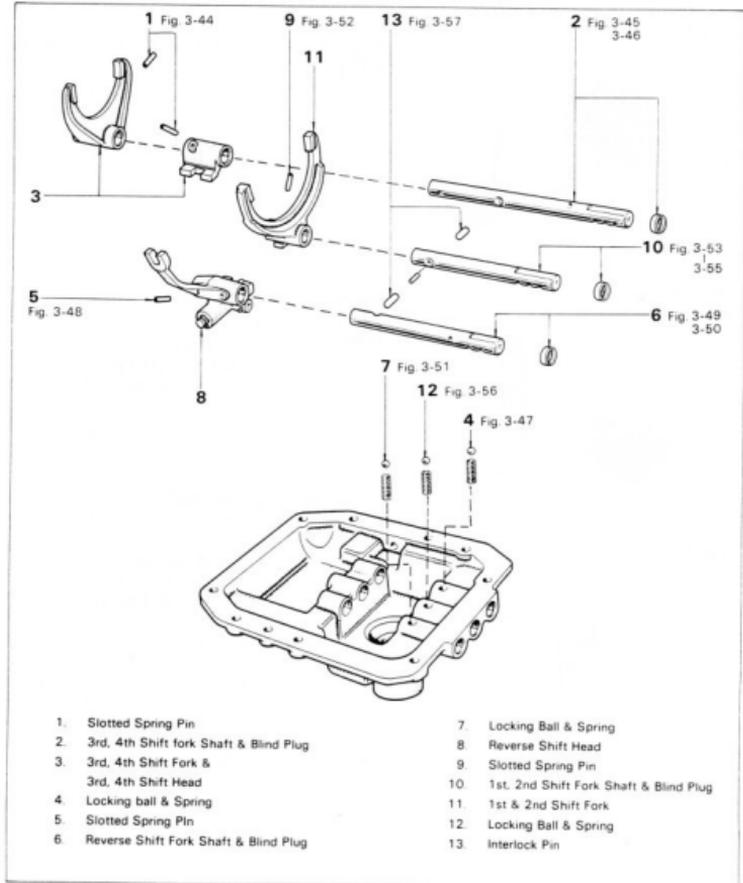
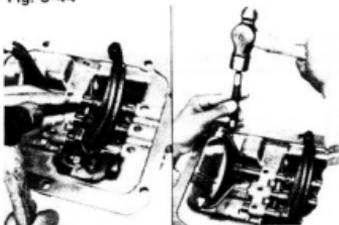
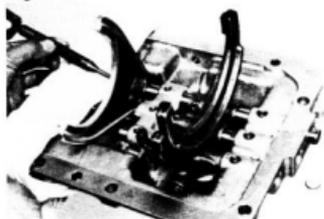


Fig. 3-44



Drive out the slotted spring pin.

Fig. 3-45



Drive out the shift fork shaft together with the blind plug.

— Note —

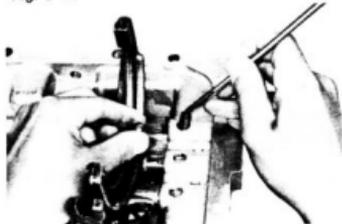
Do not damage the case cover.

Fig. 3-46



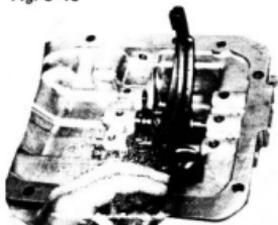
Cover the service hole with your hand to prevent locking ball from flying out.

Fig. 3-47



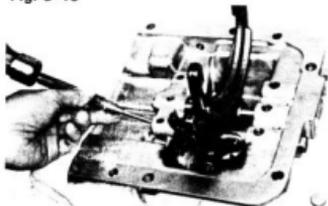
Remove the locking ball and the spring with magnet.

Fig. 3-48



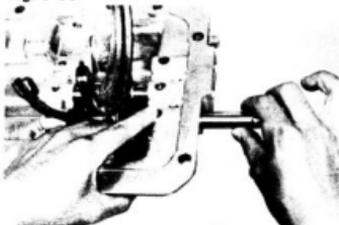
Drive out the slotted spring pin.

Fig. 3-49



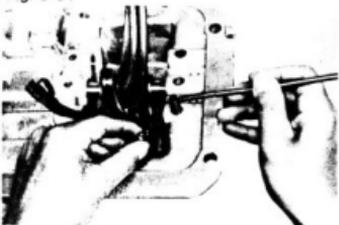
Drive out the shift fork shaft together with blined plug.

Fig. 3-50



Cover the service hole with your hand to prevent the locking ball from flying out.

Fig. 3-51



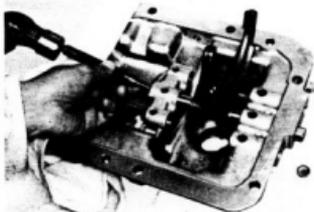
Remove the locking ball and the spring with magnet.

Fig. 3-52



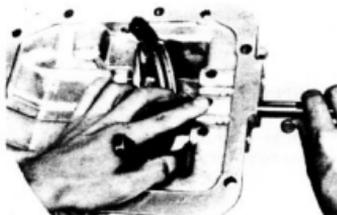
Drive out the slotted spring pin.

Fig. 3-53



Drive out the fork shaft together with the blind plug.

Fig. 3-54



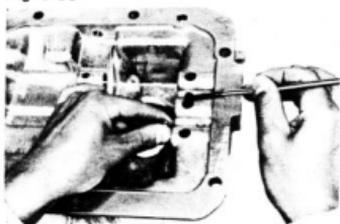
Cover the service hole with your hand to prevent locking ball from flying out.

Fig. 3-55



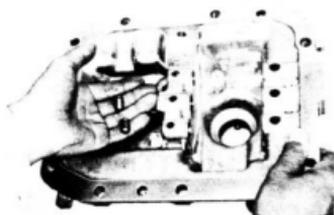
Remove the interlock pin with magnet.

Fig. 3-56



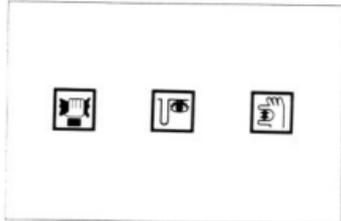
Remove the locking ball and the spring with magnet.

Fig. 3-57



Remove the interlock pins from the case cover.

Fig. 3-58



INSPECTION & REPAIR

Wash the disassembled parts and inspect them as described below. Replace any part found defective.

Fig. 3-59



Shift Lever

1. Check the sliding action of the lever.
2. Coat MP grease on the shift lever.

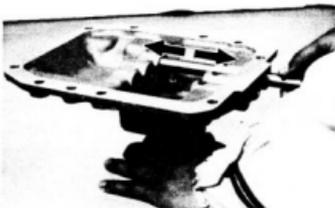
Fig. 3-60

**Shift Fork Shaft**

1. Check for wear or damage.



Fig. 3-61



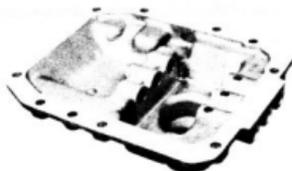
2. Check the sliding action against the case.

Fig. 3-62

**Shift Fork**

- Check for wear or damage.

Fig. 3-63

**Case**

- Check for cracks or damage.

Fig. 3-64

**Interlock Pin & Slotted Spring Pin**

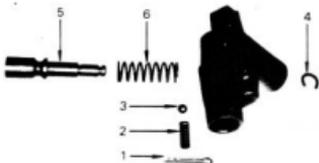
Check for wear or damage.

Fig. 3-65

**Locking Ball**

Check for wear or damage.

Fig. 3-66

**Reverse Shift Head**

1. Disassemble the shift head in the numerical order shown in the figure.
2. Reassemble in reverse sequence of disassembly.

- Note -

1. After installing the C washer, bend both ends inward.
2. Verify that the plunger slides smoothly.

ASSEMBLY

Assemble the parts in the numerical order shown in the figure.

Fig. 3-67

— Note —

Apply gear oil to all sliding, rotating and engaging parts of the transmission before assembling them.

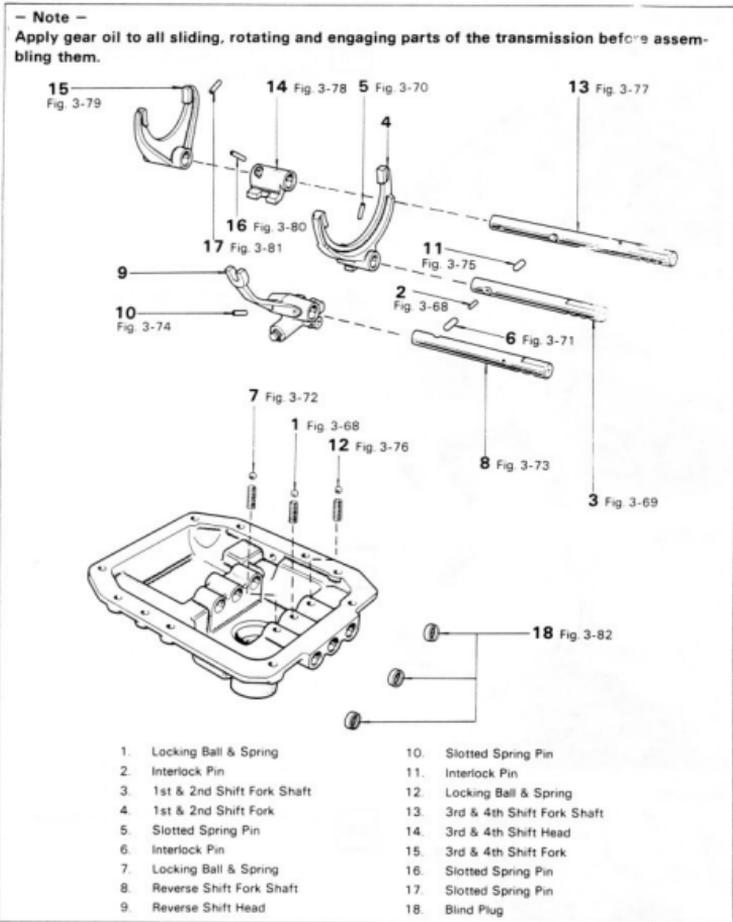
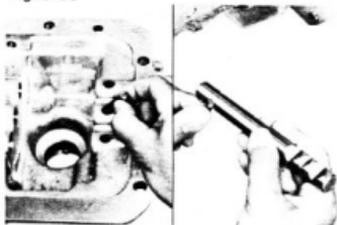
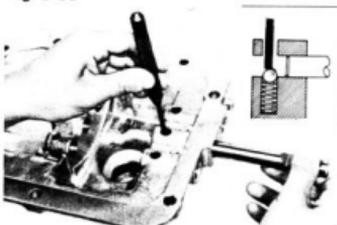


Fig. 3-68



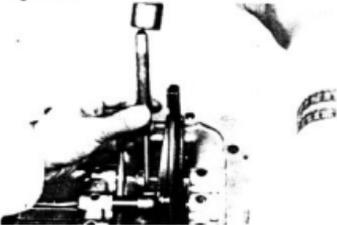
Install the spring and ball.
Install the interlock pin on the shift fork shaft with MP grease.

Fig. 3-69



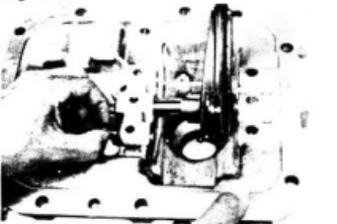
Insert the shift fork shaft over the locking ball.

Fig. 3-70



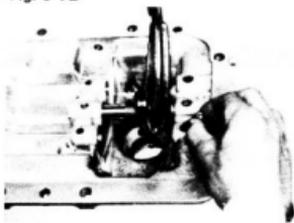
Drive in the slotted spring pin.

Fig. 3-71



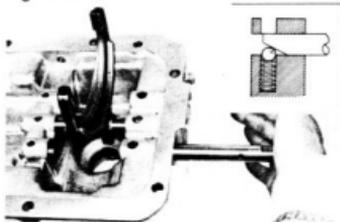
Install the interlock pin with MP grease.

Fig. 3-72



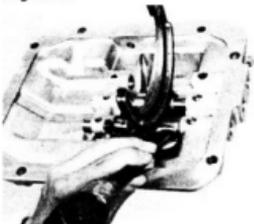
Install the spring and locking ball.

Fig. 3-73



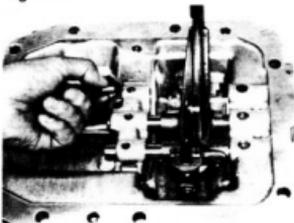
Insert the shift fork shaft over the locking ball.

Fig. 3-74



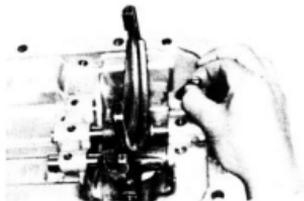
Install the slotted spring pin.

Fig. 3-75



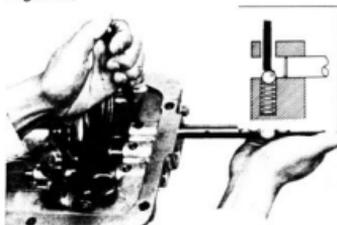
Install the interlock pin with MP grease.

Fig. 3-76



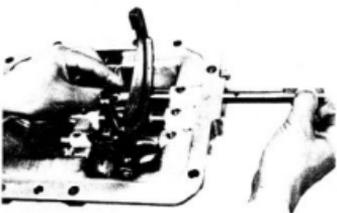
Install the spring and locking ball.

Fig. 3-77



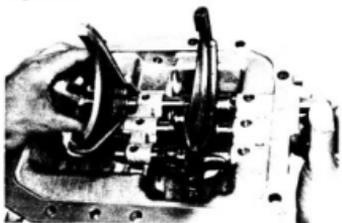
Insert the shift fork over the locking ball.

Fig. 3-78



Install the shift head.

Fig. 3-79



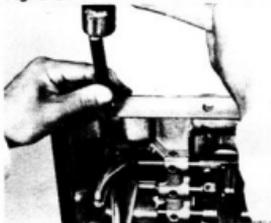
Install the shift fork.

Fig. 3-80



Install the slotted spring pin.

Fig. 3-81



Install the slotted spring pin.

Fig. 3-82



Apply liquid sealer to the blind plug before assembly.

TRANSMISSION GEAR & CASE

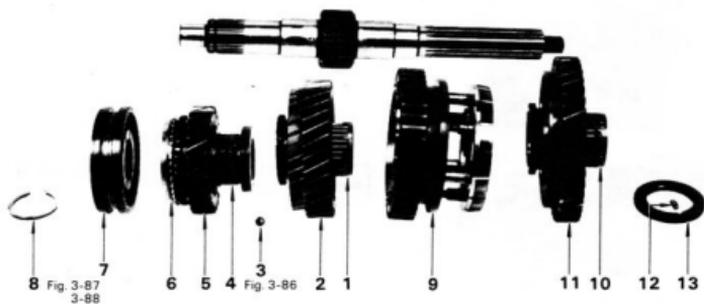
ASSEMBLY

Assemble the parts in the numerical order shown in the figure.

Fig. 3-83

— Note —

Apply gear oil to all sliding, rotating and engaging parts of the transmission before assembling them.



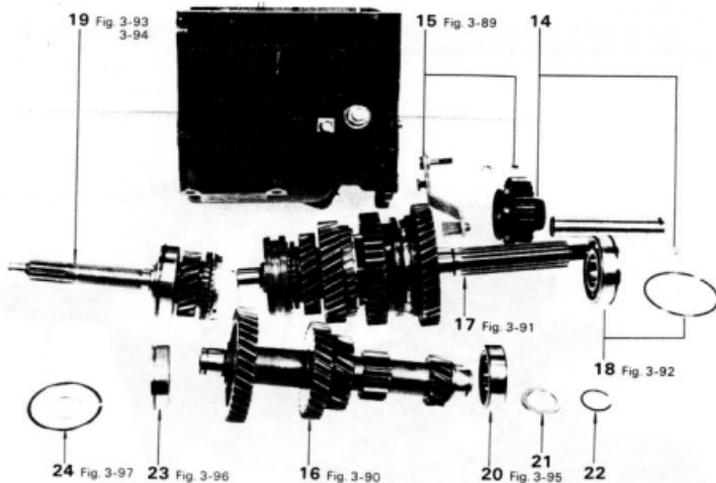
- | | |
|-----------------------------|--------------------------|
| 1. Bearing | 8. Snap Ring |
| 2. 2nd Gear | 9. No.1 Synchronzer Ring |
| 3. Locking Ball | 10. Bearing |
| 4. Bushing | 11. 1st Gear |
| 5. 3rd Gear | 12. Pin |
| 6. Synchronizer Ring | 13. Thrust Washer |
| 7. No.2 Clutch Hub & Sleeve | |

2. Assemble the parts in the numerical order shown in the figure.

Fig. 3-84

— Note —

Apply gear oil to all sliding, rotating and engaging parts of the transmission before assembling them.



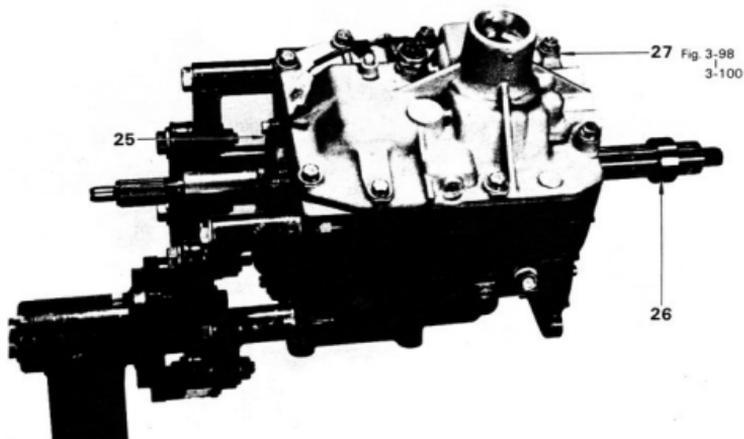
- | | | | |
|-----|--|-----|-----------|
| 14. | Idler Gear, Shaft & Key | 20. | Bearing |
| 15. | Shift Arm | 21. | Retainer |
| 16. | Countershaft | 22. | Snap Ring |
| 17. | Output Shaft | 23. | Bearing |
| 18. | Bearing | 24. | Snap Ring |
| 19. | Input Shaft, Bearing & Synchronizer Ring | | |

3. Assemble the parts in the numerical order shown in the figure.

Fig. 3-85

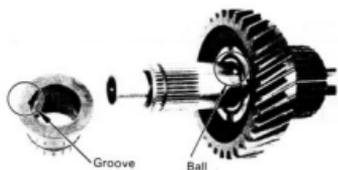
— Note —

Apply gear oil to all sliding, rotating and engaging parts of the transmission, and coat liquid sealer on the gaskets and through bolts before assembling them.



25. Front Bearing Retainer
26. Spacer
27. Case Cover

Fig. 3-86



Align the bushing groove with the ball, and install the bushing to the output shaft.

Fig. 3-87



Select a snap ring of the thickness that will reduce the clearance to a minimum.

Snap ring thickness

Mark	Thickness mm (in.)
0	2.40 - 2.45 (0.0945 - 0.0965)
1	2.45 - 2.50 (0.0965 - 0.0984)
2	2.50 - 2.55 (0.0984 - 0.1004)
3	2.55 - 2.60 (0.1004 - 0.1024)
4	2.60 - 2.65 (0.1024 - 0.1043)
5	2.65 - 2.70 (0.1043 - 0.1063)

Fig. 3-88



Measure the 2nd and 3rd gear thrust clearances.

Thrust clearance:

2nd gear

STD 0.175 - 0.0325 mm
(0.0069 - 0.0128 in.)

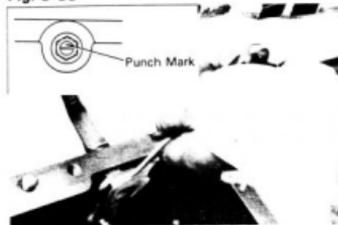
Limit 0.35 mm
(0.0138 in.)

3rd gear

STD 0.125 - 0.275 mm
(0.0049 - 0.0108 in.)

Limit 0.35 mm
(0.0138 in.)

Fig. 3-89



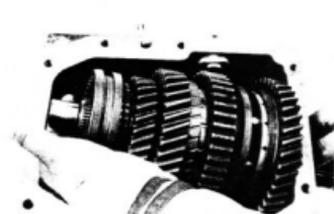
Lock the nut when the punch mark on the shift arm pivot is positioned straight up.

Fig. 3-90



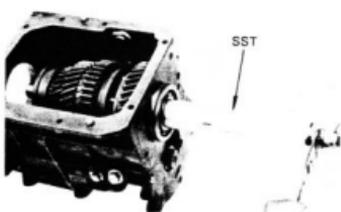
Lay the countershaft on the bottom of the transmission case.

Fig. 3-91



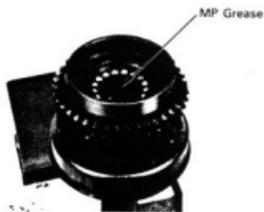
Install the output shaft assembly into the case.

Fig. 3-92



Install the bearing with SST.
SST [09309-36032]

Fig. 3-93



Apply MP grease to the input shaft and assemble the 17 bearing rollers.

Fig. 3-94



Drive in the input shaft to the case with a plastic hammer.

— Note —
Use care not to damage the synchronizer ring.

Fig. 3-95



Lift up the countershaft to proper position and install the rear bearing with a plastic hammer.

Fig. 3-96



Install the bearing with SST.
SST [09316-60010]

— Note —
Install the front and rear bearings by striking them alternately with a hammer.

Fig. 3-97



From the table below, select the thickness snap ring that will fit properly on the shaft, and install it with SST.
SST [09905-00012]

Snap ring thickness

Mark	Thickness mm (in.)
0	2.05 - 2.10 (0.0807 - 0.0827)
2	2.15 - 2.20 (0.0846 - 0.0866)
4	2.25 - 2.30 (0.0886 - 0.0906)

Fig. 3-98



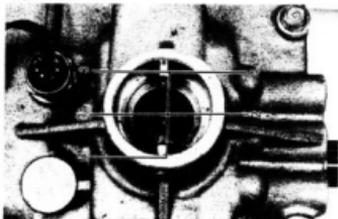
Tighten the case cover set bolts to the specified torque.

**Tightening torque: 3.0–4.5 kg-m
(22–32 ft-lb)**

— Note —

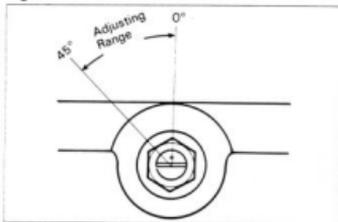
Have the case cover assembly and the gears in neutral position before installation.

Fig. 3-99



Install the shift lever temporarily, and while turning the input shaft, check the shifting and output shaft rotational relationship.

Fig. 3-100

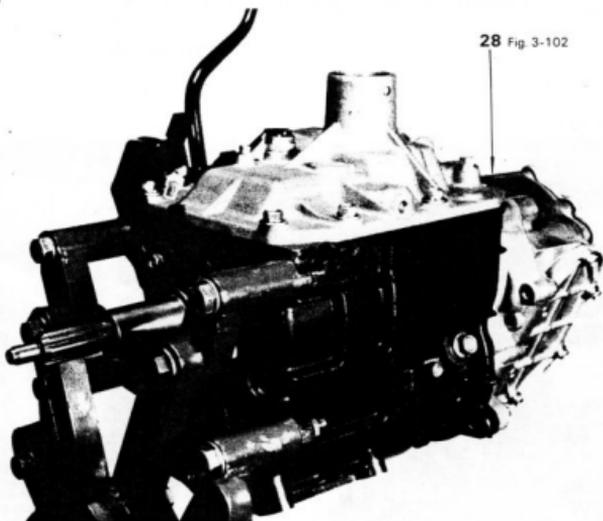


Adjust the reverse shift link.

1. Verify that no abnormal noise develops when the input shaft is turned or when the gear is shifted into reverse.
2. If abnormal noise is produced, correct by adjusting the shift link within a range of zero to 45° of the marker point.

4. Assemble the parts in the numerical order shown in the figure.

Fig. 3-101



28. Transfer

Fig. 3-102

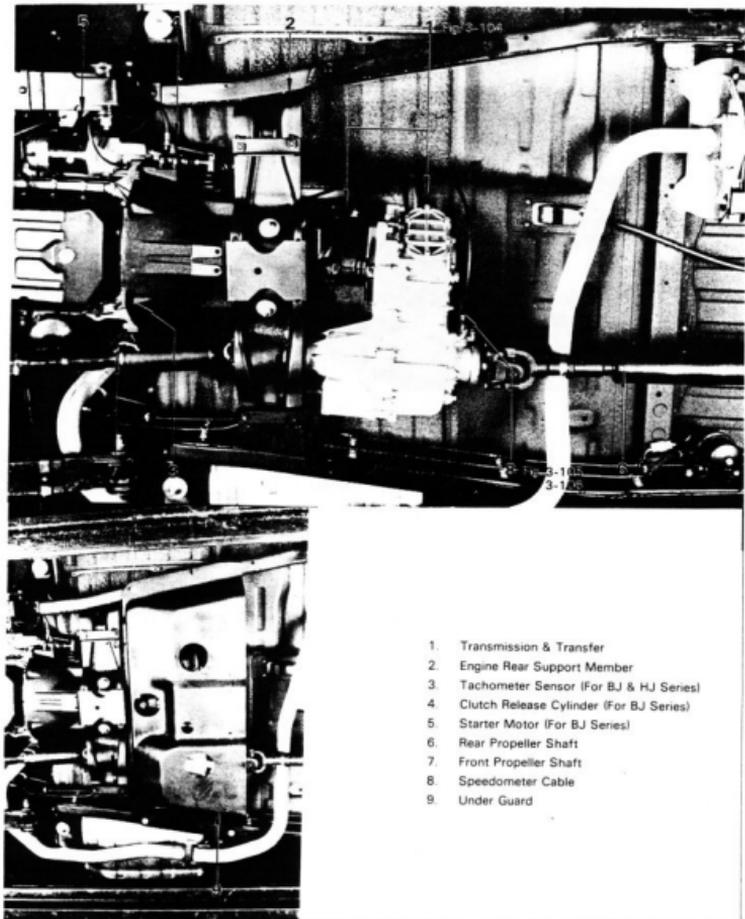
**SEE
TRANSFER ASSEMBLY
SECTION
Fig. 4-45 to 4-88**

Install the transfer.

INSTALLATION

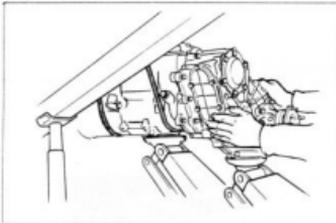
1. Install the parts in the numerical order shown in the figure.

Fig. 3-103



1. Transmission & Transfer
2. Engine Rear Support Member
3. Tachometer Sensor (For BJ & HJ Series)
4. Clutch Release Cylinder (For BJ Series)
5. Starter Motor (For BJ Series)
6. Rear Propeller Shaft
7. Front Propeller Shaft
8. Speedometer Cable
9. Under Guard

Fig. 3-104



Support the transmission and transfer assembly with a jack and rope, and install.

Tightening torque: 5.0 – 8.0 kg-m
(37 – 57 ft-lb)

Fig. 3-105



Fill the transmission and transfer with gear oil.

Transmission oil capacity:

3.1 liters (3.3 US qt., 2.7 Imp. qt.)

Type: SAE90, API GL-4 or GL-5

Fig. 3-106



Transfer oil capacity:

w/o Power take off

2.5 liters (2.6 US qt., 2.2 Imp. qt.)

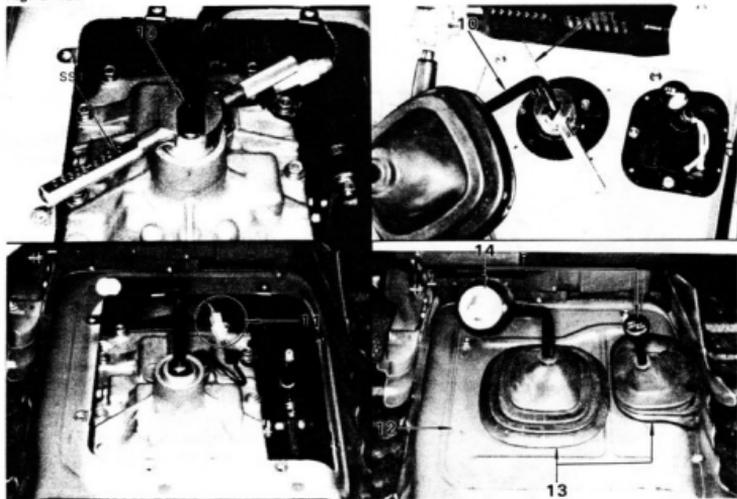
w/ Power take off

3.1 liters (3.3 US qt., 2.7 Imp. qt.)

Type: SAE90, API GL-4 or GL-5

2. Install the parts in the numerical order shown in the figure.

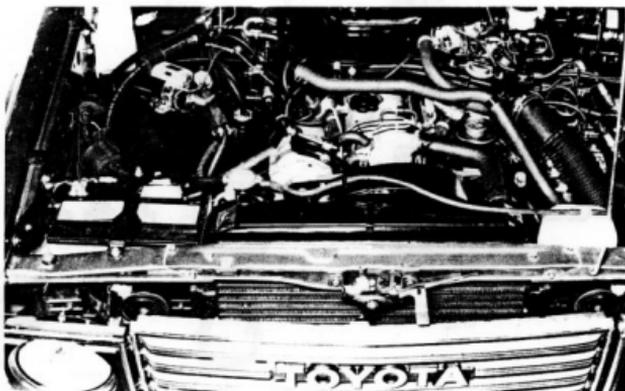
Fig. 3-107



10. Shift Lever
SST [09305-55010]
11. Back-up Light Switch Connector
12. Service Hole Cover
13. Boot
14. Knob

- 3 Install the parts in the numerical order shown in the figure.

Fig. 3-108



15. Carpet or Mat
16. Heater Duct
17. Cowl Side Trim

18. Scuff Plate
19. Battery Terminal

Fig. 3-109

SEE
4-SPEED TRANSMISSION
REMOVAL SECTION

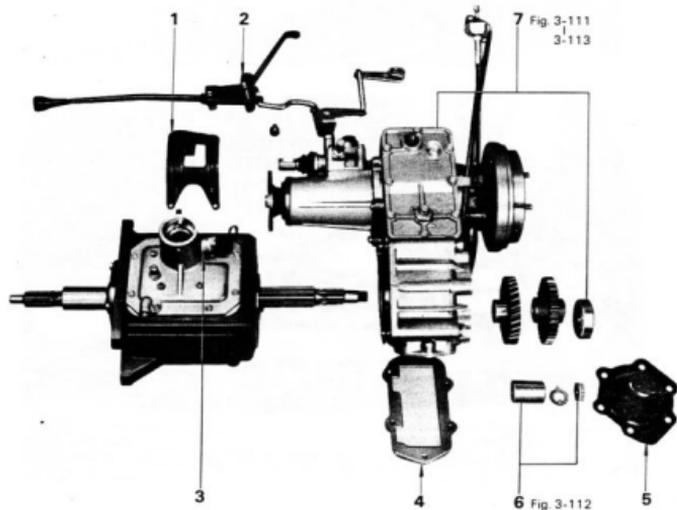
Fig. 3-2 to 3-5

3-SPEED TRANSMISSION (J30)

REMOVAL

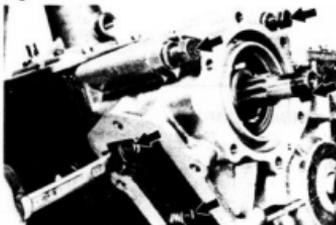
1. Remove the transmission with transfer from the vehicle.
2. Drain the transmission and transfer oil.
3. Remove the transfer to the transmission in the numerical order shown in the figure.

Fig. 3-110



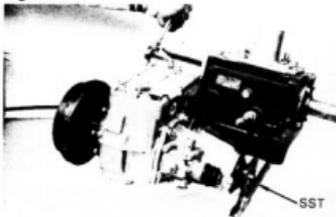
1. Shift Lever Guide
2. Lever & Rod
3. Back-up Light Switch
4. Power Take Off or Cover
5. No.2 Case Cover
6. Spacer, Washer & Nut
7. Transfer, Gear & Bearing

Fig. 3-111



Remove the five bolts.

Fig. 3-112

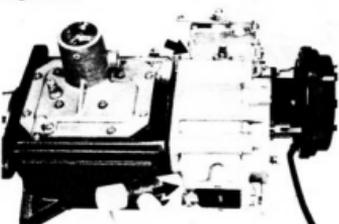


Loosen the staked parts of the nuts.
Hold the output shaft with SST.
SST [09330-00020]

— Note —

Perform the work at front drive condition.

Fig. 3-113

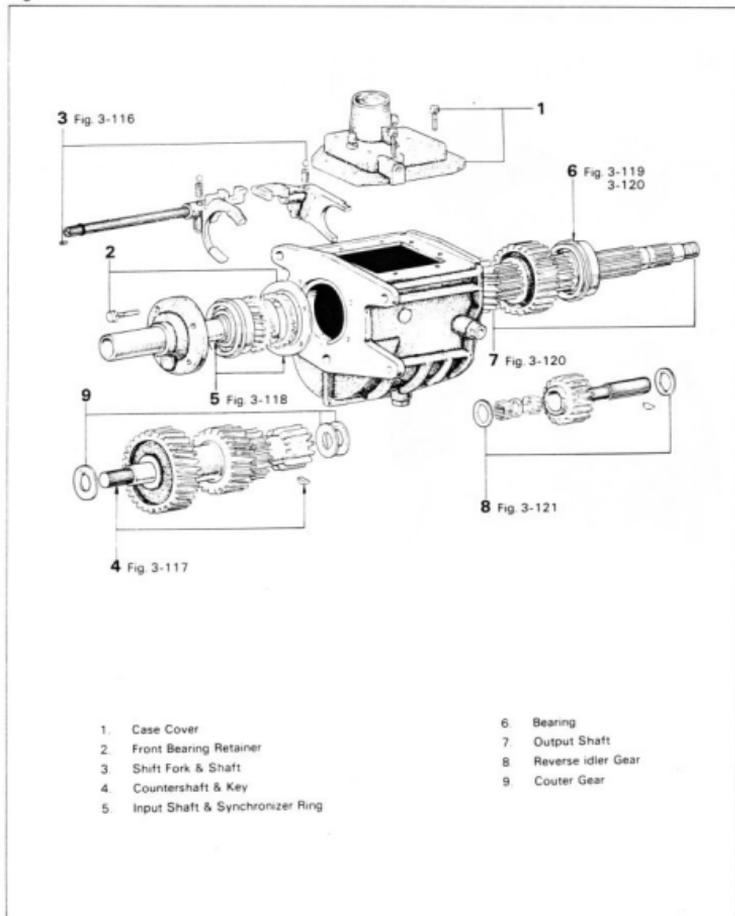


Tap out the transfer assembly.

DISASSEMBLY

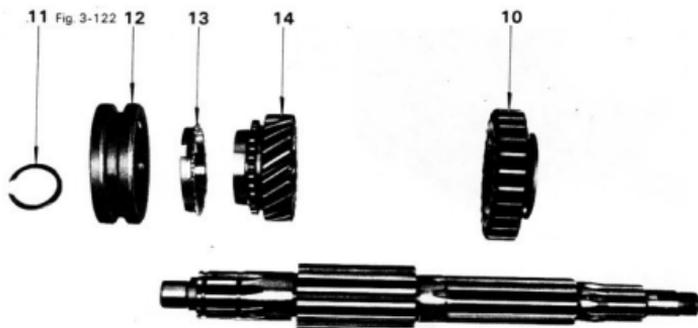
1. Disassemble the parts in the numerical order shown in the figure.

Fig. 3-114



2. Disassemble the parts in the numerical order shown in the figure.

Fig. 3-115



10. 1st & Reverse Gear
11. Snap Ring
12. Clutch Hub & Sleeve

13. Synchronizer Ring
14. 2nd Gear

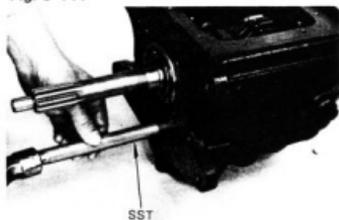
Fig. 3-116



Drive out the shaft toward the front.

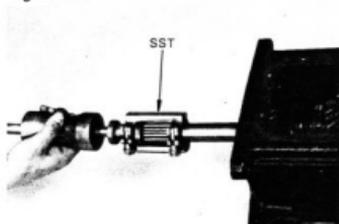
— Note —
Cover the locking ball hole with your finger so as to prevent the locking ball from jumping out.

Fig. 3-117



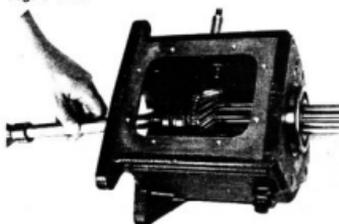
Drive out the shaft toward the rear with SST.
SST [09311-60010]

Fig. 3-118



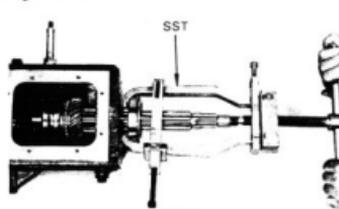
Remove the input shaft with SST.
SST [09910-00014]

Fig. 3-119



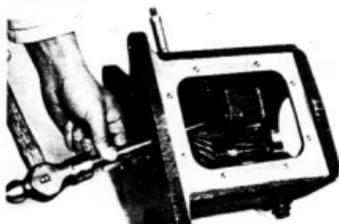
Using a brass bar, hammer the output shaft
until the bearing is separated from the case.

Fig. 3-120



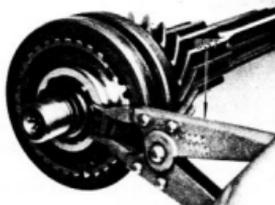
Remove the bearing with SST.
SST [09950-20014]

Fig. 3-121



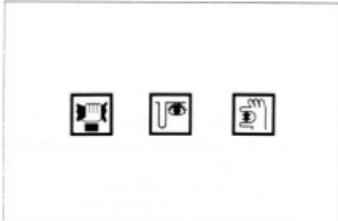
Using a drift pin, drive out the shaft.

Fig. 3-122



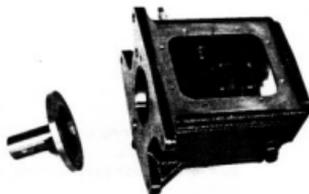
Remove the snap ring with SST.
SST [09905-00012]

Fig. 3-123

**INSPECTION**

After washing all disassembled parts, inspect them as instructed below. Replace all parts that are found defective.

Fig. 3-124

**Transmission Case & Front Bearing Retainer**

Inspect for wear or damage.

Fig. 3-125

**Output Shaft**

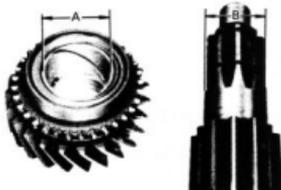
Inspect the shaft for wear or damage at the surfaces where the gears and bearing are installed.

Fig. 3-126

**1st Gear, 2nd Gear & Bearing**

1. Inspect the gears for wear or damage at the teeth, thrust faces, inside diameter surfaces, and coned parts.
2. Inspect the output shaft rear bearing for wear or damage.

Fig. 3-127

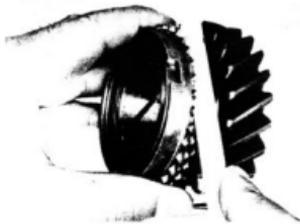


3. Measure the oil clearance.

2nd gear bushing oil clearance (A - B):

Limit 0.09 mm
(0.0035 in.)

Fig. 3-128

**Synchronizer Ring**

1. Fit the synchronizer ring on the gear and measure the clearance.

2nd & 3rd gear synchronizer ring clearance:

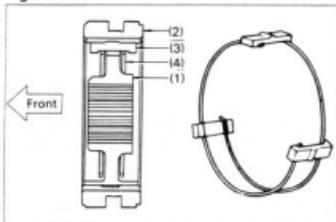
Limit 0.8 mm
(0.031 in.)

Fig. 3-129

**Clutch Hub Sleeve, Clutch Hub, Shifting Key & Shifting Key Spring**

1. Disassemble the clutch hub and sleeve.
2. Inspect the splines of hub and hub sleeve for wear or damage.
3. Inspect the humped part at center of key for wear or damage.
4. Inspect the key springs for weakening or damage.

Fig. 3-130



5. Assemble the hub sleeve (2), three shifting keys (3) and two key springs (4) to the clutch hub (1).

— Note —

1. Hub and hub sleeve are parts having directionality.
2. Install the key springs positioned so that their end gaps will not be in line.
3. Check the hub and hub sleeve to see that they slide smoothly together.

Fig. 3-131

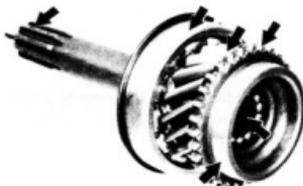
**Shift Fork**

Check the clearance between the hub sleeve groove and the shift fork.

Clearance:

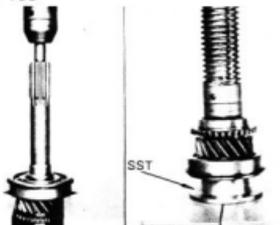
Limit 0.8 mm
(0.031 in.)

Fig. 3-132

**Input Shaft**

1. Inspect the gear teeth, splines, coned surfaces, and bearings for wear or damage.

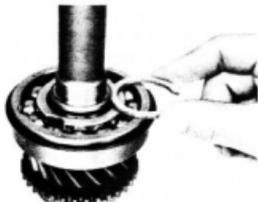
Fig. 3-133



2. Replace the input shaft bearing.

- (1) Remove the snap ring with SST.
- SST [09905-000012]
- (2) Remove the bearing with a press.
- (3) Using a press and SST, install the bearing.
- SST [09316-60010]

Fig. 3-134



- (4) Select a snap ring of the thickness that will allow minimum axial play, and install it on the shaft.

Snap ring thickness

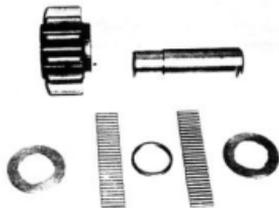
Part No.	Thickness mm (in.)
90520-33010	2.43-2.57 (0.0957-0.1012)
90520-33011	2.30-2.42 (0.0906-0.0953)

Fig. 3-135

**Counter Gear & Countershaft**

1. Inspect the counter gear teeth for wear or damage.
2. Inspect the bearings and countershaft for wear or damage.
3. Inspect the thrust washers for wear or damage.

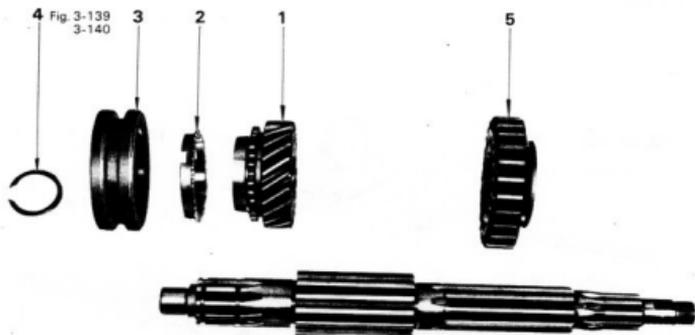
Fig. 3-136

**Reverse Idler Gear, Bearing & Shaft**

- Inspect the gear, bearings, and shaft for wear or damage.

ASSEMBLY

1. Assemble the parts in the numerical order shown in the figure.

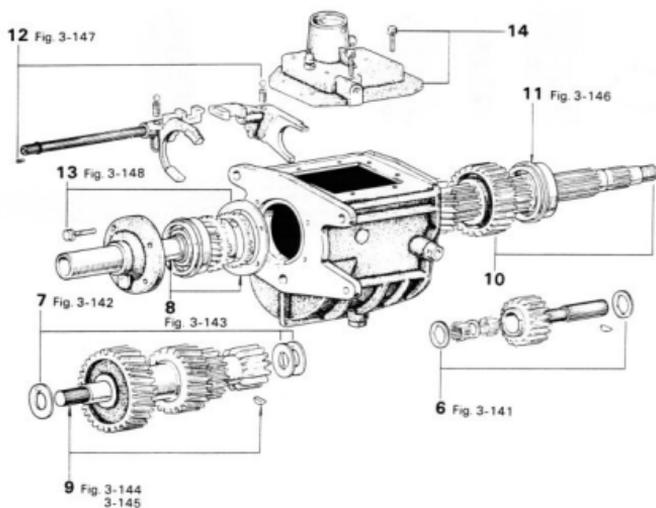
Fig. 3-137

1. 2nd Gear
2. Synchronizer Ring
3. Clutch Hub & Sleeve

4. Snap Ring
5. 1st & Reverse Gear

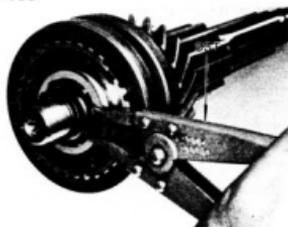
2. Assemble the parts in the numerical order shown in the figure.

Fig. 3-138



- | | |
|------------------------------------|----------------------------|
| 6. Reverse Idler Gear | 11. Bearing |
| 7. Counter Gear | 12. Shift Fork & Shaft |
| 8. Input Shaft & Synchronizer Ring | 13. Front Bearing Retainer |
| 9. Countershaft & Key | 14. Case Cover |
| 10. Output Shaft | |

Fig. 3-139



Install the snap ring with SST.
SST [09905-00012]

Fig. 3-140



Measure the 2nd gear thrust clearance.

Thrust clearance:

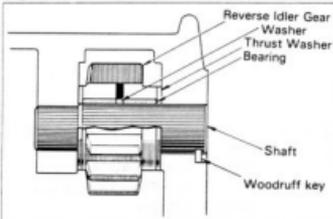
STD 0.10–0.40 mm
(0.0039–0.0157 in.)

Limit 0.4 mm
(0.016 in.)

Snap ring thickness

Part No.	Thickness mm (in.)
90520-33132	2.35–2.40 (0.0925–0.0945)
90520-33172	2.25–2.30 (0.0886–0.0906)

Fig. 3-141

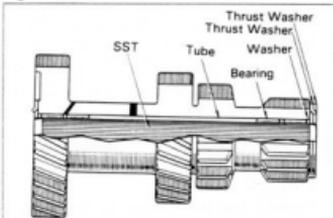


Install as illustrated at left.

– Note –

Coat MP grease on the bearing, washer, and spacer before installing.

Fig. 3-142

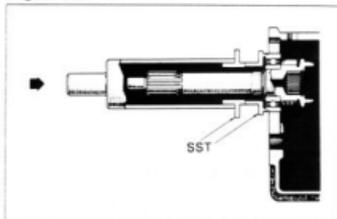


Assemble the counter gear assembly as illustrated at left, and install in the case with SST.
SST [09311-60010]

– Note –

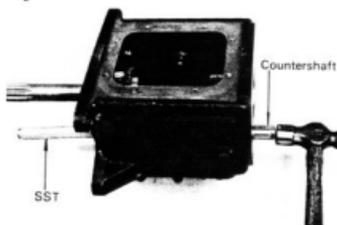
Coat MP grease on the bearing, washer, and spacer before installing.

Fig. 3-143



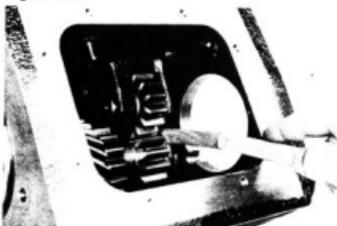
Drive in the input shaft with SST.
SST [09316-60010]

Fig. 3-144



Drive in the countershaft and key.

Fig. 3-145



Measure the counter gear thrust clearance.

Thrust clearance:

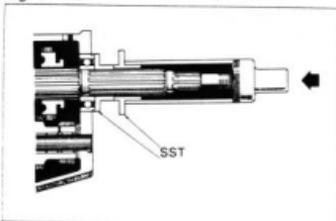
STD 0.10–0.40 mm
(0.0039–0.0157 in.)

Limit 0.4 mm
(0.016 in.)

Thrust washer thickness

Part No.	Thickness mm (in.)
33441-61010	1.45–1.50 (0.0571–0.0591)
33442-61010	1.50–1.55 (0.0591–0.0610)
33443-61010	1.55–1.60 (0.0610–0.0630)

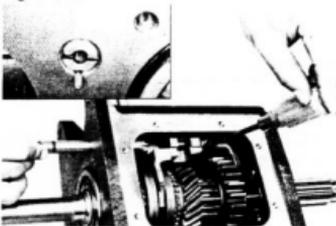
Fig. 3-146



Drive in the bearing with SST.
SST [09316-60010]

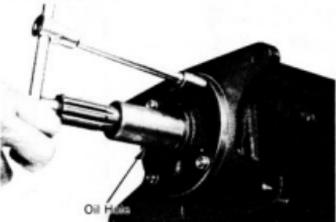
– Note –
Position the hub sleeve at 3rd gear, and insert the output shaft assembly into the case.

Fig. 3-147



While holding down the locking ball, drive in the shaft, and then lock the shaft with a straight pin.

Fig. 3-148

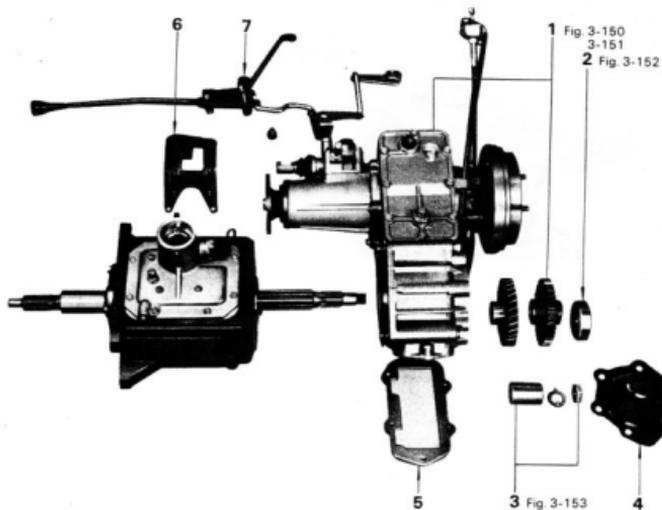


Install the retainer with its oil hole positioned downward.

INSTALLATION

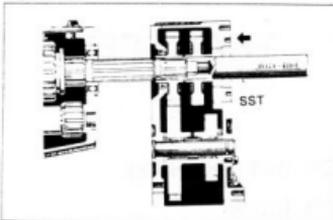
Install the parts in the numerical order shown in the figure.

Fig. 3-149



- | | |
|-------------------------|----------------------------|
| 1. Transfer & Gear | 5. Power Take Off or Cover |
| 2. Bearing | 6. Shift Lever Guide |
| 3. Spacer, Washer & Nut | 7. Lever & Rod |
| 4. No. 2 Case Cover | |

Fig. 3-150



Mount SST to the output shaft.

While supporting the gears with one hand, install the transfer assembly together with the gears to the SST.

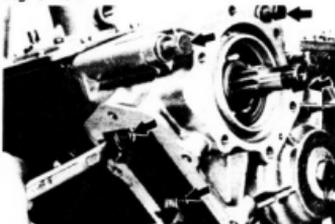
Align the splines of the output shaft and gears, and install the transfer to the transmission. SST [09323-60010]

— Note —

Make sure that the gears are positioned in correct direction.

Remove the SST from the output shaft.

Fig. 3-151

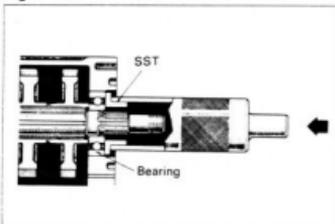


Tighten the five bolts at the specified torque.

Tightening torque:

5.0 – 8.0 kg-m
(37 – 57 ft-lb)

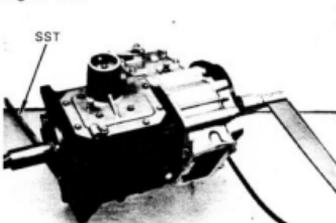
Fig. 3-152



Drive in the bearing with SST.

SST [09316-60010]

Fig. 3-153



Keep the transfer output shaft from turning and tighten the nut with SST.

SST [09330-00020]

Tightening torque:

11.0 – 14.0 kg-m
(80 – 101 ft-lb)

Secure the nut with lock washer.

— Note —

Perform the work with transmission in front drive.

TRANSFER

	Page
TRANSFER (H41 & H42)	4-2
TRANSFER (J30)	4-26

Fig. 4-1

SEE
TRANSMISSION
REMOVAL SECTION

Fig. 3-2 to 3-5

TRANSFER (H41 & H42) REMOVAL

Remove the transmission.

DISASSEMBLY

1. Disassemble the parts in the numerical order shown in the figure.

Fig. 4-2

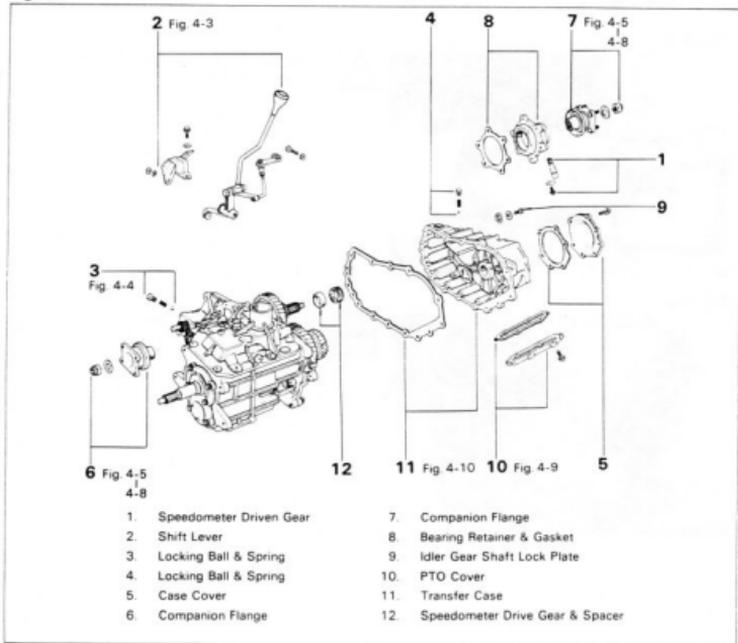


Fig. 4-3



Shift the shift lever into neutral position and measure the preload.

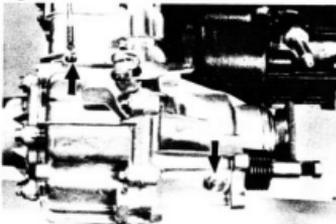
Preload (starting):**New Bearing**

15 – 24.7 kg-cm
(13.0 – 21.4 in.-lb)

Reused Bearing

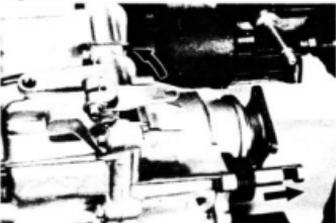
7 – 12 kg-cm
(6.1 – 10.4 in.-lb)

Fig. 4-4



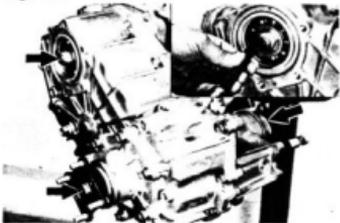
Remove the springs and the steel balls with a magnet.

Fig. 4-5



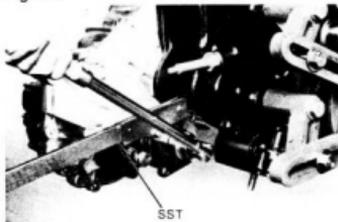
Shift the shift lever into 4L position before loosening the nuts.

Fig. 4-6



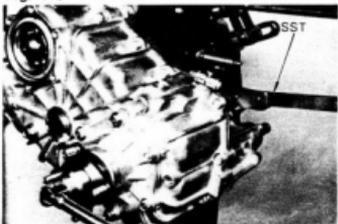
Partially loosen the nuts.

Fig. 4-7



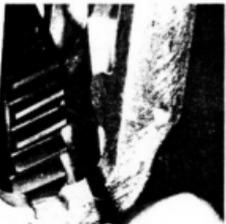
Remove the nut with SST.
SST [09330-00020]

Fig. 4-8



Remove the nut with SST.
SST [09330-00020]

Fig. 4-9

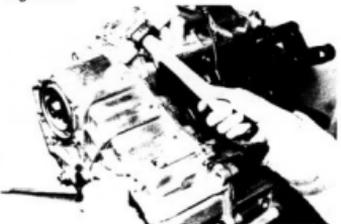


Measure the idler gear thrust clearance.

Thrust clearance:

STD	0.275 – 0.625 mm (0.0108 – 0.0246 in.)
Limit	0.625 mm (0.0246 in.)

Fig. 4-10



Shift the shift select lever into high position.
Tap on the case protrusion to separate the
transfer case from intermediate plate.

2. Disassemble the parts in the numerical order shown in the figure.

Fig. 4-11

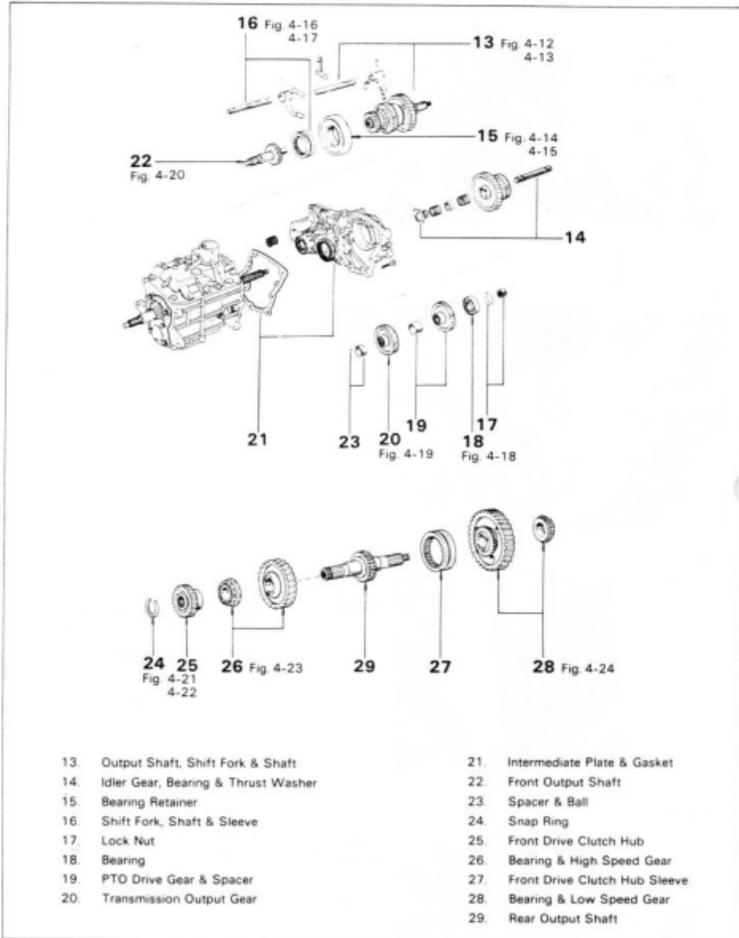
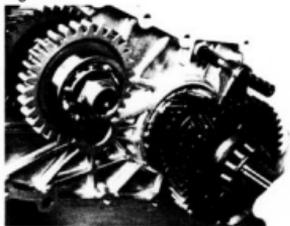


Fig. 4-12



Pull out the output shaft with gears from the intermediate plate.

— Note —

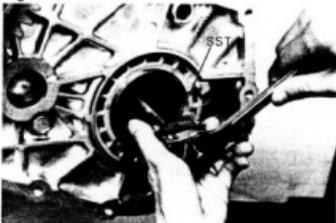
Pull out the output shaft together with the shift fork.

Fig. 4-13



Drive out the slotted spring pin.

Fig. 4-14



Remove the bearing retainer with SST.
SST [09308-10010]

Fig. 4-15

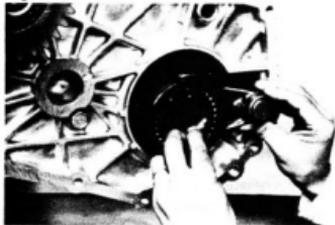


Remove the outer race.

— Note —

Heat the retainer to 80°C (176°F) and tap out the outer race.

Fig. 4-16



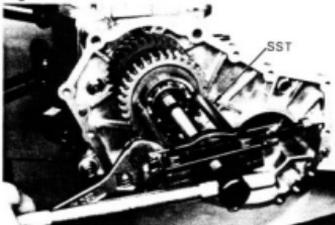
Pull out the clutch sleeve and shift fork with shaft.

Fig. 4-17



Drive out the slotted spring pin.

Fig. 4-18



Remove the bearing with SST.
SST [09950-20014]

Fig. 4-19



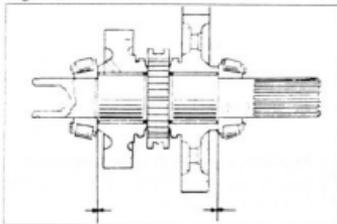
Using SST or suitable tool, pull out the gear.
SST [09950-20014]

Fig. 4-20



Using a press, remove the front output shaft.

Fig. 4-21



Measure the high and low gears thrust clearance.

Thrust clearance:

STD 0.10–0.25 mm
(0.0039–0.0098 in.)

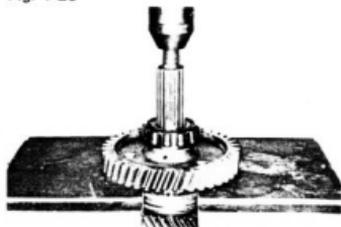
Limit 0.25 mm
(0.0098 in.)

Fig. 4-22



Remove the snap ring with SST.
SST [09905-00012]

Fig. 4-23



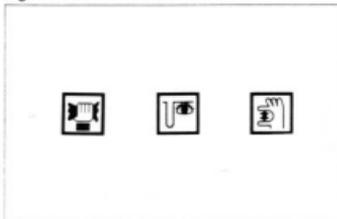
Using a press, remove the bearing.

Fig. 4-24



Using a press, remove the bearing.

Fig. 4-25



INSPECTION & REPAIR

Wash the disassembled parts and inspect them as described below. Replace any part found defective.

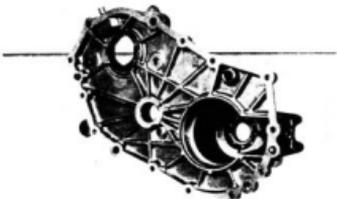
Fig. 4-26



Transfer Case & Bearing Retainer

Inspect the case, oil seal and bearing retainer for cracks or damage.

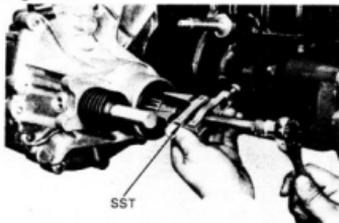
Fig. 4-27



Intermediate Plate

Inspect the shaft, bearing, oil seal, and plate for wear, cracks or damage.

Fig. 4-28



Replace The Output Shaft Front Bearing

1. Remove the oil seal with SST.
SST [09308-10010]

Fig. 4-29



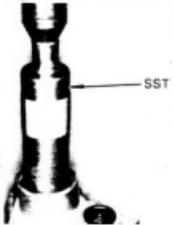
2. Remove the snap ring.

Fig. 4-30



3. Remove the bearing with a press and SST.
SST [09316-60010]

Fig. 4-31



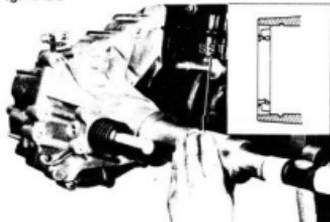
4. Install the bearing with a press and SST.
SST [09316-60010]

Fig. 4-32



5. Install the snap ring.

Fig. 4-33



6. Install a new oil seal to the correct depth with SST.
SST [09316-60010]
Oil seal depth: 0 - 1 mm
(0 - 0.04 in.)

Fig. 4-34



Output Shaft

Inspect for wear or damage.



Fig. 4-35



Replace The Output Shaft Bearing

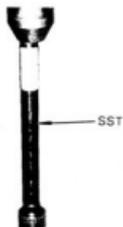
1. Remove the bearing with SST.
SST [09319-60020]



— Note —

If you remove the bearing, the bearing is broken.

Fig. 4-36



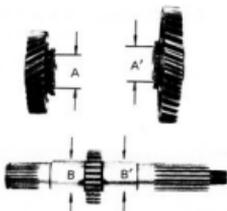
2. Press in the new bearing with SST.
SST [09608-20011] No.2

Fig. 4-37

**Gear**

Inspect the teeth, thrust faces and inside diameter surfaces for wear or damage.

Fig. 4-38



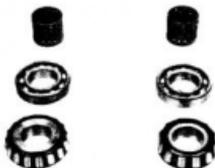
Measure the oil clearance

High & low speed output gear:

STD 0.035–0.081 mm
(0.0014–0.0032 in.)

Limit 0.081 mm
(0.0032 in.)

Fig. 4-39

**Bearing**

Inspect for wear or damage.

Fig. 4-40

**Sleeve & Fork**

Check the clearance between the sleeves and the shift forks.

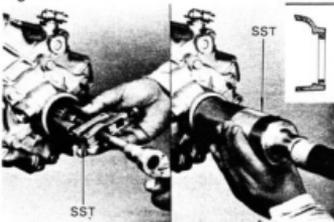
Clearance: 0.1–0.4 mm
(0.004 – 0.016 in.)

Fig. 4-41

**Idler Gear**

Inspect for wear or damage.

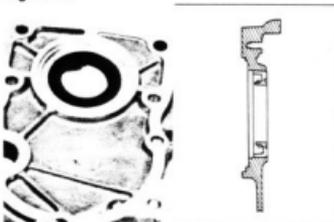
Fig. 4-42

**Replace The Transfer Rear Oil Seal**

1. Remove the oil seal with SST.
2. Install the oil seal to the correct depth with SST.

Oil seal depth: 0.5 – 1.5 mm
(0.020 – 0.059 in.)

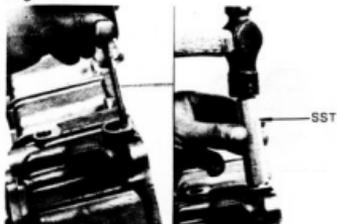
Fig. 4-43

**Replace The Transmission Rear Oil Seal**

1. Remove the oil seal with driver.
2. Install the oil seal to the correct depth with SST.

Oil Seal Depth: 7 – 8 mm
(0.028 – 0.31 in.)

Fig. 4-44

**High & Low Gear Select Lever Oil Seal**

1. Remove the oil seal by prying it with a screwdriver.
2. Install the oil seal to the correct depth with SST.

SST [09608-20011] No.2

Oil Seal depth: 0 - 1 mm
(0 - 0.04 in.)

ASSEMBLY

1. Assemble the parts in the numerical order shown in the figure.

Fig. 4-45

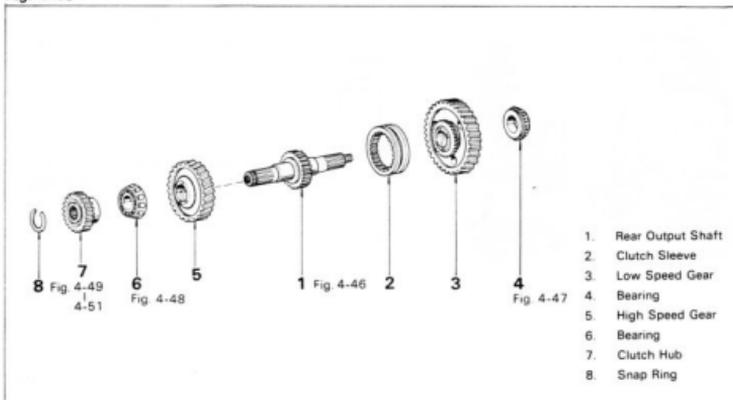
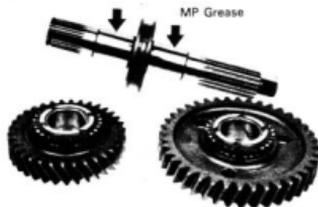
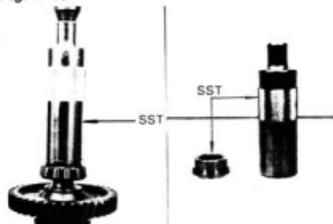


Fig. 4-46



Coat MP grease on the shaft and install the high and low gears.

Fig. 4-47



Install a bearing with a press and SST.
SST [09316-60010]

Fig. 4-48



Install a bearing with a press and SST.
SST [09316-60010]

Fig. 4-49



Select a snap ring of a thickness that will allow minimum axial play.

Axial play:

STD 0.003–0.299 mm
(0.0012–0.0118 in.)

Mark	Thickness	mm (in.)
90520-33107	2.30 – 2.35 (0.0906 – 0.0925)	
90520-33110	2.60 – 2.65 (0.1024 – 0.1043)	

Fig. 4-50



Install the snap ring with SST.
SST [09905-00012]

Fig. 4-51



Apply gear oil on the assembled parts, gears, bearings and shaft.

2. Assemble the parts in the numerical order shown in the figure.

Fig. 4-52

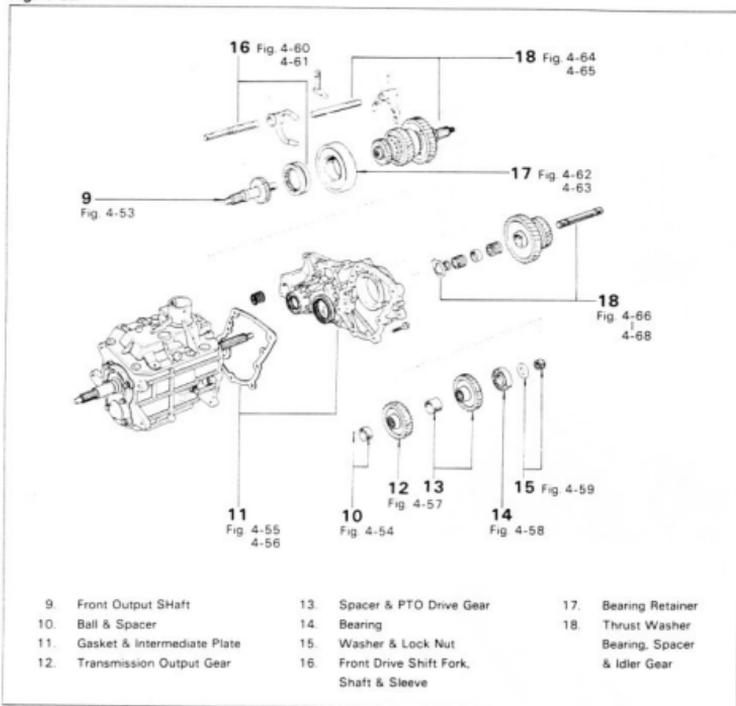
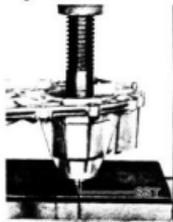


Fig. 4-53



Press in the shaft with SST.
SST [09316-60010]



Fig. 4-54



Fit the collar groove securely over the locking ball.

Fig. 4-55



Coat MP grease on the oil seal.

Fig. 4-56

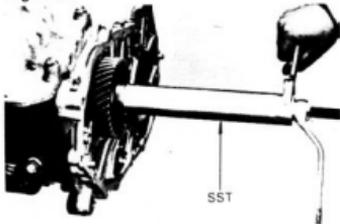


1. Apply liquid sealer to the bolts.
2. Install the intermediate plate mounting bolts in the position shown in the figure.

Tightening torque:

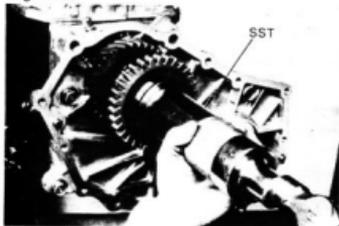
**5.0–8.0 kg-m
(37–57 ft-lb)**

Fig. 4-57



Install the gear with SST.
SST [09309-36032]

Fig. 4-58



Drive in the bearing with SST.
SST [09316-60010]

Fig. 4-59



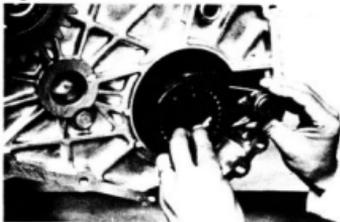
Temporarily tighten the lock nut.

Fig. 4-60



Drive in the slotted spring pin.

Fig. 4-61



Install the shift fork, shaft and clutch hub sleeve.

Fig. 4-62



Install the outer races with SST.
SST [09316-60010]

Fig. 4-63



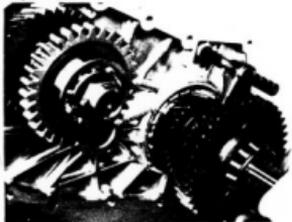
Install the bearing retainer by tapping with the plastic hammer.

Fig. 4-64



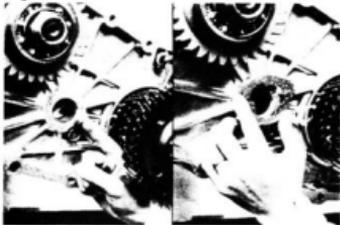
Drive in the slotted spring pin.

Fig. 4-65



Install the shift fork, shaft and output shaft together.

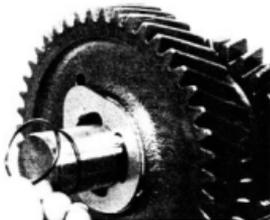
Fig. 4-66



Stick the thrust washer to the plate with MP grease.

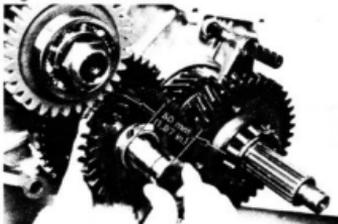


Fig. 4-67



Install the O ring on the shaft.

Fig. 4-68



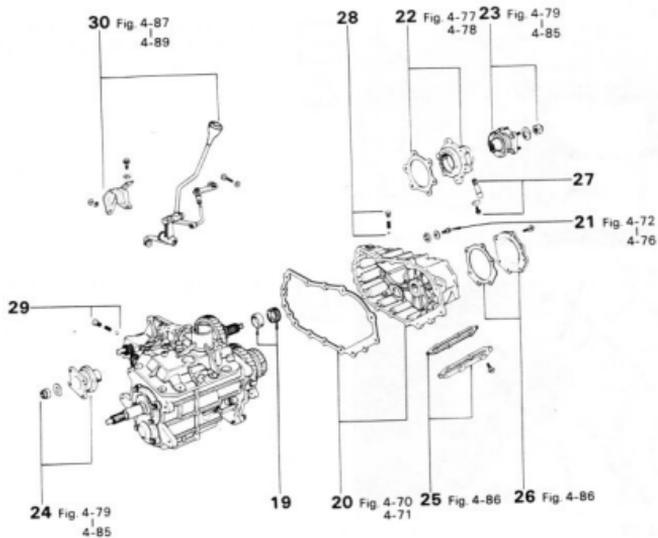
Do not completely insert the idler gear shaft.

-Note-

Do not install the rear side O ring on the shaft.

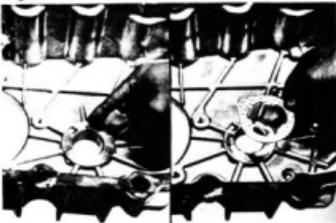
3. Assemble the parts in the numerical order shown in the figure.

Fig. 4-69



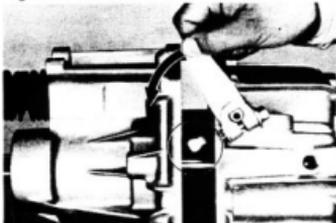
- | | | | |
|----|---------------------------------|----|-------------------------|
| 19 | Spacer & Speedometer Drive Gear | 25 | Cover |
| 20 | Gasket & Transfer Case | 26 | Cover |
| 21 | O Ring & Lock Plate | 27 | Speedometer Driven Gear |
| 22 | Bearing Retainer | 28 | Locking Ball & Spring |
| 23 | Companion Flange | 29 | Locking Ball & Spring |
| 24 | Companion Flange | 30 | Shift Lever |

Fig. 4-70



Stick the thrust washer to the case with MP grease.

Fig. 4-71



When installing the case, turn the select lever counterclockwise and engage the lever tip to the shaft groove.

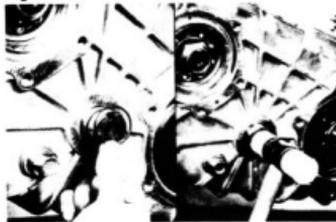


Fig. 4-72



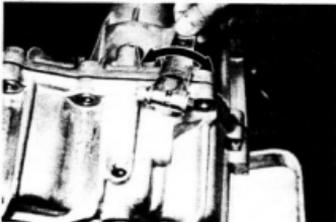
Align the shaft groove to the bolt hole.

Fig. 4-73



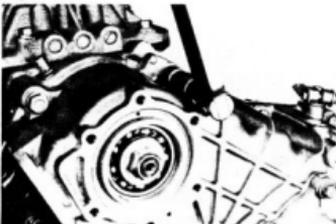
Install the O ring on the shaft and drive in the shaft by tapping with plastic hammer.

Fig. 4-74



After installing the case, check that shifting is smooth to high and low gears.

Fig. 4-75



Apply liquid sealer to the bolts.

Tightening torque:

10 mm ϕ bolt	3.5 – 4.5 kg-m (26 – 32 ft-lb)
12 mm ϕ bolt	5.0 – 8.0 kg-m (37 – 57 ft-lb)

Fig. 4-76



Measure the idler gear thrust clearance.

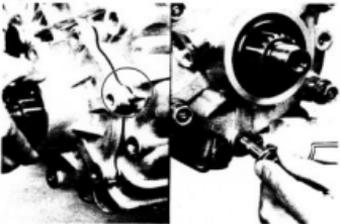
Thrust clearance:

STD	0.275 – 0.625 mm (0.0108 – 0.0246 in.)
Limit	0.625 mm (0.0246 in.)

– Note –

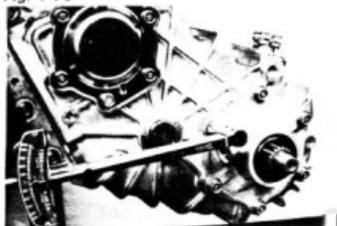
If over the limit, select proper size thrust washer.

Fig. 4-77



Align the bearing retainer rib with case rib.
Apply liquid sealer to the bolt.

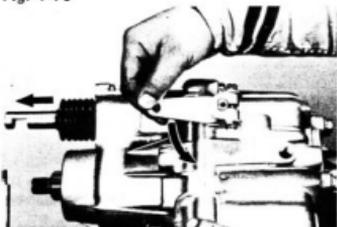
Fig. 4-78



Tighten the bearing retainer.

Tightening torque: 3.0 – 4.5 kg-m
(22 – 23 ft-lb)

Fig. 4-79



Shift the shift lever into the L4 position.

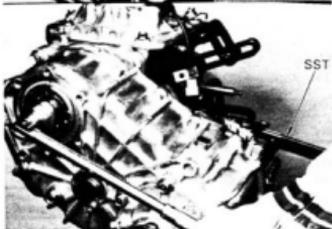
Fig. 4-80



Tighten the front and rear companion flange nuts with SST.

SST [09330-00020]

Tightening torque: 14.0 – 17.0 kg-m
(102 – 122 ft-lb)



Tighten the transmission rear bearing lock nut with SST.

SST [09330-00020]

Tightening torque: 14.0 – 17.0 kg-m
(102 – 122 ft-lb)

Fig. 4-81

Preload adjusting procedure

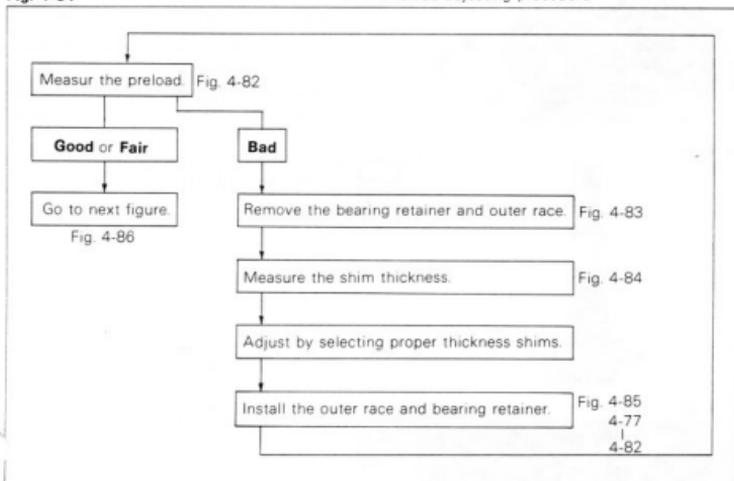


Fig. 4-82



Disengage the front drive.

Using a spring scale, measure the output shaft bearing preload.

Preload:**New bearing**

15 – 24.7 kg-cm
(13.0 – 21.4 in.-lb)

Reused bearing

7 – 12 kg-cm
(6.1 – 10.4 in.-lb)

—Note—

Shift into neutral position.

Fig. 4-83



If not within the preload adjust by selecting proper thickness shims.

1. Remove the bearing outer race.

Fig. 4-84



2. Select the shim.

Shim thickness mm (in.)

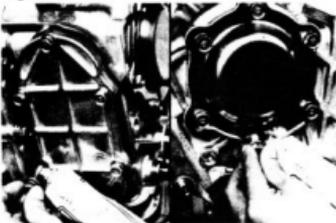
Mark	Thickness	Mark	Thickness
0	0.15 (0.0059)	10	1.0 (0.039)
4	0.4 (0.016)	11	1.1 (0.043)
5	0.5 (0.020)	12	1.2 (0.047)
6	0.6 (0.024)	13	1.3 (0.051)
7	0.7 (0.028)	14	1.4 (0.055)
8	0.8 (0.031)	15	1.5 (0.059)
9	0.9 (0.035)		

Fig. 4-85



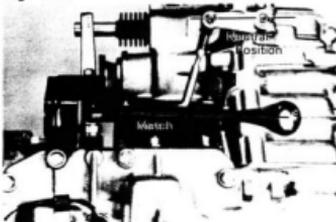
3. Install the outer race with SST.
-
- SST [09316-60010]

Fig. 4-86



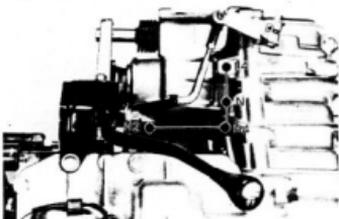
- Apply liquid sealer to the thread.

Fig. 4-87



- Adjust the shift link as shown in the figure.

Fig. 4-88



Check to see that shifting is smooth to all positions.

Fig. 4-89

**SEE
TRANSMISSION
INSTALLATION SECTION
Fig. 3-103 to 3-108**

Install the transmission.

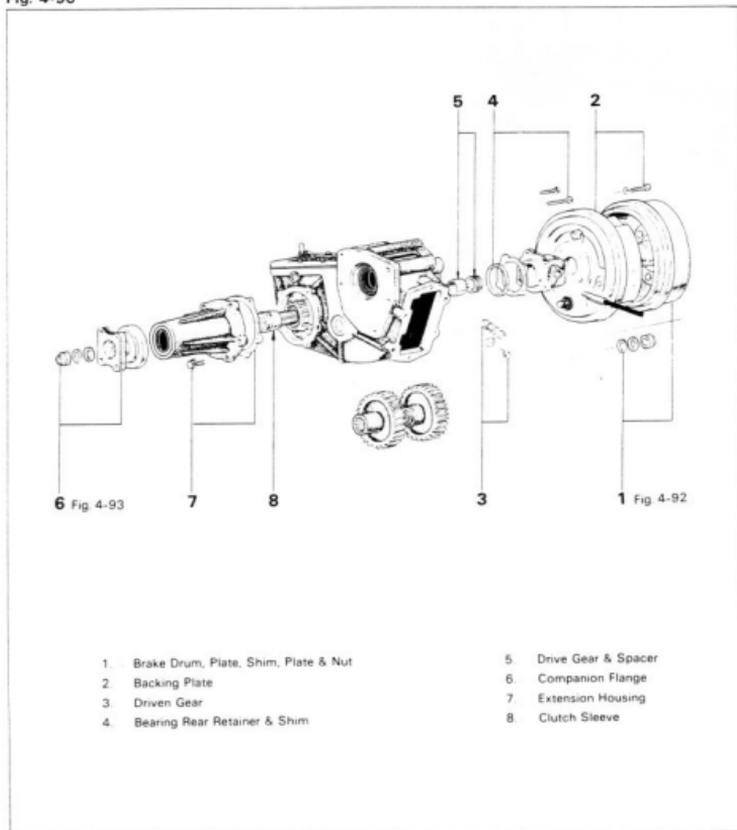
TRANSFER (J30)**REMOVAL**

Refer to section on 3-Speed Transmission.

DISASSEMBLY

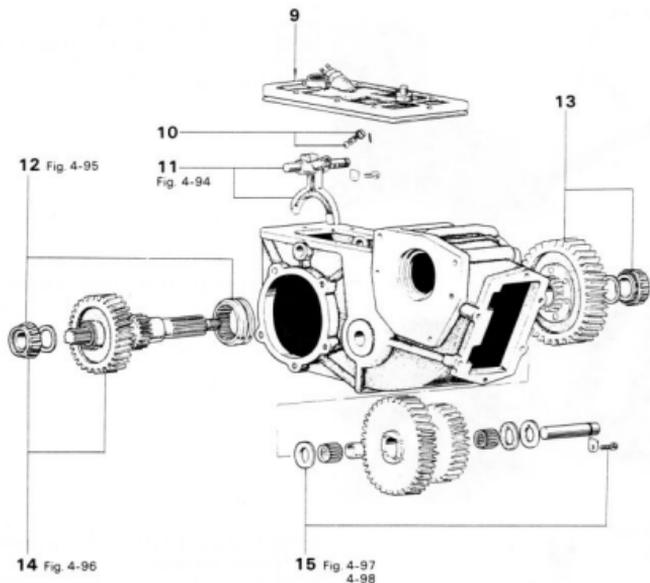
1. Disassemble the parts in the numerical order shown in the figure.

Fig. 4-90



2. Disassemble the parts in the numerical order shown in the figure.

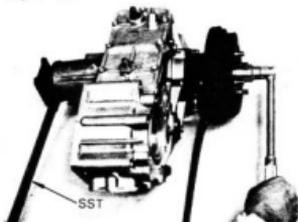
Fig. 4-91



9. Case Cover & Shift Inner Lever
 10. Plug, Spring & Ball
 11. Shift Fork & Shaft
 12. Clutch Sleeve, Gear & Output Shaft

13. Low Speed Gear, Washer & Bearing
 14. High Speed Gear, Washer & Bearing
 15. Idler Gear & Shaft

Fig. 4-92

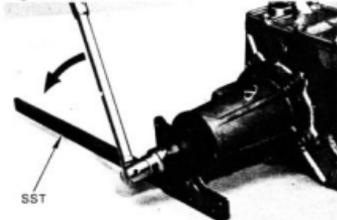


Loosen the staked parts of the nut.
Using SST to keep the companion flange from turning, unscrew the nut.
SST [09330-00020]

— Note —

Have the system in front drive at this time.

Fig. 4-93



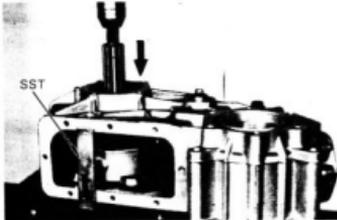
Loosen the staked parts of the nut.
Using SST to keep the companion flange from turning, unscrew the nut.
SST [09330-00020]

Fig. 4-94



Drive out the shaft toward the rear.

Fig. 4-95



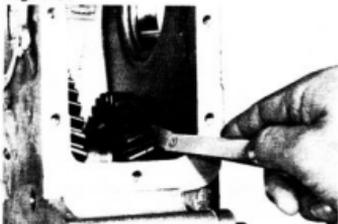
Set the SST between the low speed gear and case front side.
Force out the output shaft toward the front with a press.
SST [09318-60011]

Fig. 4-96



Using a press, remove the bearing.

Fig. 4-97

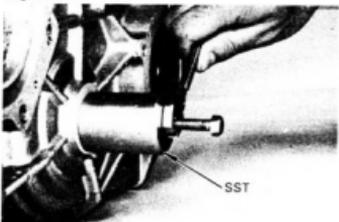


Measure the idler gear thrust clearance.

Thrust clearance:

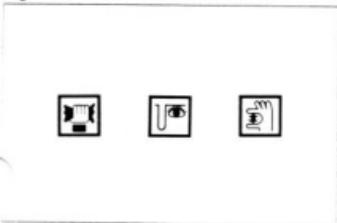
Limit 0.475 mm
(0.0187 in.)

Fig. 4-98



Remove the shaft with SST.
SST [09319-60010]

Fig. 4-99



INSPECTION & REPAIR

Wash the disassembled parts and inspect them as instructed below. Replace all parts found defective.

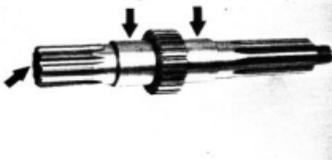
Fig. 4-100

**Transfer Case & Cover**

Inspect the case and cover for cracks or damage.

Inspect the oil seals and bushings for wear or damage.

Fig. 4-101

**Output Shaft**

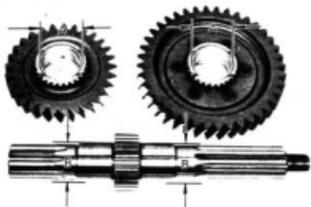
Inspect the parts indicated by arrows for wear or damage.

Fig. 4-102

**Gear**

1. Inspect the teeth, thrust faces, and inside surfaces, for wear or damage.

Fig. 4-103



2. Measure the oil clearance.

High & low speed output gear:

STD 0.035–0.081 mm
(0.0014–0.0032 in.)

Limit 0.081 mm
(0.0032 in.)

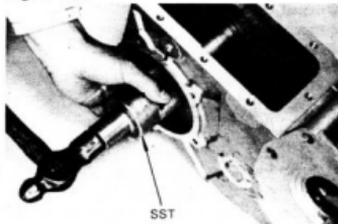
Fig. 4-104

**Bearing**

Inspect for wear or damage.

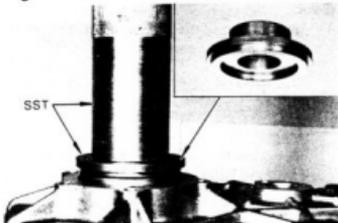


Fig. 4-105

**Replace The Bearing Race**

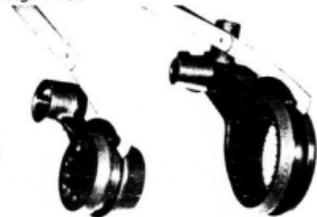
1. Drive out the outer race with SST.
SST [09316-60010]

Fig. 4-106



2. Drive in the new outer race with SST.
SST [09316-60010]

Fig. 4-107

**Sleeve & Fork**

Check the clearance between the sleeves and the shift forks.

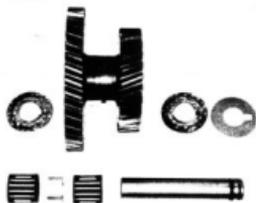
High & low clearance:

0.05 – 0.35 mm
(0.0020 – 0.0138 in.)

Front drive clearance:

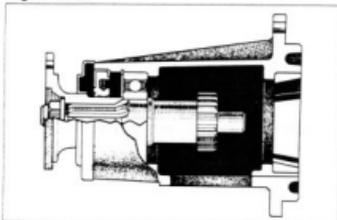
0.1 – 0.3 mm
(0.004 – 0.012 in.)

Fig. 4-108

**Idler Gear**

Inspect for wear or damage.

Fig. 4-109

**Extension Housing**

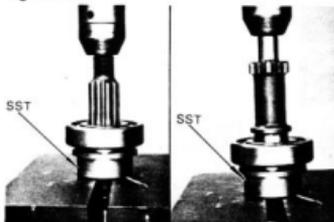
1. Inspect the shaft, bearing, and oil seal for wear or damage.

Fig. 4-110



2. Replace the bearing.
 - (1) Remove the oil seal.
 - (2) Remove the snap ring.
 - (3) Using a press, remove the bearing together with the shaft.

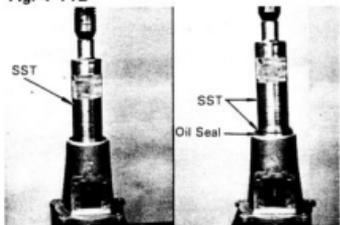
Fig. 4-111



- (4) Replace the bearing with SST.
SST [09316-60010]



Fig. 4-112

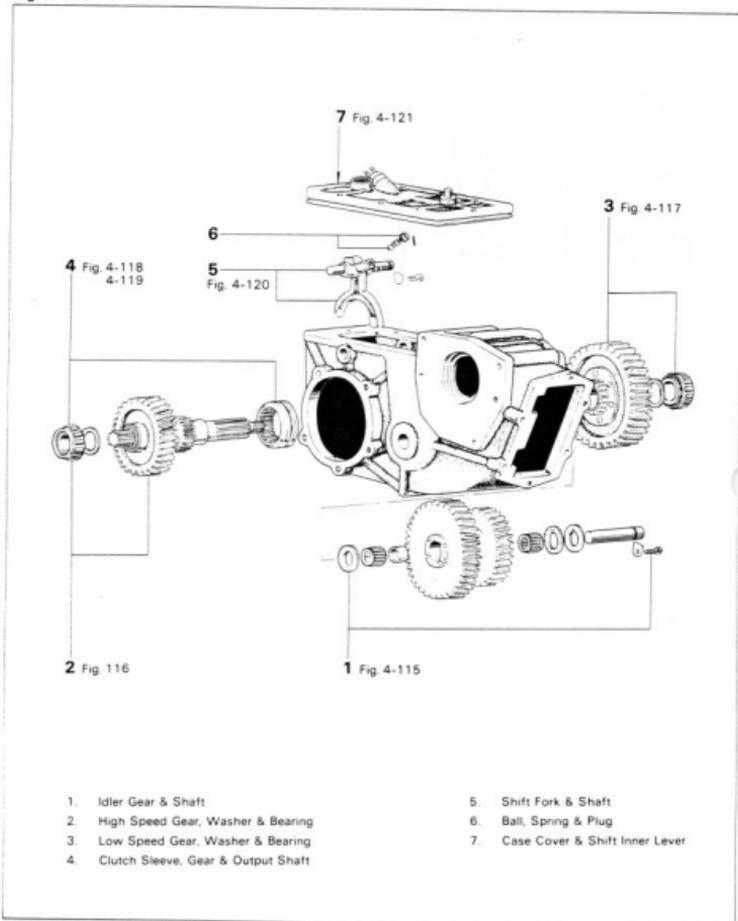


- (5) Using SST, install the bearing together with the shaft.
SST [09316-60010]
- (6) Install the snap ring.
- (7) Install the oil seal with SST.
SST [09316-60010]

ASSEMBLY

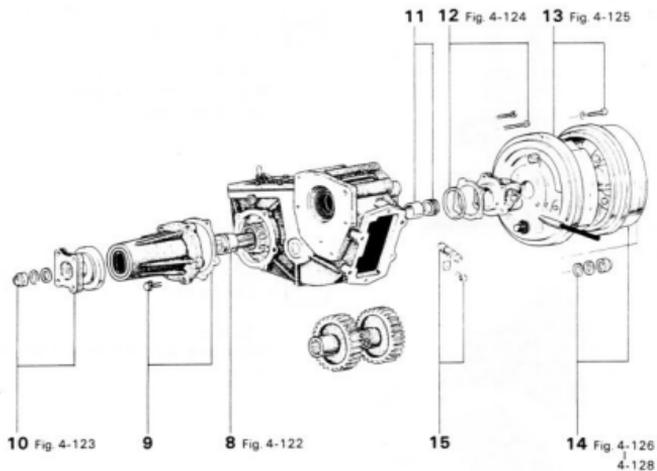
1. Assemble the parts in the numerical order shown in the figure.

Fig. 4-113



2. Assemble the parts in the numerical order shown in the figure.

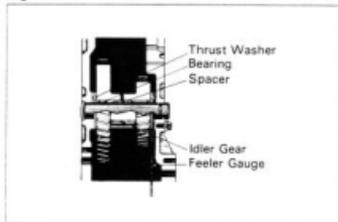
Fig. 4-114



8. Clutch Sleeve
9. Extension Housing
10. Companion Flange
11. Spacer & Drive Gear

12. Bearing Retainer & Shim
13. Backing Plate
14. Brake Drum, Plate & Nut
15. Drive Gear

Fig. 4-115

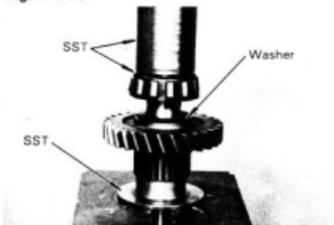


Install the idler gear assembly and shaft as illustrated.

**Thrust clearance:**

STD	0.125–0.475 mm (0.0049–0.0187 in.)
Limit	0.475 mm (0.0187 in.)

Fig. 4-116



Install the bearing with a press and a SST. SST [09316-60010]

– Note –

Make sure that the gear is positioned in correct direction.

Fig. 4-117

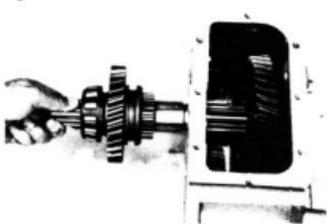


Place the low speed gear, washer and spacer inside the case.

– Note –

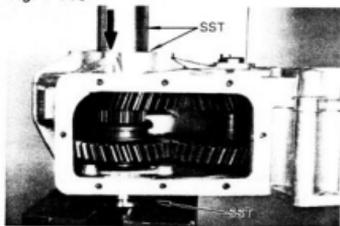
Make sure that the gear is positioned in correct direction.

Fig. 4-118



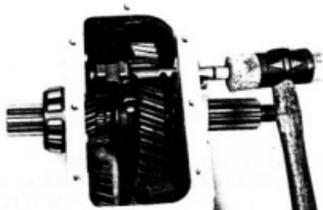
Install the clutch sleeve to the output shaft. Install the output shaft assembly to the case after inserting it through the low speed gear, washer and bearing.

Fig. 4-119



Fit the bearing to the output shaft with SST.
SST [09316-60010]

Fig. 4-120



Drive in the shaft from the rear side of case.

— Note —
Position the fork in the direction shown in the figure.

Fig. 4-121



Position the lever tip to align it with the shift fork groove, and install the cover.

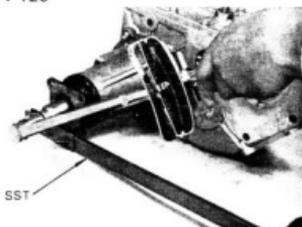
Fig. 4-122



Install the clutch sleeve to the output shaft.

— Note —
Make sure that the clutch sleeve is positioned in the correct direction.

Fig. 4-123

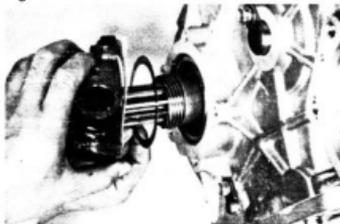


Using SST to keep the companion flange from turning, screw on the nut. Stake the nut after installation.

SST [09330-00020]

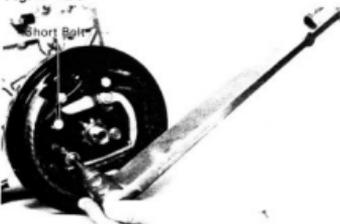
**Tightening torque: 14.0 – 17.0 kg-m
(102 – 122 ft-lb)**

Fig. 4-124



Install the retainer, using the same thickness of shim as at disassembly.

Fig. 4-125



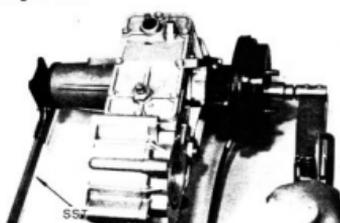
Install the backing plate assembly.

**Tightening torque: 3.0 – 4.5 kg-m
(22 – 32 ft-lb)**

— Note —

Install the short bolt at upper left.

Fig. 4-126



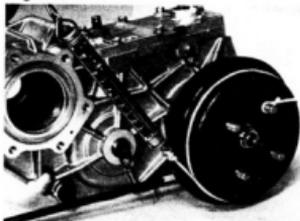
Set the system to front drive.

Using SST to keep the companion flange from turning, screw on the nut.

SST [09330-00020]

**Tightening torque: 14.0 – 17.0 kg-m
(102 – 122 ft-lb)**

Fig. 4-127



Disengage the front drive.

Using a spring scale, measure the output shaft bearing preload.

Preload:

**New bearing 1.2–4.1 kg
(2.6–9.9 lb)**

**Reused bearing
More than 0.47 kg
(1.0 lb)**

Fig. 4-128



If the preload is at standard, stake the nut to lock it in place. If not at standard, adjust by selecting proper thickness shims.

Adjust shim thickness

Part No.	Thickness	mm (in.)
90564-64017	0.10	(0.0039)
90564-64023	0.15	(0.0059)
90564-64024	0.20	(0.0079)
90564-64025	0.25	(0.0098)

INSTALLATION

Refer to the instructions in the 3-Speed Transmission Section.

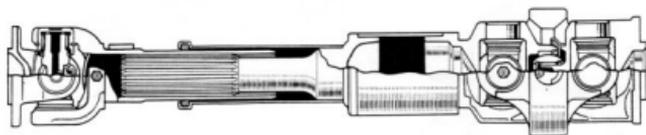
PROPELLER SHAFT

PROPELLER SHAFT Page 5-2

PROPELLER SHAFT COMPONENTS

Fig. 5-1

DOUBLE CARDAN TYPE



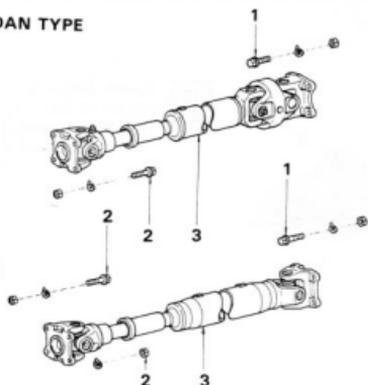
REMOVAL

Remove the parts in the numerical order shown in the figure.

Fig. 5-2

DOUBLE CARDAN TYPE

FRONT & REAR



1. Bolt & Nut
2. Bolt & Nut or Nut
3. Propeller Shaft

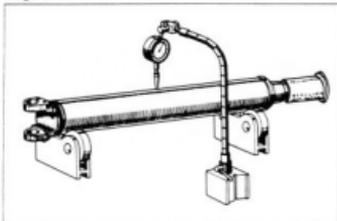
Fig. 5-3



INSPECTION Propeller Shaft

1. Place matchmarks on the sleeve yoke and propeller shaft, and remove the sleeve yoke.

Fig. 5-4

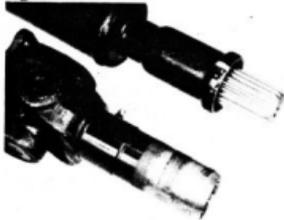


2. Inspect the propeller shaft for runout.

Runout:

**Limit 0.8 mm
(0.031 in.)**

Fig. 5-5



Propeller Shaft & Sliding Yoke

Inspect for wear or damage.

Fig. 5-6



Spider Bearing

Inspect for wear or damage.

Spider axial play:

**Less than 0.05 mm
(0.0020 in.)**

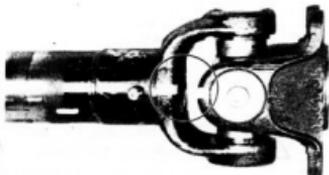
Fig. 5-7

**Double Cardan Type Propeller Shaft**

— Note —

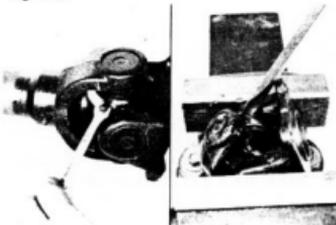
If any problem is found, replace the front propeller shaft assembly.
Do not disassemble.

Fig. 5-8

**Replace The Spider Bearing**

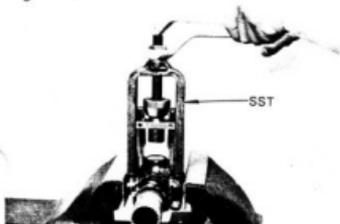
1. Place matchmarks on the flange yoke, spider and sleeve yoke (or propeller shaft).

Fig. 5-9



2. Remove the grease fitting and the snap rings.

Fig. 5-10



3. Screw out the bearing outer race about 5 mm (0.20 in.) with SST.
SST [09332-25010]

Fig. 5-11

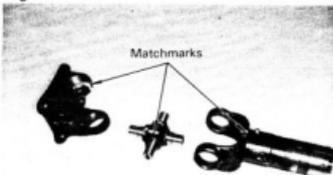


- Clamp the bearing outer race in a vise and remove it by tapping the sleeve yoke.

— Note —

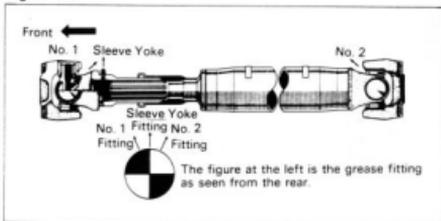
Remove the other bearing outer race of the sleeve yoke and the two bearing outer races of flange yoke by the same procedure.

Fig. 5-12



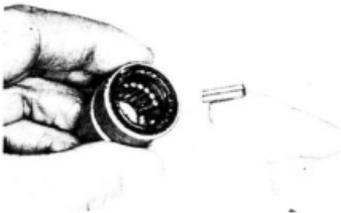
- Align matchmarks on flange yoke spider and sleeve yoke.

Fig. 5-13



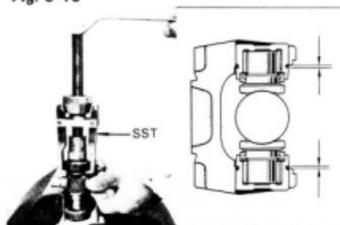
- When replacing the spider, be sure that the grease fitting assembly holes are facing in the direction shown in the figure.

Fig. 5-14



- Coat the bearing rollers with MP grease and fit them into the outer races.

Fig. 5-15



8. Screw in the bearing outer races on both sides with SST until the snap ring grooves are at maximum and equal width.
SST [09332-25010]

Fig. 5-16



9. Select and install a snap ring which will provide minimum play.

Snap ring thickness

Part No.	Thickness mm (in.)
09520-29286	1.475 - 1.525 (0.0581 - 0.0600)
09520-29287	1.525 - 1.575 (0.0600 - 0.0620)
09520-29288	1.575 - 1.625 (0.0620 - 0.0640)



Fig. 5-17



— Note —

Do not reuse snap rings.

Use the snap rings of the same thickness on both sides.

10. Lightly tap the yoke to firmly set the bearing outer race.

Fig. 5-18



11. Check to see that the spider moves smoothly.

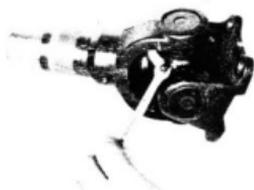
Check for axial play.

Spider axial play:

Less than 0.05 mm

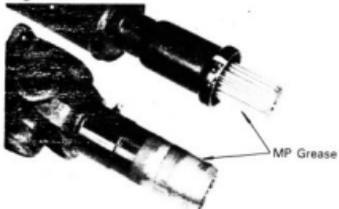
(0.0020 in.)

Fig. 5-19



12. Install the grease fitting.

Fig. 5-20



13. Apply MP grease to the splines of the propeller shaft and sleeve yoke.

Fig. 5-21

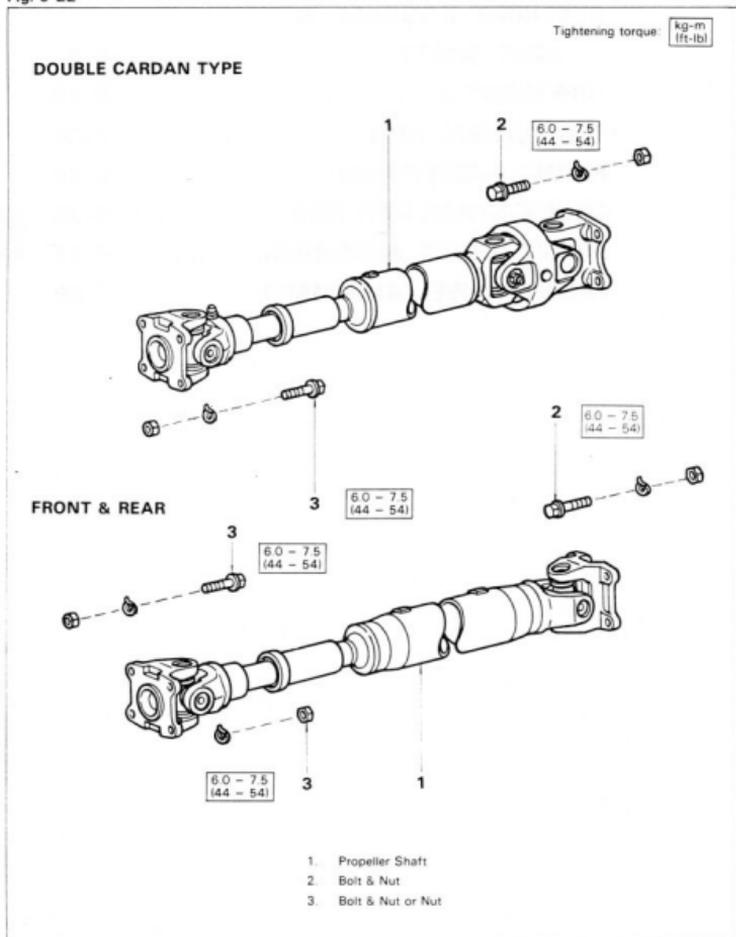


14. Align the matchmarks and install the sleeve yoke to the propeller shaft.

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 5-22

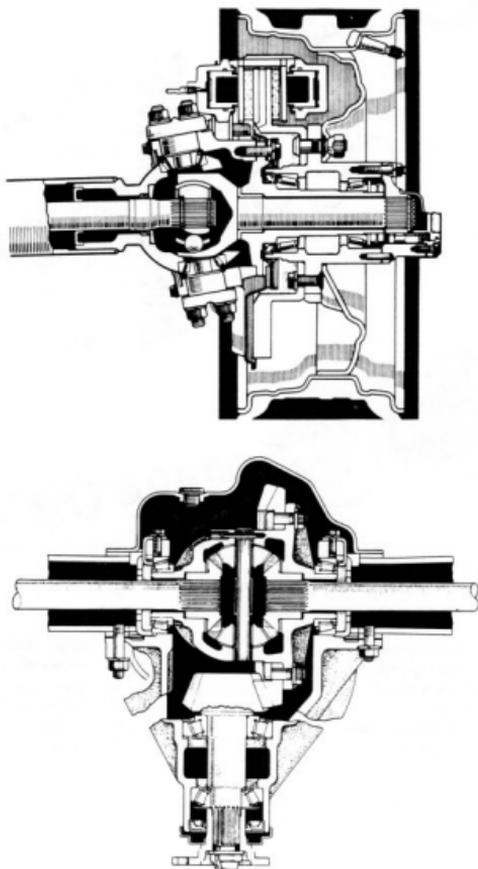


FRONT AXLE & SUSPENSION

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DIFFERENTIAL	6-19
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FRONT WHEEL AIGNMENT	6-39

CUTAWAY VIEW

Fig. 6-1



STEERING KNUCKLE & AXLE SHAFT

REMOVAL

Remove the parts in the numerical order shown in the figure.

Fig. 6-2

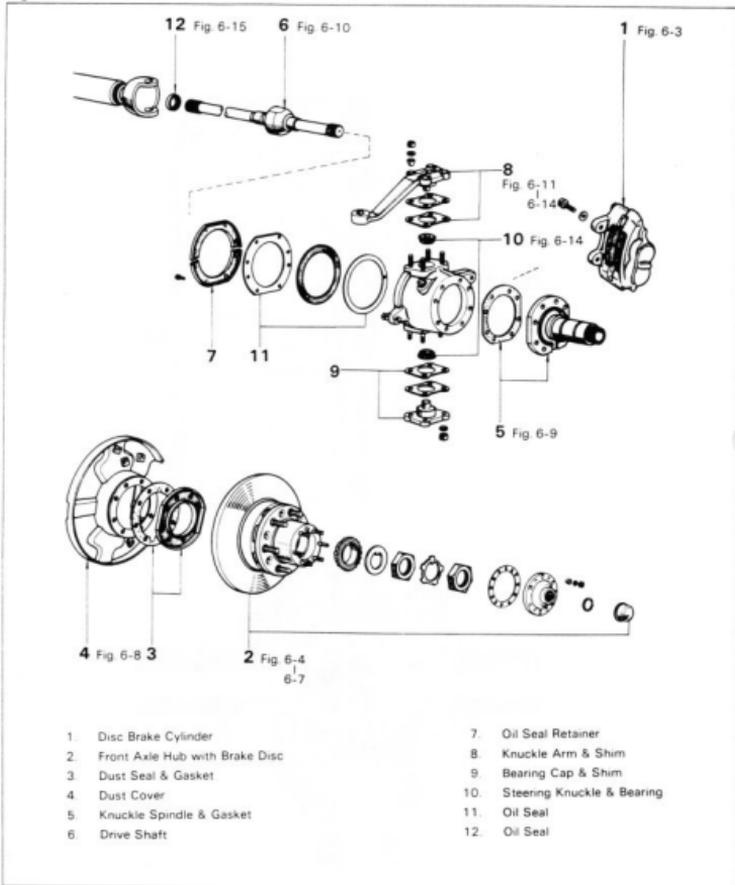
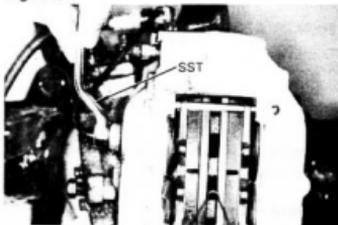


Fig. 6-3

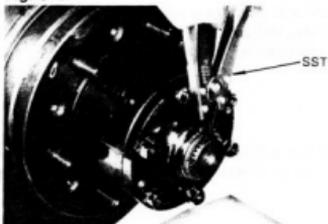


Disconnect the brake tube with SST.
SST [09751-36011]

— Note —

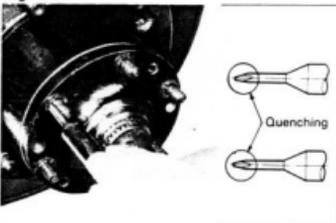
For drum brakes, do not disconnect the brake tube or hose.

Fig. 6-4



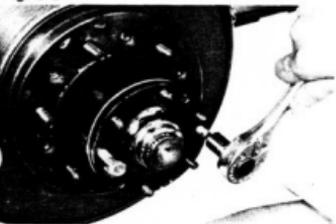
Remove the snap ring with SST.
SST [09905-00012]

Fig. 6-5



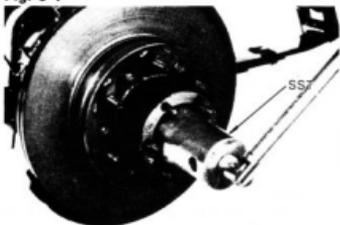
Remove the cone washers with a tapered punch.

Fig. 6-6



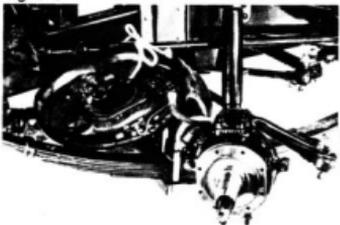
Remove the flange by tightening the bolts.

Fig. 6-7



Remove the lock nut and adjusting nut with SST.
SST [09607-60020]

Fig. 6-8



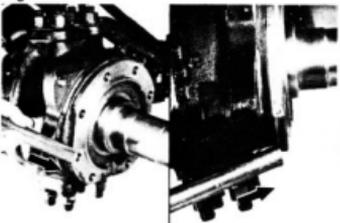
Remove the dust cover or backing plate assembly.

— Note —

For drum brakes, do not disconnect brake tube or hose.

With the steering wheel turned fully to one side, remove the backing plate assembly and keep it supported with a cord.

Fig. 6-9



If the spindle does not come off easily, tap it off with a drift.

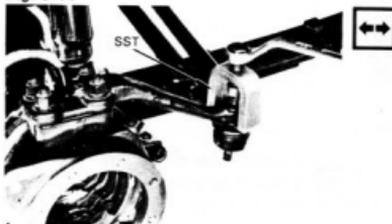
Fig. 6-10



Position one flat part of the outer shaft upward and pull out the driveshaft.

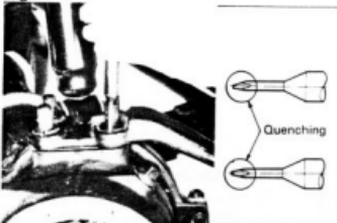


Fig. 6-11



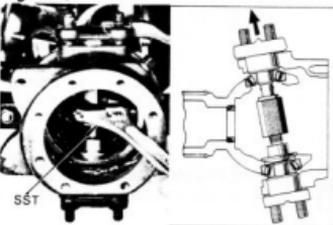
Remove the tie rod with SST.
SST [09611-22011]

Fig. 6-12



Remove the cone washers with a tapered punch.

Fig. 6-13



Remove the knuckle arm with SST.
SST [09606-60020]

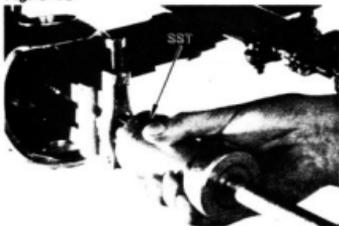
— Note —
Use SST without a collar.

Fig. 6-14



Mark the removed adjusting shims and bearings so as to enable reassembling them back to their proper positions.

Fig. 6-15



Remove the oil seal with SST.
SST [09308-00010]

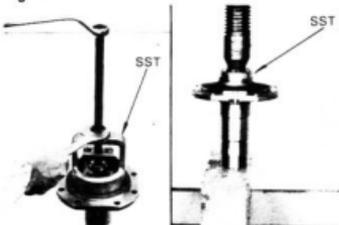
Fig. 6-16



INSPECTION & REPAIR Knuckle Spindle

Inspect for wear or damage.

Fig. 6-17



Replace The Bushing

1. Remove the bushing with SST.
SST [09612-65013]
2. Install a new bushing with a press and SST.
SST [09608-35013]



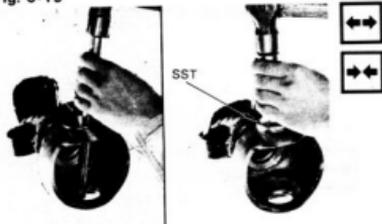
Fig. 6-18



Steering Knuckle Bearing

Inspect for wear or damage.

Fig. 6-19

**Replace The Bearing Outer Race**

1. Remove the outer races with a drift.
2. Install the new outer races with SST. SST [09605-60010]

Fig. 6-20

**Drive Shaft**

- Inspect the parts indicated by arrows for wear, damage or rusting.
Inspect the joint for excessive looseness.

Fig. 6-21

**Drive Shaft Inner Parts**

1. Hold the inner shaft in a vise.
2. Place a drift against the inner race and drive out the outer shaft.

Fig. 6-22



3. Take out the six bearing balls.

— Note —

Tilt the inner race and cage, and take out the bearing balls one by one.

Fig. 6-23



4. Remove the cage and inner race from the outer shaft.

— Note —

Fit the two large openings in the cage against the protruded parts of the outer shaft, and pull out the cage and inner race.

Fig. 6-24



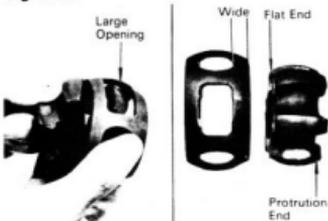
5. Take out the inner race from the cage through the large opening in the cage.

Fig. 6-25



6. Inspect the drive shaft inner parts for wear or damage.

Fig. 6-26



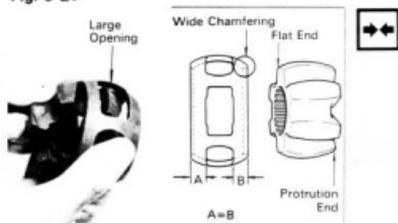
7. Assemble the inner race to the cage by inserting it through the large opening.

- (1) For FJ, BJ, HJ4_series
Make sure to position the protrusion end of the race toward the wide side of cage.

— Note —

Coat with molybdenum disulphide lithium base grease before assembly.

Fig. 6-27

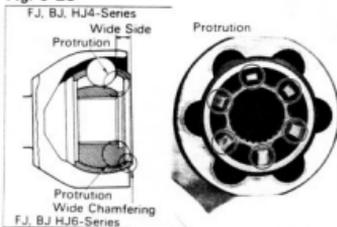


- (2) For FJ, BJ, HJ6_series
Make sure to position the protrusion end of the race toward the wide chamfering side of cage.

– Note –

Coat with molybdenum disulphide lithium base grease before assembling.

Fig. 6-28



- 8 Assemble the cage and inner race to the outer shaft.

– Note –

FJ, BJ, HJ4_series

Make sure to position the cage wide side and race protrusion end toward the outside.

FJ, BJ, HJ6_series

Make sure to position the cage wide chamfering side end race protrusion end toward the outside.

Fig. 6-29

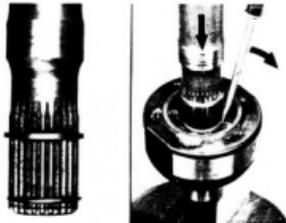


- 9 Fit the inner race and cage, and assemble the six bearing balls in the outer shaft.

– Note –

Pack molybdenum disulphide lithium base grease in the outer shaft without fail.

Fig. 6-30



10. Install new snap rings on the inner shaft.
11. Hold the outer shaft in a vise, and while keeping the snap ring (liner) compressed, install the inner shaft to the outer shaft.

– Note –

After installing, verify that the inner shaft will not pull out.

ADJUSTMENT

Whenever the axle housing or the steering knuckle is replaced, the front driveshaft alignment and knuckle bearing preload are adjusted with SST.

SST [09634-60013]

Fig. 6-31

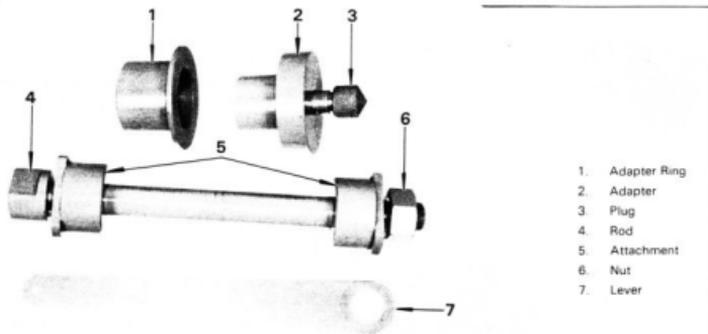
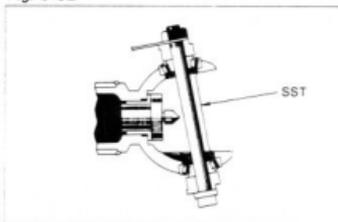


Fig. 6-32

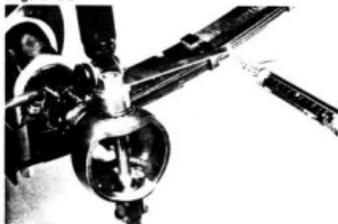


1. Mount the SST on the housing.
SST [09634-60013]

— Note —

Coat knuckle bearings lightly with molybdenum disulphide lithium base grease.

Fig. 6-33



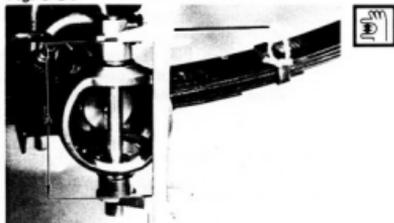
2. Add preload to the bearing by tightening the nut.

Preload (while turning):

1.8 – 3.8 kg

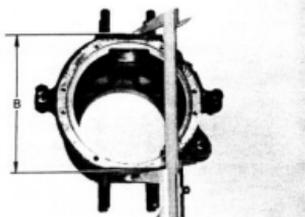
(4.0 – 8.4 lb)

Fig. 6-34



3. Measure the distance A.

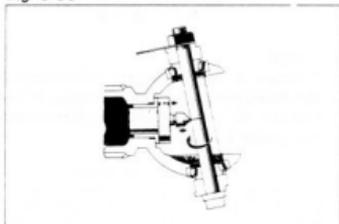
Fig. 6-35



4. Measure the distance B.
5. The difference between A and B is the total adjusting shim thickness that is required to maintain the correct bearing preload.

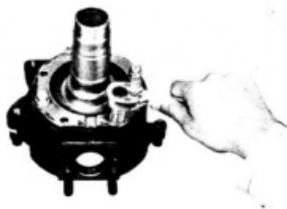
$$\text{TOTAL SHIM THICKNESS C} \\ C = A - B$$

Fig. 6-36



6. Apply a light coat of red lead on the center part of rod (4).
7. Press the adapters (1) and (2) against the housing, press the plug (3) against the rod (4), and turn the lever (7) so as to have a line scribed on the rod (4).

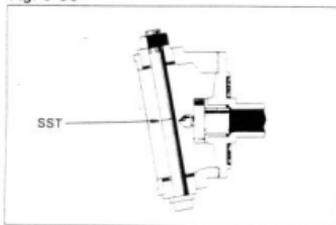
Fig. 6-37



8. Bolt on the knuckle spindle to the knuckle.

— Note —
Install the bolt over two washers.

Fig. 6-38

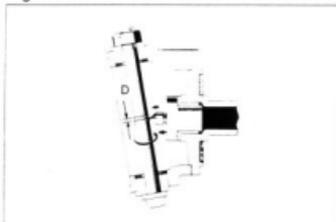


9. Dismount the SST from the housing, and mount it on the knuckle.
SST [09634-60013]

— Note —

1. Use care not to erase the scribed line when dismounting and remounting the SST.
2. Make sure that the rod (5) is in the same vertical direction that it was when mounted on the housing.

Fig. 6-39



10. Turn the rod (5) and scribe another line on it.
11. Measure the distance D between the two scribed lines.
12. The thickness of the steering knuckle lower bearing shim E will be the distance D less 3 mm (0.12 in.).

LOWER SHIM THICKNESS E

$$E = D - 3\text{mm}$$

13. The thickness of the steering knuckle upper bearing shim F will be different between the total adjusting shim thickness C and the shim thickness E.

UPPER SHIM THICKNESS F

$$F = C - E$$

— Note —

Compare E and F with the thicknesses of the shims removed at disassembly. If there should be considerable difference, remeasure E and F.

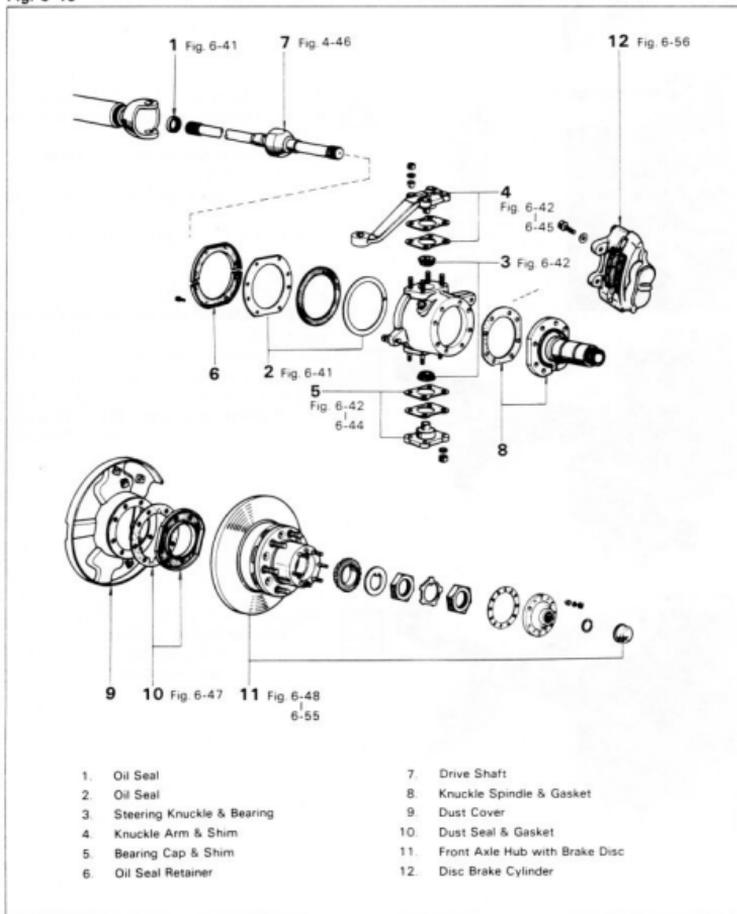
Adjusting shim sizes

Part No.	Thickness mm (in.)
43236-60010	0.1 (0.004)
43233-60011	0.2 (0.008)
43234-60011	0.5 (0.020)
43235-60010	1.0 (0.039)

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 6-40



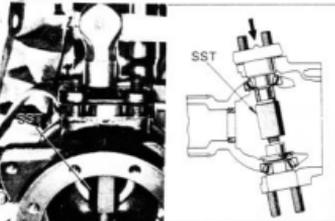
- | | |
|-------------------------------|------------------------------------|
| 1. Oil Seal | 7. Drive Shaft |
| 2. Oil Seal | 8. Knuckle Spindle & Gasket |
| 3. Steering Knuckle & Bearing | 9. Dust Cover |
| 4. Knuckle Arm & Shim | 10. Dust Seal & Gasket |
| 5. Bearing Cap & Shim | 11. Front Axle Hub with Brake Disc |
| 6. Oil Seal Retainer | 12. Disc Brake Cylinder |

Fig. 6-41



Install the oil seal with SST.
Apply MP grease on the oil seal lip.
SST [09618-60010]
Place the oil seal set in the housing.

Fig. 6-42



Apply molybdenum disulphide lithium base grease to the bearings, and install the knuckle and the bearings.

Hold the upper bearing inner race with SST.
SST [09606-60020]

Install the knuckle arm over the shims that were originally used or were selected as described in adjustment operations.

— Note —

Use SST with a collar.

Install the lower bearing cap by the same procedure.

Fig. 6-43



The SST should be removed before tightening the knuckle arm and the bearing cap.

Tighten the knuckle arm and the bearing cap.

**Tightening torque: 8.5 – 11.0 kg-m
(62 – 79 ft-lb)**

Fig. 6-44



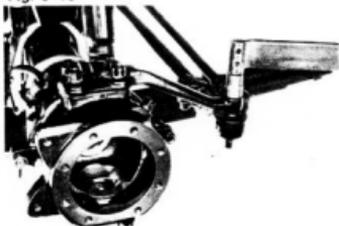
Measure the knuckle bearing preload.

Preload (while rotating):

1.8 – 3.8 kg

(4.0 – 8.4 lb)

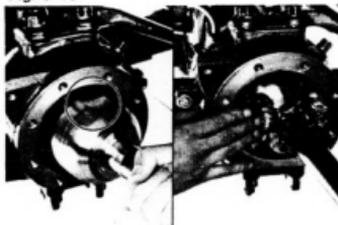
Fig. 6-45



Install the tie rod.

Tightening torque: 7.5 – 11.0 kg-m
(55 – 79 ft-lb)

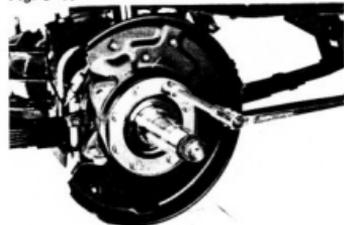
Fig. 6-46



Position one flat part of the outer shaft upward, and install the shaft.

Pack molybdenum disulphide lithium base grease into the knuckle to about three fourth of the knuckle volume.

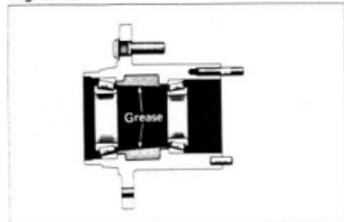
Fig. 6-47



Tighten the bolts.

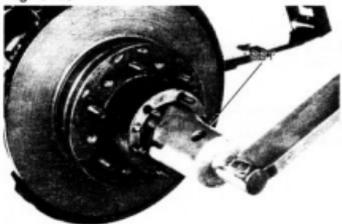
Tightening torque: 4.0 – 5.5 kg-m
(29 – 39 ft-lb)

Fig. 6-48



Pack MP grease into the hub.

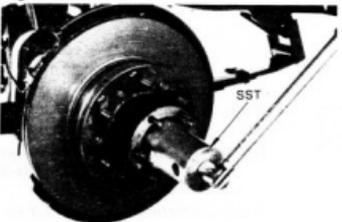
Fig. 6-49



Tighten the adjusting nut with SST and turn the hub left and right two or three times.
SST [09607-60020]

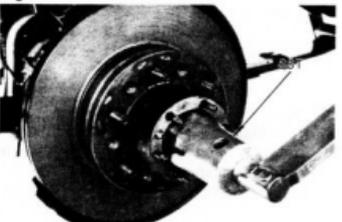
Tightening torque: 6.0 kg-m
(43 ft-lb)

Fig. 6-50



Loosen the adjusting nut.
SST [09607-60020]

Fig. 6-51



Retighten the adjusting nut.

Tightening torque: 0.4 - 0.7 kg-m
(35 - 60 in.-lb)

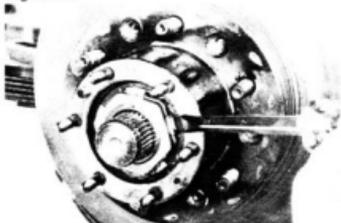
Fig. 6-52



Measure the revolving weight at the hub bolt.

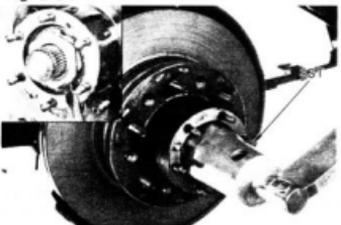
Preload (starting): 2.8 - 5.7 kg
(6.2 - 12.6 lb)

Fig. 6-53



Lock the adjusting nut by bending one of the lock washer teeth inward.

Fig. 6-54



Tighten the lock nut with SST.
SST [09607-60020]

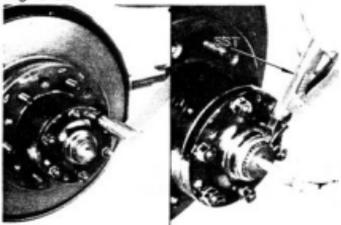
Tightening torque: 8.0 – 10.0 kg-m
(58 – 72 ft-lb)

Recheck the revolving weight.

Preload (starting): 2.8 – 5.7 kg
(6.2 – 12.6 lb)

Lock the lock nut by bending one of the lock washer teeth outward.

Fig. 6-55



Install the flange.

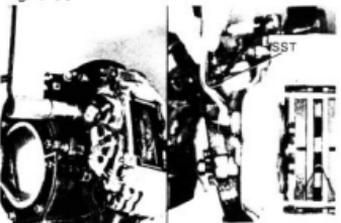
Tightening torque: 2.8 – 3.5 kg-m
(21 – 25 ft-lb)

Install the snap ring with SST.
SST [09905-00012]

— Note —

Grip the bolt and pull out the axle shaft to install the snap ring.

Fig. 6-56



Tighten the caliper mounting bolts.

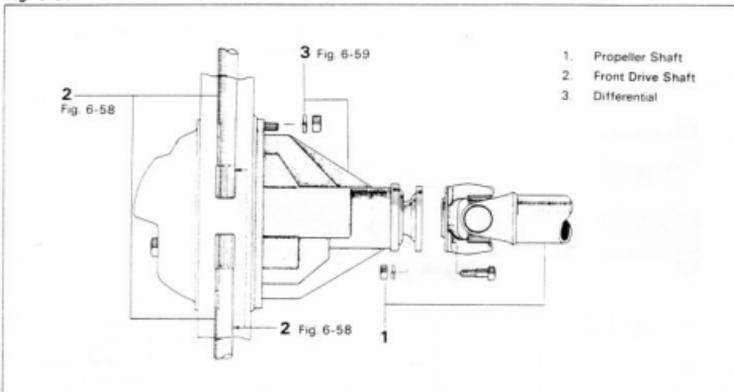
Tightening torque: 7.5 – 10.5 kg-m
(55 – 75 ft-lb)

Connect the brake tube with SST.
SST [09751-36011]

Tightening torque: 1.3 – 1.8 kg-m
(10 – 13 ft-lb)

DIFFERENTIAL**REMOVAL**

Remove the parts in the numerical order shown in the figure.

Fig. 6-57**Fig. 6-58**

SEE
STEERING KNUCKLE & AXLE
SHAFT REMOVAL SECTION

Fig. 6-3 to 6-15

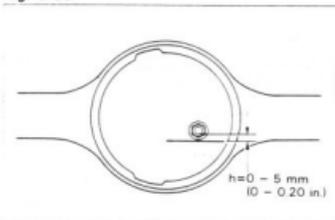
Remove the axle shafts.

DISASSEMBLY & ASSEMBLY

Refer to the disassembly and assembly procedures for the differential in the Rear Axle and Rear Suspension Section.

INSTALLATION

Perform the removal in reverse order.

Fig. 6-59

After installing the axle shaft fill in hypoid gear oil SAE90, API GL-5.

Capacity:

STD

2.5 liters

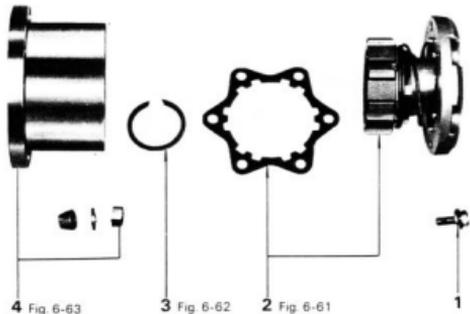
(2.6 US qt, 2.2 Imp.qt)

FREE WHEEL HUB

REMOVAL

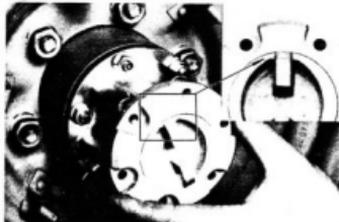
Remove the parts in the numerical order shown in the figure.

Fig. 6-60



1. Bolt
2. Cover & Gasket
3. Snap Ring
4. Free Wheel Hub, Nut, Spring Washer & Cone Washer

Fig. 6-61



Remove the free wheel hub cover.

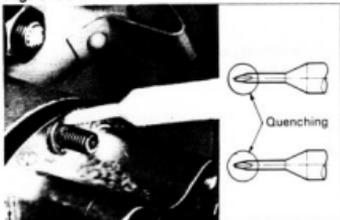
— Note —
The control handle should be set to FREE.

Fig. 6-62



Remove the snap ring with SST.
SST [09905-00012]

Fig. 6-63



Remove the cone washer.

DISASSEMBLY

Disassemble the parts in the numerical order shown in the figure.

Fig. 6-64

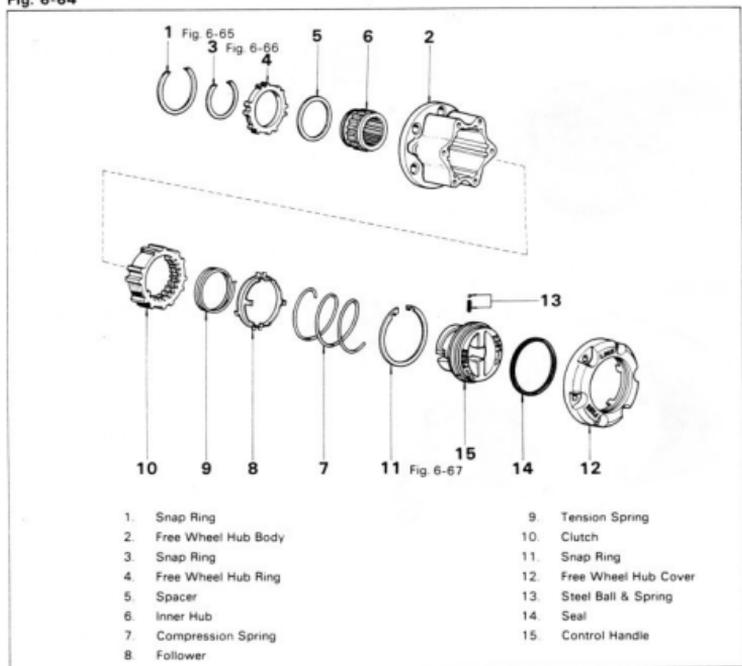
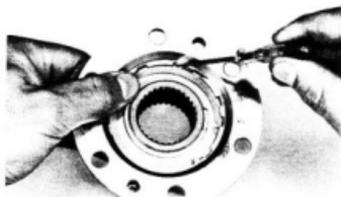
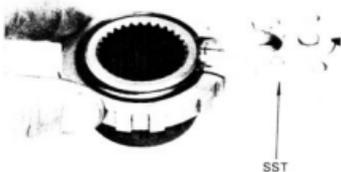


Fig. 6-65



Remove the snap ring and free wheel hub ring.

Fig. 6-66



Remove the snap ring from the inner hub with SST.
SST [09905-00012]

Fig. 6-67



Remove the snap ring, cover and handle.

Fig. 6-68

**INSPECTION**

Wash the disassembled parts and inspect them on the following points.

**Inner & Free Wheel Hub Ring**

1. Inspect for wear or damage.
2. Measure the oil clearance.

Oil clearance (A - B):
Limit 0.3 mm
(0.012 in.)

Fig. 6-69

**Body & Clutch**

1. Inspect for wear, damage or rust.
2. Verify that the clutch moves smoothly in the body.

Fig. 6-70

**Cover, Handle & O Ring**

1. Inspect for wear or damage.

Fig. 6-71



2. Rotate the control handle of the hub back and forth to make sure that it moves smoothly and freely.

ASSEMBLY

Assemble the parts in the numerical order shown in the figure.

Fig. 6-72

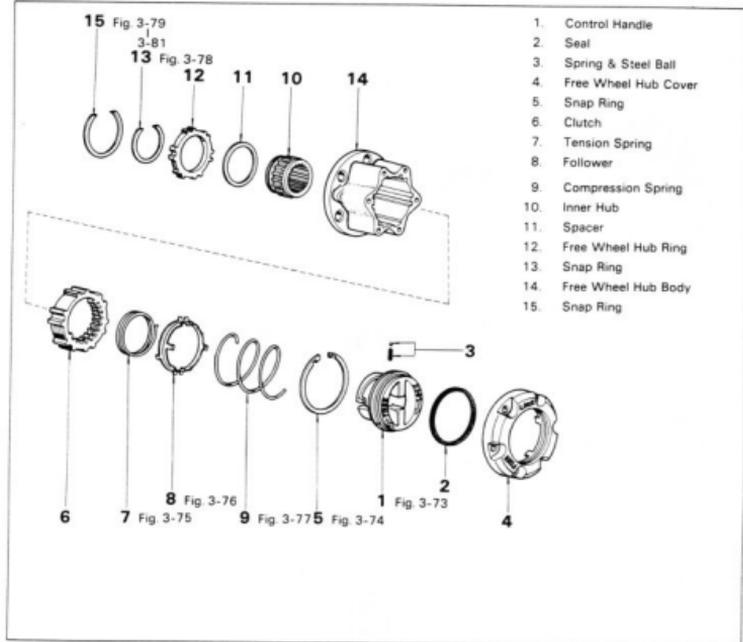


Fig. 6-73

MP grease



Apply MP grease on the arrow mark portion, before assembling.

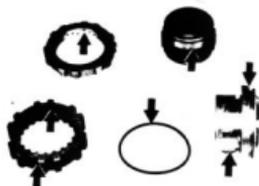
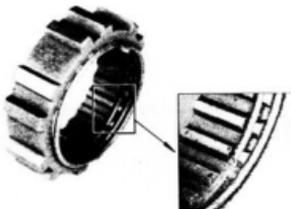


Fig. 6-74



Install the handle in the cover.

Fig. 6-75

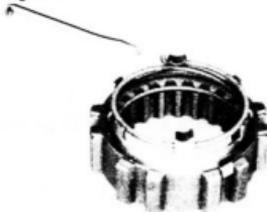


Install the tension spring in the clutch.

— Note —

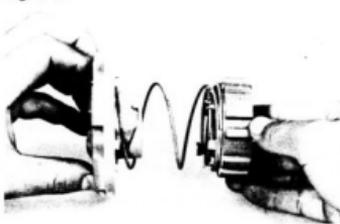
Fit the spring end into the clutch spring so as to be aligned with the initial groove.

Fig. 6-76



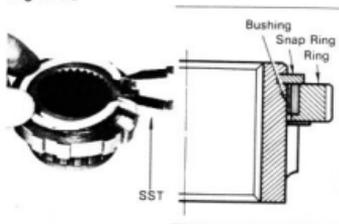
Fit follower pawl together with spring bent portion.

Fig. 6-77



Install the clutch and spring into the handle assembly.

Fig. 6-78



Install the spacer, free wheel hub ring, and snap ring to the inner with SST.
SST [09905-00012]

— Note —

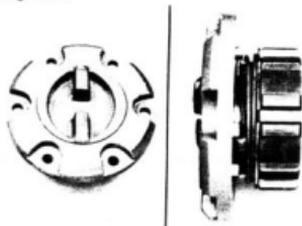
Make sure that ring is assembled in the correct direction as shown in the illustration.

Fig. 6-79



Install the inner assembly and snap ring in the body.

Fig. 6-80



1. Set the handle and clutch to the FREE position.

Fig. 6-81



2. Temporarily install the cover assembly to the body assembly.
3. Verify that the inner assembly turns smoothly.
4. Remove the cover assembly.

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 6-82

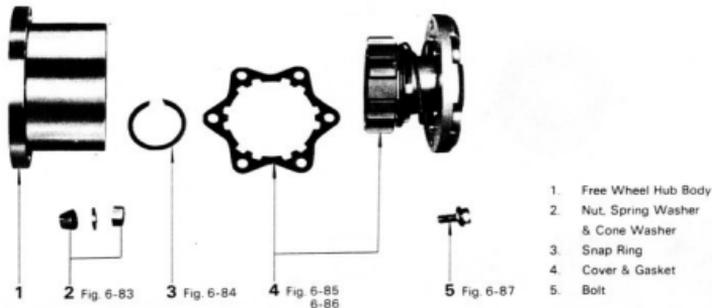
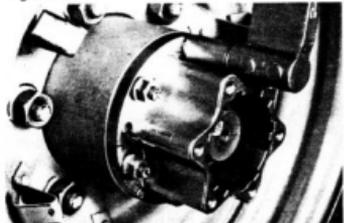


Fig. 6-83



Tighten six nuts to the specified torque.

**Tightening torque: 2.8 – 3.5 kg-m
 (21 – 25 ft-lb)**

Fig. 6-84



Install the snap ring with SST.
 SST [09905-00012]

– Note –
 Gripping a bolt, pull the axle shaft out to install the snap ring.

Fig. 6-85

MP Grease



Apply MP grease on the portion indicated.

Fig. 6-86

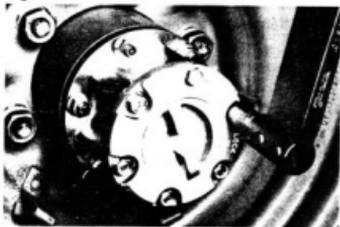


Install the cover.

— Note —

Set the handle and the clutch to the FREE position.

Fig. 6-87



Tighten six bolts to the specified torque.

Tightening torque: 0.8 – 1.2 kg-m
(70 – 104 in.-lb)

— Note —

Verify that the control handle rotates smoothly.

FRONT SUSPENSION LEAF SPRING

REMOVAL

Remove the parts in the numerical order shown in the figure.

Fig. 6-88

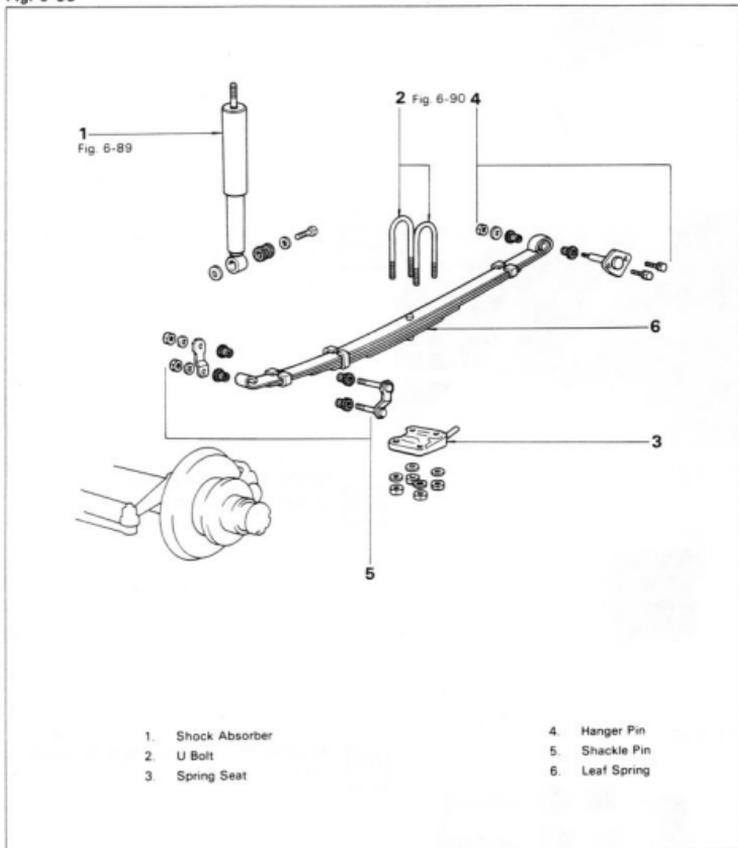
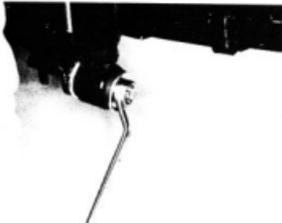
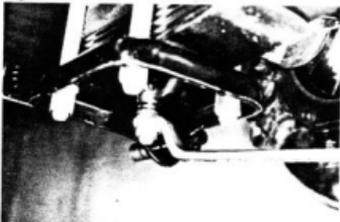


Fig. 6-89



1. Jack up and support the frame on stands.
2. Remove the wheels.
3. Disconnect the shock absorber lower side.

Fig. 6-90



- Support the front axle housing with a jack, and remove the U bolts.

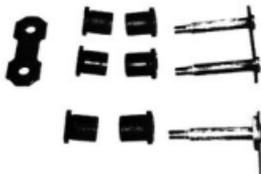
Fig. 6-91



INSPECTION & REPAIR U Bolt & Spring Seat

Inspect for wear or damage.

Fig. 6-92



Shackle Pin, Hanger Pin & Bushing

Inspect for wear or damage.

Fig. 6-93

**Replace The Leaf**

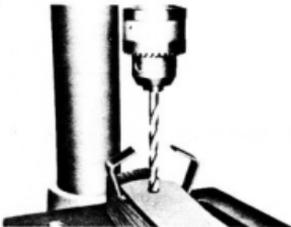
1. Pry up the spring clip.

Fig. 6-94



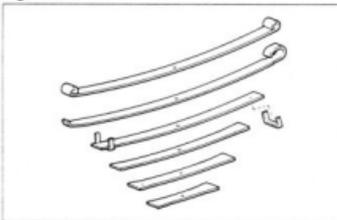
2. Secure the spring with a vise, and remove the spring center bolt.
3. Disassemble the leaf spring.

Fig. 6-95



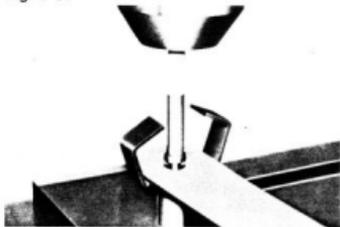
4. Drill the rivetted head of the rivet, then drive it out.

Fig. 6-96



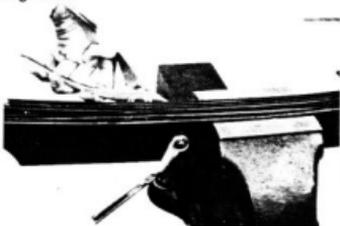
5. Inspect the leaves for damage or weakness.

Fig. 6-97



6. Using a press, install a new rivet into the holes of the leaf and clip.

Fig. 6-98



7. Secure the spring leaves with a vise, then install the spring center bolt and tighten firmly.

Fig. 6-99



8. Bend the clip into the position.

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 6-100

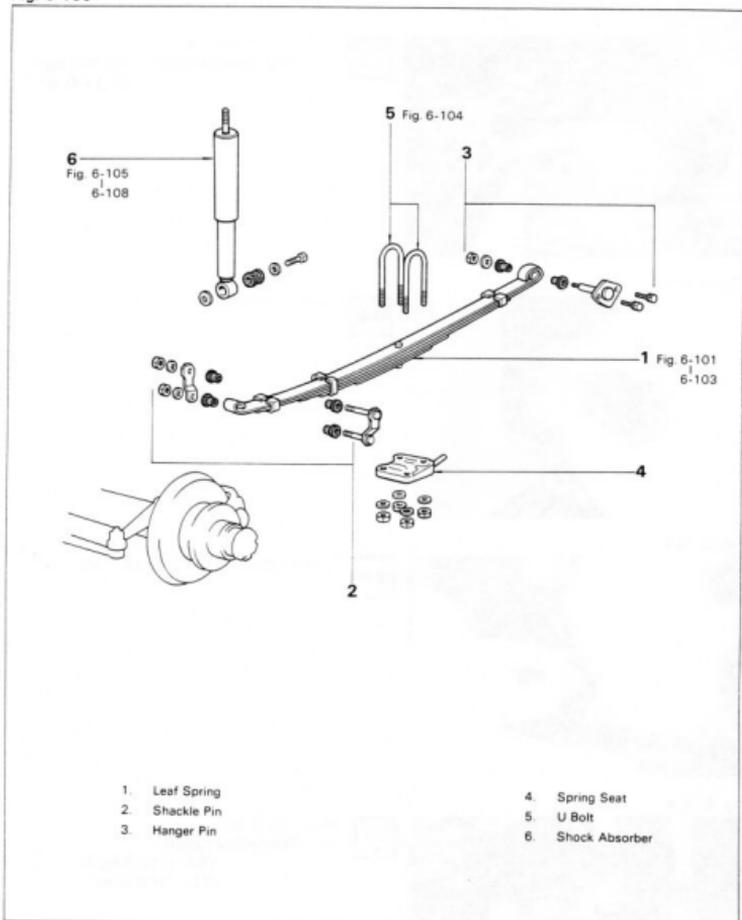
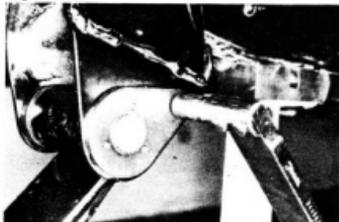


Fig. 6-101



Install the hanger pin.

Tightening torque: 1.0-1.6 kg-m
(8-11 ft-lb)

Fig. 6-102



Finger tighten the nut.

Fig. 6-103



Finger tighten the shackle pin nuts.

Fig. 6-104



Install the U bolt.

Tightening torque: 10.0 - 15.0 kg-m
(73 - 108 ft-lb)

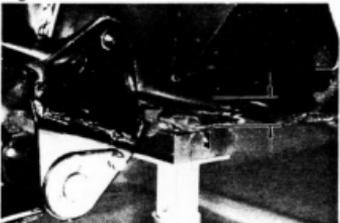
Fig. 6-105



Connect the shock absorber.

Tightening torque: 5.0 – 5.8 kg-m
(37 – 41 ft-lb)

Fig. 6-106



Raise the axle housing until the vehicle is free from the stands.

Fig. 6-107



Tighten the hanger pin nut.

Tightening torque: 7.5–11.0 kg-m
(55–79 ft-lb)

Fig. 6-108



Tighten the shackle pin nuts.

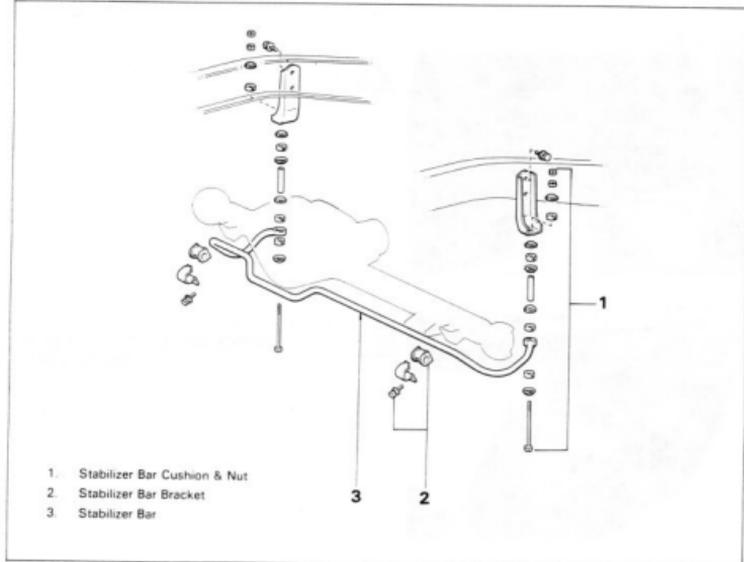
Tightening torque: 7.5–11.0 kg-m
(55–79 ft-lb)

FRONT STABILIZER BAR

REMOVAL

Remove the parts in the numerical order shown in the figure.

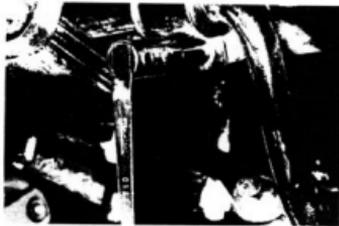
Fig. 6-109



INSTALLATION

Perform the removal procedure in reverse order.

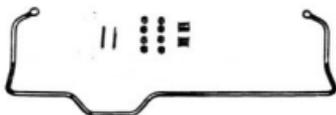
Fig. 6-110



Install the mounting bolts.

Tightening torque: 1.0–1.6 kg-m
(8–11 ft-lb)

Fig. 6-111

**INSPECTION**

Inspect the disassembled parts for wear, damage or cracks.

Fig. 6-112

**FRONT SHOCK ABSORBER****REMOVAL**

Remove the lock nut and the mounting nut.

Fig. 6-113



Remove the lower mounting bolt.

Fig. 6-114

**INSPECTION**

1. Inspect the disassembled parts for wear, damage or oil leakage.

Fig. 6-115



2. Check the operation.
Apply an even pressure and insure that the tension is equal throughout the stroke.

Fig. 6-116

**INSTALLATION**

Install the lower mounting bolt.

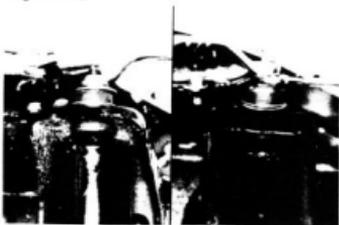
Tightening torque: 5.0 – 5.8 kg-m
(37 – 41 ft-lb)

Fig. 6-117



Install the bushings and retainers.

Fig. 6-118



Tighten the upper mounting nut and lock nut.

Tightening torque: 1.9–3.1 kg-m
(14–22 ft-lb)

FRONT WHEEL ALIGNMENT

PRE-ALIGNMENT PREPARATIONS

Check the following points before performing the front wheel alignment:

1. Tire pressure, tire wear and difference in outer diameter measurements
2. Wheel play or unbalance
3. Play in the front wheel bearing
4. King pin play
5. Tie rod end and drag link play
6. Disalignment of wheel base left-right movement
7. Body leaning
8. Looseness of the spring U bolt, knuckle arm or steering gear housing
9. Improper movement of the shock absorbers
10. During alignment the vehicle must be empty and level.

Fig. 6-119

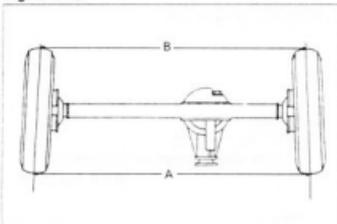
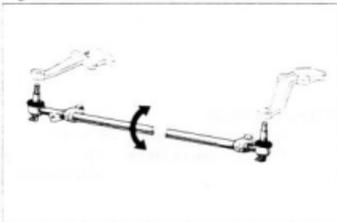


Fig. 6-120



Toe-in

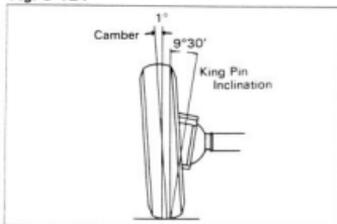
Measure the toe-in.

Toe-in:

Bias tire	4 ± 2 mm (0.10 ± 0.08 in.)
Radial tire	1 ± 2 mm (0.04 ± 0.08 in.)

To adjust, turn the tie rod adjusting tube.

Fig. 6-121

**Camber & King Pin Angle**

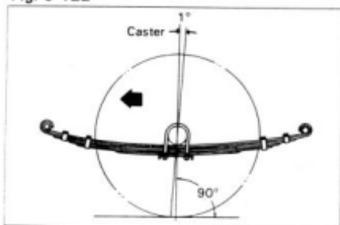
Measure the camber and king pin angle.

Camber angle: $1^\circ \pm 45'$ **King pin inclination: $9^\circ 30'$**

– Note –

If measurements are off standard, inspect each part thoroughly and adjust.

Fig. 6-122

**Caster**

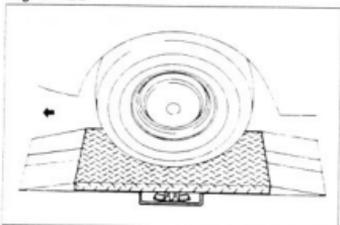
Measure the caster.

Caster angle:FJ, BJ, HJ4_series $1^\circ \pm 45'$ FJ, BJ, HJ6_series $1^\circ 05' \pm 45'$

– Note –

If measurements are off standard, inspect each part and adjust.

Fig. 6-123

**Side Slip**

Measure the side slip

**Side slip: With in 3.0 mm/m
(0.12 in./3.3 ft)**

– Note –

If not within limit, adjust by lengthening or shortening the tie rod.

Fig. 6-124

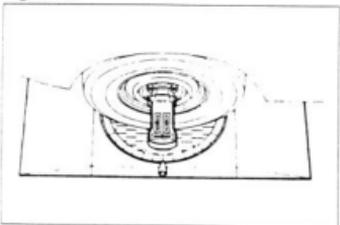
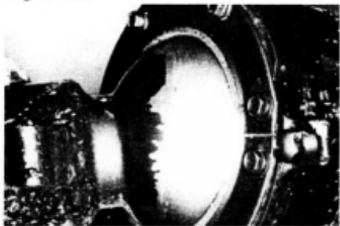
**Turning Angle****Inside wheel angle: $29 - 32^\circ$** **Outside wheel angle: 30°
(Reference)**

Fig. 6-125



If not within limits, adjust the steering angles to standard values with knuckle stopper.

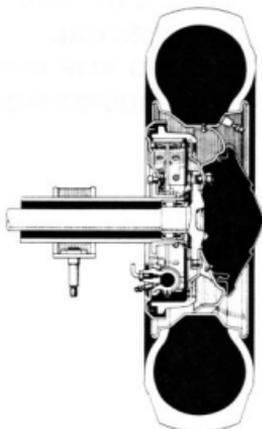
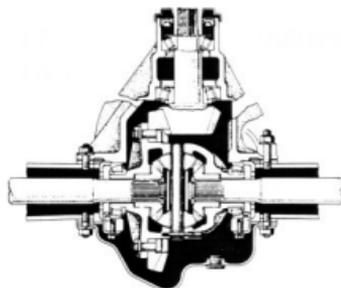
REAR AXLE & SUSPENSION

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REAR AXLE SHAFT	7-4
REAR AXLE HUB	7-11
DIFFERENTIAL	7-17
LIMITED SLIP DIFFERENTIAL	7-31
REAR SUSPENSION	7-41

CUTAWAY VIEW

Fig. 7-1

Semi-Floating Type



Full Floating Type

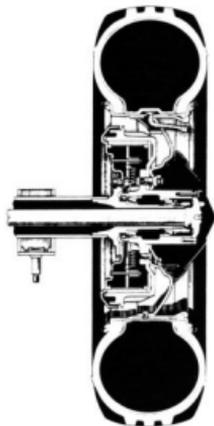
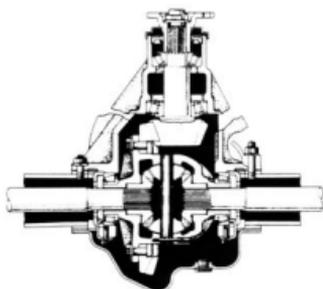
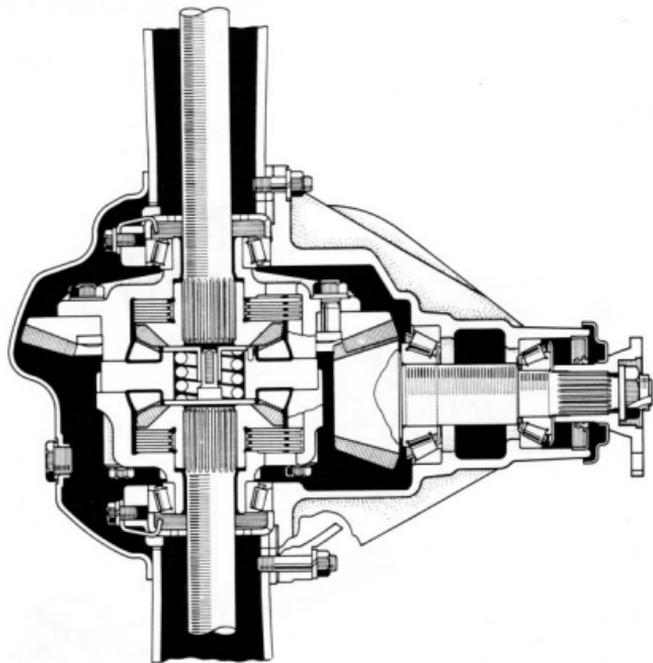


Fig. 7-2

LIMITED SLIP DIFFERENTIAL



REAR AXLE SHAFT (SEMI-FLOATING TYPE)

REMOVAL

Remove the parts in the numerical order shown in the figure.

Fig. 7-3

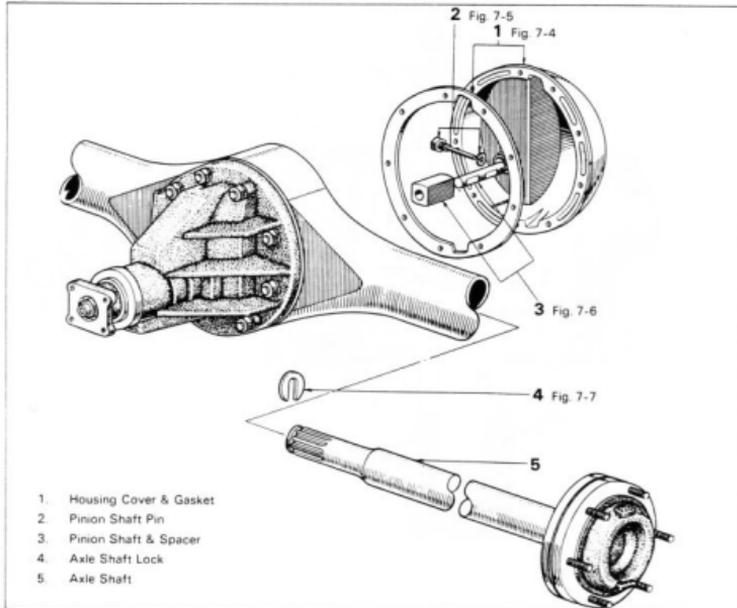
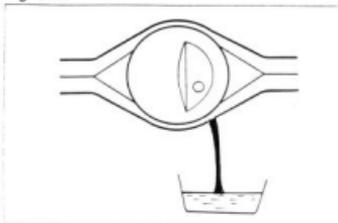
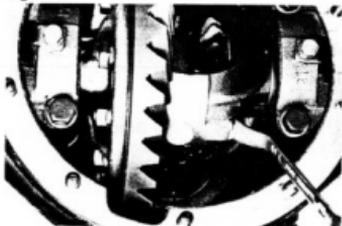


Fig. 7-4



Remove the drain and filler plugs and drain the oil.

Fig. 7-5



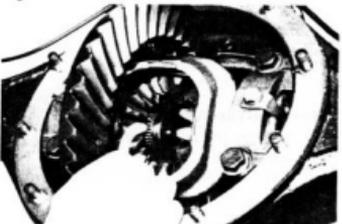
Remove the pinion shaft pin.

Fig. 7-6



Draw out the pinion shaft and spacer.

Fig. 7-7



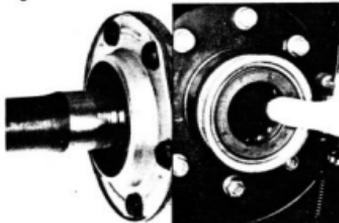
Push the axle shaft to the center of vehicle and remove the axle shaft lock.

Fig. 7-8

**INSPECTION****Axle Shaft & Pinion Shaft Spacer**

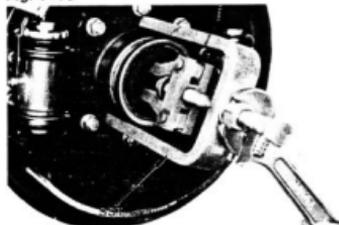
Inspect for wear or damage.

Fig. 7-9

**Axle Shaft Bearing**

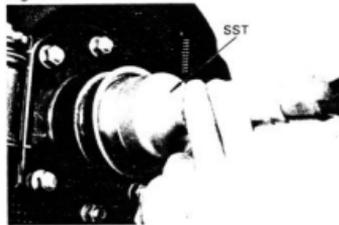
Inspect for wear or damage.

Fig. 7-10

**Replace The Axle Shaft Bearing**

1. Remove the bearing and oil seal together with SST.
SST [09514-35011]

Fig. 7-11



2. Drive in the bearing and oil seal with SST.
SST [09515-35010]

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 7-12

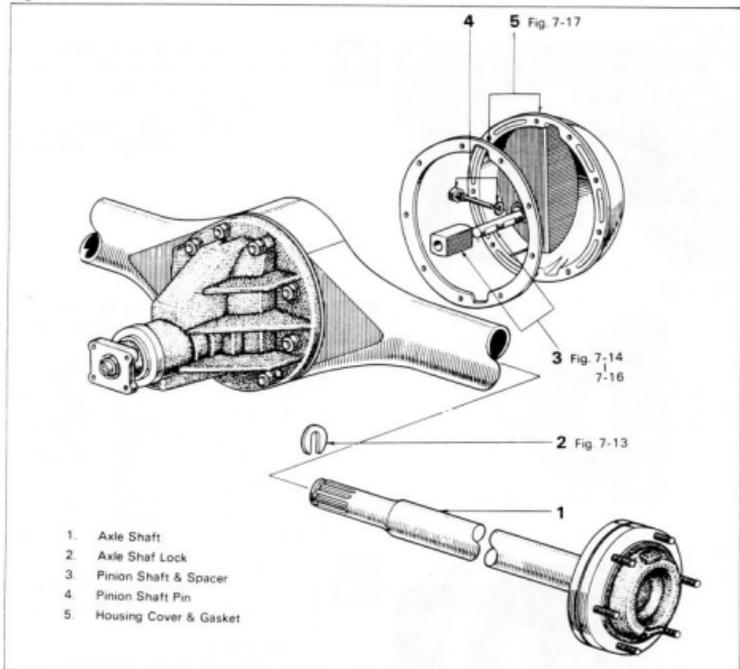
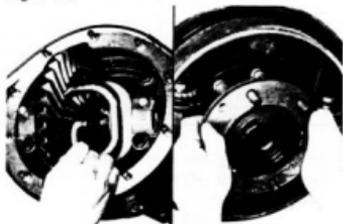
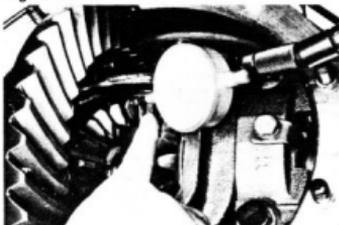


Fig. 7-13



After installing the lock to the shaft, pull the shaft fully toward the outer side of vehicle.

Fig. 7-14



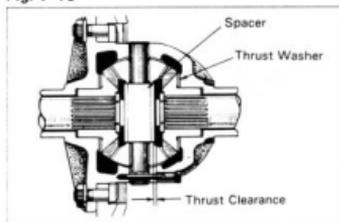
Measure the differential gear backlash.

1. Hold the side gear steady and measure the backlash of the pinion.

Backlash:

STD 0.02 – 0.20 mm
(0.0008 – 0.0079 in.)

Fig. 7-15



2. If outside the standard value range, correct by selecting proper size side gear thrust washers.

Thrust washer thickness

Part No.	Thickness	mm (in.)
41361-60010	1.55 – 1.65	(0.0610 – 0.0650)
41361-60020	1.70 – 1.80	(0.0670 – 0.0709)
41361-60030	1.85 – 1.95	(0.0728 – 0.0768)
41361-60040	2.00 – 2.10	(0.0787 – 0.0827)

Fig. 7-16



Rear axle shaft end thrust clearance.

- Select pinion shaft spacer of the thickness that will set the thrust clearance to the standard value.

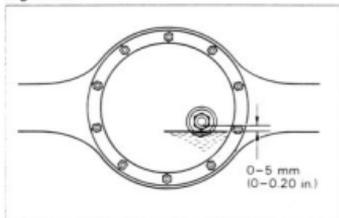
Clearance:

STD 0.060 – 0.465 mm
(0.0024 – 0.0183 in.)

Spacer thickness

Part No.	Thickness	mm (in.)
41344-35010	29.8	(1.173)
41345-35010	30.2	(1.189)
41346-35010	30.6	(1.205)
41347-35010	29.0	(1.142)
41348-35010	24.9	(1.157)

Fig. 7-17



After installing the axle shaft, fill in hypoid gear oil SAE90, API GL-5.

Capacity:

STD 2.5 liters
(2.6 US qt., 2.2 Imp. qt.)

-Note-
With LSD fill in hypoid gear oil LSD, SAE90, API GL-5.

REAR AXLE SHAFT (FULL FLOATING TYPE) COMPONENTS

Fig. 7-18

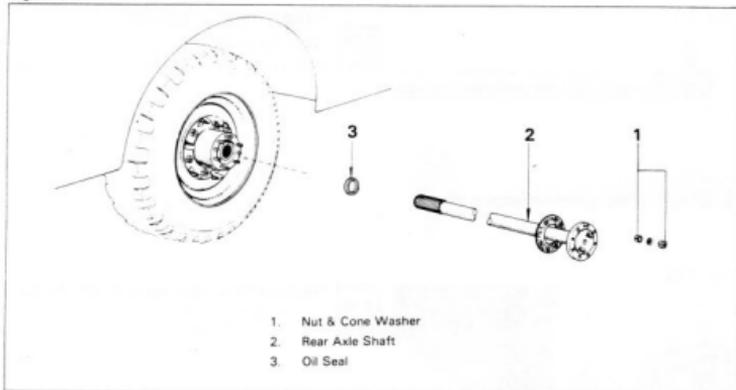
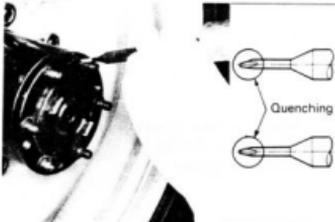


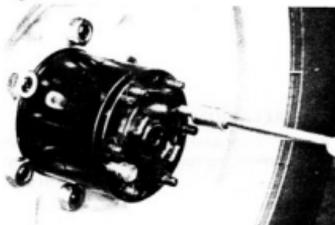
Fig. 7-19



REMOVAL

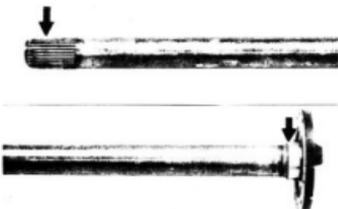
1. Remove the nuts and cone washers with a tapered punch.

Fig. 7-20



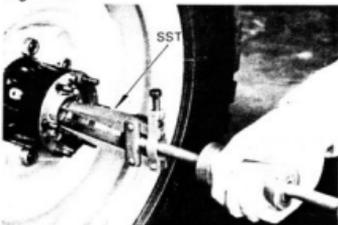
2. Remove the rear axle shaft by tightening the bolts.

Fig. 7-21

**INSPECTION & REPAIR****Rear Axle Shaft**

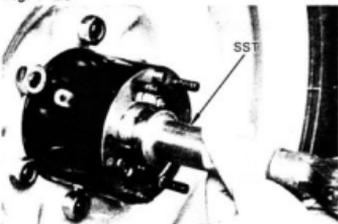
Inspect the parts identified by arrows for wear or damage.

Fig. 7-22

**Replace The Rear Axle Shaft Oil Seal**

1. Remove the oil seal with SST.
SST [09308-00010]

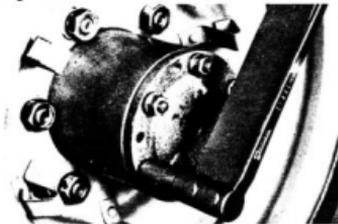
Fig. 7-23



2. Install the new oil seal with SST.
SST [09517-36010]
3. Apply MP grease on the oil seal.



Fig. 7-24

**INSTALLATION**

Install the rear axle shaft and tighten the nuts.

Tightening torque: 2.8 – 3.5 kg-m
(21 – 25 ft-lb)

REAR AXLE HUB (FULL FLOATING TYPE)

REMOVAL

Remove the parts in the numerical order shown in the figure.

Fig. 7-25

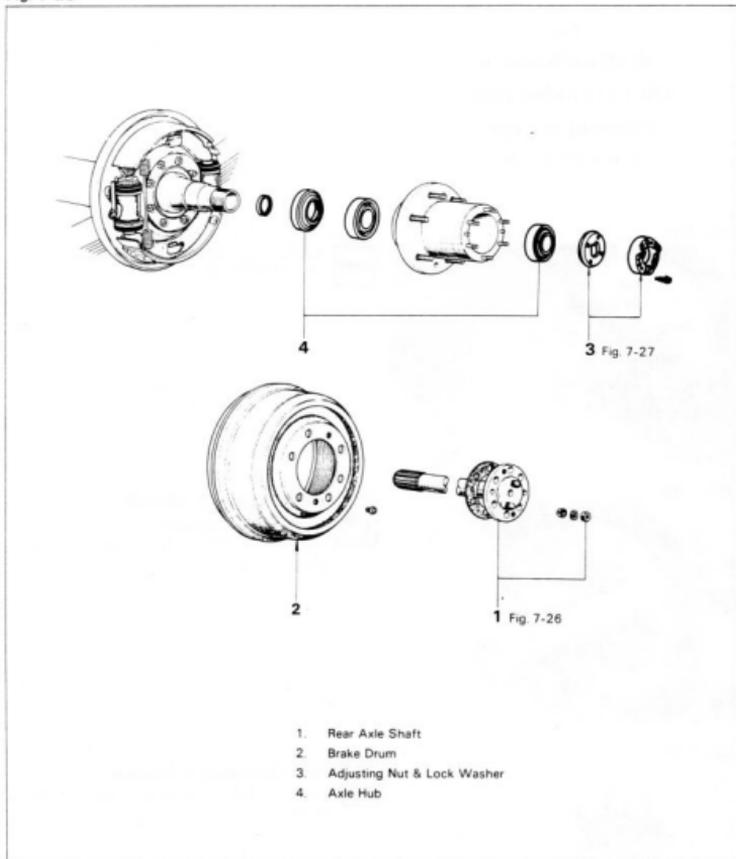
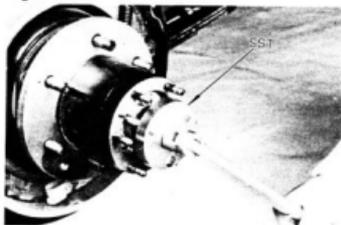


Fig. 7-26

SEE
 REAR AXLE SHAFT
 (FULL FLOATING TYPE)
 REMOVAL SECTION
 Fig. 7-19 & 7-20

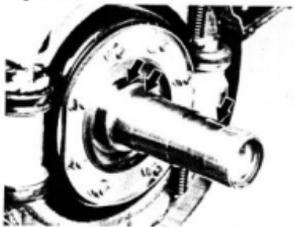
Remove the rear axle shaft.

Fig. 7-27



Remove the adjusting nut with SST.
 SST [09509-25011]

Fig. 7-28

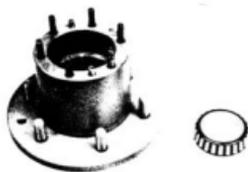


INSPECTION & REPAIR

Rear Axle Housing

Inspect the parts indicated by arrows for wear or damage.

Fig. 7-29



Rear Axle Hub & Bearing

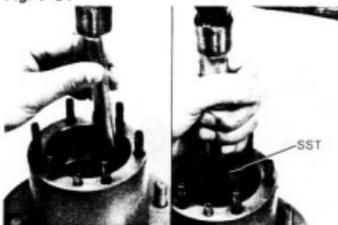
Inspect the bearings and oil seal for wear or damage.

Fig. 7-30

**Replace The Bearing**

1. Remove the oil seal with a screw driver.

Fig. 7-31

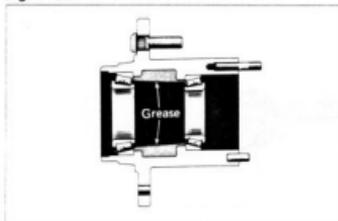


2. Remove the bearing outer races with a drift.



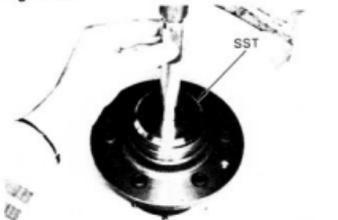
3. Install the new bearing outer races with SST
SST [09608-35013]

Fig. 7-32



4. Pack MP grease into the hub and bearings.

Fig. 7-33



5. Install the inner bearing and oil seal with SST
SST [09608-35013]



6. Apply MP grease on the oil seal.

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 7-34

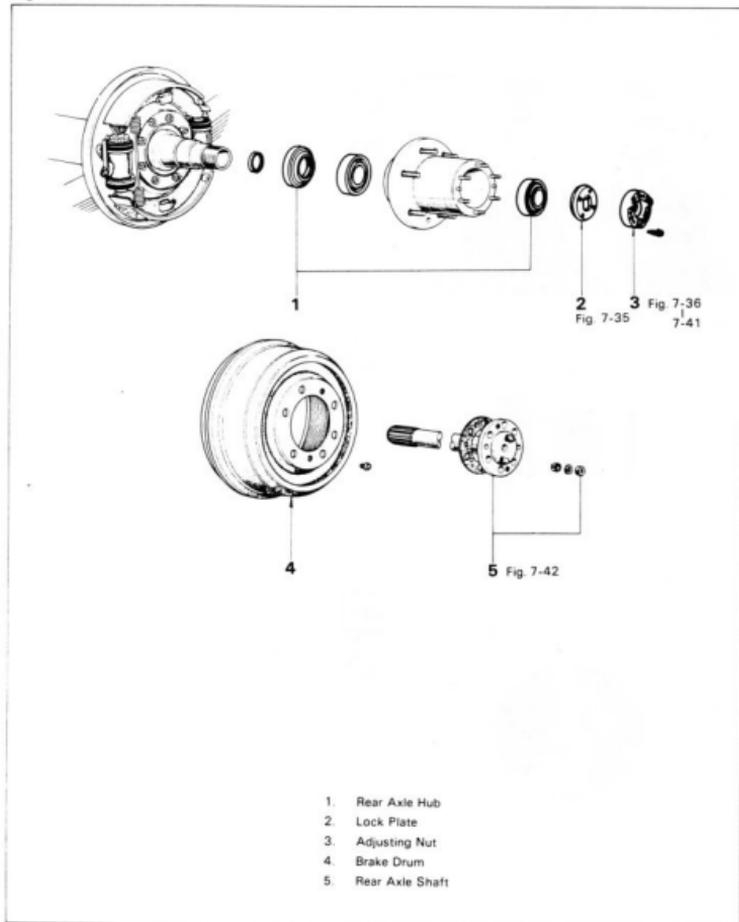


Fig. 7-35



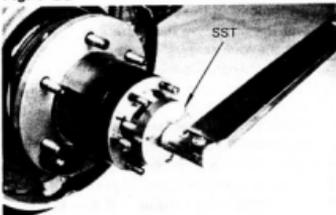
Install the lock plate.

—Note—



After fully pushing in the outer bearing, position the protrusion of the lock plate into axle housing groove.

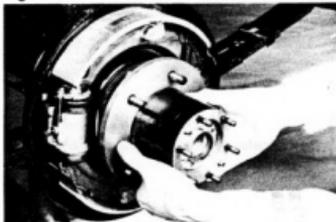
Fig. 7-36



Tighten the adjusting nut with SST.
SST [09509-25011]

**Tightening torque: 6.0 kg-m
(43 ft-lb)**

Fig. 7-37



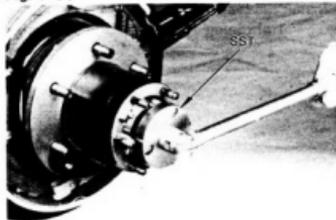
Rotate the rear axle hub about three times to snug down the bearings.

Retighten the adjusting nut.



**Tightening torque: 6.0 kg-m
(43 ft-lb)**

Fig. 7-38



With SST, loosen the adjusting nut until it can be rotated by hand.

Then, add the preload a little at a time by tightening the nut.

SST [09509-25011]

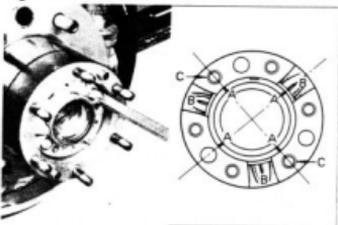
Fig. 7-39



Measure the preload at the hub bolt.

Preload (starting): 2.6 – 5.7 kg
(5.7 – 12.6 lb)

Fig. 7-40



Align one of the axle housing slots A with one of the adjusting nut slots B.

Install the lock screws into the holes C which are at right angles to the aligned slots A and B.

Tightening torque: 0.4 – 0.7 kg-m
(35 – 60 in.-lb)

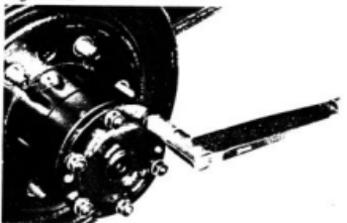
Fig. 7-41



Recheck the preload at the hub bolt.

Preload (starting): 2.6 – 5.7 kg
(5.7 – 12.6 lb)

Fig. 7-42



Install the rear axle shaft.

Tightening torque: 2.8 – 3.5 kg-m
(21 – 25 ft-lb)

DIFFERENTIAL**REMOVAL**

After draining out the oil, remove the parts in the numerical order shown in the figure.

Fig. 7-43

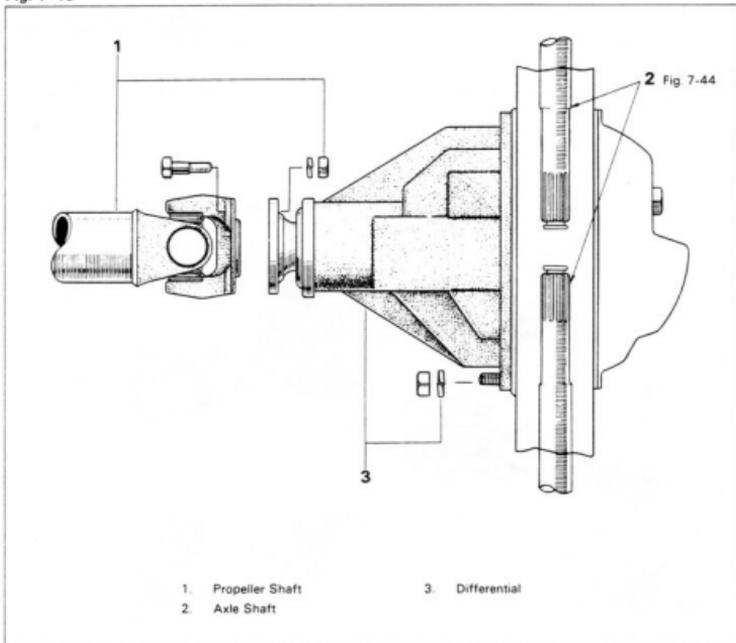


Fig. 7-44

SEE
REAR AXLE SHAFT
(SEMI-FLOATING TYPE)
REMOVAL SECTION

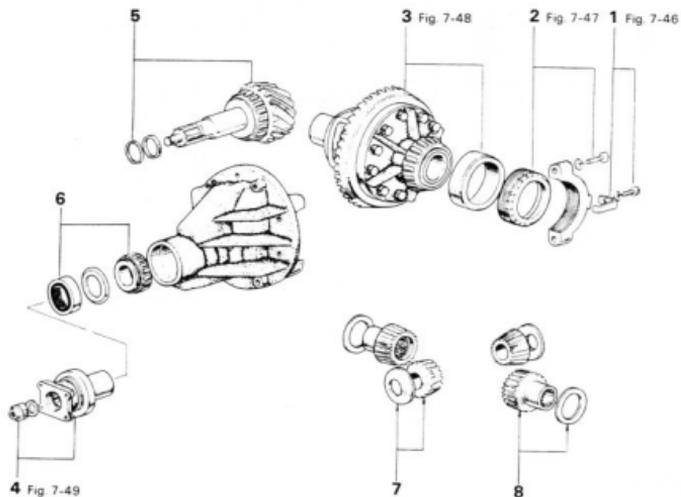
Fig. 7-4 to 7-7,
 7-19 & 7-20

Remove the axle shafts.

DISASSEMBLY

Disassemble the parts in the numerical order shown in the figure.

Fig. 7-45



1. Adjust Nut Lock
2. Bearing Cap & Adjusting Nut
3. Ring Gear, Cap & Bearing
4. Joint Flange

5. Drive Pinion, Bearing, Shim & Washer
6. Oil Seal, Slinger & Bearing
7. Pinion & Thrust Washer
8. Side Gear & Thrust Washer

Fig. 7-46



Before starting disassembly, measure the runout of the ring gear back face.

Runout:

**Limit 0.10 mm
(0.0039 in.)**

Fig. 7-47



Place matchmarks on the bearing caps.

Fig. 7-48



Place tags on the bearing outer races to differentiate the left and right side usage.

Fig. 7-49

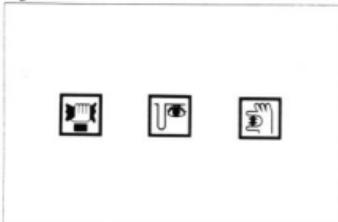


Loosen the staked parts of the nut, and remove the nut with SST. SST [09330-00020]

-Note-

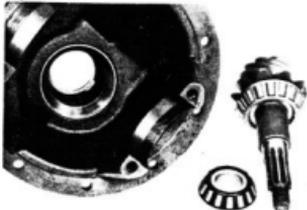
Hold the gear part of the drive pinion with hand, and remove the flange by tapping the pinion gear with a plastic hammer.

Fig. 7-50

**INSPECTION**

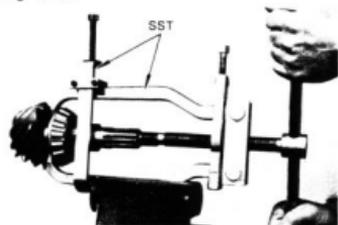
Wash the disassembled parts and inspect them on the following points.
Replace any part found defective.

Fig. 7-51

**Drive Pinion & Bearing**

1. Inspect the drive pinion gear teeth for damage, wear or burning.
2. Inspect the bearings for wear or damage.
3. Measure the shim and adjust washer thickness.

Fig. 7-52

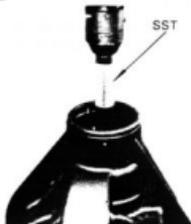
**Replace The Bearing**

1. Remove the bearings with SST.
SST [09950-20014]

—Note—

If there is not enough clearance for the SST to hook on, draw out the bearing slightly with a chisel.

Fig. 7-53



2. Remove the bearing outer race with SST.
SST [09608-35013]

Fig. 7-54

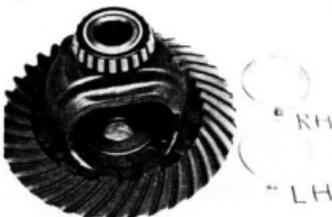


3. Install the new bearing outer race with SST.
SST [09608-35013]

—Note—

Make sure to reinstall the shim to the back side of outer race at gear side that was removed at disassembly.

Fig. 7-55



Differential Case, Side Bearing & Ring Gear

1. Inspect the ring gear teeth for damage, wear or burning.
2. Inspect the side bearings for wear or damage.
3. Inspect the case for cracks.

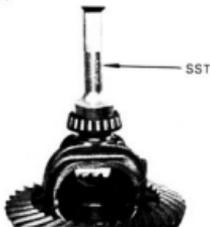
Fig. 7-56



Replace The Side Bearing

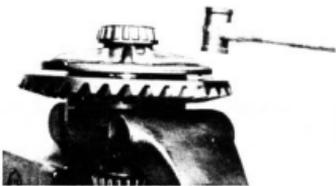
1. Remove the bearing with SST.
SST [09950-20014]

Fig. 7-57



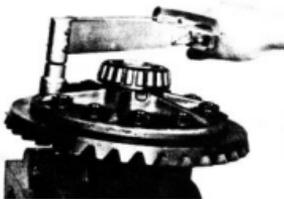
2. Install the bearing with SST.
SST [09505-20010]

Fig. 7-58

**Replace The Ring Gear**

1. Loosen the attaching bolts uniformly, and remove the ring gear by tapping it with a plastic hammer.

Fig. 7-59



2. Heat the ring gear to 90 – 110°C (194 – 230°F) and quickly fit it into the case. Tighten the nuts at the specified torque.

Tightening torque:

10.5 – 12.0 kg-m
(76 – 86 ft-lb)

Fig. 7-60

**Pinion, Side Gear & Washer**

Inspect for wear or damage.

Fig. 7-61

Differential Adjusting Procedure

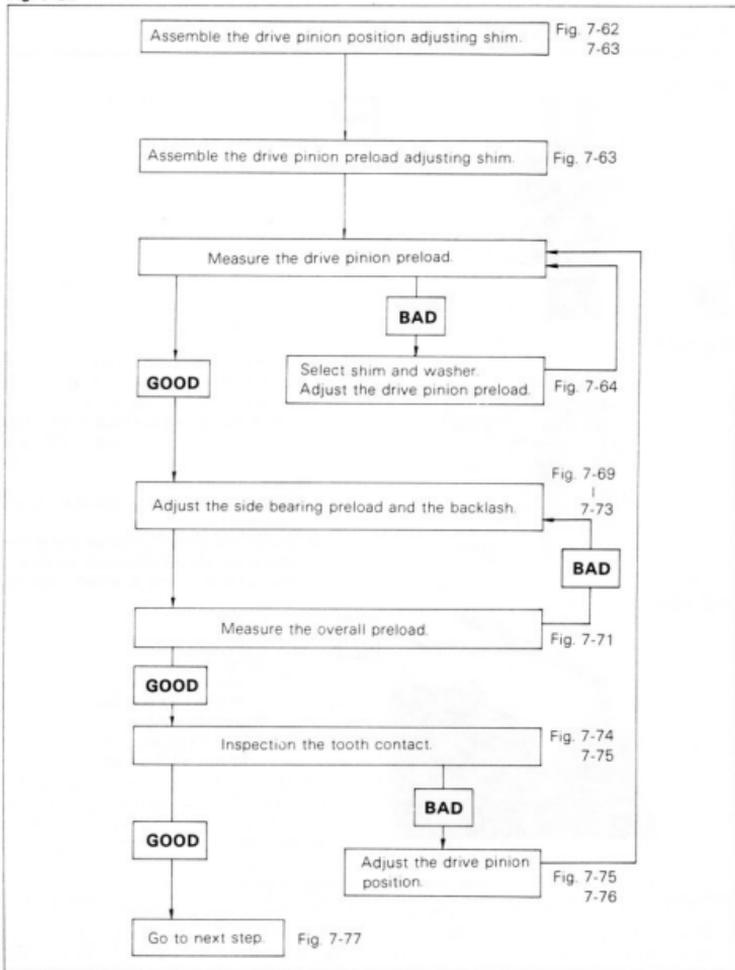
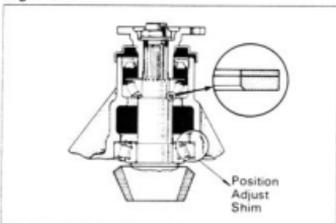


Fig. 7-62



Install the bearing to the drive pinion with SST.
SST [09506-35010]

Fig. 7-63



Install the drive pinion assembly to the differential carrier as shown in the figure, and tighten the nut at the specified torque.

**Tightening torque: 20.0 – 24.0 kg-m
(145 – 173 ft-lb)**

-Note-

1. Have the bearings lubricated with hypoid gear oil.
2. Install the same size shims and washer that wear used before disassembly. (for position and preload adjusting shim)

Fig. 7-64



Measure the preload.

Preload (starting):

- New bearing**
19 – 26 kg-cm
(16.5 – 22.6 in.-lb)
- Reused bearing**
9 – 13 kg-cm
(7.8 – 11.3 in.-lb)

If the preload is not within the specified limits, correct by selecting suitable adjusting washer and increasing or decreasing the number of adjusting shims (limited to 4 shims).

Adjusting shim & washer thickness

Part No.	Thickness mm (in.)	Part No.	Thickness mm (in.)
90564-30035	0.25 (0.0098)	90560-30188	2.86 – 2.88 (0.1126 – 0.1134)
90560-30184	2.74 – 2.76 (0.1079 – 0.1087)	90560-30190	2.89 – 2.91 (0.1138 – 0.1146)
90560-30185	2.77 – 2.79 (0.1091 – 0.1098)	90560-30191	2.92 – 2.94 (0.1150 – 0.1157)
90560-30186	2.80 – 2.82 (0.1102 – 0.1110)	90560-30192	2.95 – 2.97 (0.1161 – 0.1169)
90560-30187	2.83 – 2.85 (0.1114 – 0.1122)	90560-30199	2.98 – 3.00 (0.1173 – 0.1181)

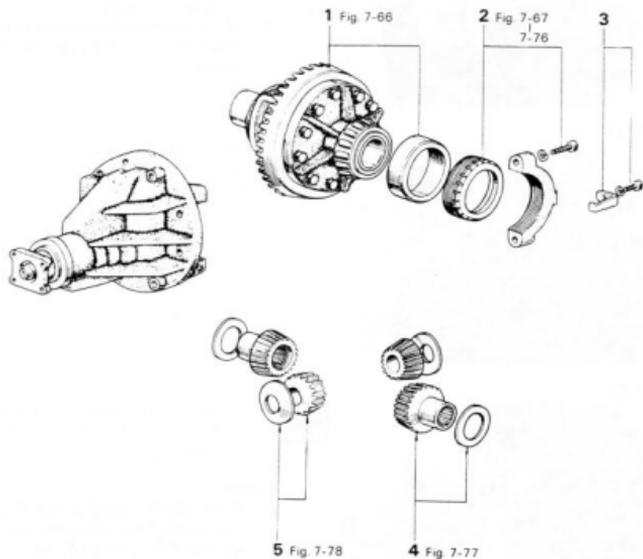
ASSEMBLY & ADJUSTMENT

Assemble the parts in the numerical order shown in the figure.

Fig. 7-65

-Note-

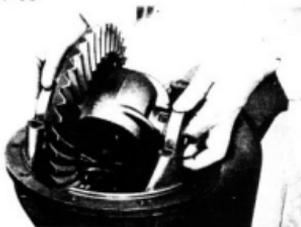
Coat hypoid gear oil on the bearings, thrust washers, and similar parts before assembling them.



1. Ring Gear, Case & Bearing
2. Bearing Cap & Adjusting Nut
3. Adjusting Nut Lock

4. Thrust Washer & Side Gear
5. Thrust Washer & Pinion

Fig. 7-66

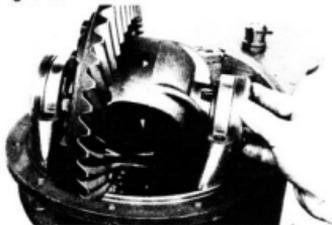


Assemble the bearing cups to the side bearings and install the differential case to the carrier.

—Note—

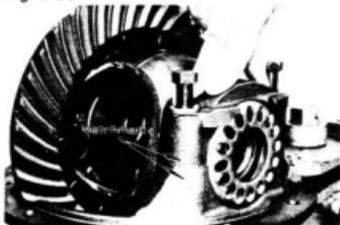
1. Use care not to intermix the left and right bearing cups.
2. Make sure that backlash has been provided between the ring gear and drive pinion.

Fig. 7-67



1. Assemble the adjusting nuts to their respective carriers with the threads fitted on properly.

Fig. 7-68

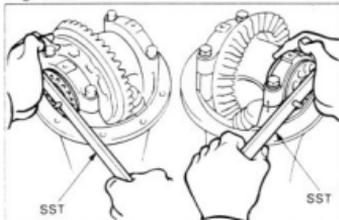


2. Screw in the two bearing cap bolts two or three turns and press down the bearing cap with hand.

—Note—

1. If the bearing cap does not fit tightly on the carrier, the adjusting nut threads are not fitting properly so that operations 1 and 2 above must be repeated.
2. Make sure that the bearing cap matchmarks are aligned with that on the carrier.

Fig. 7-69

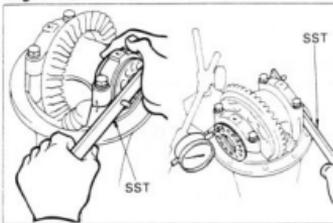


Adjust The Side Bearing Preload

SST [09504-00010]

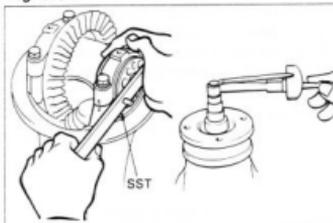
1. Tighten the bearing cap bolts until the spring washers are slightly compressed.
2. Tighten the adjusting nut on the ring gear side with SST so that the ring gear has a backlash of about 0.2 mm (0.008 in).
3. With SST, tighten firmly the adjusting nut on the drive pinion side in order to snug down the bearing in the carrier.
4. Check to see if tightening of the adjusting nut creates ring gear backlash.

Fig. 7-70



5. With SST, sufficiently loosen the side bearing adjusting nut on the drive pinion side.
6. Set the adjusting nut to the zero preload position for the side bearing.
 - (1) Place a dial gauge on top of the bearing outer race.
 - (2) Tighten the other adjusting nut until the dial gauge pointer begins to move.

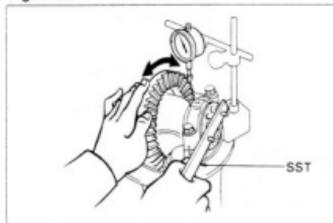
Fig. 7-71



7. Tighten adjusting nut 1 – 1.5 clicks from the zero preload position.
8. Measure the overall preload.

Preload (starting):**(For both new and reused bearing)****4 – 6 kg-cm****(3.5 – 5.2 in.-lb)****+ Drive pinion preload**

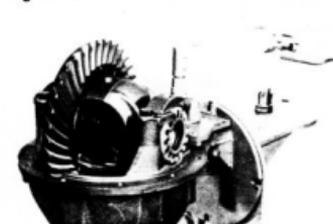
Fig. 7-72

**Adjust The Backlash**

1. Adjust the backlash to the specified value with SST, turning the left and right adjusting nuts by equal amounts (such as loosening the left side one click and tightening the right side one click).

Backlash: 0.15 – 0.20 mm**(0.0059 – 0.0079 in.)**

Fig. 7-73



2. Tighten the bearing cap bolts at the specified torque.

Tightening torque:**9.0 – 11.0 kg-m****(66 – 79 ft-lb)**

Fig. 7-74

**Inspect The Tooth Contact**

1. Inspect the contact between the ring gear and drive pinion teeth by coating red lead on the ring gear teeth.

—Note—

1. Hold the companion flange steady with hand and rotate the ring gear, and inspect the contact pattern formed.
2. If the teeth are not contacting properly, correct by method shown in the figure.
2. Install the adjusting lock nut on each bearing cap, and stake the companion flange nut.

Fig. 7-75

(1) Heel Contact

Select Adjusting Shim That Will Bring Drive Pinion Closer To Ring Gear

(3) Face Contact

Adjust By Same Method As In (1)

(2) Toe Contact

Select Adjusting Shim That Will Shift Drive Pinion Away From Ring Gear

(4) Flank Contact

Adjust By Same Method As In (2)

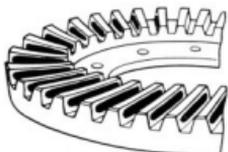
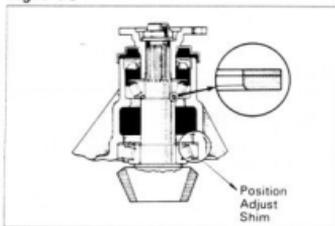
**Proper Contact**

Fig. 7-76



Adjusting shim thickness

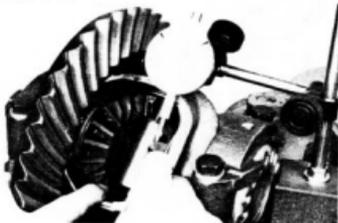
Part No.	Thickness	mm (in.)
90564-68001	0.25	(0.0098)
90564-68002	0.30	(0.0118)
90564-68003	0.35	(0.0138)
90564-68004	0.40	(0.0157)
90564-58005	0.45	(0.0177)

Fig. 7-77



Install the thrust washers and side gears.

Fig. 7-78



Measure the differential gear backlash.

1. Hold the pinion gear steady with hand, and measure the side gear backlash.

Backlash:

**STD 0.02 – 0.20 mm
(0.0008 – 0.0079 in.)**

2. If outside the specified limit, correct by selecting proper thickness side gear thrust washers.

–Note–

All efforts should be taken to use same thickness thrust washers at the left and right sides.

Thrust washer thickness

Part No.	Thickness	mm (in.)
41361-60010	1.55 – 1.65 (0.0610 – 0.0650)	
41361-60020	1.70 – 1.80 (0.0669 – 0.0709)	
41361-60030	1.85 – 1.95 (0.0728 – 0.0768)	
41361-60040	2.00 – 2.10 (0.0787 – 0.0827)	

LIMITED SLIP DIFFERENTIAL DIFFERENTIAL CASE

DISASSEMBLY

Disassemble the parts in the numerical order shown in the figure.

Fig. 7-81

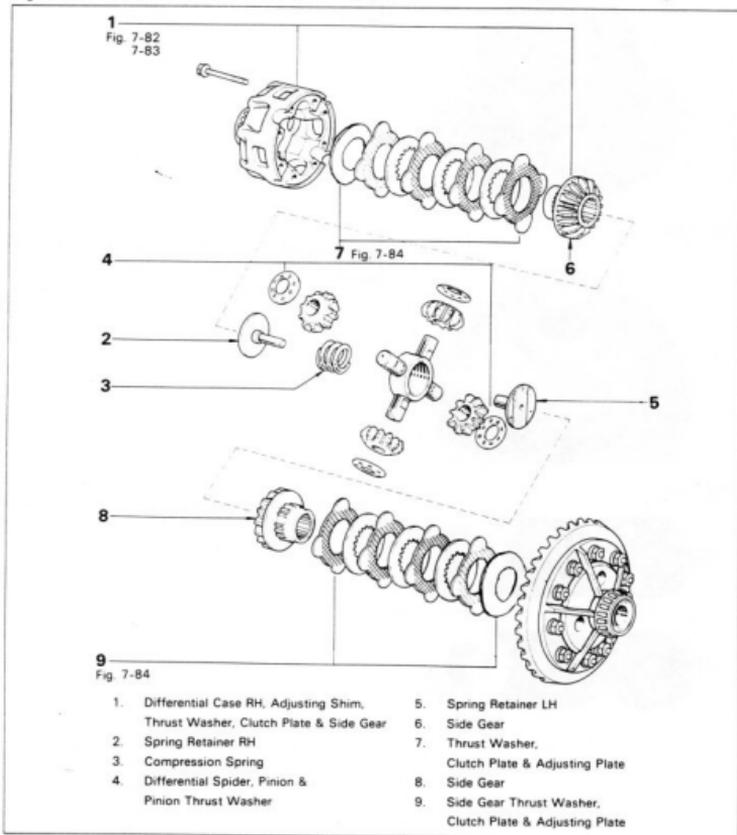


Fig. 7-82



Place matchmarks on the RH and LH differential case.

Fig. 7-83



Loosen each bolt a little at a time, and in the sequence shown in the figure.

Fig. 7-84



Arrange the clutch plate, side gear and thrust washer in order.

Fig. 7-85

**INSPECTION****Differential Case**

Check for wear or damage.

Fig. 7-86

**Differential Spider, Pinion & Pinion Thrust Washer**

Check for wear or damage.

Fig. 7-87

**Spring Retainer & Compression Spring**

Check for wear or damage.

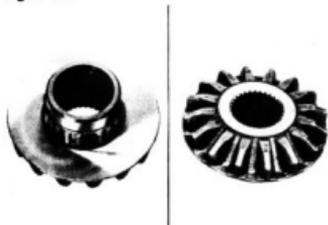
Fig. 7-88



Measure the free length of the spring.

Free length:**Compression spring 38.6 mm
(1.520 in.)**

Fig. 7-89

**Side Gear**

Check for wear or damage.

-Note-

If replacing the side gear, also replace the side gear thrust washer making contact with it.

Fig. 7-90

**Clutch Plate & Side Gear Thrust Washer**

Check for wear or damage.

Thrust washer thickness:**(Reference only)****Wear**

Limit 1.93 mm
(0.0760 in.)

Clutch plate thickness:**(Reference only)****Wear**

Limit 1.93 mm
(0.0760 in.)

Fig. 7-91

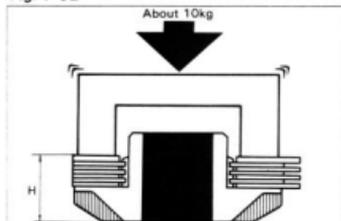
**Select The Adjusting Shim**

1. Assemble the side gear thrust washer and clutch plate on the side gear.

-Note-

Do not assemble the adjusting shim.

Fig. 7-92



2. Using a suitable tool as shown, press down with about 10 kg (22 lb) of pressure, and measure the dimension H.

Fig. 7-93



3. Select the adjusting shim thickness.
Adjusting shim thickness T
T = 31.02 - H

4. Select a proper adjusting shim according to the following table.

Shim thickness

Part No.	Thickness	mm (in.)
90564-54001	0.20	(0.0079)
90564-54002	0.25	(0.0098)
90564-54003	0.30	(0.0118)
90564-54004	0.35	(0.0138)

Fig. 7-94

SEE
SELECT THE SIDE GEAR
THRUST WASHER

Fig. 7-91 to 7-93



5. In the same manner, select the another thrust washer for the others.

Fig. 7-95



6. Assemble the following parts in the case
- (1) Adjusting shim
 - (2) Thrust washer
 - (3) Clutch plate
 - (4) Thrust washer
 - (5) Clutch plate
 - (6) Thrust washer
 - (7) Clutch plate
 - (8) Thrust washer
 - (9) Side gear

Fig. 7-96



7. Install the spring retainer, pinion and thrust washer.
8. Secure the side gear and measure the backlash while pushing in the spring retainer.

Backlash: 0.02 - 0.24 mm
(0.0008 - 0.0094 in.)

-Note-

1. Measure at all four locations.
2. Measure the others in the same manner.
3. If one of the backlashes are not within specification, change that pinion gear with another and measure again.

ASSEMBLY

Assemble the parts in the numerical order shown in the figure.

Fig. 7-97

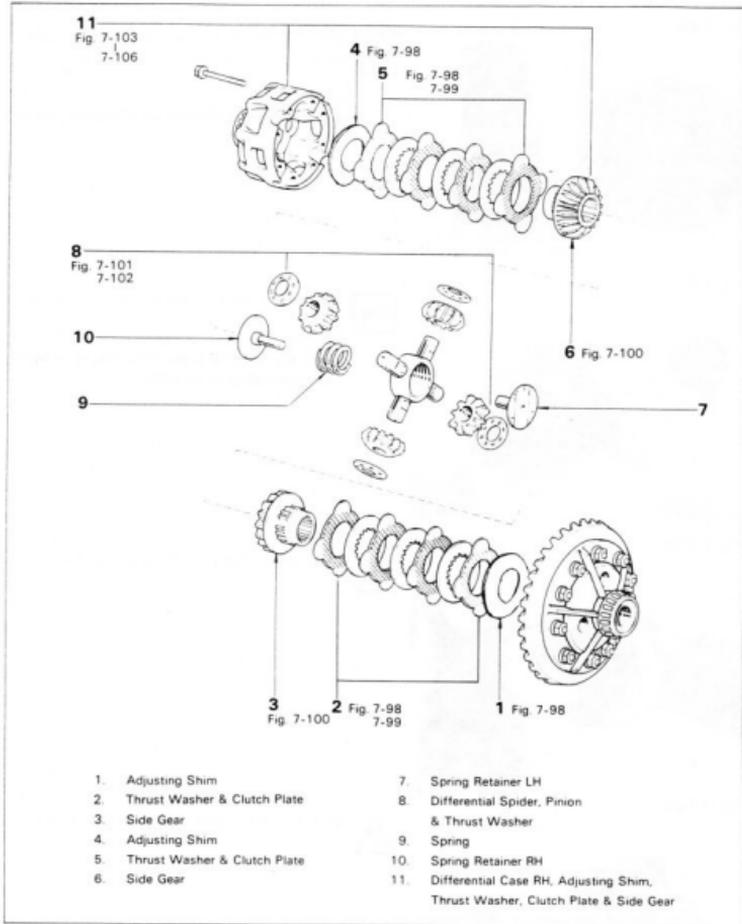
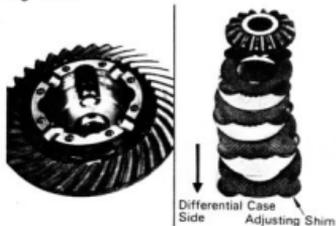


Fig. 7-98



Assemble the thrust washer with the surface without an oil groove facing the case.

—Note—

Coat the thrust washer with hypoid gear oil LSD.

Fig. 7-99



Assemble the clutch plate and thrust washer.

—Note—

Coat the clutch plate and thrust washer with hypoid gear oil LSD.

Fig. 7-100



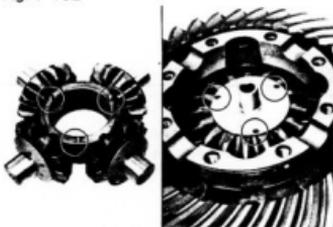
Coat the side gear with hypoid gear oil LSD.

Fig. 7-101



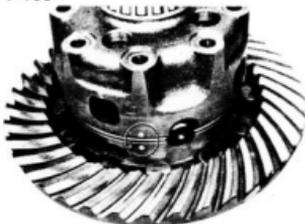
Coat the pinion gear with hypoid gear oil LSD.

Fig. 7-102



Align the protrusion of the spider and hole of the spring retainer.

Fig. 7-103



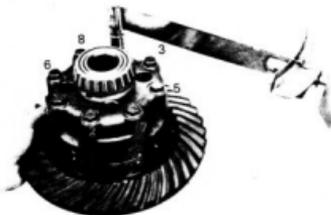
Align the matchmarks and assemble the differential cases.

Fig. 7-104



Mesh the side gear and pinion gears.

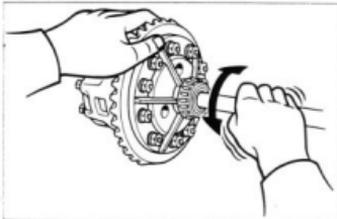
Fig. 7-105



Tighten each bolt a little at a time to the specified torque, in the sequence shown in the figure.

Tightening torque: 3.9 – 5.7 kg-m
(29 – 41 ft-lb)

Fig. 7-106



Turn the side gears with axle shaft or other means and check to see that they turn smoothly.

-Note-

Reselect thrust washer if side gear does not turn smoothly.

REAR SUSPENSION COMPONENTS

Fig. 7-107

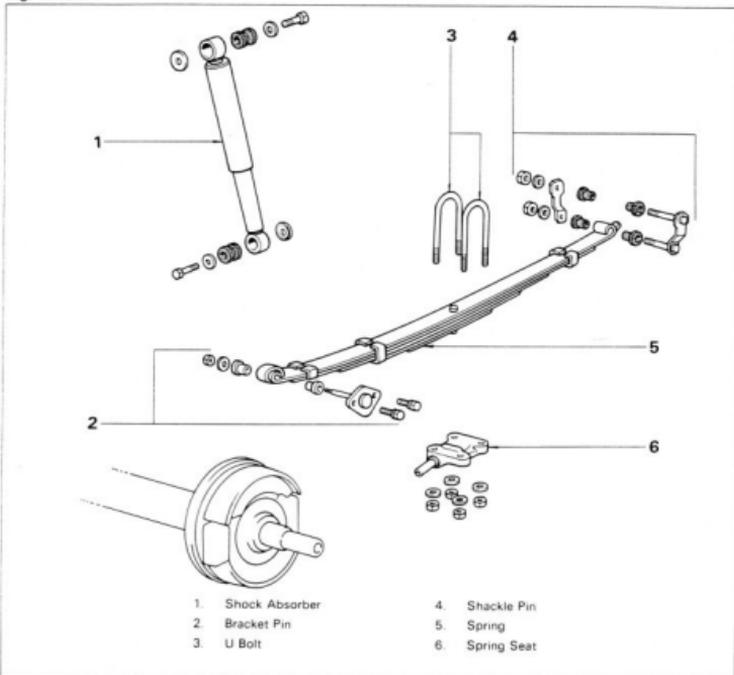


Fig. 7-108

SEE
FRONT SUSPENSION
SECTION

Fig. 6-88 to 6-118

Disassemble and assemble the rear suspension.

STEERING

	Page
CUTAWAY VIEW	8-2
INTERMEDIATE SHAFT	8-4
TILT TYPE STEERING COLUMN & MAIN SHAFT	8-15
STEERING COLUMN & MAIN SHAFT	8-42
STEERING GEAR HOUSING	8-55
STEERING LINKAGE	8-88
POWER STEERING	8-102

CUTAWAY VIEW

Fig. 8-1

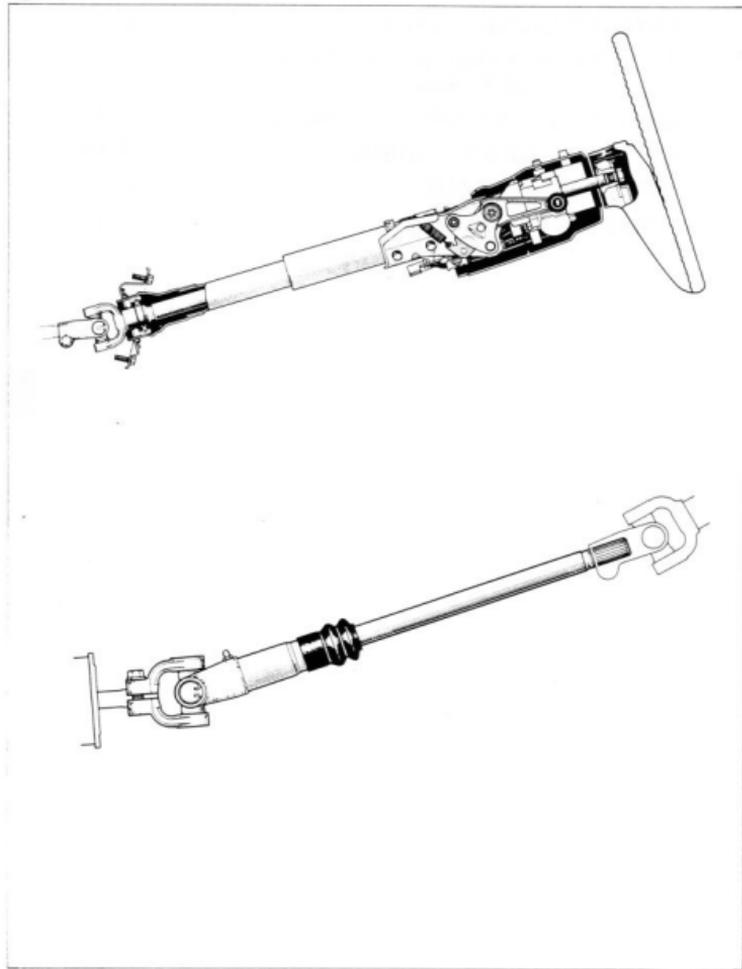
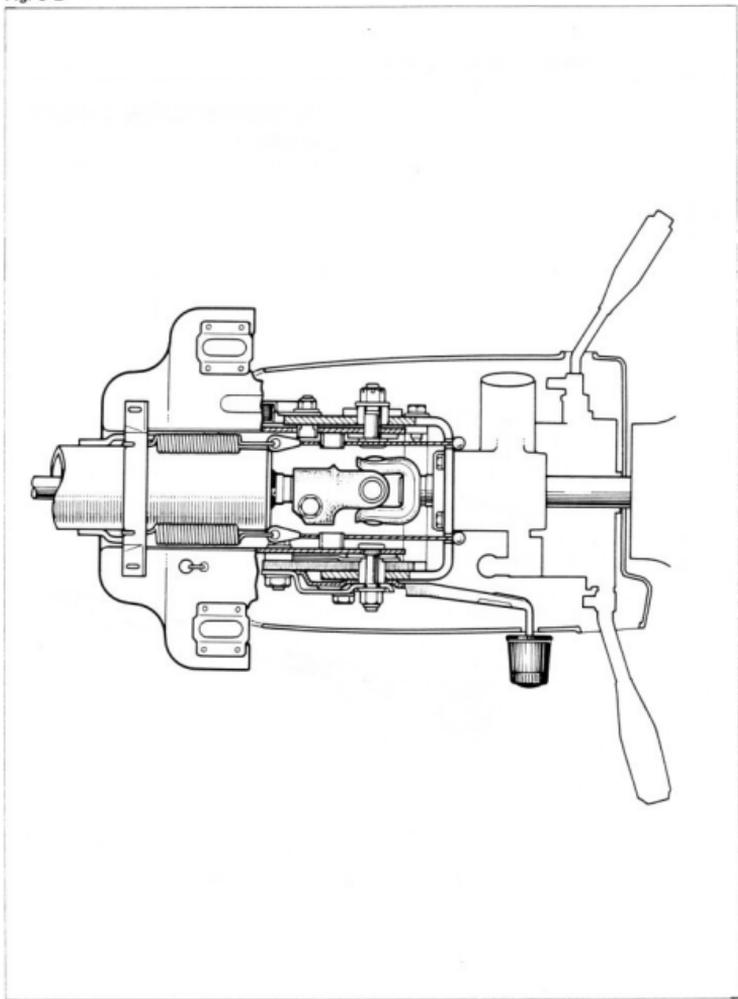


Fig. 8-2



INTERMEDIATE SHAFT**REMOVAL**

Remove the parts in the numerical order shown in the figure.

Fig. 8-3

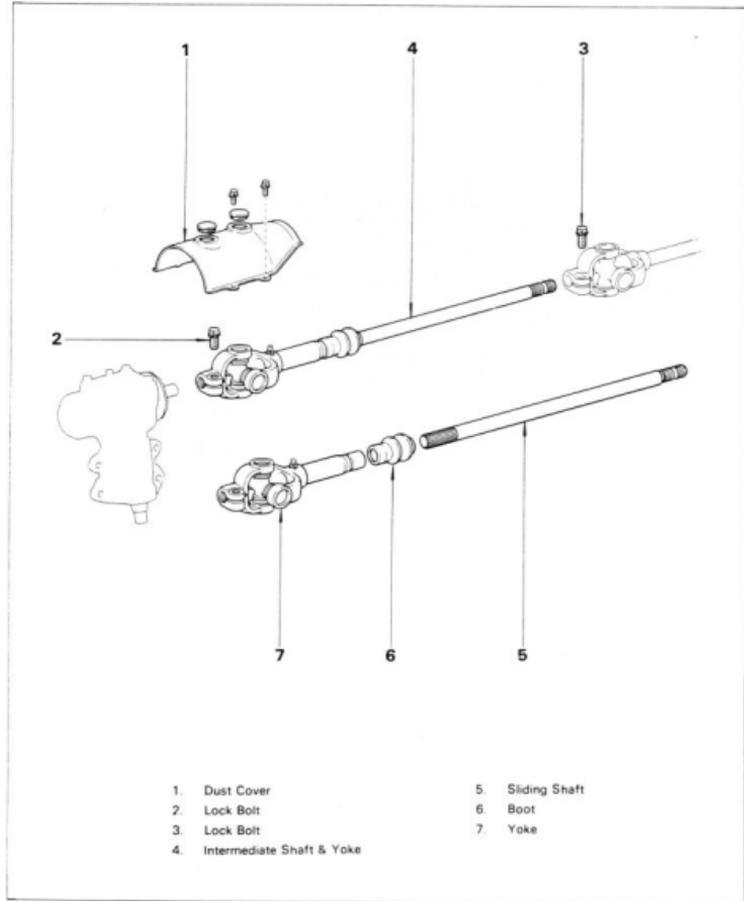


Fig. 8-4

**INSPECTION & REPAIR****Shaft**

Check for wear, bending or damage.

Fig. 8-5

**Spline**

Check for wear or damage.

Fig. 8-6

**Boot**

Check for damage.

Fig. 8-7

**Spider Bearing**

Check for wear or damage.

Fig. 8-8

**Replace The Spider Bearing**

1. Remove the snap rings.

Fig. 8-9



2. Remove the bearing outer race with a vice and socket wrench.
3. Tap out the bearing outer race.

Fig. 8-10



4. Remove the bearing outer race on the opposite side.

— Note —

Remove the shaft side bearings by the same procedure.

Fig. 8-11



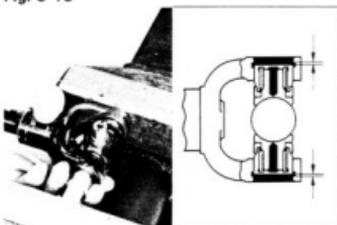
5. Apply MP grease to the new bearings.

Fig. 8-12



6. Push in the bearing outer races on both sides until the surfaces.

Fig. 8-13



7. Push in the bearing outer race until the spider is moved.
8. Push in the bearing outer race on the opposite side until both snap ring grooves have equal clearance.

— Note —

Install the yoke side bearings by the same procedure.

9. Select snap rings that will provide minimum play.

Spider axial play:

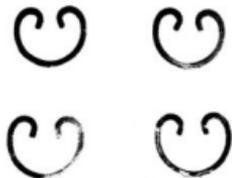
Less than 0.05 mm (0.0020 in.)

Snap ring thickness

Mark	Thickness	mm (in.)
None	1.175 — 1.225	(0.0463 — 0.0482)
Brown	1.225 — 1.275	(0.0482 — 0.0502)
Blue	1.275 — 1.325	(0.0502 — 0.0522)



Fig. 8-14



— Note —

- Do not reuse the snap rings.
- Use the snap rings of the same thickness at both sides.

Fig. 8-15



10. Install the snap rings.

Fig. 8-16



11. Check to see that spider moves smoothly.

ASSEMBLY & INSTALLATION

Assemble and install the parts in the numerical order shown in the figure.

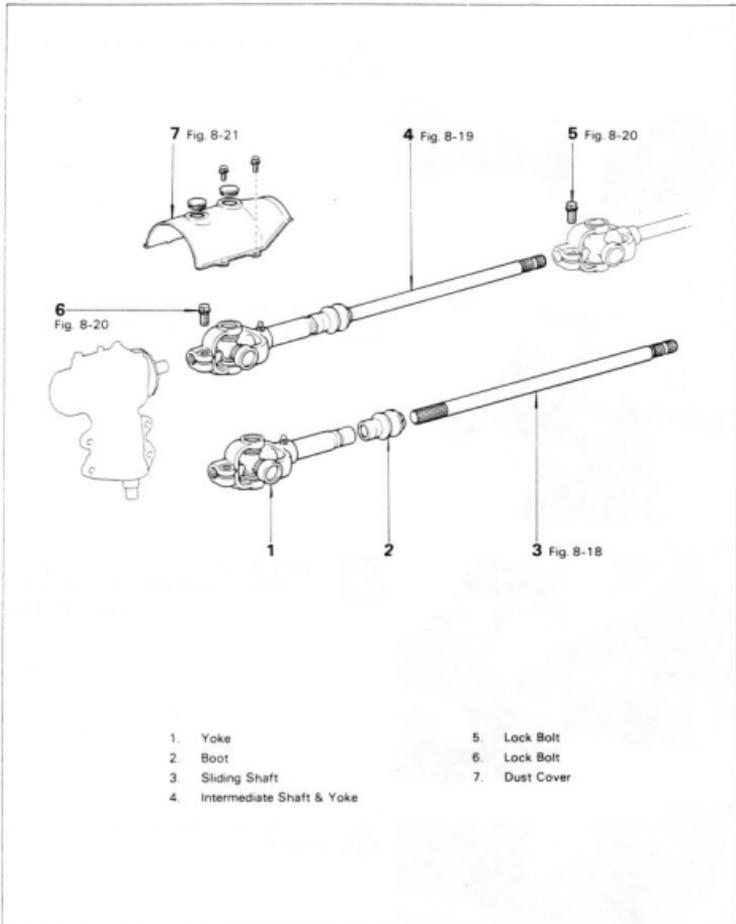
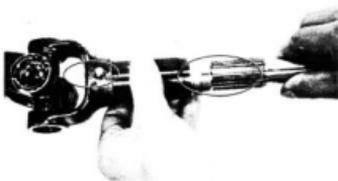
Fig. 8-17

Fig. 8-18



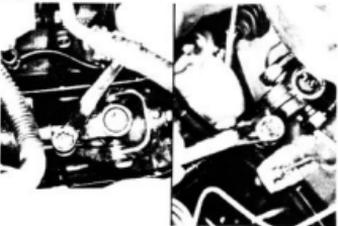
Align the grease nipple to the cut of spline tooth.

Fig. 8-19



Align the non-toothed portions of the intermediate shaft and joint yoke.

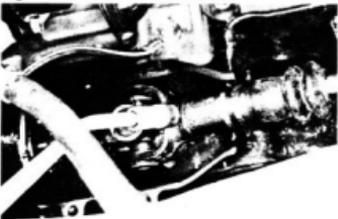
Fig. 8-20



Tighten the bolt.

**Tightening torque: 3.0 – 4.5 kg-m
(22 – 32 ft-lb)**

Fig. 8-21



Before installing the dust cover, grease to the grease fitting.

DISASSEMBLY

Disassemble the parts in the numerical order shown in the figure.

Fig. 8-22

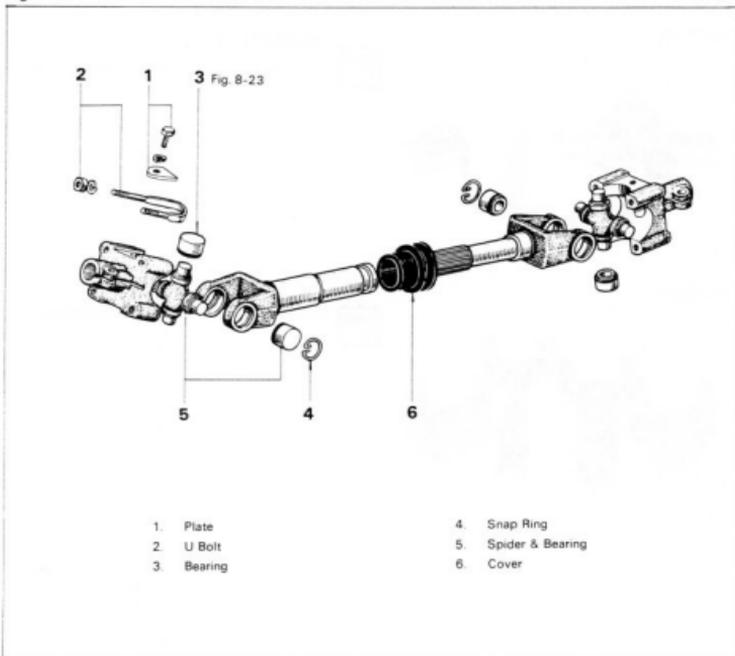


Fig. 8-23



Remove the bearing cup by lightly tapping the yoke with a hammer.

— Note —
Hold downward the bearing and spider at the other end while tapping the yoke.

Fig. 8-24

**INSPECTION**

Inspect the spider and bearing for wear or damage.

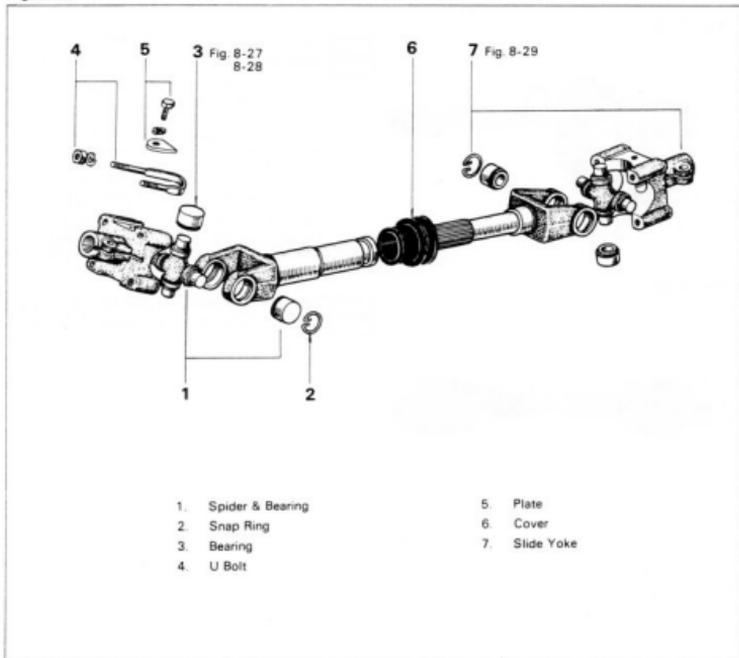
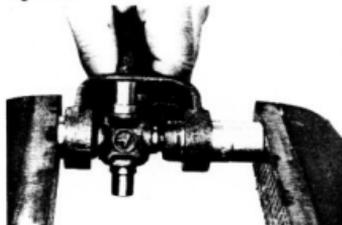
Fig. 8-25



Inspect the splines for wear or damage.

ASSEMBLY

Assemble the parts in the numerical order shown in the figure.

Fig. 8-26**Fig. 8-27**

Using a vise, assemble the bearings.

Fig. 8-28



Select snap rings of the thickness that will provide minimum thrust clearance in the joint spider but will still allow the joint spider to operate smoothly.

Snap ring thickness

Part No.	Thickness mm (in.)
90521-22011	1.20 (0.0472)
90521-22012	1.25 (0.0492)
90521-22013	1.30 (0.0512)

Fig. 8-29



Make the assembly so that the steering yokes will be positioned in the same direction.

TILT TYPE STEERING COLUMN & MAIN SHAFT**REMOVAL**

Remove the parts in the numerical order shown in the figure.

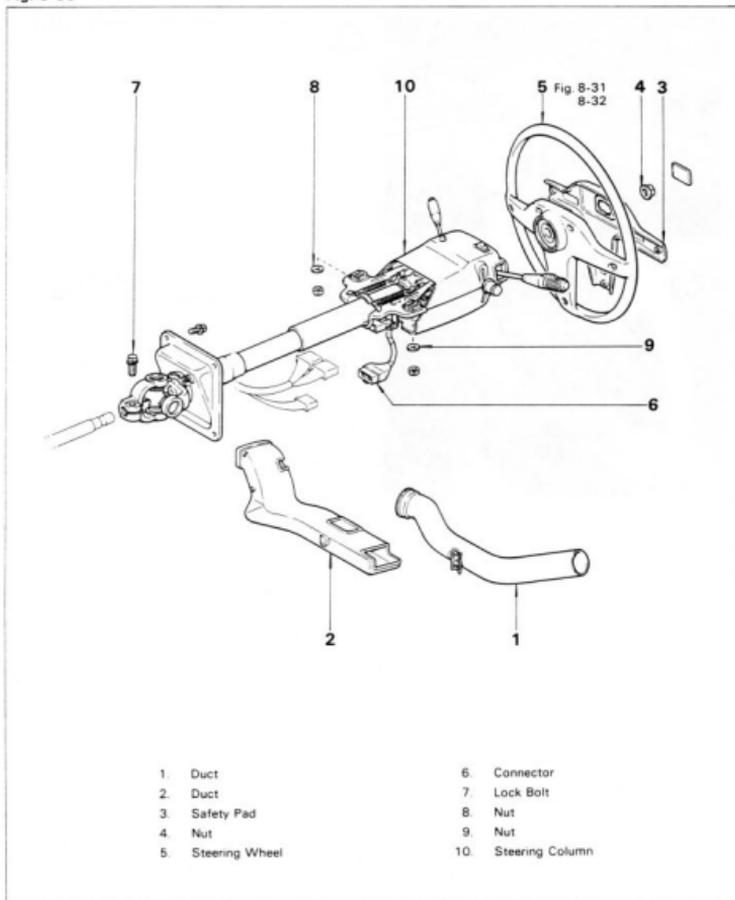
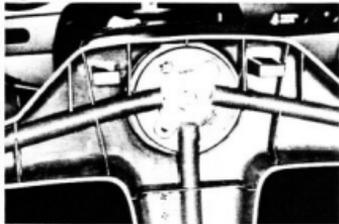
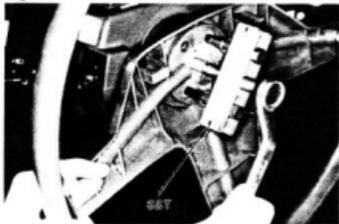
Fig. 8-30

Fig. 8-31



Place matchmarks on the steering wheel and main shaft.

Fig. 8-32



Remove the steering wheel with SST.
SST [09609-20010]

DISASSEMBLY

1. Disassemble the parts in the numerical order shown in the figure.

Fig. 8-33

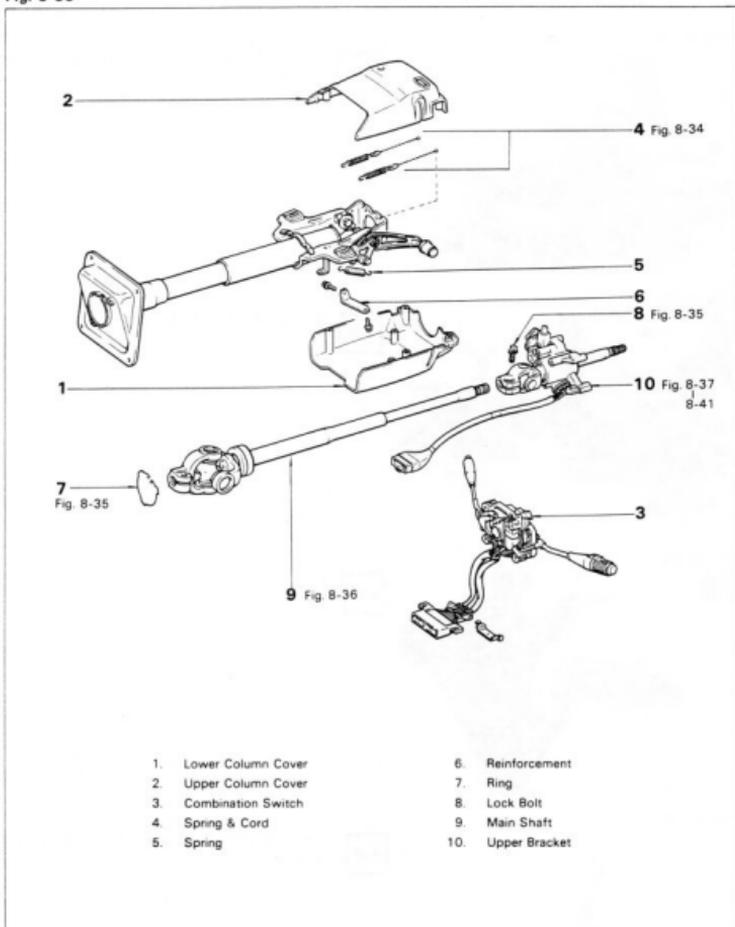
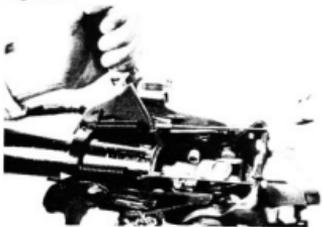
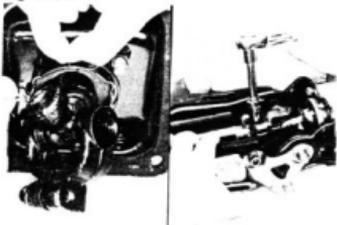


Fig. 8-34



Extend the spring and remove the cord and spring.

Fig. 8-35



Remove the ring and bolt.

Fig. 8-36



Remove the shaft.

Fig. 8-37



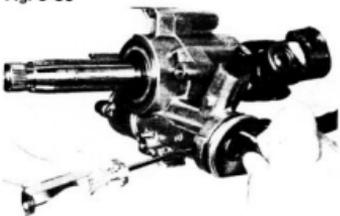
Loosen the broken down bolt by tapping the chisel.

Fig. 8-38



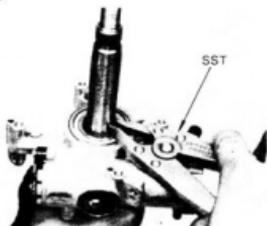
Remove the upper bracket and main shaft.

Fig. 8-39



Position the key at ACC and push the knob.
At this time, remove the key cylinder.

Fig. 8-40



Remove the snap ring with SST.
SST [09905-00012]

Fig. 8-41



Remove the upper bracket from the shaft.

2. Disassemble the parts in the numerical order shown in the figure.

Fig. 8-42

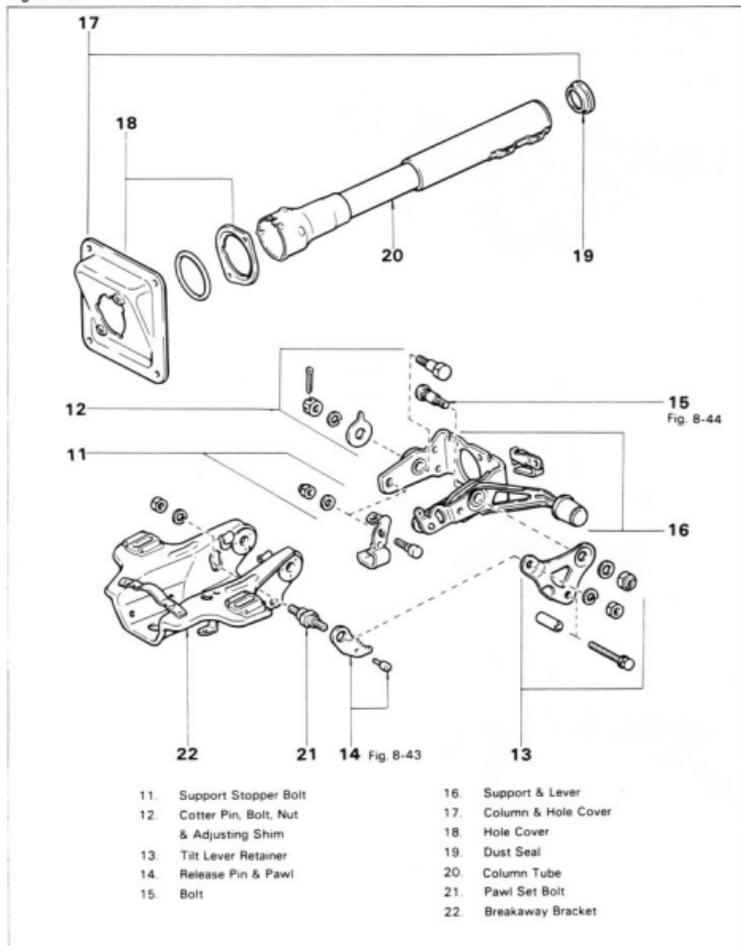


Fig. 8-43



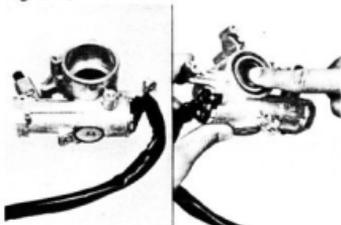
Pull out the reclining pawl release pin and remove the tilt steering pawl.

Fig. 8-44



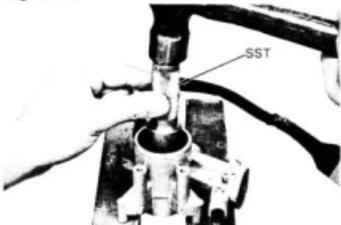
Temporarily install another nut flat with the end of the bolt and tap it in with a hammer.

Fig. 8-45

**INSPECTION & REPAIR****Upper Bracket**

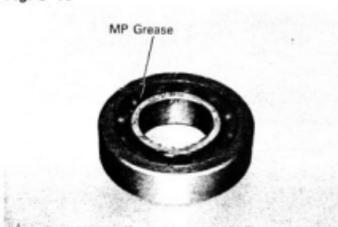
1. Inspect the upper bracket for damage.
2. Inspect the bearing rotation.

Fig. 8-46

**Replace The Bearing**

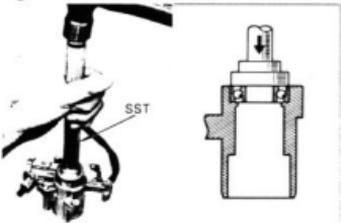
1. Remove the bearing with SST.
SST [09620-30010]

Fig. 8-47



2. Pack MP grease into the new bearing.

Fig. 8-48



3. Install the bearing with SST.
SST [09620-30010]

Fig. 8-49

**Main Shaft, Thrust Collar & Spring**

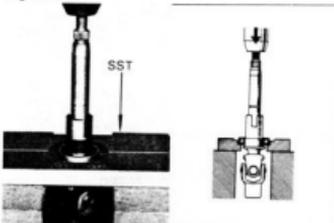
1. Inspect for wear or damage.

Fig. 8-50



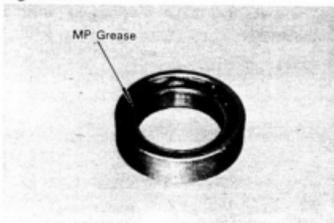
2. Inspect the universal joint for play or binding.
3. Inspect the bearing rotation.

Fig. 8-51

**Replace The Bearing**

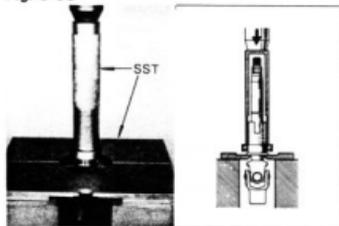
1. Remove the bearing with a press and SST [09527-20011]

Fig. 8-52



2. Pack MP grease into the new bearing.

Fig. 8-53



3. Install the bearing with a press and SST.
SST [09236-28011]
[09612-22010]

Fig. 8-54

**Intermediate Shaft**

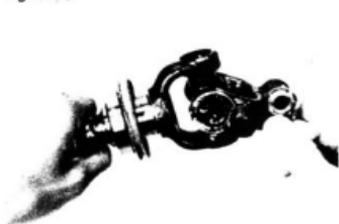
1. Inspect the shafts for damage or bending.
2. Inspect the flexible coupling for wear or damage.

Fig. 8-55



3. Inspect the bearing.

Fig. 8-56



4. Inspect the spider bearings for wear or damage.

Fig. 8-57

**Replace The Bearing**

1. Remove the snap ring with SST.
SST [09905-00012]

Fig. 8-58



2. Replace the bearing.



Fig. 8-59



3. Install the snap ring with SST.
SST [09905-00012]

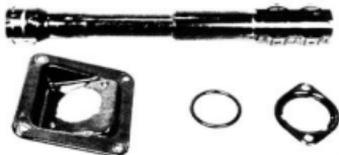
Fig. 8-60

SEE
INTERMEDIATE
SHAFT SECTION
Fig. 8-8 to 8-16

Replace The Spider Bearing

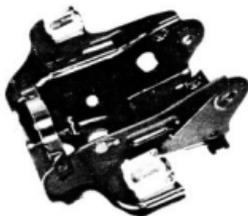
Replace the spider bearing.

Fig. 8-61

**Column Tube**

Inspect for damage or bending.

Fig. 8-62

**Breakaway Bracket**

Inspect for wear or damage.

Fig. 8-63

**Tilt Steering Support, Collar & Pawl**

1. Remove the collar.

Fig. 8-64



2. Inspect the pawl for wear or damage.

Fig. 8-65



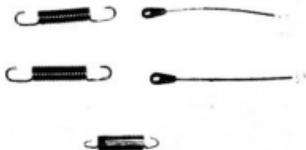
3. Inspect the support, collar and lever for wear or damage.

Fig. 8-66



- Lever Retainer, Bolt & Nut**
Inspect for wear or damage.

Fig. 8-67

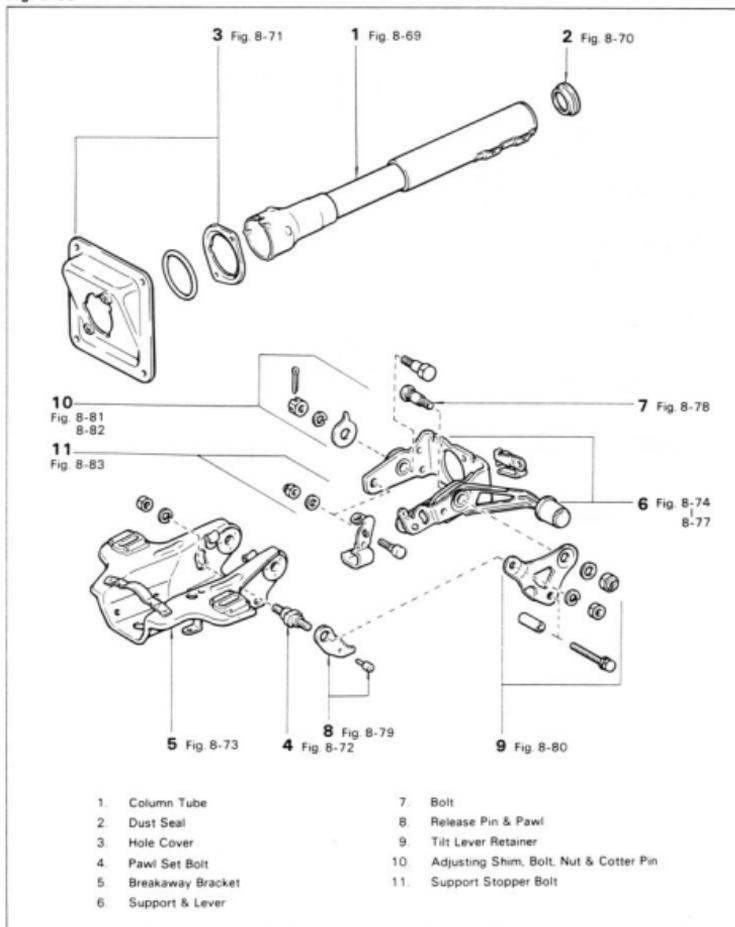


- Spring & Cord**
Inspect for wear or damage.

ASSEMBLY

1. Assemble the parts in the numerical order shown in the figure.

Fig. 8-68



— Note —
Coat all rubbing parts with MP grease.

Fig. 8-69

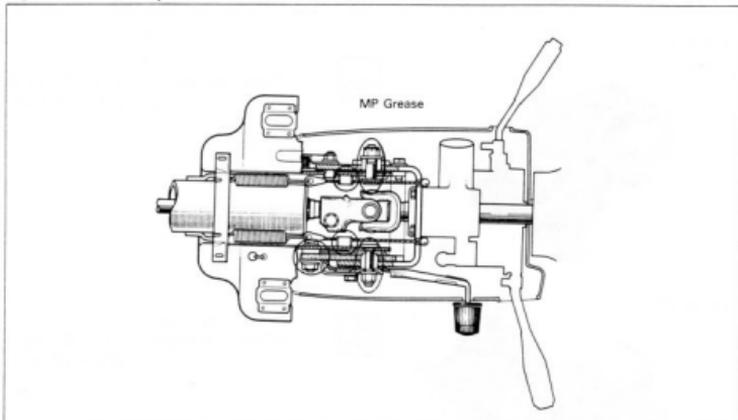
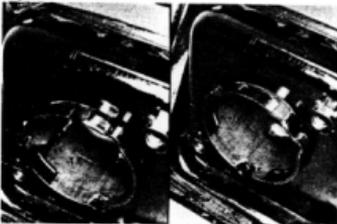


Fig. 8-70



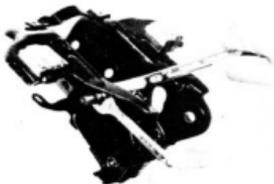
Stick the dust seal with adhesive.

Fig. 8-71



Align the protrusion so that it fits into the column tube groove.

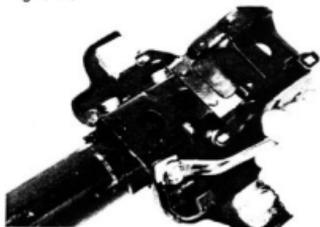
Fig. 8-72



Tighten the pawl set bolt.

Tightening torque: 1.5 – 2.2 kg-m
(11 – 15 ft-lb)

Fig. 8-73



Install the column tube.

Tightening torque: 1.5 – 2.2 kg-m
(11 – 15 ft-lb)

Fig. 8-74



Install the lever onto the support.

Fig. 8-75



Install the tilt lever to the steering support.
Select a collar No.1 which will eliminate all play.

Collar No. 1 outer diameter	mm (in.)
17.989 – 17.996	(0.7082 – 0.7085)
17.996 – 18.003	(0.7085 – 0.7088)
18.003 – 18.010	(0.7088 – 0.7091)
18.010 – 18.017	(0.7091 – 0.7093)
18.017 – 18.024	(0.7093 – 0.7096)

Fig. 8-76



Select a collar No.2 which will eliminate all play.

Collar No.2 outer diameter		mm (in.)
17.982 - 18.000	(0.7080 - 0.7087)	
18.000 - 18.018	(0.7087 - 0.7094)	

Fig. 8-77



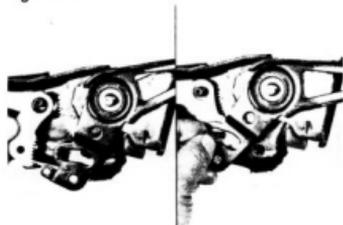
Install the lever on the support and collars.

Fig. 8-78



Drive in the serration bolt.

Fig. 8-79



Install the tilt steering pawl and the reclining release pin.

Fig. 8-80



Install the collar on one of the part.
Tighten the bolt and nuts.

Tightening torque: 1.5 – 2.2 kg-m
(11 – 15 ft-lb)

Fig. 8-81



Select a shim which fits snugly when pressed in by hand.

Shim thickness mm (in.)

0.2 (0.008)	1.4 (0.055)
0.5 (0.020)	1.8 (0.071)
0.8 (0.031)	

Fig. 8-82



Tighten the castle nut.

Tightening torque: 1.5–3.0 kg-m
(11–21 ft-lb)

Fig. 8-83



Install the tilt steering support stopper bolt.

Tightening torque: 0.8–1.2 kg-m
(70–104 in.-lb)

2. Assemble the parts in the numerical order shown in the figure.

Fig. 8-84

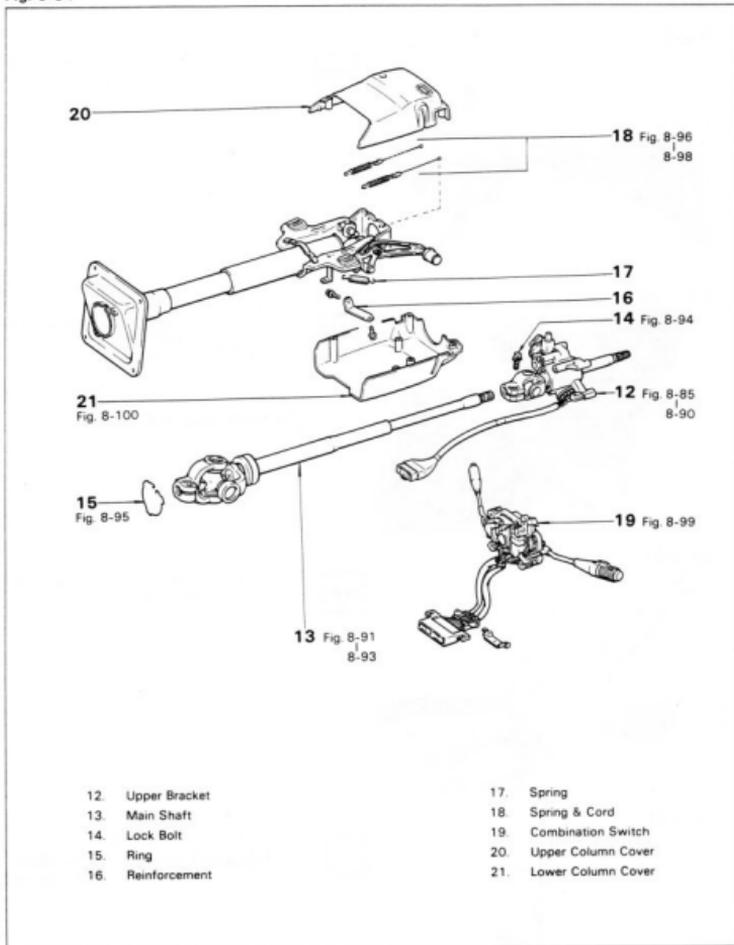


Fig. 8-85



Install the upper bracket and main shaft.

1. Install the spring seat facing as shown in the figure.

Fig. 8-86



2. Using a vise, assemble the upper bracket to the main shaft with SST. SST [09905-00012]

— Note —
Use a new snap ring.

Fig. 8-87



3. Insure that the upper bracket bearing turns smoothly.

Fig. 8-88



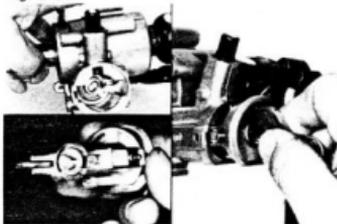
4. Install the upper bracket.
Tightening torque: 0.6 – 0.9 kg-m
(53 – 78 in.-lb)

Fig. 8-89



5. Using the new lock bolt, tighten the it until the tops break off.

Fig. 8-90



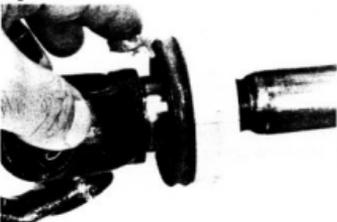
6. Turn the ignition key to the ACC position, and install the key cylinder into the upper bracket.

Fig. 8-91



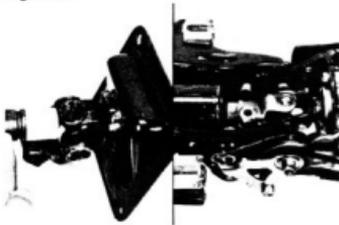
- Install the O ring on the outer race and teflon ring.

Fig. 8-92



- Coat MP grease on the shaft and oil seal.

Fig. 8-93



Align both side yoke direction when install the main shaft.

Fig. 8-94



Tighten the clamp bolt.

Tightening torque: 2.0 - 3.0 kg-m
(15 - 21 ft-lb)

Fig. 8-95



Be sure that the retainer is properly assembled.

Fig. 8-96



Extend the spring with screwdriver when install the spring and cord.

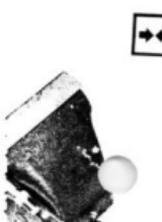
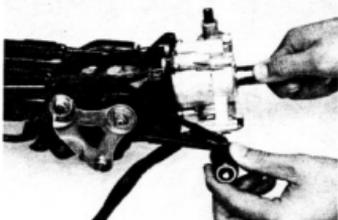


Fig. 8-97



Hook the cords.

Fig. 8-98

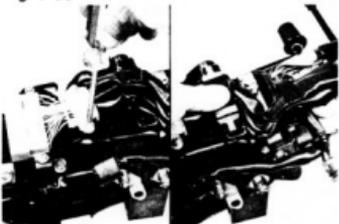


Check the operation of the tilt steering lever and support.

- Note -

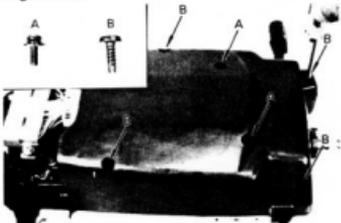
1. Insure that there is no axial or horizontal play at the end of the main shaft.
2. Insure that the main shaft is locked securely in all 6 positions.

Fig. 8-99



Install the connector and wiring band on the column.

Fig. 8-100



Install the column cover.

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 8-101

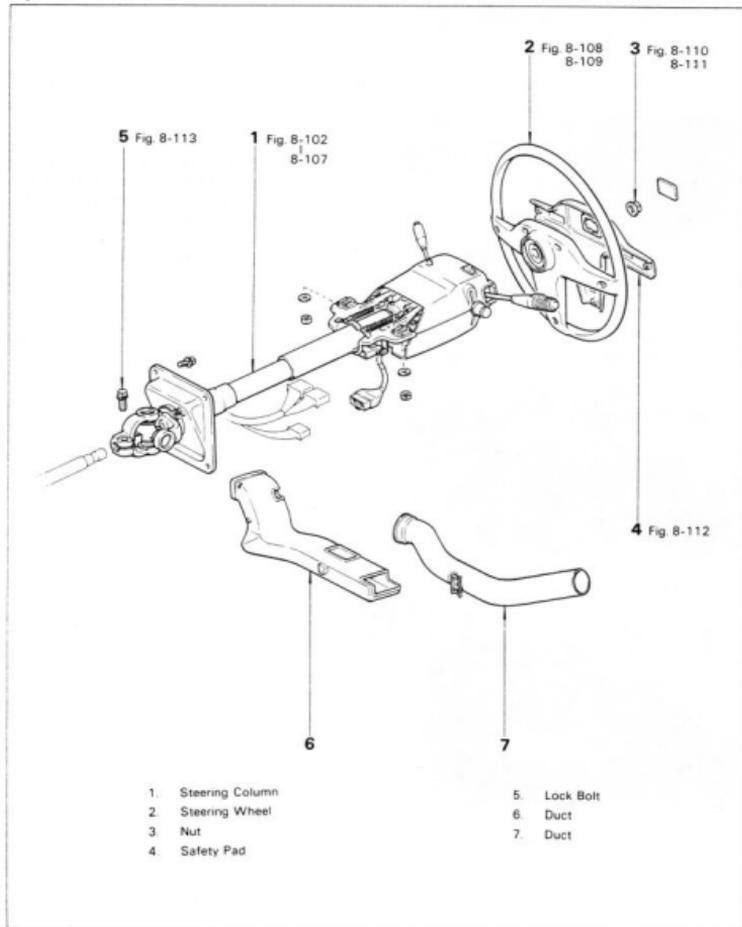


Fig. 8-102



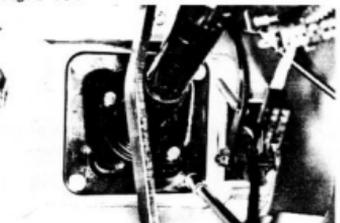
Align the non-toothed portions of intermediate shaft and yoke.

Fig. 8-103



Temporarily tighten the breakaway bracket nuts.

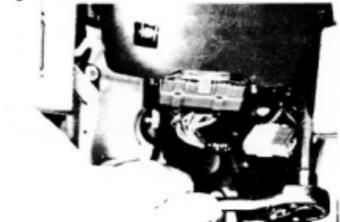
Fig. 8-104



Tighten the column hole cover.

Tightening torque: 1.0 - 1.6 kg-m
(8 - 11 ft-lb)

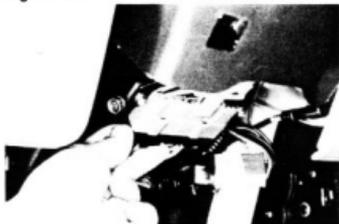
Fig. 8-105



Tighten the breakaway bracket nuts.

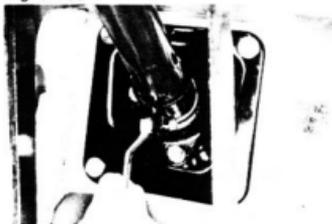
Tightening torque: 1.9 - 3.1 kg-m
(14 - 22 ft-lb)

Fig. 8-106



Connect the combination switch and ignition switch connectors.

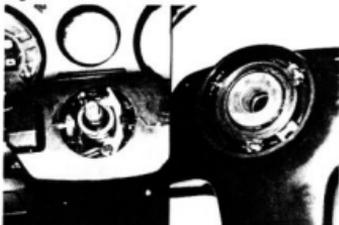
Fig. 8-107



Tighten the column tube clamp.

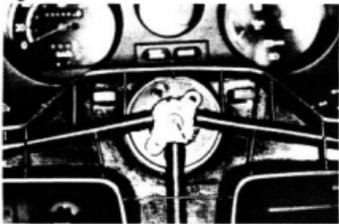
Tightening torque: 1.5–2.2 kg-m
(11–15 ft-lb)

Fig. 8-108



Align the turn signal cancel cam claw and the steering wheel, and then assemble them.

Fig. 8-109



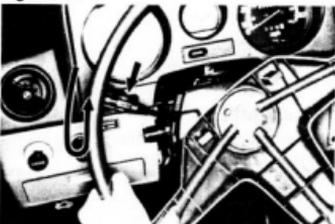
Align the matchmarks on the steering wheel and the main shaft.

Fig. 8-110



Tighten the steering wheel mounting nut.
Tightening torque: 3.0 – 4.0 kg-m
(22 – 28 ft-lb)

Fig. 8-111



Insure that the turn signal automatic cancel lever functions properly.

Fig. 8-112



Connect the horn switch connector.

Fig. 8-113



Tighten the yoke bolts.
Tightening torque: 3.0 – 4.5 kg-m
(22 – 32 ft-lb)

Fig. 8-114

SEE
TILT TYPE STEERING
COLUMN & MAIN
SHAFT REMOVAL SECTION

Fig. 8-30 to 3-32

STEERING COLUMN & MAIN SHAFT (FJ, BJ, HJ6 — SERIES)

REMOVAL

Remove the steering column.

DISSAEMBLY

Disassemble the parts in the numerical order shown in the figure.

Fig. 8-115

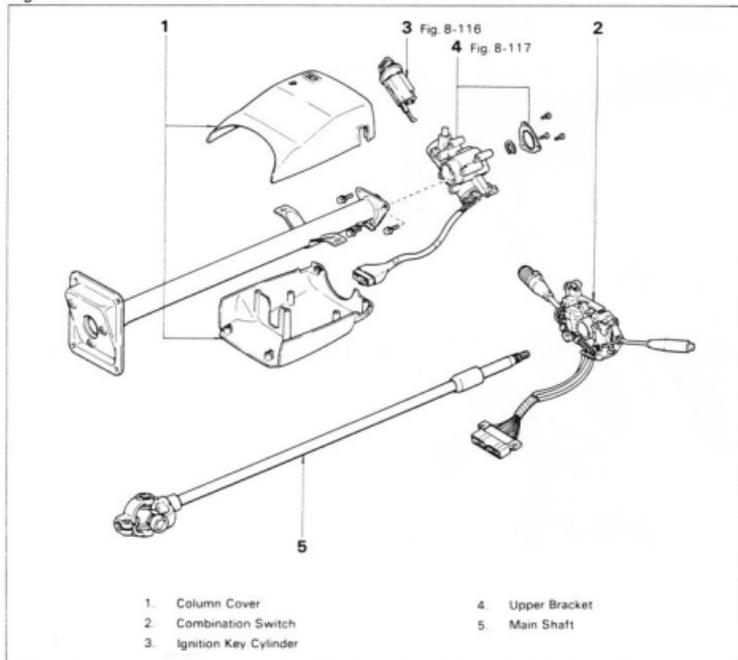


Fig. 8-116



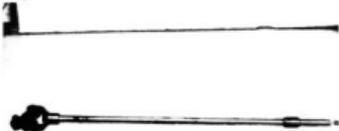
Position the key at ACC and push the knob.
At this time, remove the key cylinder.

Fig. 8-117



Remove the snap ring with SST.
SST [09905-00012]

Fig. 8-118

**INSPECTION & REPAIR****Main Shaft**

1. Check the shaft for damage or berding.

Fig. 8-119



2. Check the spider bearing for wear or damage.

Fig. 8-120

SEE
INTERMEDIATE
SHAFT SECTION
Fig. 8-8 to 8-16

Replace The Spider Bearing

Replace the spider bearing.

Fig. 8-121

**Upper Bracket**

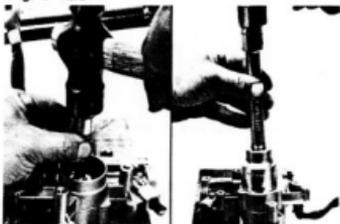
1. Check the steering lock system.

Fig. 8-122



2. Check the bearing for rotation condition.

Fig. 8-123

**Replace The Upper Bearing**

1. Remove the bearing.
2. Install the bearing until its upper surface is even with the bracket surface.



Fig. 8-124

**Column Tube & Hole Cover**

Check for wear or damage.

Fig. 8-125

**Lower Bearing**

Check for rotation condition.

Fig. 8-126

**Replace The Lower Bearing**

1. After place matchmarks, separate the tube from the tube support.

Fig. 8-127



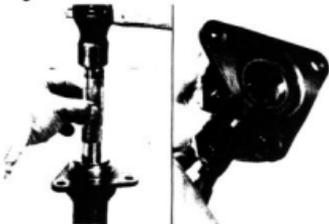
2. Remove the hole cover.

Fig. 8-128



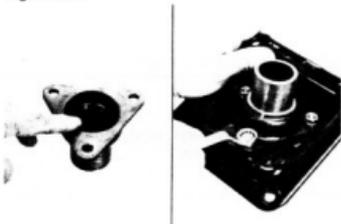
3. Remove the snap ring and bearing.

Fig. 8-129



4. Install the new bearing and snap ring.

Fig. 8-130



5. Install the dust seal on the bearing.
6. Install the hole cover.

Fig. 8-131



7. Align the matchmarks and temporarily tighten the tube clamp bolt.

— Note —

After installing the steering column on the vehicle, retighten the it.

ASSEMBLY

Assemble the parts in the numerical order shown in the figure.

Fig. 8-132

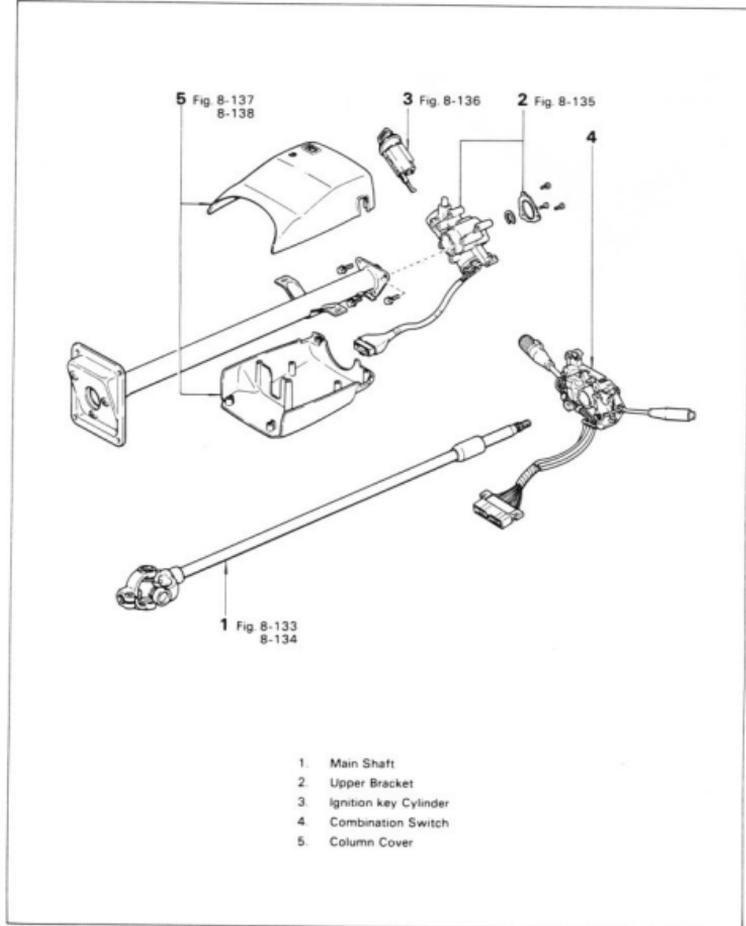


Fig. 8-133



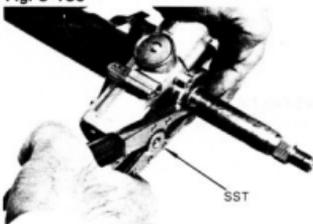
Coat the dust seal with MP grease.

Fig. 8-134



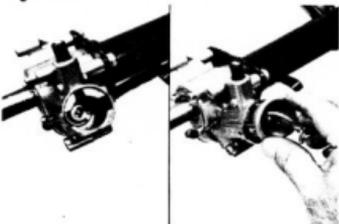
Apply MP grease to the dust seal and make sure it doesn't turn over when inserting the main shaft.

Fig. 8-135



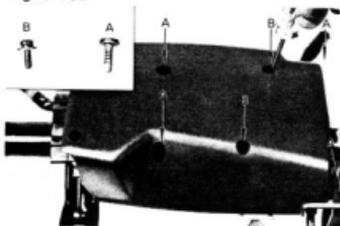
Install the snap ring with SST.
SST [09905-00012]

Fig. 8-136



Turn the key to the ACC position, and install the key cylinder.

Fig. 8-137



Be sure the screws are put in the proper places when installing the column cover.

Fig. 8-138



Install the connector on the lower cover.

Fig. 8-139

SEE
TILT TYPE STEERING COLUMN &
MAIN SHAFT INSTALLATION
SECTION

Fig. 8-101 to 8-113

INSTALLATION

Install the steering column.

STEERING COLUMN & MAIN SHAFT**(FJ, BJ, HJ4 — SERIES)****REMOVAL**

Remove the parts in the numerical order shown in the figure.

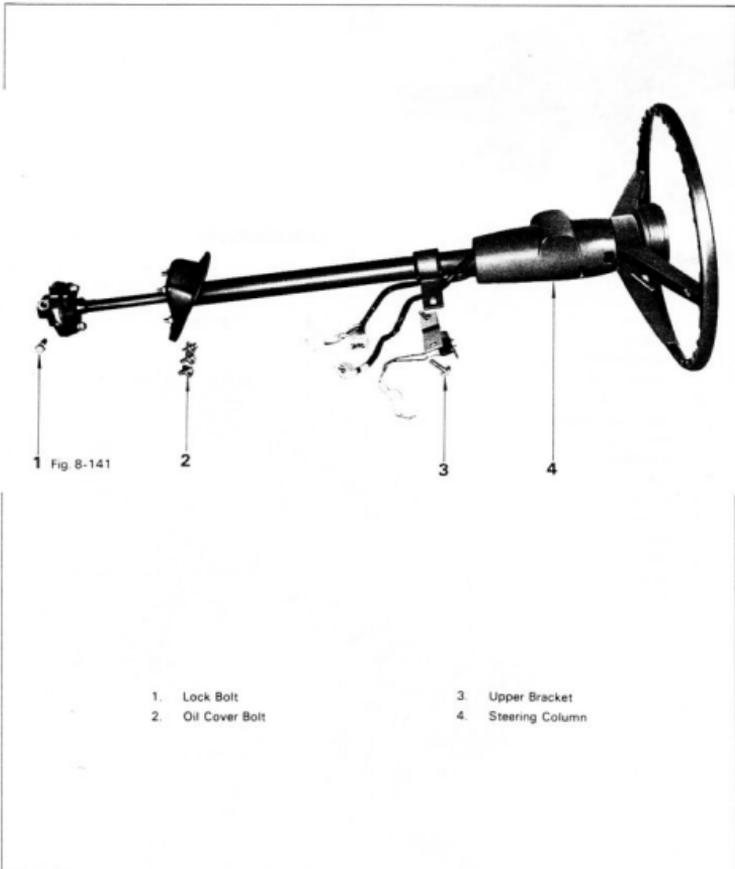
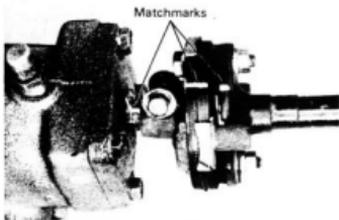
Fig. 8-140

Fig. 8-141

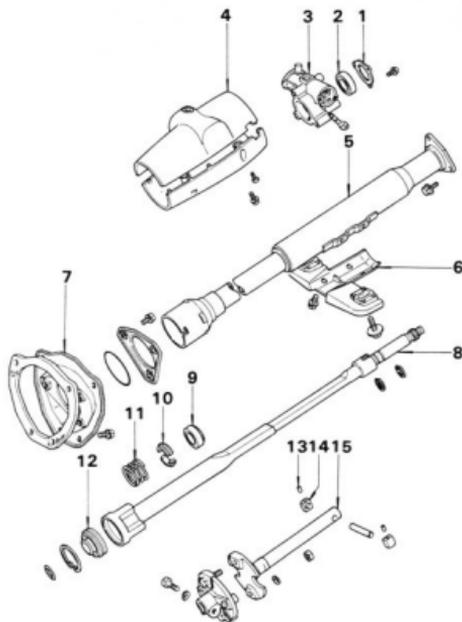


Place matchmarks on the gear box, couplings, and main shaft.

Fig. 8-142

COMPONENTS

1. Retainer
2. Bearing
3. Upper Bracket
4. Column Cover
5. Column Tube
6. Breakaway Bracket
7. Hole Cover
8. Main Shaft
9. Bearing
10. Retainer
11. Spring
12. Cover
13. Anti-rattle
14. Block
15. Shaft



DISASSEMBLY

Disassemble the parts in the numerical order shown in the figure.

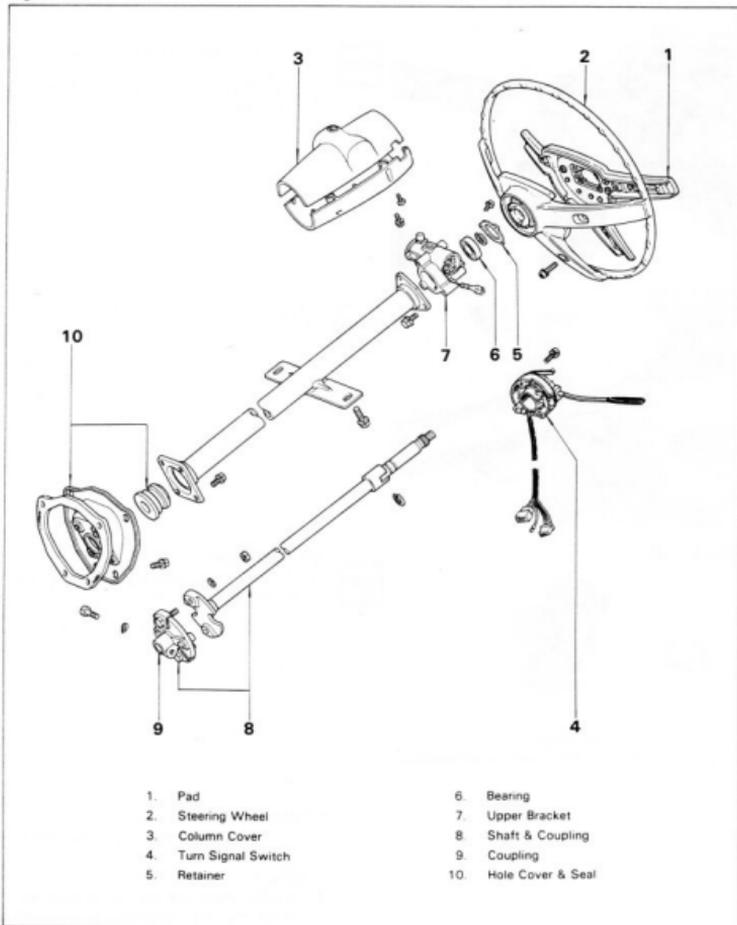
Fig. 8-143

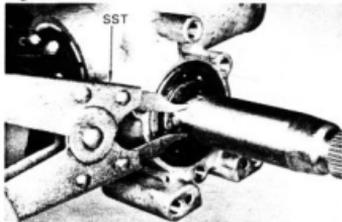
Fig. 8-144



Place matchmarks on the shaft and steering wheel.

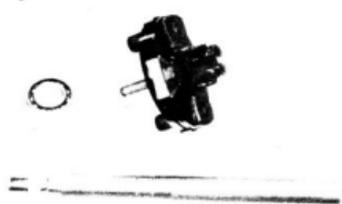
Remove the steering wheel with SST.
SST [09609-20010]

Fig. 8-145



Remove the snap ring with SST.
SST [09905-00012]

Fig. 8-146



INSPECTION

Inspect the shaft, bearing, and coupling for wear, damage or cracks.

ASSEMBLY

Perform the disassembly in reverse order.

— Note —

1. Pack grease into the upper bearing.
2. Align the matchmarks when installing the steering wheel.

INSTALLATION

Perform the removal in reverse order.

— Note —

Align the matchmarks when installing the steering column assembly.

STEERING GEAR HOUSING (FJ, BJ, HJ6—SERIES)

REMOVAL

Remove the parts in the numerical order shown in the figure.

Fig. 8-147

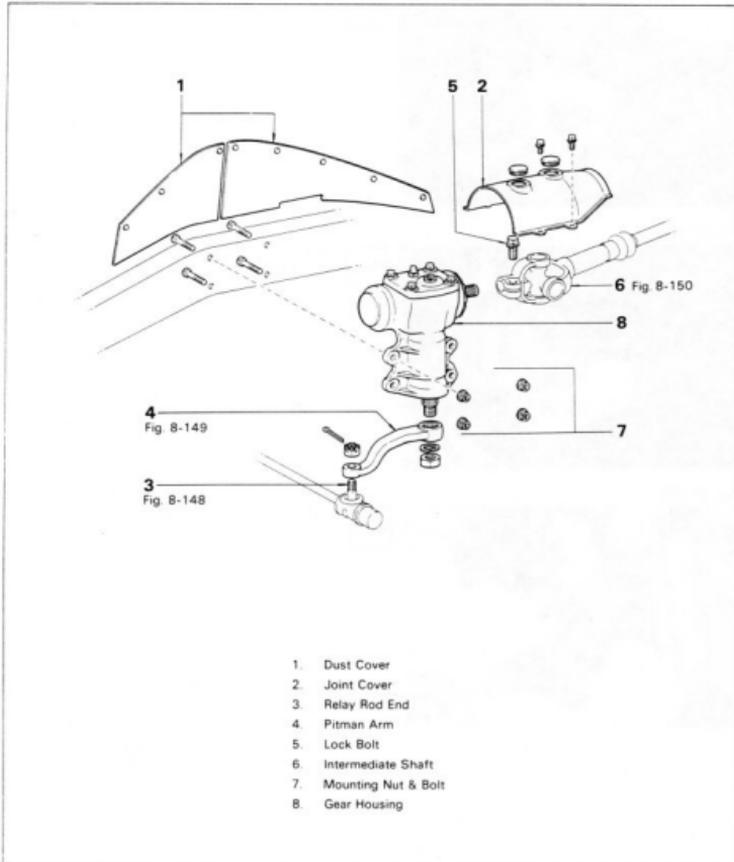
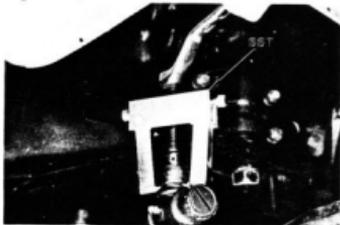
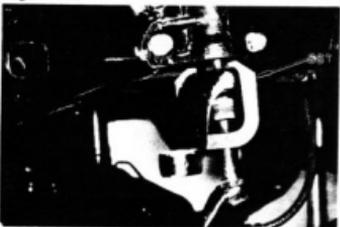


Fig. 8-148



Remove the pitman arm with SST.
SST [09628-62010]

Fig. 8-149



Disconnect the tie rod end with SST.
SST [09610-55012]

Fig. 8-150



Remove the intermediate shaft.

DISASSEMBLY

Disassemble the parts in the numerical order shown in the figure.

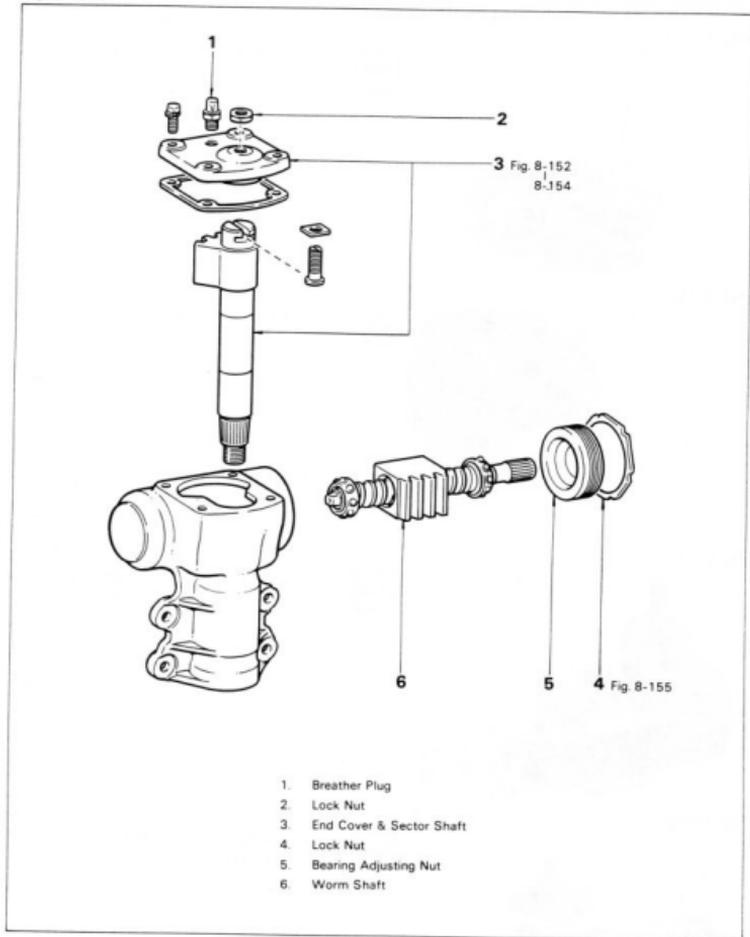
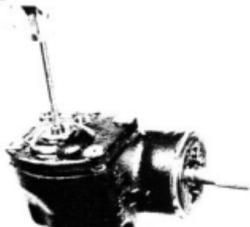
Fig. 8-151

Fig. 8-152



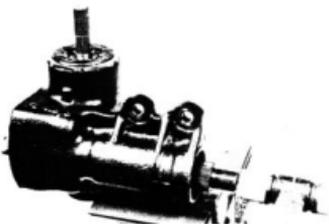
Screw in the bolt to remove the cover.

Fig. 8-153



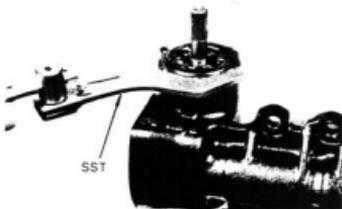
Pour out the remaining oil before removing the sector shaft.

Fig. 8-154



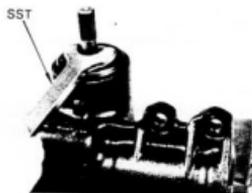
Remove the sector shaft by tapping the bottom end with a plastic hammer.

Fig. 8-155



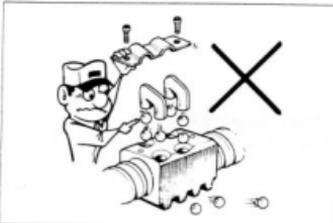
Loosen the lock nut with SST.
SST [09617-22010]

Fig. 8-156



Remove the bearing adjusting screw with SST.
SST [09616-22010]

Fig. 8-157



— Note —
Do not disassemble the ball nut from steering main shaft.

Fig. 8-158

**INSPECTION & REPAIR****Worm & Nut**

Inspect the worm and nut for wear or damage.

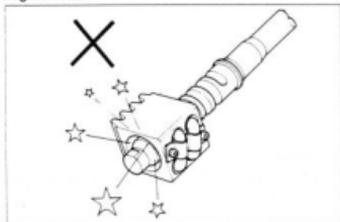
Fig. 8-159



Check the turning condition of nut.

— Note —
It should revolve smoothly by own weight.

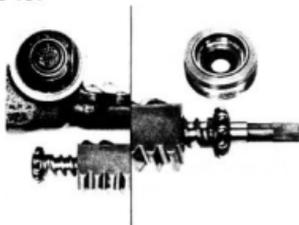
Fig. 8-160



— Note —

To prevent ball damage, do not strike the ball nut against the ends of the worm.

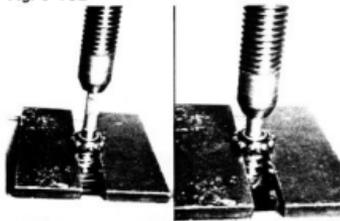
Fig. 8-161



Worm Bearing Race

Inspect the worm bearing for wear or damage.

Fig. 8-162



Replace The Worm Bearing

1. Remove the worm bearing.

Fig. 8-163



2. Install the worm bearing.

Fig. 8-164



3. Install the worm bearing.

Fig. 8-165



4. Replace the outer race.

Fig. 8-166

5. Remove the bearing outer race from the gear housing with SST.
SST [09612-65013]

— Note —

Align the claw on the SST with the depression in the housing.

Fig. 8-167

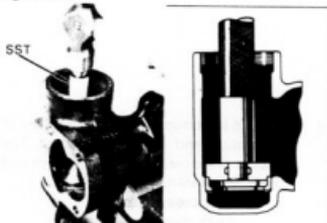
6. Install the bearing outer race with SST.
SST [09608-35013]

Fig. 8-168

**Sector Shaft Oil Seal**

Check for wear or damage.

Fig. 8-169

**Replace The Oil Seal**

Replace the oil seal.



Fig. 8-170

**Sector Shaft**

1. Inspect the sector shaft, thrust washer and adjusting screw for wear or damage.

Fig. 8-171



3. Measure the thrust clearance between the sector shaft and the adjusting bolt. Then select a thrust washer that will provide minimum clearance.

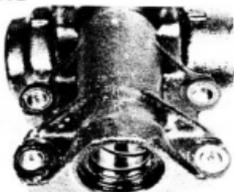
Thrust clearance:

Less than **0.05 mm**
(**0.0020 in.**)

Thrust washer thickness mm (in.)

2.00 (0.0787)	2.15 (0.0846)
2.05 (0.0807)	2.20 (0.0866)
2.10 (0.0827)	

Fig. 8-172

**Bushing**

1. Inspect for wear or damage.

Fig. 8-173



2. Check the oil clearance.

Oil clearance:

STD 0.009–0.060 mm
(0.0004–0.0024 in.)

Limit 0.10 mm
(0.0039 in.)

Fig. 8-174

**Replace The Bushing**

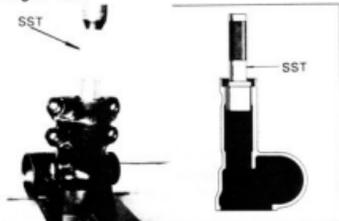
1. Remove the oil seal.

Fig. 8-175



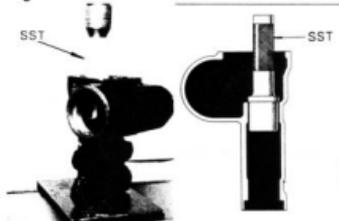
2. Remove the two bushings.

Fig. 8-176



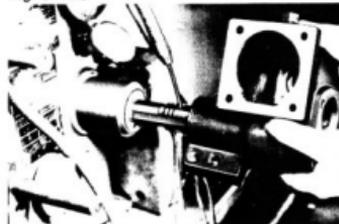
3. Install the outer bushing with SST.
SST [09615-37010]

Fig. 8-177



4. Install the inner bushing with SST.
SST [09615-37010]

Fig. 8-178



- 5.hone the inner surface of the bushings until standard oil clearance is obtained between the bushings and sector shaft.

Oil clearance:

STD	0.009–0.060 mm
	(0.0004–0.0024 in.)

Fig. 8-179



6. Install a new oil seal.
Apply MP grease to the lip.

Fig. 8-180

**Gear Housing**

Inspect for damage or cracks.

Fig. 8-181

**Sector Shaft End Cover**

1. Inspect for wear or damage.

Fig. 8-182



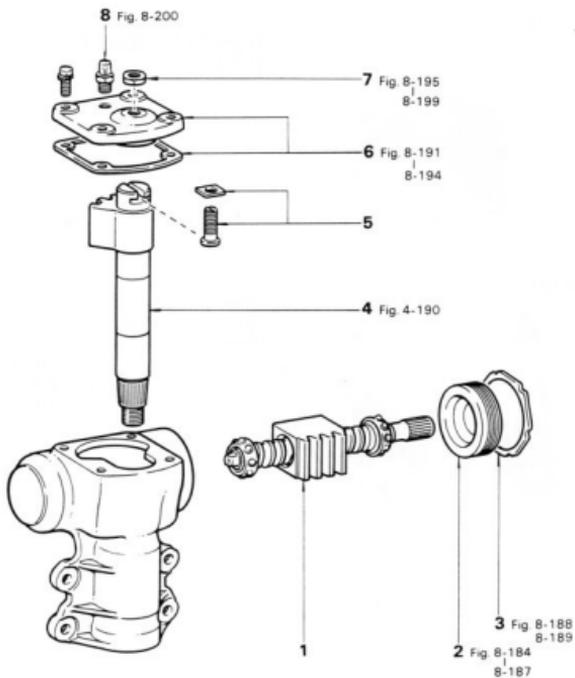
2. Check the oil clearance.

Oil clearance:**STD** 0.009–0.060 mm
(0.0004–0.0024 in.)**Limit** 0.10 mm
(0.0039 in.)

ASSEMBLY

Assemble the parts in the numerical order shown in the figure.

Fig. 8-183



1. Worm Shaft
2. Bearing Adjusting Nut
3. Lock Nut
4. Sector Shaft
5. Adjusting Bolt & Washer
6. Gasket & End Cover
7. Lock Nut
8. Breather Plug

Fig. 8-184



Before starting assembly, apply MP grease to bushing.

Coat the oil seal with MP grease.

Fig. 8-185



When inserting the shaft through the adjusting nut, be careful not to damage the oil seal lip.

Fig. 8-186



Assemble the bearing adjusting screw, then adjust the bearing preload by gradually tightening the screw with SST.
SST [09616-22010]

— Note —

Before adjusting the preload, tighten the screw to snug down the bearing.

Fig. 8-187



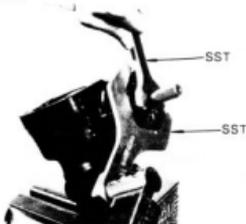
Measure the bearing preload with SST and a torque meter.
SST [09616-00010]

Preload (starting): 3.5–6.5 kg-cm
(3.0–5.6 in.-lb)

— Note —

Check to see that both the right and left rotations are identical.

Fig. 8-188



Tighten the lock nut with SST.

SST [09616-22010]

[09617-22010]

**Tightening torque: 23.0–26.0 kg-m
(167–188 ft-lb)**

Fig. 8-189



After tightening the lock nut, make sure that the bearing preload has not changed.

SST [09616-00010]

Fig. 8-190



Set the ball nut at center of the worm and insert the sector shaft into gear housing.

— Note —

Insure that the center teeth of the ball nut and sector shaft are meshing.

Fig. 8-191



Assemble the sector shaft end cover with the adjusting screw and thrust washer.

1. Before tightening the set bolts, completely loosen the adjusting screw with a screwdriver.

Fig. 8-192



2. Coat the sealer on the thread and tighten the bolts.

Tightening torque:

4.5 – 5.5 kg-m
(33 – 39 ft-lb)

Fig. 8-193



- Set in the neutral position of the worm shaft and place matchmarks on the worm shaft.

— Note —

Count the total number of worm shaft rotations and turn back half of the total number from one end to determine the neutral position.

Fig. 8-194



- Adjust the overall preload with the adjusting screw at the neutral position. Measure the preload with SST.

SST [09616-00010]

Preload (starting): 8 – 11 kg-cm
(6.9 – 9.5 in.-lb)

— Note —

Preload measurement should be made with the meshing in the center (neutral) position.

Fig. 8-195



- Tighten the lock nut.

Tightening torque: 3.0 – 4.0 kg-m
(22 – 28 ft-lb)

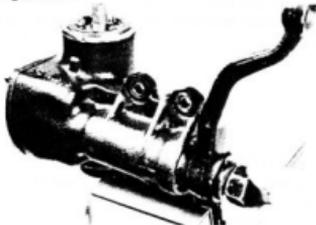
Fig. 8-196



After tightening the lock nut, reconfirm the preload.
SST [09616-00010]

**Preload (starting): 8 - 11 kg-cm
(6.9 - 9.5 in.-lb)**

Fig. 8-197



Install the pitman arm and slightly tighten the nut.

— Note —
Align the matchmarks on the pitman arm and sector shaft.

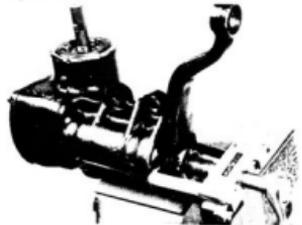
Fig. 8-198



Measure the sector shaft backlash.

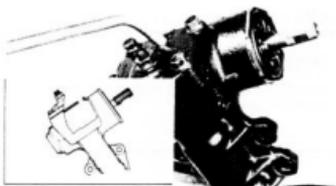
— Note —
Sector shaft should have no backlash within 100 degrees on the left and right side of neutral position.

Fig. 8-199



After checking the backlash, remove the pitman arm.

Fig. 8-200



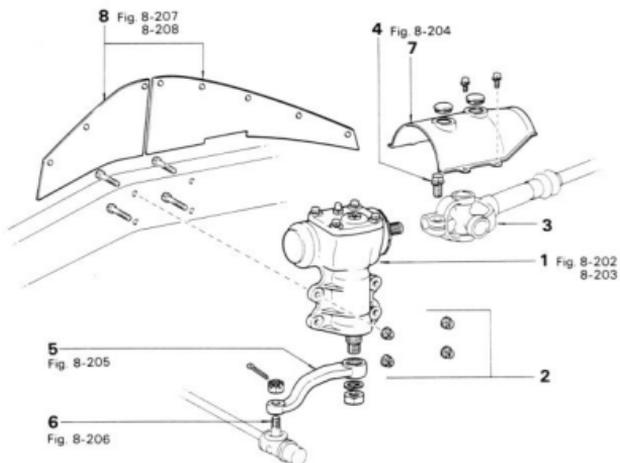
Replenish with gear oil.

Capacity: 500 cc
(30.5 cu in.)**Oil level:**
API GL-5, SAE 90

INSTALLATION

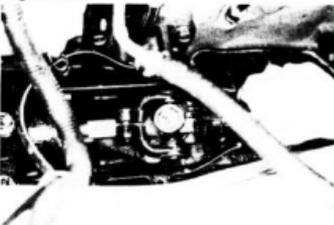
Install the parts in the numerical order shown in the figure.

Fig. 8-201



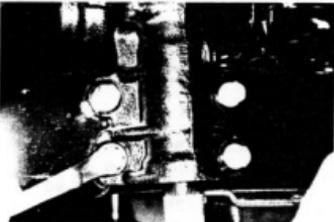
1. Gear Housing
2. Mounting Bolt & Nut
3. Intermediate Shaft
4. Lock Bolt
5. Pitman Arm
6. Relay Rod End
7. Cover
8. Dust Cover

Fig. 8-202



Align the slit on yoke to the shaft groove.

Fig. 8-203



Tighten the gear housing set bolts.

Tightening torque: 5.5 – 8.8 kg-m
(40 – 63 ft-lb)

Fig. 8-204



Tighten the coupling bolt.

Tightening torque: 3.0 – 4.5 kg-m
(22 – 32 ft-lb)

Fig. 8-205



Align the matchmarks on the pitman arm and tighten the nut.

Tightening torque:
16.5 – 19.5 kg-m
(120 – 141 ft-lb)

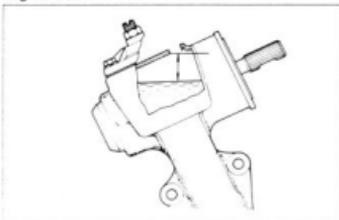
Fig. 8-206



Connect the pitman arm to the steering linkage and install a new cotter pin.

Tightening torque: 7.5–11.0 kg-m
(55–79 ft-lb)

Fig. 8-207



Fill with gear oil.

Capacity: 500 cc
(30.5 cu in.)
API GL-5, SAE 90

Oil level: 25 – 28 mm
(0.98 – 1.02 in.)

Fig. 8-208



Check the steering wheel play at the neutral position.

Steering wheel play:
Less than 30 mm
(1.18 in.)

STEERING GEAR HOUSING (FJ, BJ, HJ4 — SERIES)

REMOVAL

Remove the parts in the numerical order shown in the figure.

Fig. 8-209

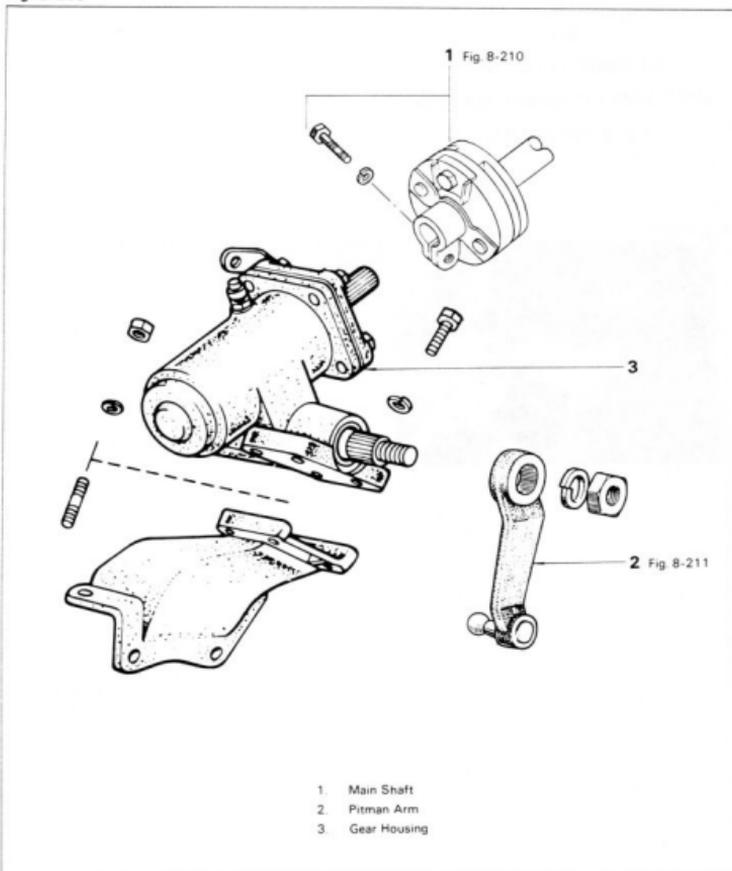
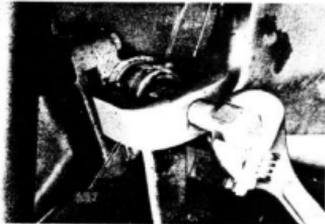


Fig. 8-210

SEE
STEERING COLUMN &
MAIN SHAFT REMOVAL SECTION
Fig. 8-140 to 8-142

Remove the steering wheel and main shaft.

Fig. 8-211



Remove the pitman arm with SST.
SST [09610-55012]

DISASSEMBLY

Disassemble the parts in the numerical order shown in the figure.

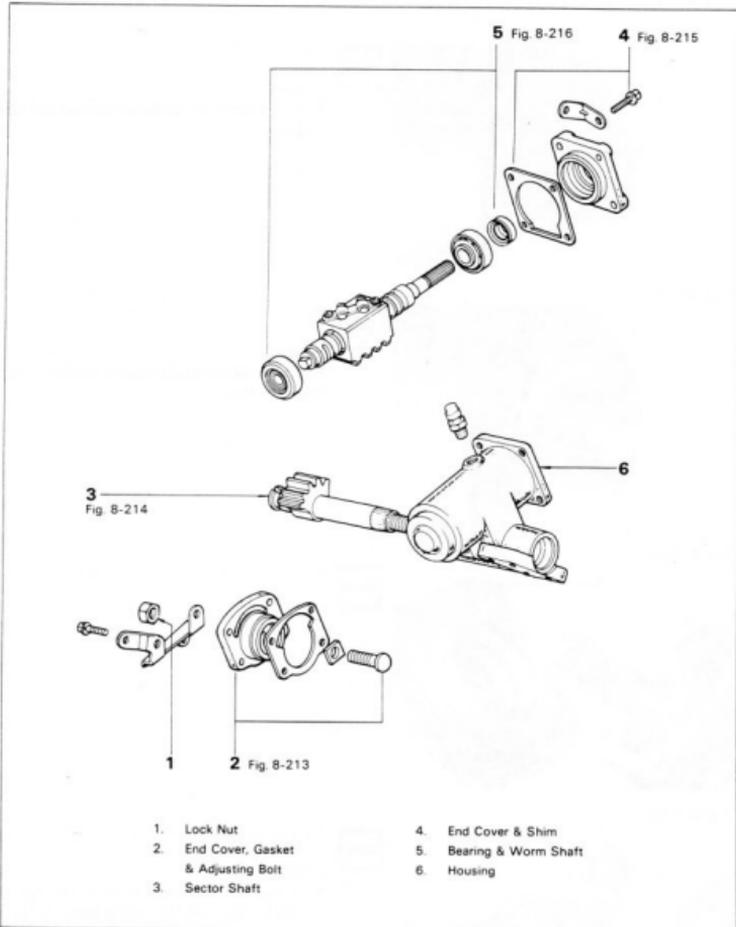
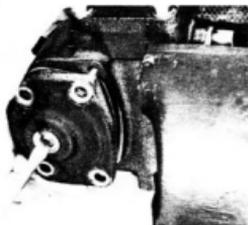
Fig. 8-212

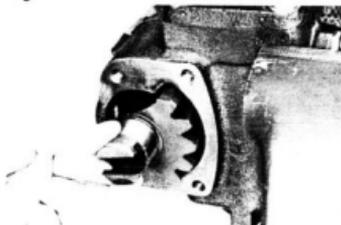
Fig. 8-213



Screw in the bolt and remove the cover.

- Note —
Use a receiver to catch the oil from the gear housing.

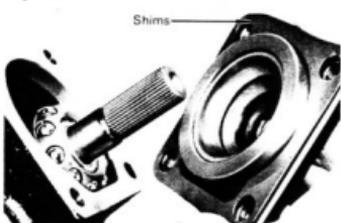
Fig. 8-214



Pull the sector shaft out of the housing.

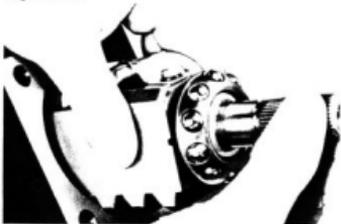
- Caution —
Have the sector shaft positioned at its rotational center.

Fig. 8-215



Record the number of shims used.

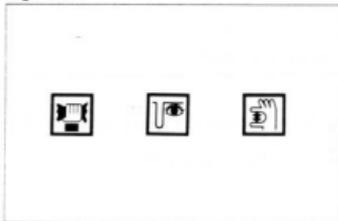
Fig. 8-216



Remove the worm assembly.

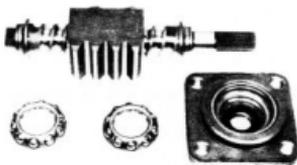
- Note —
1. Keep the bearings in proper order so that they can be reassembled to their initial positions.
 2. Do not attempt to disassemble the steering worm assembly.
If any part of it is defective, replace the entire assembly.
 3. Do not run the ball nut to the worm end.

Fig. 8-217

**INSPECTION**

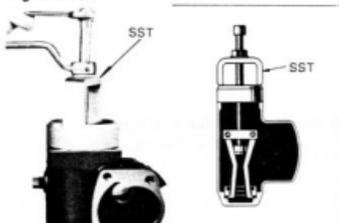
Wash the disassembled parts and inspect them on the following points.
Replace any part found defective.

Fig. 8-218

**Steering Worm & Bearing**

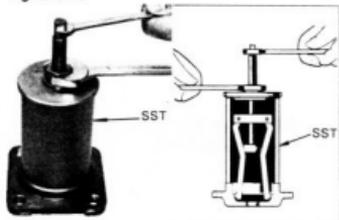
1. Inspect the bearings for wear or damage.
2. Inspect the worm threads and ball nut rack for or wear damage.
3. Check the turning condition of the ball nut.

Fig. 8-219

**Replace The Worm Bearing Outer Race**

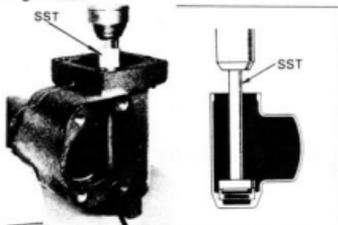
1. Remove the outer race at housing end with SST.
SST [09612-65013]

Fig. 8-220



2. Remove the outer race at end cover end with SST.
SST [09612-30012]

Fig. 8-221



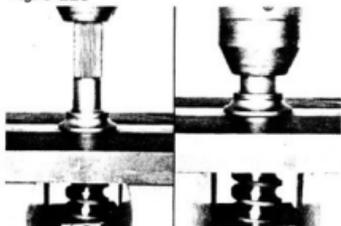
3. Install the outer race at housing end with SST.
SST [09608-35013]

Fig. 8-222



4. Install the outer race at end cover end with SST.
SST [09608-35013]

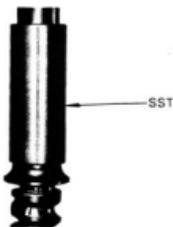
Fig. 8-223



Replace The Inner Race

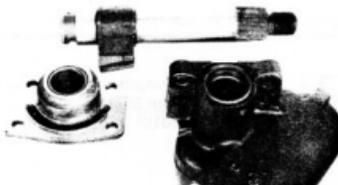
1. Force out the inner race with a press.

Fig. 8-224



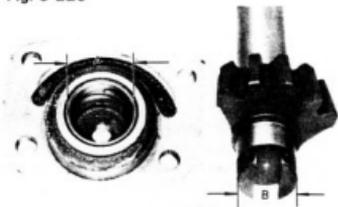
2. Press in the inner race, using SST.
SST [09620-30010]

Fig. 8-225

**Sector Shaft & Bushing**

1. Inspect the shaft at bushing contacting surfaces and at gear teeth for wear or damage.
Inspect the bushings for wear or damage.

Fig. 8-226

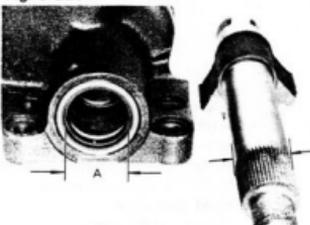


2. Check the sector shaft oil clearance (A — B).

Oil clearance:

Limit 0.1 mm
(0.004 in.)

Fig. 8-227

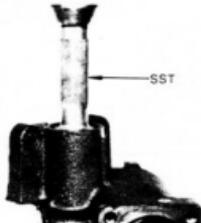


3. Check the sector shaft oil clearance (A — B).

Oil clearance:

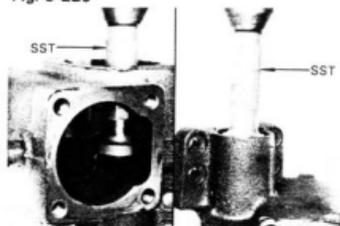
Limit 0.1 mm
(0.004 in.)

Fig. 8-228

**Replace The Gear Housing**

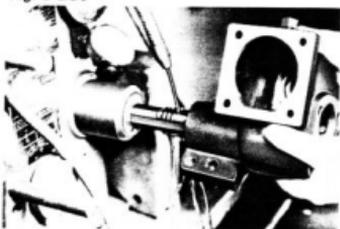
1. Remove the oil seal.
2. Press out the two bushings at the same time in the same direction with SST.
SST [09307-12010]

Fig. 8-229



3. Press in the bushings from each end of the gear housing with SST.
SST [09307-12010]

Fig. 8-230



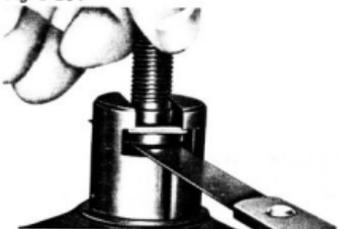
4. Hone the bushings with a pin hole grinder or similar means until standard oil clearance is obtained between the bushings and the sector shaft.

Oil clearance:

STD 0.009 – 0.060 mm
(0.0004 – 0.0024 in.)

5. Install the oil seal.

Fig. 8-231



6. Measure the sector shaft thrust clearance, and select a thrust washer that will provide minimum clearance between the sector shaft and the adjusting screw.

Thrust clearance

Limit 0.05 mm
(0.0020 in.)

Thrust washer thickness mm (in.)

Part No.	Mark	Thickness
45352-36010	1	2.00 (0.0787)
45353-36010	2	2.05 (0.0807)
45354-36010	3	2.10 (0.0827)
45355-36010	4	2.15 (0.0846)
45356-36010	5	2.20 (0.0866)

ASSEMBLY

Assemble the parts in the numerical order shown in the figure.

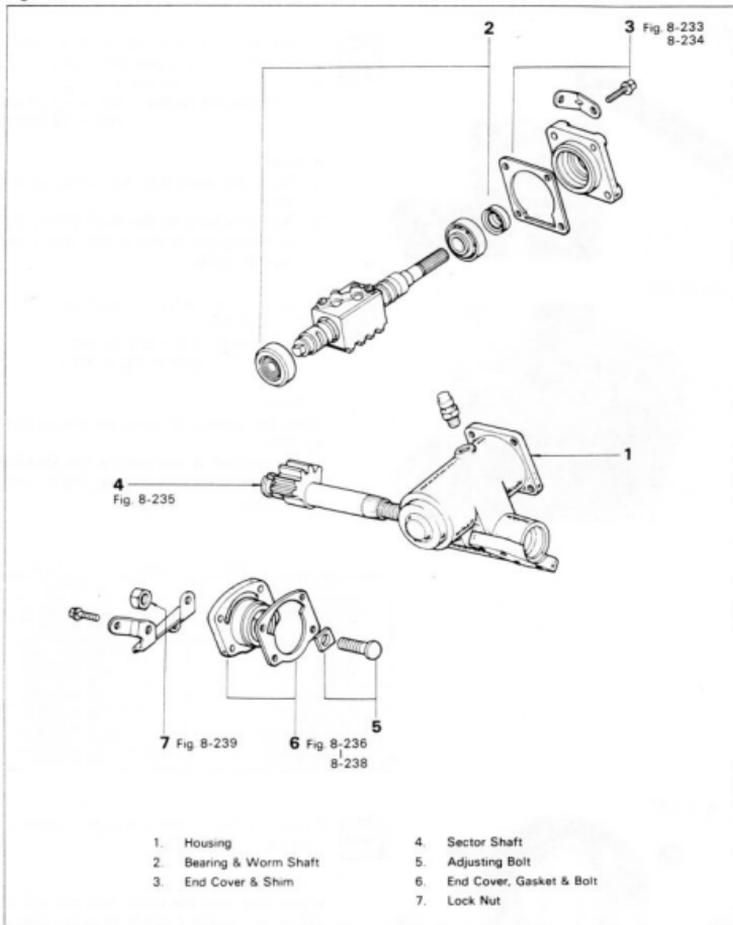
Fig. 8-232

Fig. 8-233



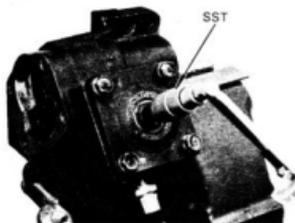
Install the cover over the same amount of shims removed at disassembly, and tighten the cover bolts at specified torque.

**Tightening torque: 3.0 – 4.5 kg-m
(22 – 32 ft-lb)**

– Note –

1. Have the worm bearing lubricated with gear oil.
2. While tightening the cover bolts, keep checking the worm to see that it will turn properly.

Fig. 8-234



Measure the worm bearing preload.
SST [09616-00010]

**Preload: 3.5 – 6.5 kg-cm
(3.0 – 5.6 in.-lb)**

– Note –

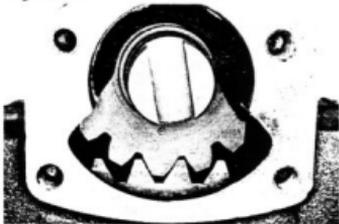
Read the scale just when the worm starts to turn.

If the preload is not within the specified limits, correct by selecting proper thickness shim.

Shim thickness mm (in.)

Part No.	Mark	Thickness
45323-36010	1	0.05 (0.0020)
45323-36020	2	0.07 (0.0028)
45323-36030	3	0.08 (0.0031)
45323-36040	4	0.10 (0.0039)
45323-36050	5	0.20 (0.0079)
45323-36060	6	0.50 (0.0197)
45323-36070	7	0.06 (0.0024)
45323-36080	8	0.09 (0.0035)

Fig. 8-235

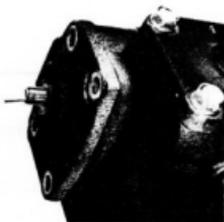


Position the worm ball nut at the center and insert the sector shaft.

– Caution –

Make sure that the worm ball nut and the sector are meshing together at the center.

Fig. 8-236



Loosen the adjusting bolt all the way, and install the cover.

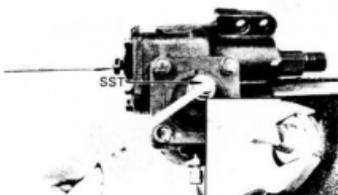
Fig. 8-237



Tighten the cover bolts at the specified torque.

Tightening torque: 3.0 – 4.5 kg-m
(22 – 32 ft-lb)

Fig. 8-238



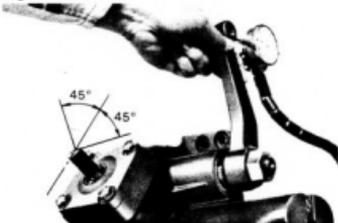
Set the worm shaft preload to the specified value by means of the adjusting bolt.

Preload: 8.0 – 11.0 kg-cm
(6.9 – 9.5 in.-lb)

— Note —

Measurement should be made with the meshing positioned at the center.

Fig. 8-239



Install the pitman arm and check to see that there is no backlash when the worm is rotated within 45 degrees to either side from center position.

Tighten the adjusting screw lock nut.

— Note —

After tightening, recheck the preload.

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 8-240

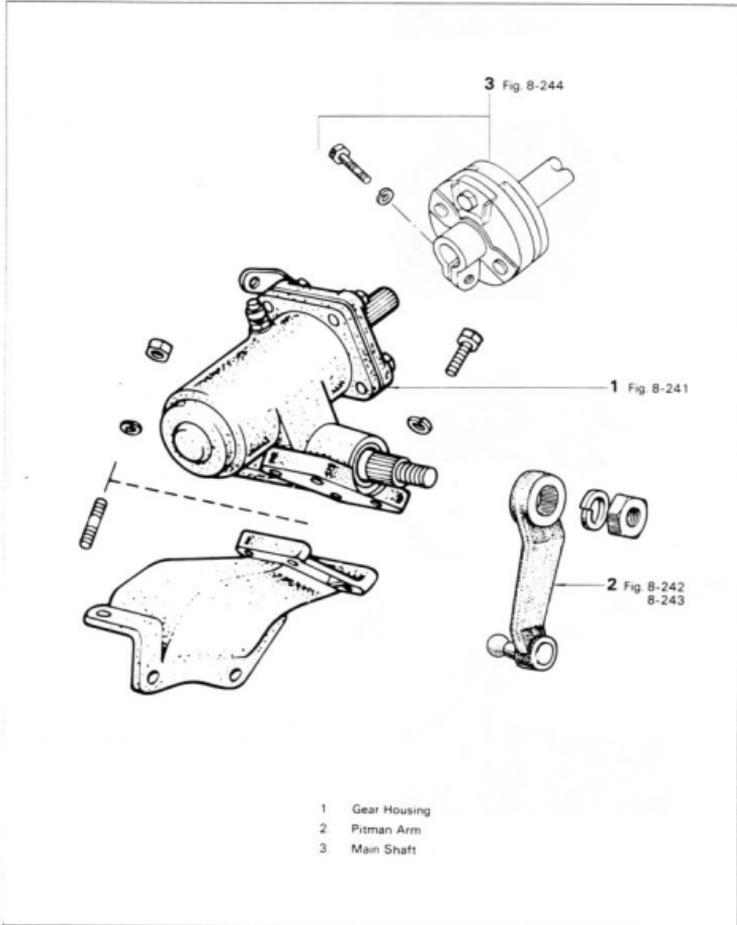


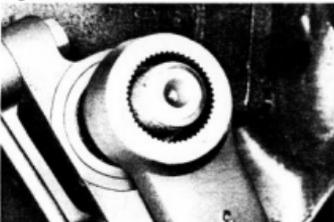
Fig. 8-241



Tighten the bolts and nuts at the specified torque.

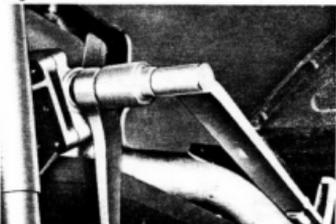
Tightening torque: 4.0 – 4.5 kg-m
(29 – 32 ft-lb)

Fig. 8-242



Align the matchmarks on the pitman arm and sector shaft.

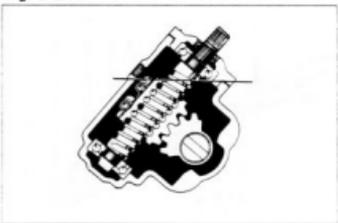
Fig. 8-243



Tighten at specified torque.

Tightening torque: 16.5–19.5 kg-m
(120 – 141 ft-lb)

Fig. 8-244



Fill in gear oil.

Capacity:

STD 610 cc
(37.2 cu in.)

Type: SAE 90, API GL-4

STEERING LINKAGE (FJ, BJ, HJ6 — SERIES)

COMPONENTS

Fig. 8-245

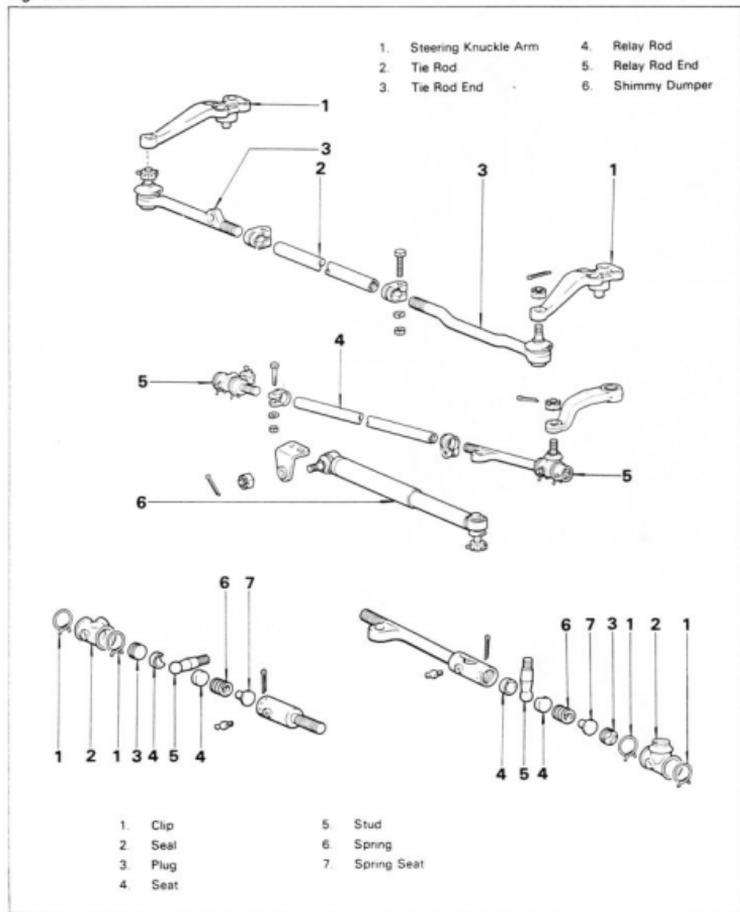
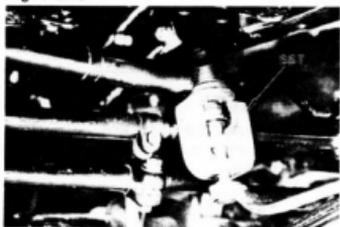


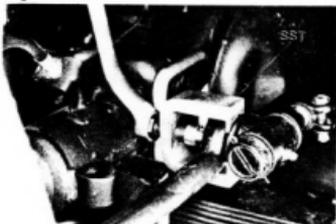
Fig. 8-246

**RELAY ROD****REMOVAL**

Disconnect the dumper from the relay rod with SST.

SST [09611-22011]

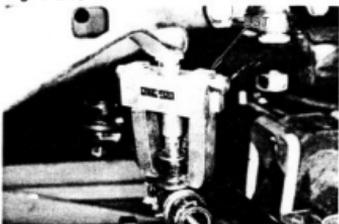
Fig. 8-247



Disconnect the pitman side stud with SST.

SST [09611-20014]

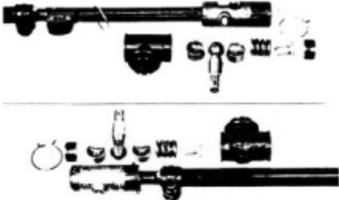
Fig. 8-248



Disconnect the tie rod side stud with SST.

SST [09628-62010]

Fig. 8-249

**INSPECTION****Relay Rod**

1. Check the stud, seat, spring and boot for wear or damage.
2. Check the tube for damage or bending.

Fig. 8-250



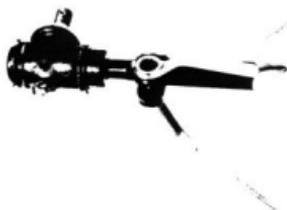
Fig. 8-251



Fig. 8-252



Fig. 8-253

**ADJUSTMENT**

Adjust the relay rod length.

1. Screw the end into the tube equally on both ends.

2. Adjust the rod length.

**Relay rod length: 836 mm
(32.91 in.)**

3. Both side studs are crossed 90 degree.

4. Install the clamp bolt facing opposite for stud.

Tightening torque:

**2.0 – 3.0 kg-m
(15 – 21 ft-lb)**

Fig. 8-254



Adjust the plug tightness.

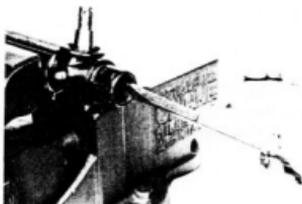
1. Install the damper side as shown in the figure.

Fig. 8-255



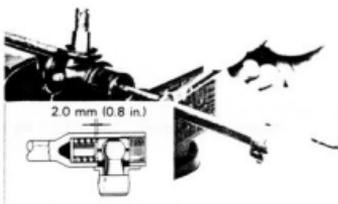
2. Install the tie rod side as shown in the figure.

Fig. 8-256



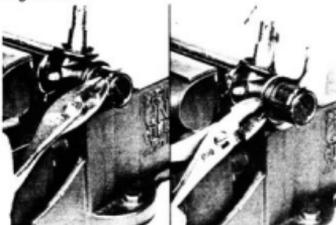
3. Tighten the plug down completely. Be sure that the spring seat and bolt seat come into contact.

Fig. 8-257



4. Loosen the plug one and one third turns.
Spring seat and bolt seat clearance: 2.0 mm (0.079 in.)

Fig. 8-258



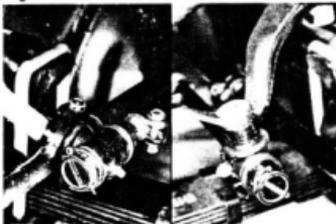
5. Assemble the cotter pin and clip.

Fig. 8-259



6. Grease where necessary.

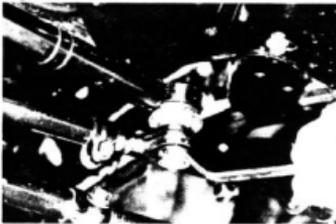
Fig. 8-260

**INSTALLATION**

Tighten the nut.

Tightening torque: 7.5 – 11.0 kg-m
(55 – 79 ft-lb)

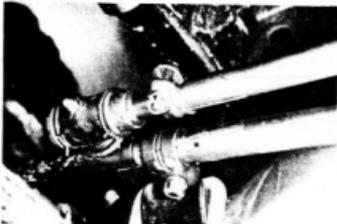
Fig. 8-261



Tighten the nut.

Tightening torque: 7.5 – 11.0 kg-m
(55 – 79 ft-lb)

Fig. 8-262



Confirm that there is no interference between the clamp and rod.

Fig. 8-263

**TIE ROD****REMOVAL**

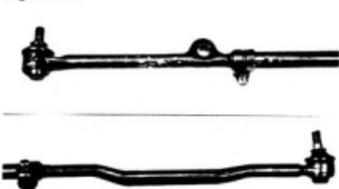
Disconnect both tie rod ends with SST.
SST [09611-22011]

Fig. 8-264



Disconnect the relay rod side with SST.
SST [09611-20014]

Fig. 8-265



Check the tie rod end for wear or damage.

Fig. 8-266



Check the tube for damage or bending.



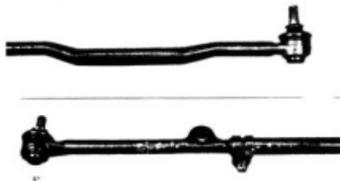
Fig. 8-267

**ADJUSTMENT**

Adjust the tie rod length.

1. Screw the ends into the tube equally.

Fig. 8-268



2. Temporarily adjust the tie rod length.

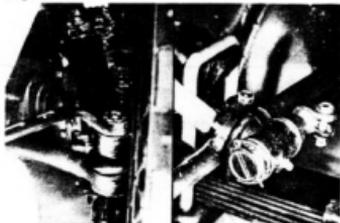
**Tie rod end length: 1,267.4 mm
(49.898 in.)**

Fig. 8-269



3. Temporarily install both side tube clamps.

Fig. 8-270

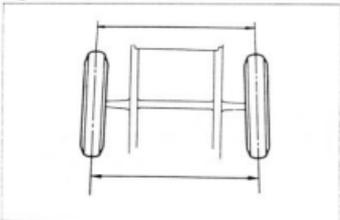
**INSTALLATION**

Tighten the nut.

Tightening torque: 7.5 – 11.0 kg-m
(55 – 79 ft-lb)

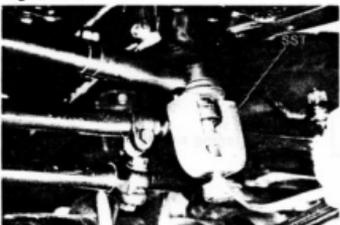
Install the cotter pin.

Fig. 8-271



Inspect and adjust the front wheel alignment.

Fig. 8-272

**SHIMMY DAMPER****REMOVAL**

Disconnect the relay rod side with SST.
SST [09611-22011]

Fig. 8-273



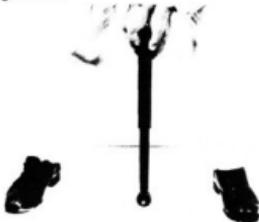
Disconnect the body with SST.
SST [09628-62010]

Fig. 8-274

**INSPECTION**

1. Check for damage or oil leakage.

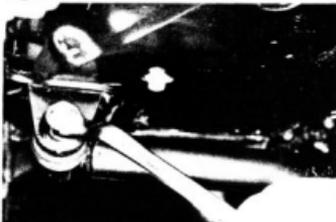
Fig. 8-275



Check the operation.

- Apply an even pressure and insure that the tension is equal throughout the stroke.

Fig. 8-276



Tighten the nut.

Tightening torque: 7.5 – 11.0 kg-m
(55 – 79 ft-lb)

Fig. 8-277



Tighten the nut.

Tightening torque: 7.5 – 11.0 kg-m
(55 – 79 ft-lb)

STEERING LINKAGE (FJ, BJ, HJ4 — SERIES)

REMOVAL & DISASSEMBLY

Remove and disassemble the parts in the numerical order shown in the figure.

Fig. 8-278

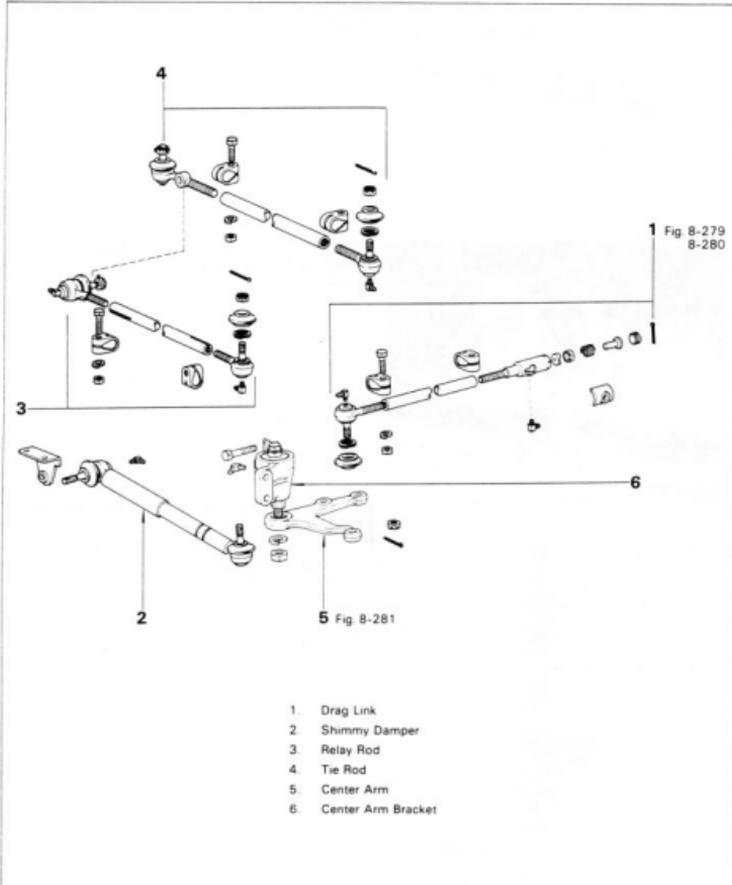
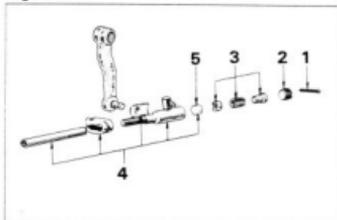
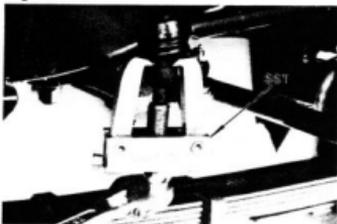


Fig. 8-279



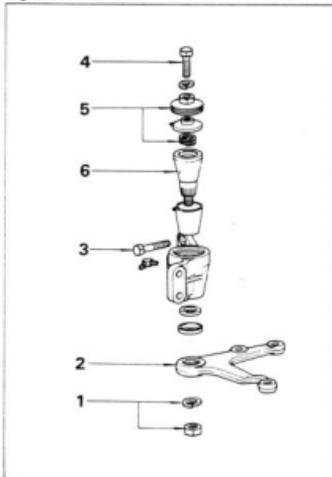
Disassemble the parts in the order shown by numbers.

Fig. 8-280



Disconnect the drag link with SST.
SST [09628-62010]

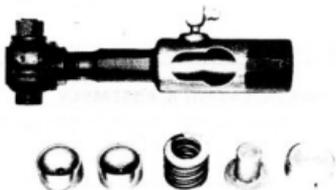
Fig. 8-281



Disassemble the parts in the order shown by numbers.

To remove the arm 2, use SST.
SST [09628-62010]

Fig. 8-282

**INSPECTION
Seat & Spring**

Inspect for wear or damage.

Fig. 8-283

**Shaft & Bushing**

Inspect for wear or damage.

Fig. 8-284

**Drag Link, Tie Rod & Relay Rod**

1. Inspect the link and rod for bending or cracks.
2. Inspect the ball joint for wear.

INSTALLATION & ASSEMBLY

Install and assemble the parts in the numerical order shown in the figure.

Fig. 8-285

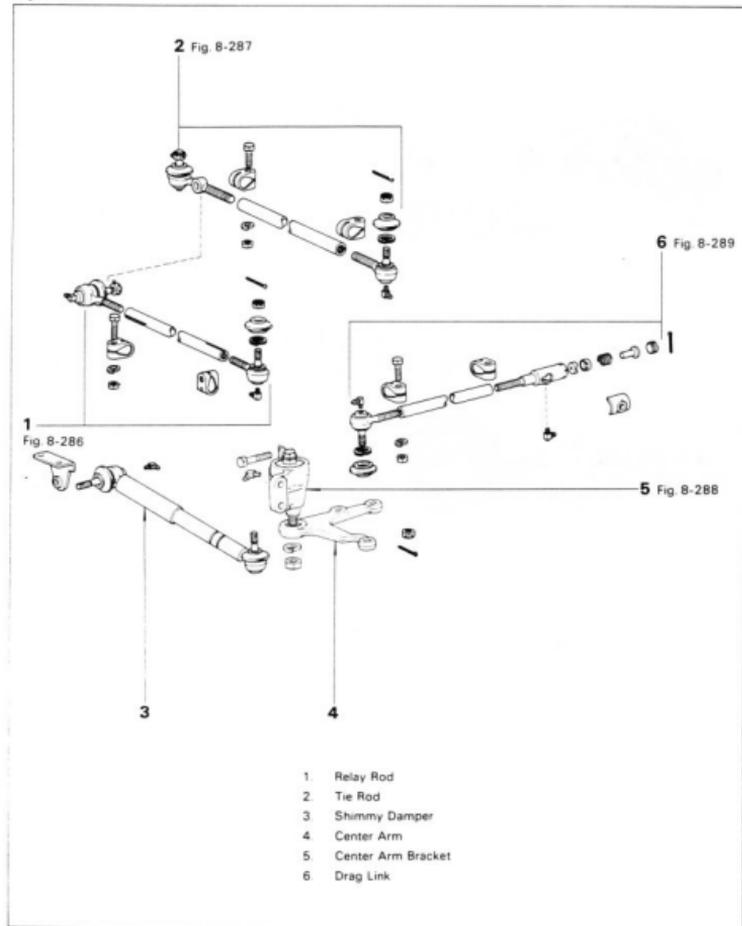
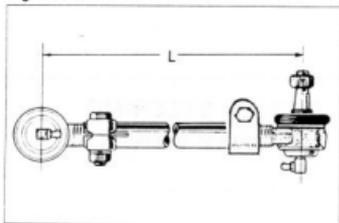


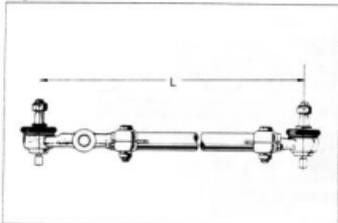
Fig. 8-286



Adjust the length L of relay rod to the standard value.

Relay rod length:
STD 842 mm
(33.15 in.)

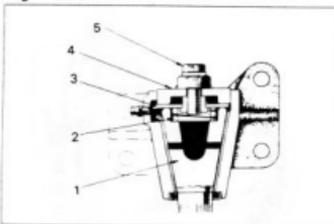
Fig. 8-287



Adjust the length L of tie rod to the standard value.

Tie rod length:
STD 1,205 mm
(47.44 in.)

Fig. 8-288

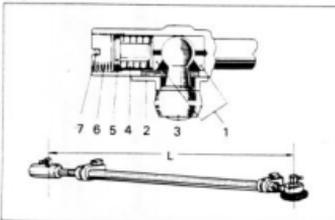


Grease the parts and assemble them in the order shown by numbers.

Tighten the nut 4 fully and then unscrew it 1/4 turn.

Tighten the bolt 5 fully.

Fig. 8-289



Grease the parts and assemble them in the order shown by numbers.

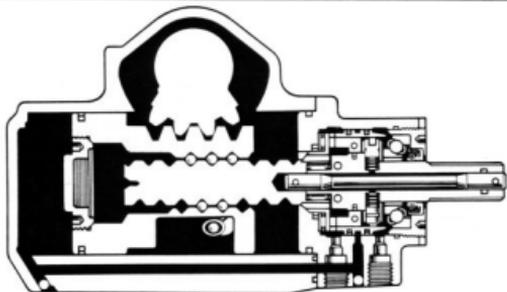
Tighten the end plug 6 fully and then unscrew it 1/2 turn.

Adjust the length L of drag link to the standard value.

Drag link length:
STD 855 mm
(33.66 in.)

POWER STEERING CUTAWAY VIEW

Fig. 8-290



FJ, BJ, HJ4 — Series

FJ, HJ6 — Series

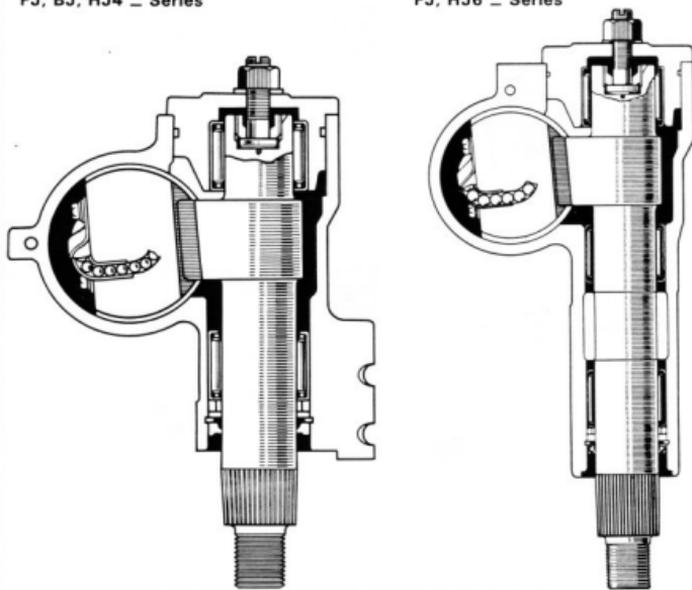


Fig. 8-291

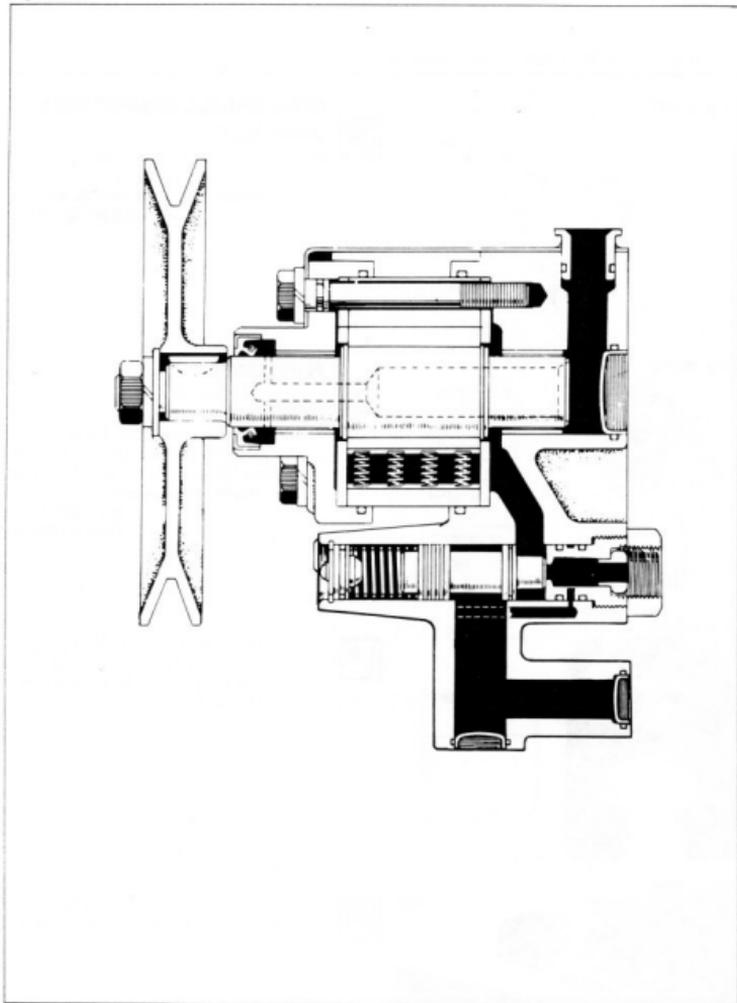
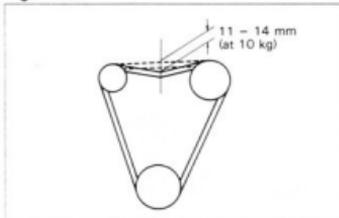


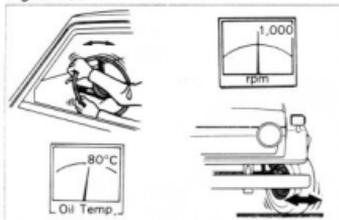
Fig. 8-292

**ON-VEHICLE INSPECTION****DRIVE BELT**

Measure the belt tension between alternator pulley and vane pump pulley.

**Tension: 11 – 15 mm/10 kg
(0.43 – 0.59 in./22 lb)**

Fig. 8-293

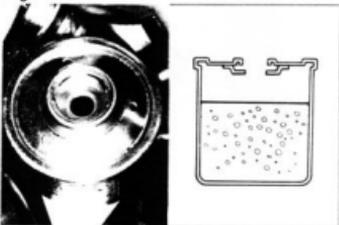
**FLUID LEVEL**

1. Keep the vehicle level.
2. Warm up the engine.
3. With engine running at 1,000 rpm, turn the steering wheel from lock to lock several times to boost fluid temperature.

Fluid temperature:

**40 – 80°C
(104 – 176°F)**

Fig. 8-294



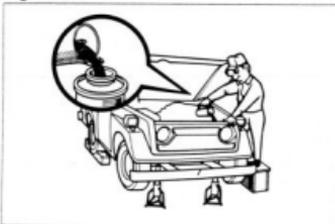
4. Inspect for foaming or emulsification. Note that foaming and emulsification indicate the existence of air in the system or that the fluid level is too low.

Fig. 8-295



5. Inspect the fluid level with a dip stick.
6. Inspect the complete system for fluid leakage.

Fig. 8-296

**BLEEDING**

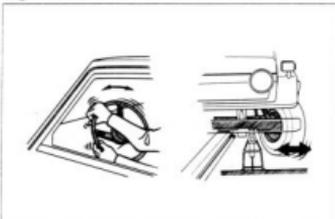
1. Inspect the fluid level and add fluid if necessary.

Fluid: ATF type Dexron

2. Jack up the front of the vehicle and support it on stands.



Fig. 8-297



3. Turn the steering wheel from lock to lock two or three times.



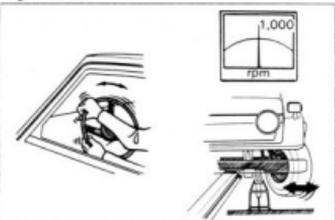
Fig. 8-298



4. Recheck the fluid level.



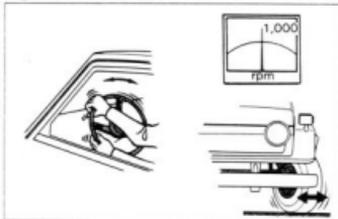
Fig. 8-299



5. Start the engine and run it at 1,000 rpm.
6. Turn the steering wheel from lock to lock two or three times.

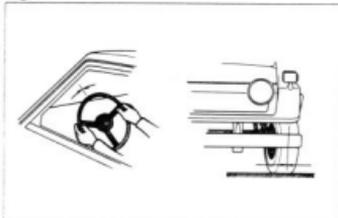


Fig. 8-300



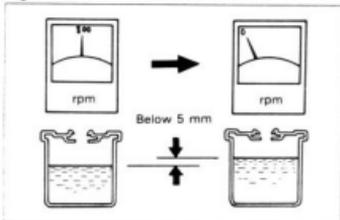
7. Lower the front of vehicle.
8. Run the engine at 1,000 rpm.
9. Turn the steering wheel from lock to lock several times.

Fig. 8-301



10. Center the steering wheel.

Fig. 8-302

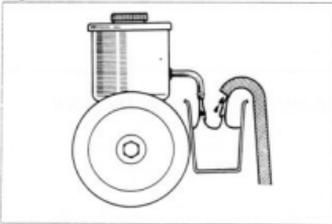


11. Bleeding is complete if the fluid level in the reservoir has not risen excessively and no foaming or emulsification is observed when the engine is stopped.

Maximum rise of fluid level:
Below 5mm
(0.20 in.)

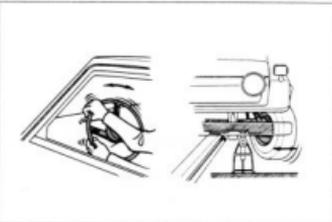
12. If foaming or excessive rise of fluid is noticed, repeat step 8 – 11 until the level is correct.

Fig. 8-303

**FLUID REPLACEMENT**

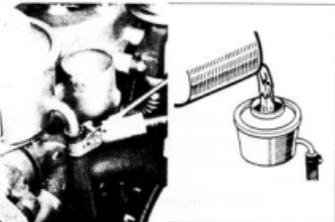
1. Jack up the front of the vehicle.
2. Remove the return hose from the fluid reservoir and drain the fluid into a vessel.

Fig. 8-304



3. Turn the steering wheel from lock to lock, while draining the fluid.

Fig. 8-305



4. Connect the return hose to the fluid reservoir.
5. Add fresh fluid.

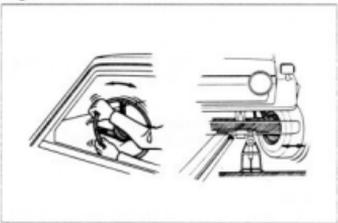
Fluid: ATF type Dexron

Capacity:

Vane pump 300 cc
(18.3 cu in.)

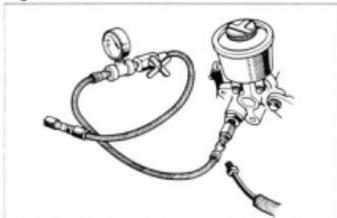
Gear housing 330 cc
(20.1 cu in.)

Fig. 8-306



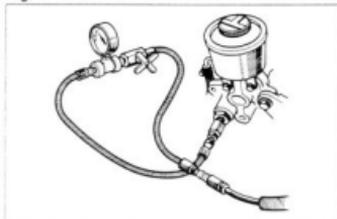
6. Bleed the system.

Fig. 8-307

**FLUID PRESSURE INSPECTION**

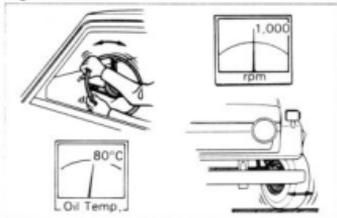
1. Attach a pressure gauge.
 - (1) Disconnect the pressure hose from the vane pump with SST. SST [09631-22020]
 - (2) Connect the gauge side of the pressure gauge to the vane pump.

Fig. 8-308



- (3) Connect the valve side of the pressure gauge to the pressure hose with SST. SST [09631-22020]
 - (4) Bleed the air.
 - (5) Inspect the fluid level.

Fig. 8-309



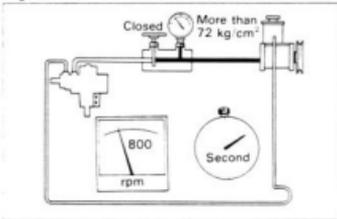
2. Boost the fluid temperature by turning the steering wheel from lock to lock several times with the engine running at 1,000 rpm.

**Fluid temperature: 80°C
(176°F)**

3. Measure the fluid pressure generated by the vane pump.
 - (1) Idle the engine.
 - (2) Measure the fluid pressure reading with the pressure gauge valve fully closed.

**Fluid pressure:
More than 72kg/cm²
(1,022 psi)**

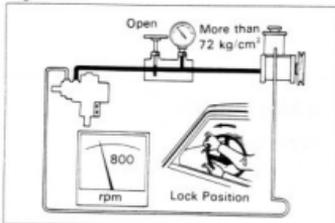
Fig. 8-310



- Note —
Do not keep the valve closed for more than 10 seconds.**

- (3) If the pressure does not reach 72 kg/cm² (1,022 psi) within 10 seconds, there is a problem with the vane pump.

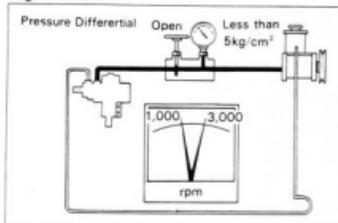
Fig. 8-311



4. Measure the fluid pressure utilized in the gear housing.
- (1) Fully open the pressure valve.
 - (2) With the steering wheel at full lock, measure the fluid pressure reading.

Fluid pressure:
More than 72 kg/cm²
(1,022 psi)

Fig. 8-312



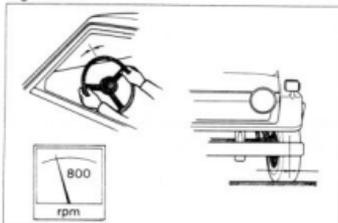
5. Measure the pressure differential under no-load running condition (flow control valve operation check).

- (1) Fully open the pressure gauge valve.
- (2) Measure the fluid pressure with the engine running at 1,000 rpm.
- (3) Measure the fluid pressure with the engine running at 3,000 rpm.

Pressure differential:
Less than 5 kg/cm²
(71 psi)

- (4) If not within limit, check the flow control valve.

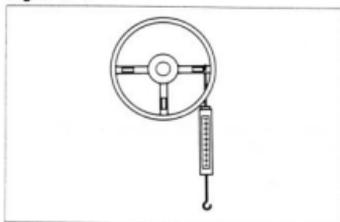
Fig. 8-313



STEERING POWER INSPECTION

1. Place the vehicle on flat surface.
2. Turn the steering wheel to the straight ahead position (midpoint).
3. Idle the engine.

Fig. 8-314



4. Measure the steering power at the steering wheel within one turn on both side of midpoint.

Steering effort:
Less than 6.0 kg
(13.2 lb)

VANE PUMP**REMOVAL**

Remove the parts in the numerical order shown in the figure.

Fig. 8-315

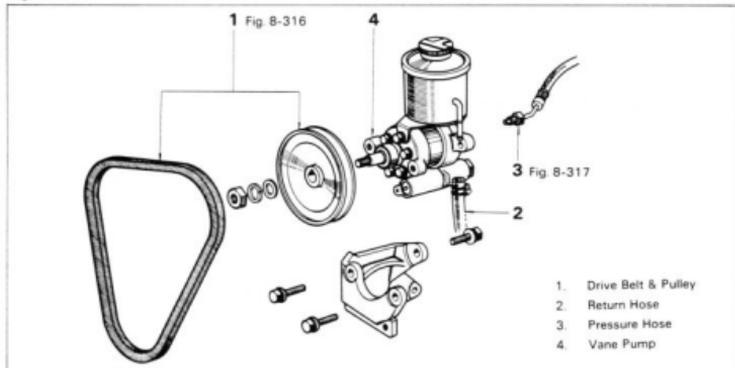


Fig. 8-316



Before releasing tension of the drive belt, loosen the pulley nut.

Fig. 8-317



Disconnect the pressure hose with SST. SST [09631-22020]

DISASSEMBLY

Disassemble the parts in the numerical order shown in the figure.

Fig. 8-318

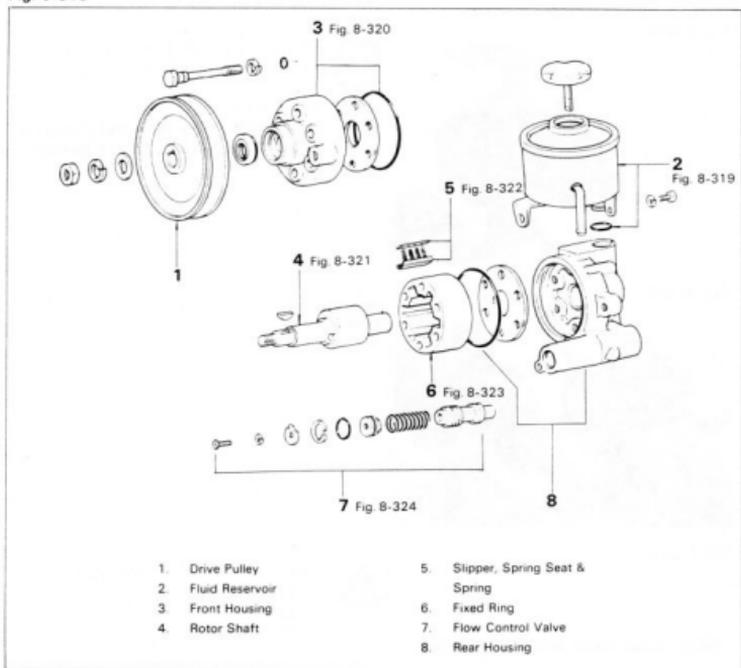
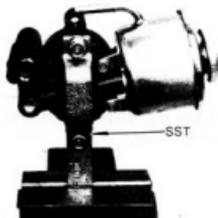


Fig. 8-319



Attach SST to the vane pump and hold it in a vice.
SST (09631-00030) of set [09630-00010]

Fig. 8-320

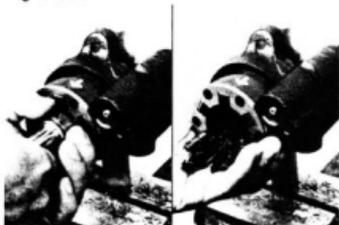


After affixing matchmarks, remove only the front housing with a soft hammer.

— Caution —

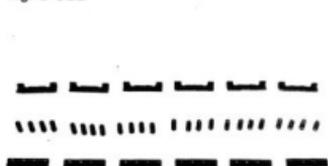
Do not pull out the rotor and fixed ring.
Do not allow the slippers and springs to fly out.

Fig. 8-321



Remove the rotor shaft.

Fig. 8-322



Confirm the numbers of each part.

- | | |
|----------------|----|
| 1. Slipper | 6 |
| 2. Spring | 24 |
| 3. Spring seat | 6 |

Fig. 8-323



Remove the rear housing from the fixed ring with soft hammer.



Remove the flow control valve plug in numerical order as shown in the figure below.

Fig. 8-324



Fig. 8-325

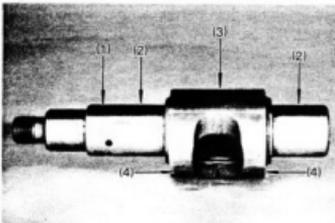


Fig. 8-326

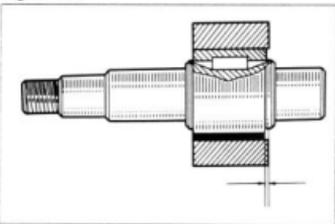
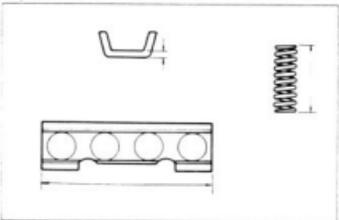


Fig. 8-327



Fig. 8-328



INSPECTION & REPAIR

Rotor Shaft

1. Inspect the following for wear or damage.
 - (1) Oil seal tip contact surface
 - (2) Bushing contact surface
 - (3) Slipper contact surface
 - (4) Side plate contact surface

2. Measure overall length of the rotor and fixed ring.

Fixed ring length — Rotor length:

STD	0.03 mm (0.0012 in.)
Limit	0.06 mm (0.0024 in.)

Slipper & Spring

1. Inspect the surface of the slipper for wear or damage.

Thickness:

STD	1.55 mm (0.0610 in.)
Limit	1.40 mm (0.0551 in.)

Length:

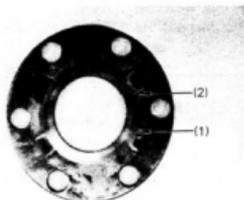
STD	w/mark 39.940 mm (1.5724 in.)
	w/o mark 39.945 mm (1.5726 in.)
Limit	39.920 mm (1.5717 in.)

2. Measure the free height of the spring

Free height:

STD	14 mm (0.55 in.)
Limit	13 mm (0.51 in.)

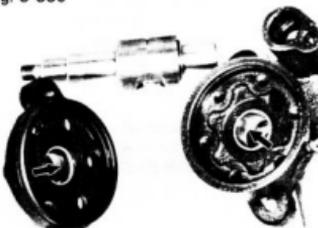
Fig. 8-329

**Side Plate**

Inspect the following for wear or damage.

1. Rotor contact surface
2. Slippers contact surface

Fig. 8-330

**Housing**

1. Inspect the bushings for wear or damage.

Fig. 8-331



2. Measure the clearance between the rotor shaft and the front housing.

Clearance:

STD 0.010–0.015 mm
(0.0004–0.0006 in.)

Limit 0.03 mm
(0.0012 in.)

Fig. 8-332



3. Measure the clearance between the rotor shaft and the rear housing.

Clearance:

STD 0.010–0.015 mm
(0.0004–0.0006 in.)

Limit 0.03 mm
(0.0012 in.)

Fig. 8-333

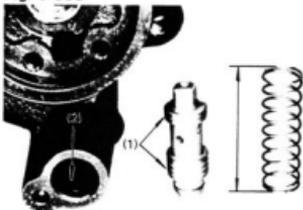


Fig. 8-334

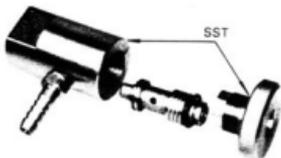


Fig. 8-335

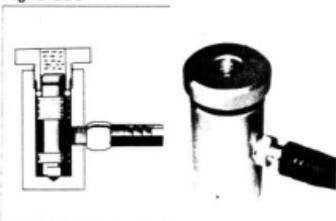
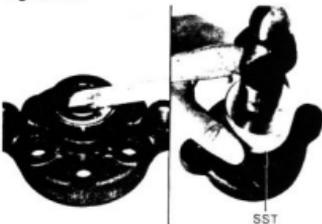


Fig. 8-336

**Flow Control Valve**

1. Inspect the following for wear or damage.
 - (1) Flow control valve
 - (2) Inner surface of the control valve housing
2. Measure free height of the spring.

Free height:

STD	50mm
	(1.97 in.)
Limit	47 mm
	(1.85 in.)



3. Pressure leakage test
 - (1) Install the flow control valve to SST, SST [09630-30030]



- (2) Pour cleaning oil into the center hole of the locking nut.
- (3) Apply compressed air (4 - 5 atmospheres) to the air hole joint.
- (4) If bubbles can be seen coming out through the center of the valve, there is pressure leakage.

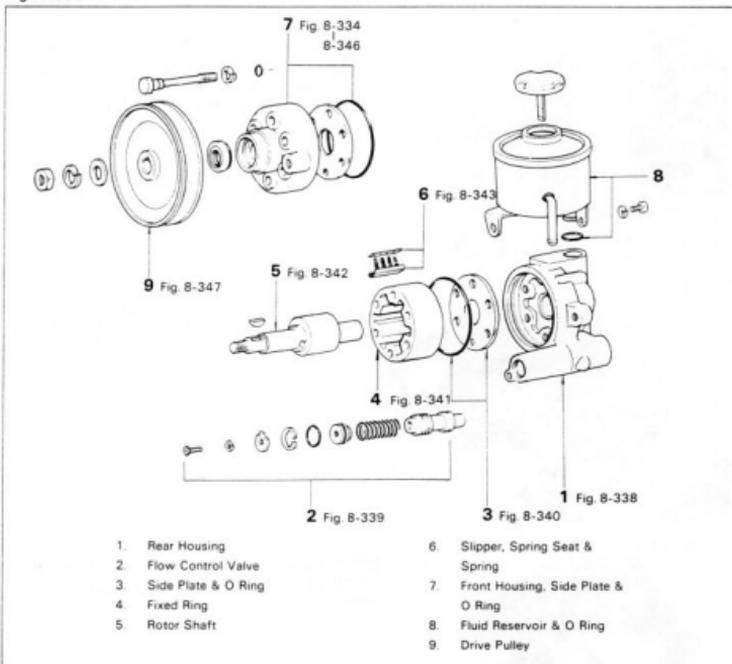
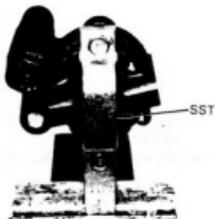
**Replace The Front Housing Oil Seal**

1. Remove the oil seal with a screwdriver.
2. Install a new oil seal with SST, SST [09632-00010] of set [09630-00010]



ASSEMBLY

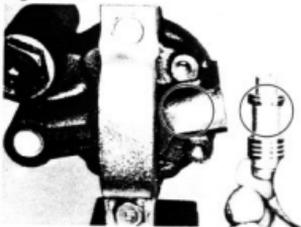
Assemble the parts in the numerical order shown in the figure.

Fig. 8-337**Fig. 8-338**

Attach SST to the rear housing and hold it in a vice.

SST (09631-00030) of set (09630-00010)

Fig. 8-339



Be sure the identifying mark on the valve matches the identifying mark scribed on the rear of the pump body.

Identifying marks: A ~ F

Fig. 8-340



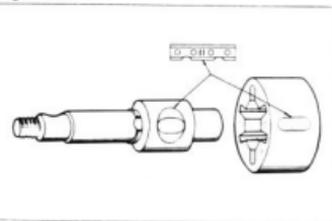
To assemble, place the side plate with the larger bevelled width facing towards the housing side.

Fig. 8-341



Using the two bolts as a guide, drive in the fixed ring evenly with a soft hammer.

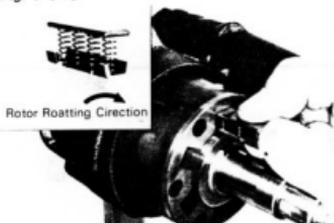
Fig. 8-342



Select a fixed ring, rotor shaft and slipper with matching identifying marks.

Identifying marks: Nothing or 2

Fig. 8-343



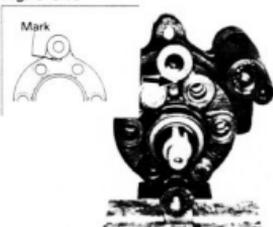
Compress the spring with the slipper and spring seat and install. Position the slipper notch in the direction shown in the figure.

Fig. 8-344



To assemble, place the side plate with the larger bevelled width facing towards the housing side.

Fig. 8-345



Fit the front housing, and position the mark as is shown in the figure.

Fig. 8-346



Tighten evenly in three or four rotations.

Tightening torque: 3.3-4.2 kg-m
(24-30 ft-lb)

2 small bolts behind the reservoir:
0.4-0.7 kg-m
(35-60 in.-lb)

Fig. 8-347



Check the preload at the pulley.

Preload (while turning):

**Less than 2.8 kg
(6.2 lb)**

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 8-348

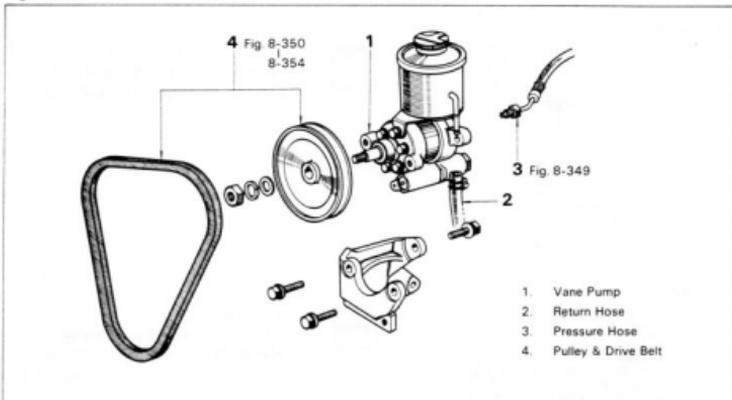


Fig. 8-349



Connect the pressure hose with SST.
SST [09631-22020]

Tightening torque: 4.0–5.0 kg-m
(29–36 ft-lb)

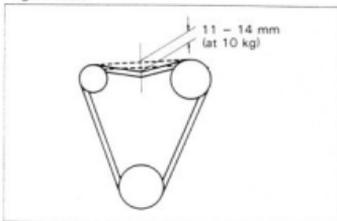
Fig. 8-350



Tighten the pulley set nut securely.

Tightening torque: 3.5–5.4 kg-m
(26–39 ft-lb)

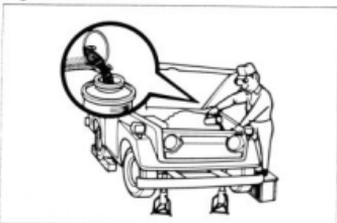
Fig. 8-351



Adjust the drive belt tension.

Tension: 11-14 mm/10 kg
(0.4-0.6 in./22 lb)

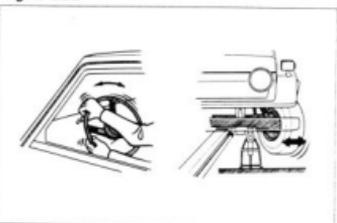
Fig. 8-352



Fill with fluid.

Fluid: ATF type Dexron
Capacity: Vane pump 300cc
(18.3 cu in.)

Fig. 8-353



Bleed the system.

Fig. 8-354

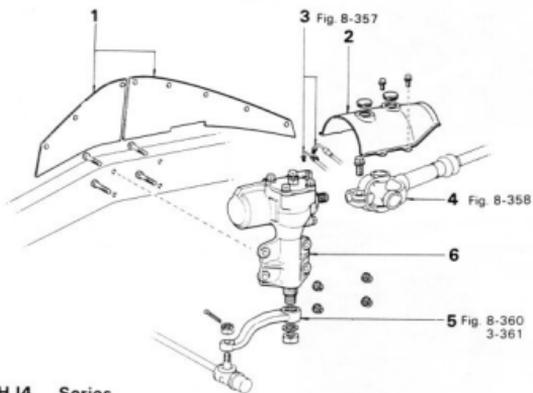
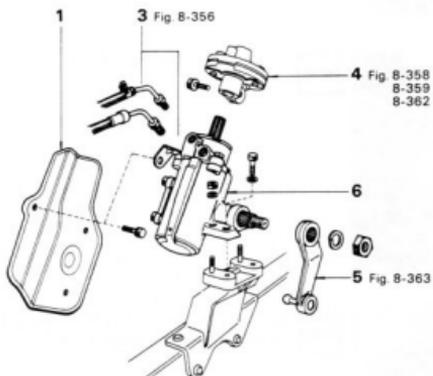


Boost the fluid pressure to check for fluid leakage.

GEAR HOUSING**REMOVAL**

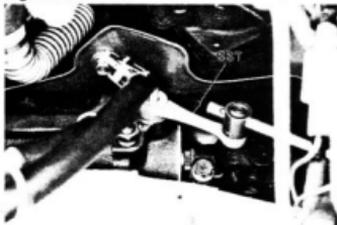
Remove the parts in the numerical order shown in the figure.

Fig. 8-355

FJ, HJ6 _ Series**FJ, BJ, HJ4 _ Series**

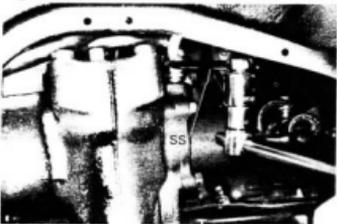
1. Dust Cover or Heat Insulator
2. Dust Cover
3. Fluid Return Hose & Fluid Pressure Hose
4. Intermediate Shaft Yoke or Main Shaft Coupling
5. Pitman Arm
6. Gear Housing

Fig. 8-356



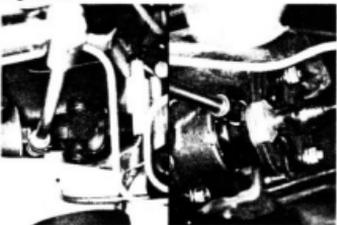
Disconnect the return hose with SST.
SST [09631-22020]

Fig. 8-357



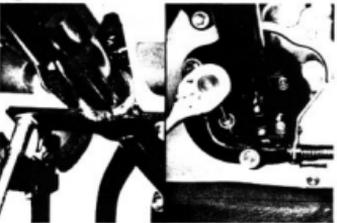
Disconnect the pressure hose with SST.
SST [09631-22020]

Fig. 8-358



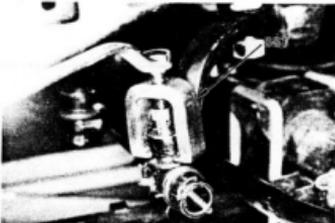
Remove the coupling set bolt.

Fig. 8-359



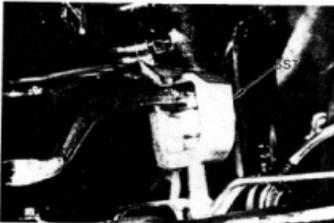
Remove the steering column tube set bolts.
Loosen the upper bracket set bolts.

Fig. 8-360



Disconnect the relay rod with SST.
SST [09611-20014]

Fig. 8-361



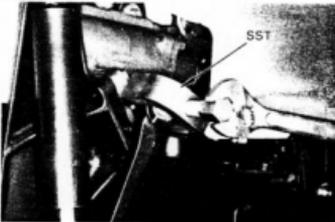
Remove the pitman arm with SST.
SST [09610-55012]

Fig. 8-362



Remove the coupling from the steering gear housing.

Fig. 8-363



Remove the pitman arm with SST.
SST [09610-55012]

DISASSEMBLY

Disassemble the parts in the numerical order shown in the figure.

Fig. 8-364

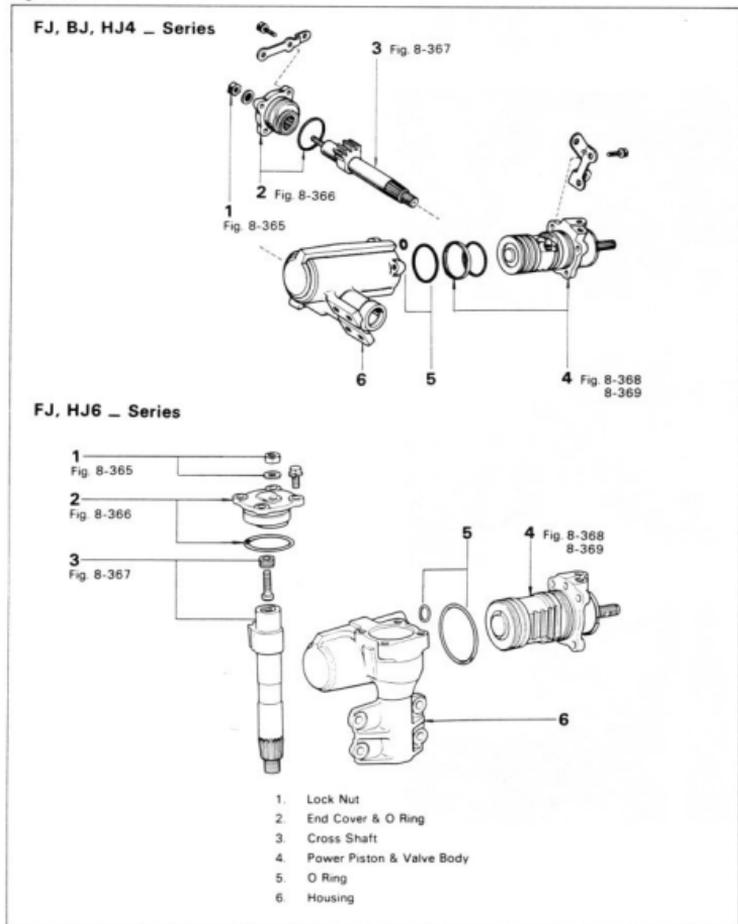
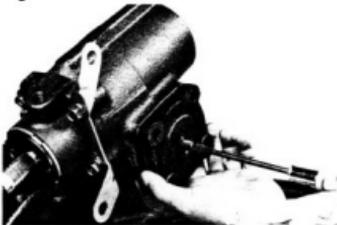


Fig. 8-365



Clamp the gear housing in a vice.

Fig. 8-366



Tighten the adjusting screw until the end cover and O ring are removed from the housing.

Fig. 8-367



Remove the cross shaft by tapping the bottom end with a hammer.

Fig. 8-368



Hold the power piston with your finger and turn the worm shaft clockwise. Then pull out the valve body and power piston.

Fig. 8-369



— Note —

Do not disassemble the valve body.

Do not remove the power piston nut from
the worm shaft.

Fig. 8-370

**INSPECTION & REPAIR****End Cover**

Inspect the following for wear or damage.

1. Needle roller bearing
2. O ring groove



Fig. 8-371

**Cross Shaft**

Inspect the following for wear or damage.

1. Needle roller bearing running surface
2. Teflon ring contact surface
3. Dust seal contact surface
4. Power piston nut gear tooth contact surface



Fig. 8-372

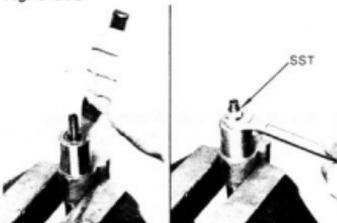
**Adjust The Cross Shaft Adjusting Screw**

1. Measure the thrust clearance of the adjusting screw.

Clearance: 0.03–0.05 mm
(0.0012–0.0020 in.)



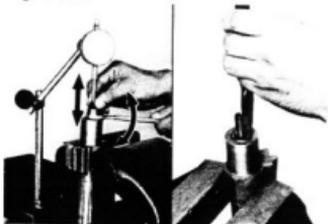
Fig. 8-373



2. Unstack the lock nut.
3. Loosen the lock nut with SST. SST (09632-00030) of set (09630-00010)

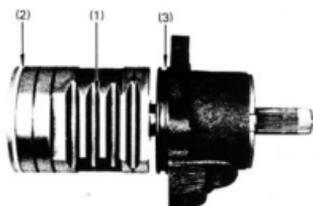


Fig. 8-374



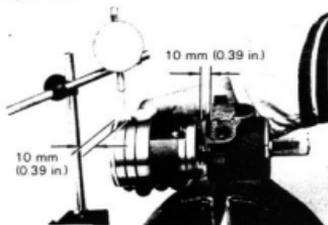
4. Adjust the clearance of the adjusting screw by turning the lock nut.
5. Stake the lock nut.

Fig. 8-375

**Power Piston Nut**

1. Inspect the following for wear or damage.
 - (1) Cross shaft gear tooth contact surface
 - (2) Teflon ring
 - (3) O ring groove

Fig. 8-376



2. Measure the ball clearance.

Clearance:

STD 0.02–0.06 mm
(0.0008–0.0024 in.)

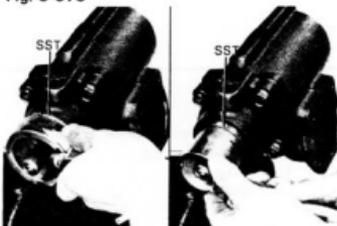
Limit 0.15 mm
(0.0059 in.)

Fig. 8-377

**Adjusting Plug & Worm Bearing**

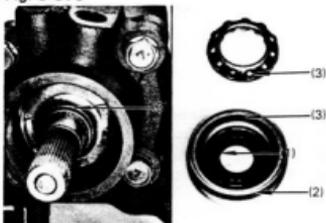
1. Support the valve body by installing it to the gear housing.

Fig. 8-378



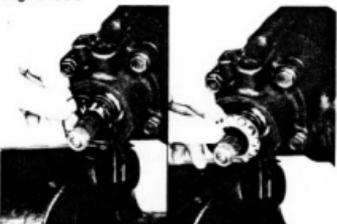
2. Remove the lock nut with SST.
SST (09631-00040) of set [09630-00010]
3. Remove the adjusting plug with SST.
SST (09631-00050) of set [09630-00010]

Fig. 8-379



4. Inspect the following for wear or damage.
 - (1) Oil Seal
 - (2) O ring contact surface
 - (3) Bearing

Fig. 8-380



5. Install the adjusting plug provisionally.
 - (1) Use a new O ring.
 - (2) Install the bearing.

Fig. 8-381



- (3) Install the adjusting plug provisionally with SST.
SST (09631-00050) of set [09630-00010]



- (4) Remove the valve body and the power piston nut from the gear housing.

Fig. 8-382

**Gear Housing**

Inspect the following for wear or damage.

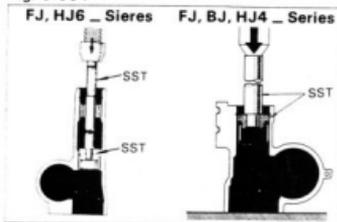
1. Needle roller bearing
2. Teflon ring
3. Dust seal

Fig. 8-383

**Replace The Needle Roller Bearing**

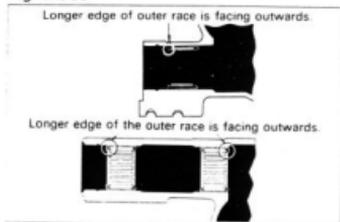
1. Remove the dust seal with a screwdriver.
2. Remove the snap ring.
3. Remove the teflon ring.

Fig. 8-384



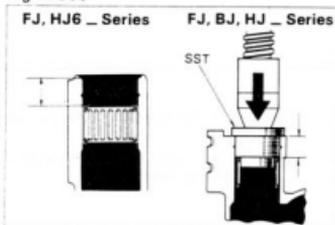
4. Remove the needle roller bearing with SST.
SST (09631-00080) of set [09630-00010]

Fig. 8-385



5. Install the needle roller bearing with the longer edge of the outer race facing outwards.

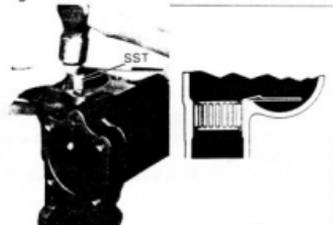
Fig. 8-386



6. Install the needle roller bearing with SST (09631-00090) of set [09630-00010] (09631-60010) FJ, HJ6 _ series
FJ, HJ4 _ series

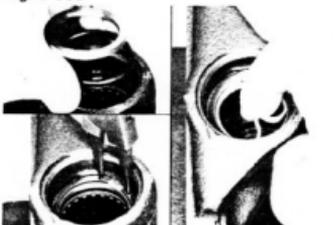
Installed position:**FJ, HJ6 _ Series****23.1 mm (0.909 in.)****FJ, HJ4 _ Series****23.6 mm (0.929 in.)**

Fig. 8-387



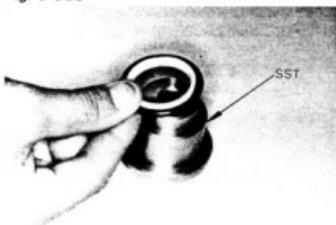
7. The bearing top end should be installed so that it aligns with the housing end surface.
SST (09631-00090) of set [09630-00010]

Fig. 8-388



8. Install the teflon ring and O ring
FJ, HJ6 _ series
(1) Install the O ring, spacer and snap ring.
(2) Form the teflon ring into a heart shape and install with your finger.

Fig. 8-389



FJ, HJ4 _ Series

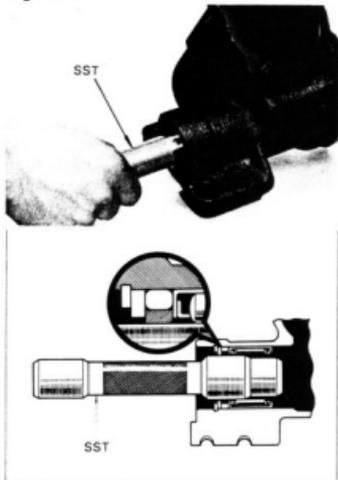
- (1) Install the teflon ring together the O ring to SST.
SST [09631-60010]
(2) Install SST together with the rings to the gear housing.
SST [09631-60010]

Fig. 8-390



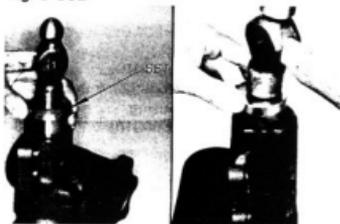
- (3) Install the steel ring and the snap ring.
Confirm that the steel ring can be turned by hand.

Fig. 8-391



9. Rub SST along the inside of the teflon ring so that it will fit smoothly over the cross shaft.
SST (09631-00060) of set [09630-00010]

Fig. 8-392

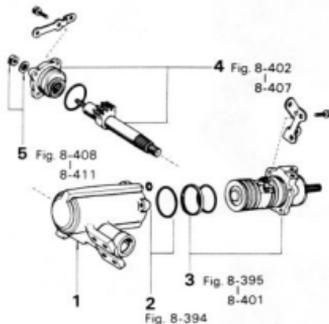
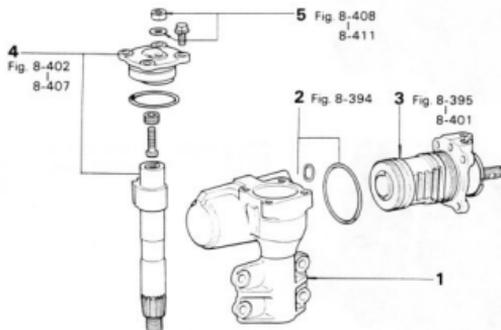


10. Install the dust seal with SST.
SST (09631-00010) of set [09630-00010]
FJ, HJ6 _ series
[09631-60010] FJ, HJ4 _ series

ASSEMBLY

Assemble the parts in the numerical order shown in the figure.

Fig. 8-393

FJ, BJ, HJ4 _ Series**FJ, HJ6 _ Series**

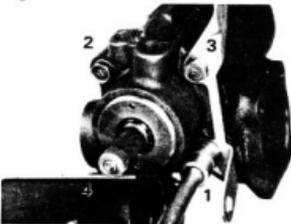
1. Housing
2. O Ring
3. Power Piston & Valve Body
4. End Cover, O Ring & Cross Shaft
5. Lock Nut & Seal Washer

Fig. 8-394



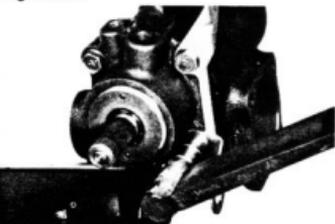
Fit the O ring accurately.

Fig. 8-395



Tighten the bolts diagonally and evenly in two or three rotations.

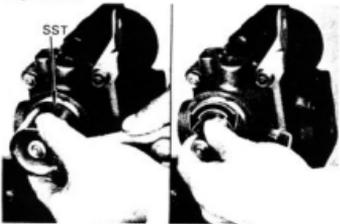
Fig. 8-396



Tighten the valve body.

**Tightening torque: 4.0 – 5.5 kg-m
(29 – 39 ft-lb)**

Fig. 8-397



Adjust the preload of the worm shaft.

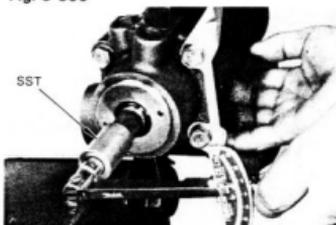
1. Tighten the adjusting plug with SST [09631-00050] of set [09630-00010]
2. Turn the worm shaft to check the turning condition.

Fig. 8-398



3. Loosen the adjusting plug with SST to adjust the preload.
SST (09631-00050) of set [09630-00010]

Fig. 8-399



4. Insert SST into the serrated section of the worm shaft, and measure the preload with a torque meter.
SST [09616-00010]

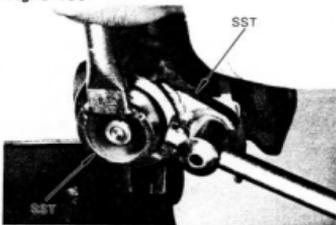
Preload (starting):

4.0 – 6.5 kg-cm
(3.5 – 5.6 in.-lb)

– Note –

Hold the power piston nut to prevent it from turning.

Fig. 8-400

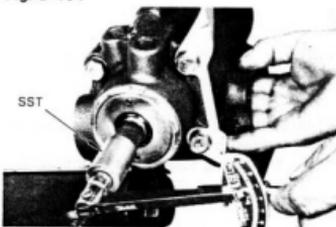


5. Tighten the lock nut with SST.
SST (09631-00050) of set [09630-00010]
(09631-00040) of set [09630-00010]

Tightening torque:

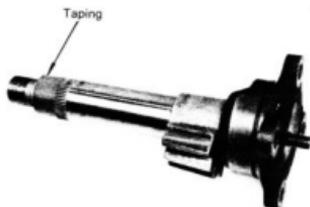
4.5 – 5.5 kg-m
(33 – 39 ft-lb)

Fig. 8-401



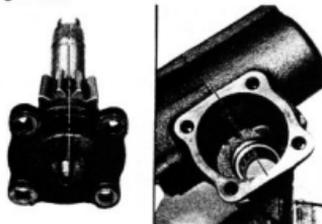
6. Recheck the preload.
Check to see that both the right and left rotations are identical.
SST [09616-00010]

Fig. 8-402



Wrap vinyl tape around the spline area of the cross shaft and loosen the adjusting screw fully.

Fig. 8-403



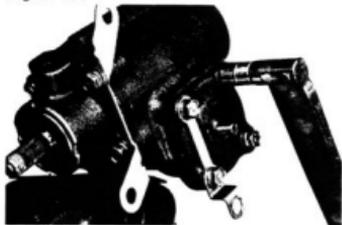
Align the cross shaft gear center with that of the power piston nut gear.

Fig. 8-404



Never turn the cross shaft, as this may cause O ring damage.

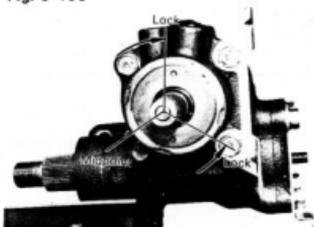
Fig. 8-405



Tighten the end cover diagonally and evenly in two or three rotations.

**Tightening torque: 4.0–5.5 kg-m
(29–39 ft-lb)**

Fig. 8-406



Adjust the cross shaft preload.

1. Set worm shaft to midpoint position. Determine total number of the worm shaft turns and return from full lock by half that number.

Fig. 8-407



2. Insert SST into the serrated section of the worm shaft.

Turn the adjusting screw, and measure preload with a torque meter.

SST [09616-00010]

Preload (starting):

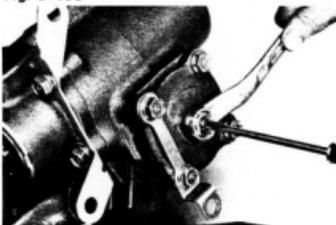
Worm shaft preload plus
 2 – 3 kg-cm
 (1.8 – 2.6 in.-lb)

Fig. 8-408



3. Use a new seal washer.

Fig. 8-409



4. Tighten the lock nut.

Tightening torque:
 4.0 – 5.5 kg-m
 (29 – 39 ft-lb)

Fig. 8-410



5. Recheck the preload.
Check to see that both the right and left rotations are identical.
SST [09616-00010]

Fig. 8-411



6. Stake at three points.

INSTALLATION

Install the parts in the numerical order shown in the figure.

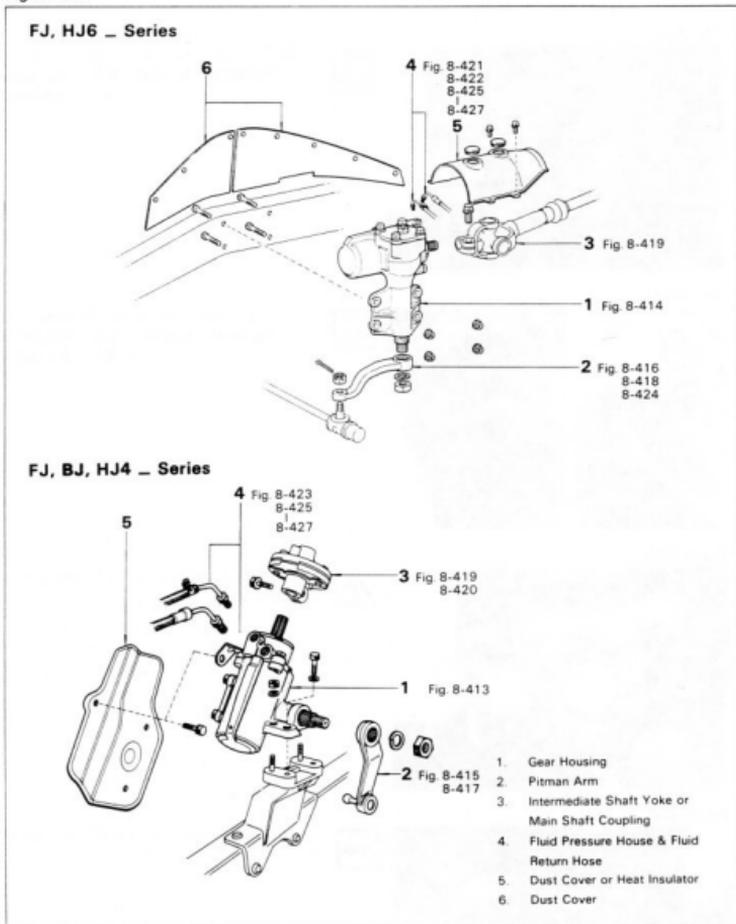
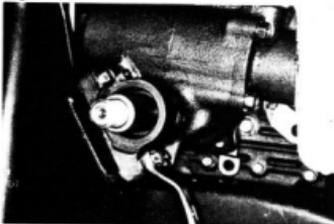
Fig. 8-412

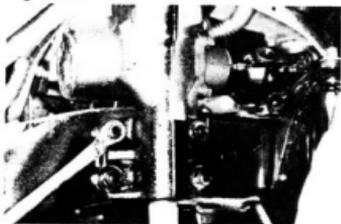
Fig. 8-413



Tighten the gear housing set bolts and nuts

Tightening torque: 5.5 – 8.8 kg-m
(40 – 63 ft-lb)

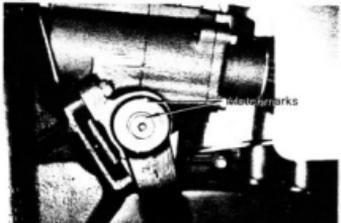
Fig. 8-414



Tighten the gear housing set bolts and nuts.

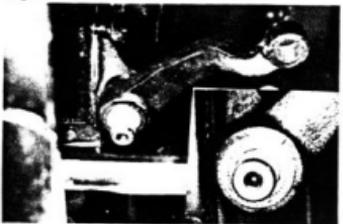
Tightening torque: 5.5 – 8.8 kg-m
(40 – 63 ft-lb)

Fig. 8-415



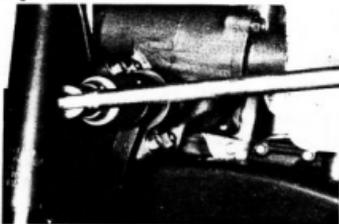
Align the matchmarks on the pitman arm and the cross shaft.

Fig. 8-416



Align the matchmarks on the pitman arm and the cross shaft.

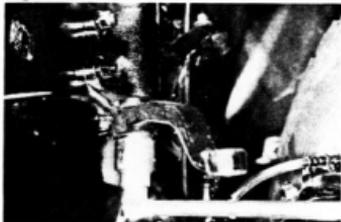
Fig. 8-417



Tighten the pitman arm set nut.

Tightening torque:
16.5 – 19.5 kg-m
(120 – 141 ft-lb)

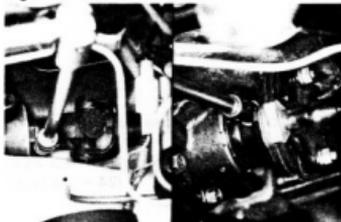
Fig. 8-418



Tighten the pitman arm set nut.

Tightening torque:
16.5 – 19.5 kg-m
(120 – 141 ft-lb)

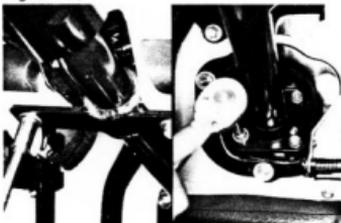
Fig. 8-419



Tighten the coupling set bolt.

Tightening torque: 3.0 – 4.5 kg-m
(22 – 32 ft-lb)

Fig. 8-420



Install the steering column tube.

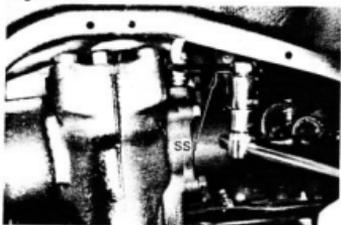
Fig. 8-421



Connect the pressure hose with SST.
SST [09631-22020]

Tightening torque: 4.0 – 5.0 kg-m
(29 – 36 ft-lb)

Fig. 8-422



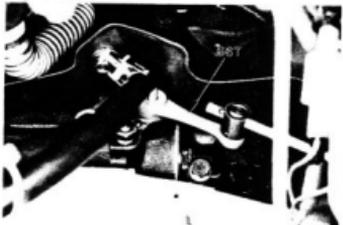
Connect the pressure hose with SST.
SST [09631-22020]

Tightening torque: 4.0 – 5.0 kg-m
(29 – 36 ft-lb)

Connect the return pipe with SST.
SST [09631-22020]

Tightening torque: 3.2 – 4.2 kg-m
(24 – 30 ft-lb)

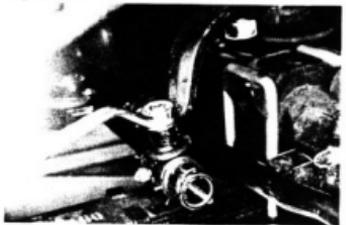
Fig. 8-423



Connect the return hose with SST.
SST [09631-22020]

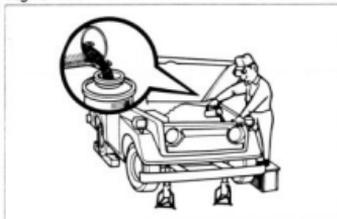
Tightening torque: 3.2 – 4.2 kg-m
(24 – 30 ft-lb)

Fig. 8-424



Connect the relay rod.

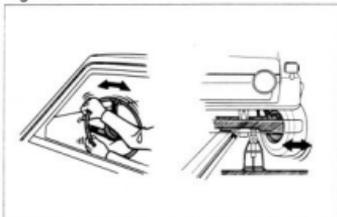
Fig. 8-425



Fill with fluid.

Fluid: ATF type Dexron
Capacity: Gear housing 330 cc
(20.1 cu in.)

Fig. 8-426



Bleed the system.

Fig. 8-427



Boost the fluid pressure to check for fluid leakage.

BRAKE

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CUTAWAY VIEW

Fig. 9-1

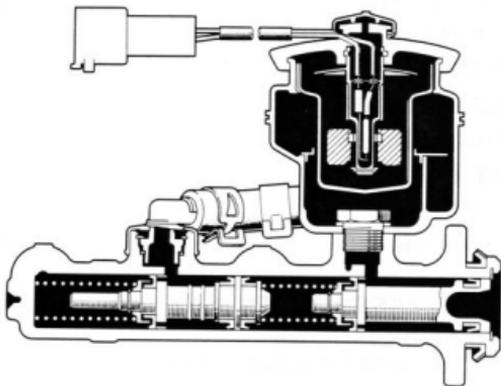
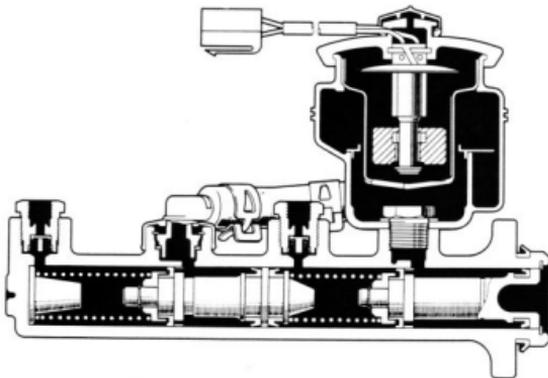
**TANDEM MASTER CYLINDER
(For Disc Brake)****TANDEM MASTER CYLINDER
(For Drum Brake)**

Fig. 9-2

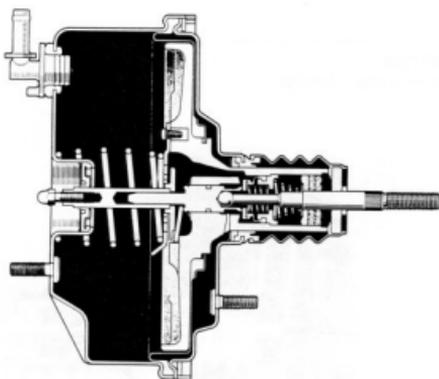
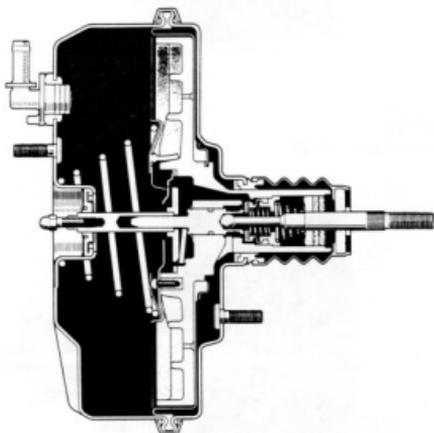
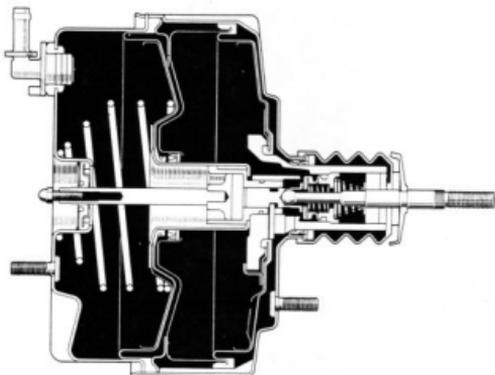
BRAKE BOOSTER
(7.5 in. For Drum Brake)**BRAKE BOOSTER**
(9.0 in. For Drum & Disc Brake)

Fig. 9-3

BRAKE BOOSTER
(7.5 in. Tandem Type : AISIN)



BRAKE BOOSTER
(7.5 in. Tandem Type : JKC)

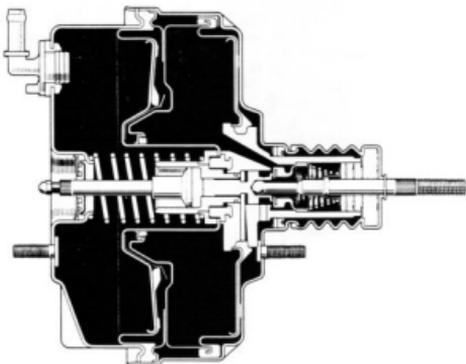
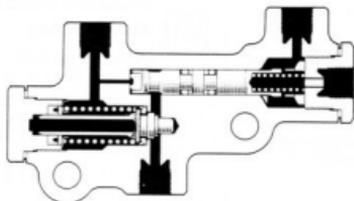


Fig. 9-4

P & B VALVE



LSPV

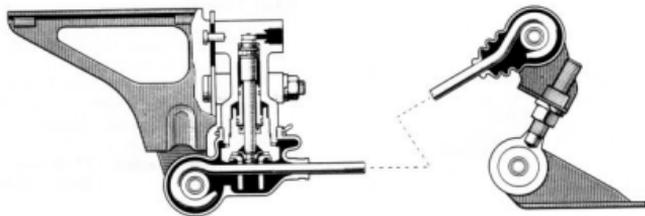
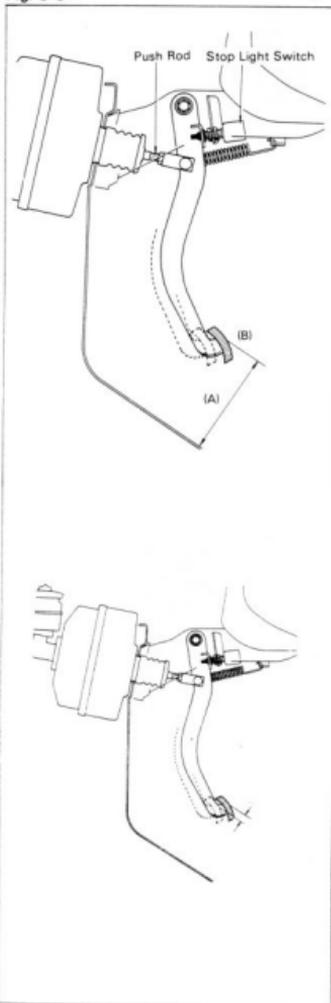


Fig. 9-5



ADJUSTMENT



BRAKE PEDAL

Pedal Height (A)

1. Measure the pedal height between the pedal top and asphalt sheet.

Pedal height:

FJ, BJ, HJ 4 _ series 215 mm
(8.46 in.)

FJ, BJ, HJ 6 _ series 192 mm
(7.55 in.)

2. Adjust the pedal height.
 - (1) Sufficiently loosen the stop light switch.
 - (2) Adjust the pedal height by turning the push rod.
 - (3) Return the stop light switch until its body lightly contacts the pedal stopper.

Pedal Freeplay

1. Stop the engine and depress the brake pedal several times until there is no more vacuum left in the booster.
2. Press down the pedal with fingers until initial resistance is felt. The amount of play sensed at this time should be within the specified range.

Pedal freeplay: 3 - 6 mm

(0.12 - 0.24 in.)

- Note -

1. If the pedal freeplay is not within the specified range, adjust the pedal height by the method described in Pedal Height so as to provide the proper amount of pedal freeplay.
2. The pedal freeplay is not the amount of stroke up to the time the booster piston starts to move.

Fig. 9-6

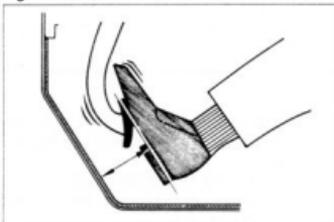


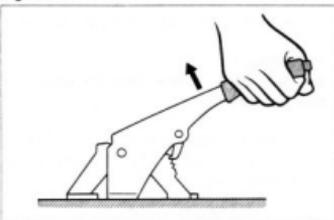
Fig. 9-7



Fig. 9-8



Fig. 9-9

**SHOE CLEARANCE****Check The Pedal Reserve Distance**

Depress the brake pedal and check the pedal reserve distance.

Pedal reserve distance:**Disc brake**

FJ, BJ 40-42-43 series

More than 115 mm (4.53 in.)

FJ, BJ, HJ60 series

More than 105 mm (4.13 in.)

Drum brake

FJ, BJ 40-42-43 series

More than 110 mm (4.33 in.)

FJ, BJ, HJ 45-46-47-60 series

More than 100 mm (3.94 in.)

Adjust The Shoe Clearance**Front Brake**

1. Jack up the vehicle so that the wheels turn freely.
2. Turn the wheel and spread the shoes by screwing the adjusting nut until the wheel locks with SST.
SST [09704-10010]
3. While pumping the pedal, close the shoes until the wheel turn freely.

The standard number of notches to be backed off : 5 notches

PARKING BRAKE**Center Brake Type**

1. Turn the adjuster counterclockwise until the brake shoes are fully expanded.
2. Return the adjuster one notch.
3. Check the brake drums to see that the brakes are not dragging after pulling the parking brake lever all the way back and then releasing it.
If dragging, return the adjuster another notch.

**Parking Brake Lever**

1. Pull the parking brake lever and check its distance.

Parking brake lever distance:

FJ, BJ, HJ 60 series

7 - 9 clicks at 20 kg (44 lb)

FJ, BJ 40-42-43 series

8 - 10 clicks at 20kg (44 lb)

3 - 6 clicks at 25 kg (55 lb)

with center brake

Fig. 9-10

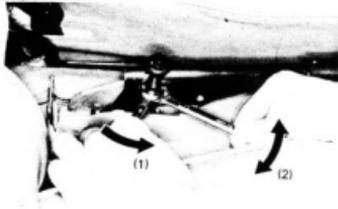


Fig. 9-11

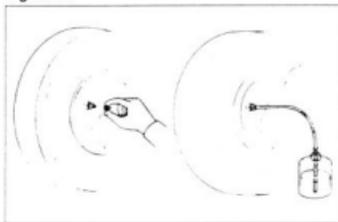


Fig. 9-12

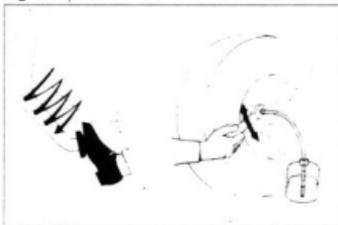
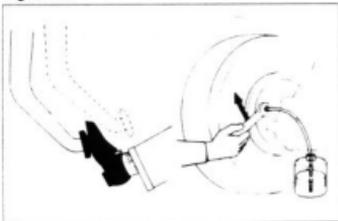


Fig. 9-13



2. If the parking brake lever does not have the specified travel, adjust parking brake cables.

- (1) Loosen the adjusting cap.
- (2) Adjust the amount of lever travel by turning the nut.
- (3) Fully tighten the adjusting cap by hand.

— Note —

In the adjustment of the parking brake travel, make sure that the rear brake shoe clearance has been correctly adjusted before hand.

AIR BLEEDING

1. Remove the bleeder plug cap. Attach a vinyl tube to the wheel cylinder bleeder plug and insert the other end into a container.

— Note —

1. **Begin bleeding air from the wheel cylinder with the longest hydraulic line.**
2. **Bleed air from the bypass pipe (with LSPV).**

2. Depress the brake pedal several times and then while holding it depressed, loosen the bleeder plug about one-third to one-half turn.
3. When the fluid pressure in the cylinder is almost depleted, retighten the plug.
4. Repeat this operation until there are no more air bubbles in the hydraulic line.

— Caution —

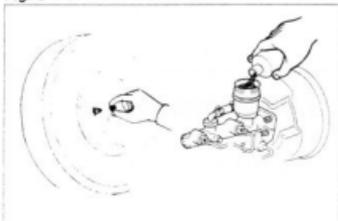
Do not allow brake fluid to remain on painted surface.

5. When the bubbles stop, depress and hold the brake pedal, and then tighten the bleeder plug.

Tightening torque:

0.9 — 1.3 kg-m
(79 — 112 in.-lb)

Fig. 9-14



6. Attach the bleeder plug cap.
7. After bleeding, apply fluid pressure to the line and check for leakage.
8. Replenish the fluid in the reservoir to the specified level.

BRAKE PEDAL REMOVAL

Remove the parts in the numerical order shown in the figure.

Fig. 9-15

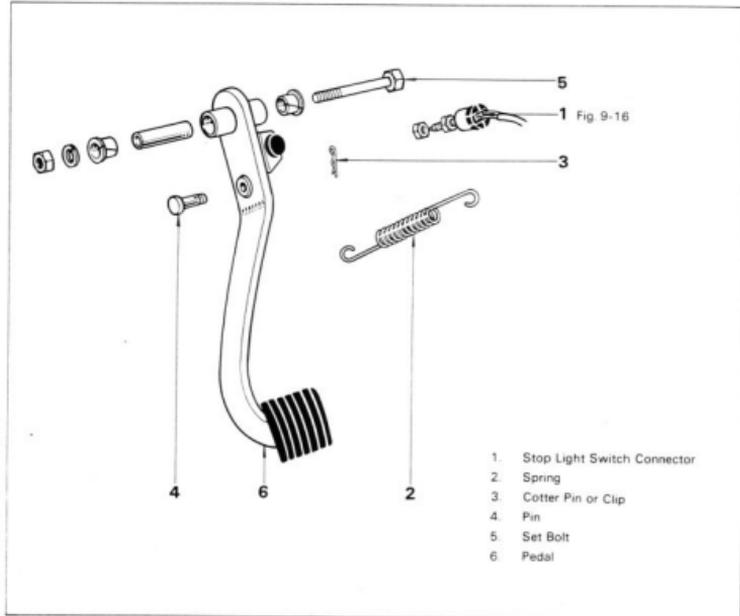
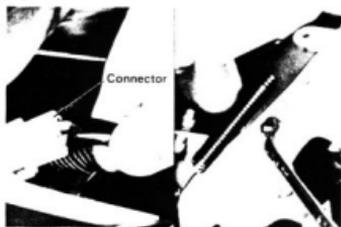


Fig. 9-16



Disconnect the stop light switch connector and remove the pedal.

Fig. 9-17



Fig. 9-18

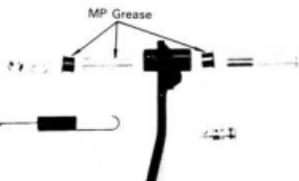


Fig. 9-19



Fig. 9-20

SEE
BRAKE PEDAL
ADJUSTMENT
SECTION
Fig. 9-5

**INSPECTION**

Inspect the removed parts for wear or damage, and replace parts if necessary.

**INSTALLATION**

1. Install in reverse sequence of removal.

— Note —
Coat the bushings with MP grease.



2. Install the bolt.

Tightening torque:
3.0 – 4.5 kg-m
(22 – 32 ft-lb)

3. Adjust the pedal height and play.

BRAKE HOSE & TUBE**REMOVAL**

Remove the parts in the numerical order shown in the figure.

— Note —

Only servicing for the main components is described.

Fig. 9-21

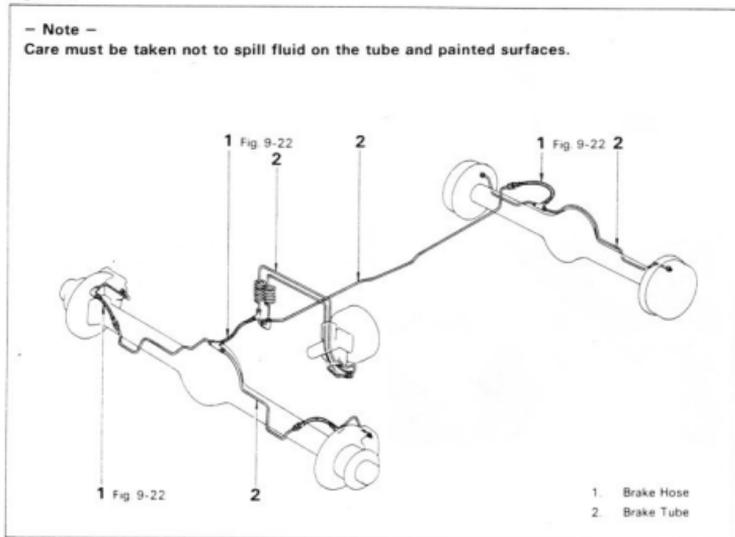
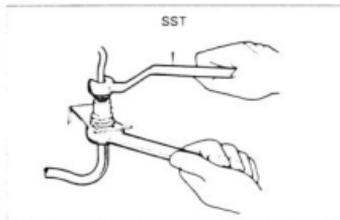


Fig. 9-22



Disconnect the hose and tube with a wrench and SST.

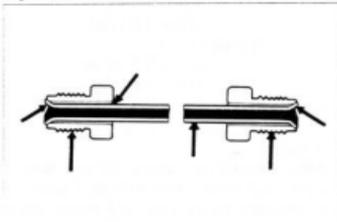
SST [09751-36011]

Fig. 9-23

**INSPECTION****Brake Hose**

1. Inspect the hose for damage, cracks or swelling.
2. Inspect the threads and tapered portion for damage.

Fig. 9-24

**Brake Tube**

1. Inspect the tube for damage, cracks, dents or corrosion.
2. Inspect the threads for damage.

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 9-25

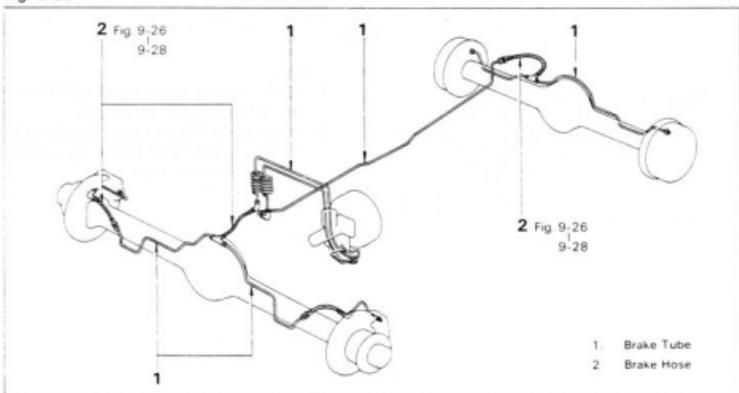
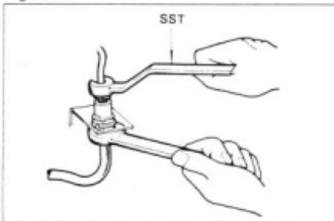


Fig. 9-26



Connect the tubes to the proper places with a wrench and SST.

SST [09751-36011]

— Note —

All hoses should be free from excessive bending, twisting or pulling.

Tightening torque:

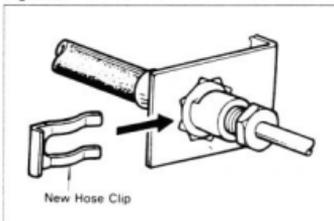
Brak tube union nut

1.3 – 1.8 kg-m
(10 – 13 ft-lb)

Flexible hose

2.0 – 2.7 kg-m
(15 – 19 ft-lb)

Fig. 9-27

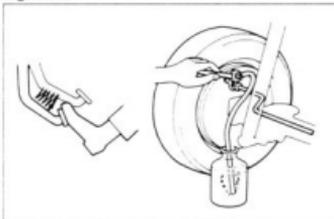


Install a new hose clip.

— Note —

After installation, check to see that all hoses and tubes have sufficient clearance to prevent contacting any sharp edges, moving components or the exhaust pipe.

Fig. 9-28



Bleed the air from the brake line.
(See Fig. 9-11 to 9-14)

— Note —

1. Care must be taken not to spill fluid on the tube and painted surface.
2. After the bleeding, depress the brake pedal strongly and check the connection for leaks or oozing.

MASTER CYLINDER**REMOVAL**

Remove the parts in the numerical order shown in the figure.

Fig. 9-29

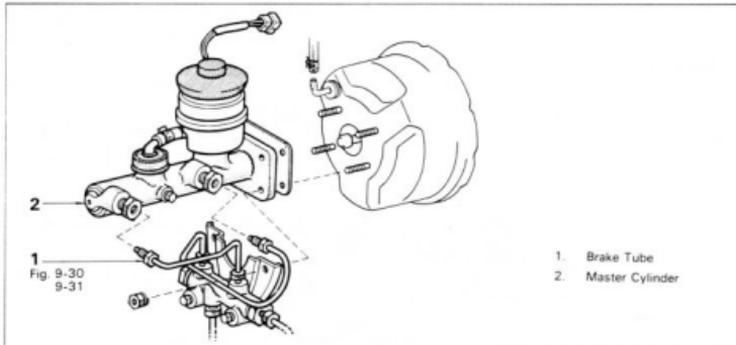
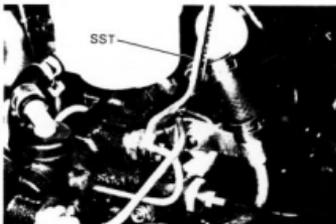


Fig. 9-30



Take out fluid with a syringe or such.

Fig. 9-31



Disconnect the brake tube from the master cylinder with SST.
SST [09751-36011]

— Note —
Do not allow brake fluid together painted surfaces.

DISASSEMBLY

Disassemble the parts in the numerical order shown in the figure.

Fig. 9-32

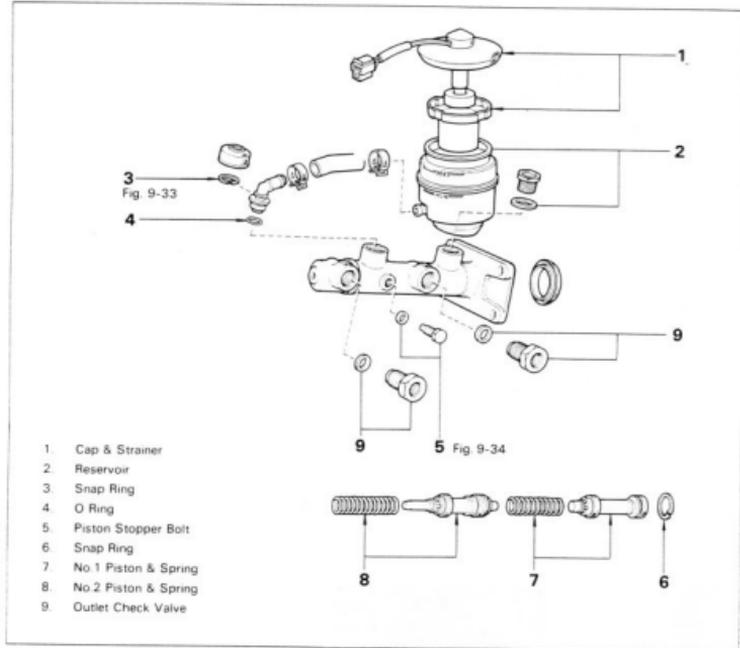
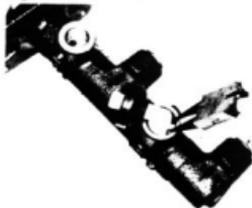


Fig. 9-33



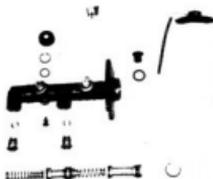
Remove the snap ring, and take out the elbow

Fig. 9-34



Remove the piston stopper bolt with the pistons pushed in all the way.

Fig. 9-35

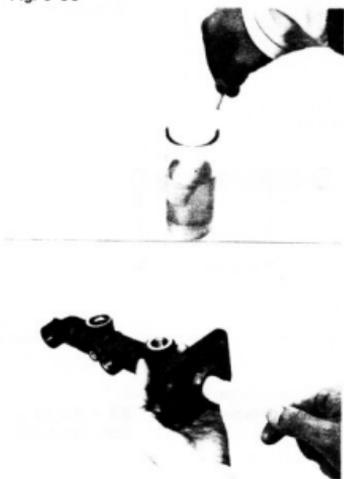
**INSPECTION**

Inspect the all disassembled parts for wear or damage, and replace parts if necessary.

— Note —

1. Wash the disassembled parts with brake fluid.
2. Do not reuse the piston cup.

Fig. 9-36

**MASTER CYLINDER INNER WALL CLEANING**

1. Use a thin wooden stick having soft white cloth wound on its tip and sook in the new brake fluid.
2. Insert the stick into the cylinder halfway and rotate to clean the inner wall.

— Note —

Do not push and pull the stick to clean the inner wall.

3. Fill the new brake fluid in the cylinder and shake to clean the inner wall.
4. Air blow to remove the fluid and dust in the master cylinder.
5. Make sure that there are no dust and scratch on the inner wall.

ASSEMBLY

Assemble the parts in the numerical order shown in the figure.

Fig. 9-37

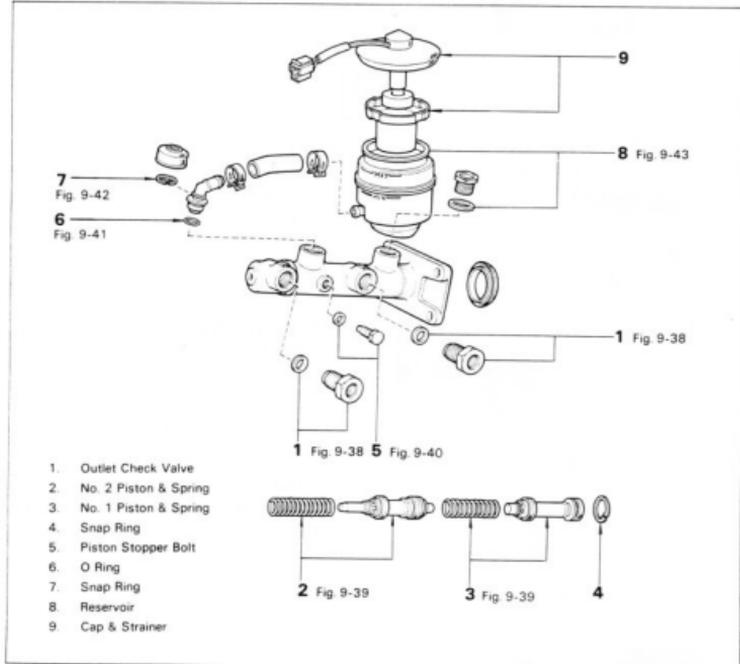


Fig. 9-38



Install the outlet check valve.

Tightening torque: 3.5 – 5.5 kg-m
(26 – 39 ft-lb)

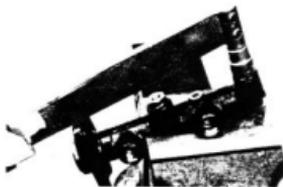
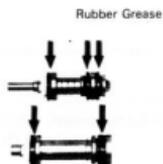


Fig. 9-39



— Note —

Before assembly, coat rubber grease on the parts indicated by arrows.

Fig. 9-40



Install the piston stopper bolt with pistons pushed in all the way.

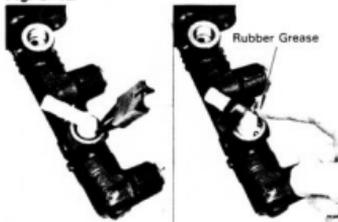
Tightening torque: 0.8 – 1.5 kg-m
(70 – 130 in.-lb)

Fig. 9-41



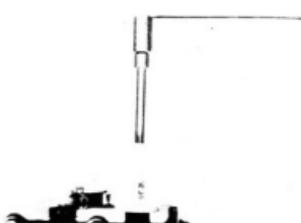
Apply rubber grease to the O ring and install the O ring to the elbow.

Fig. 9-42



After assembling the snap ring, insert rubber grease between elbow and boots.

Fig. 9-43



Tighten the reservoir set bolt

Tightening torque: 2.0 - 3.0 kg-m
(15 - 21 ft-lb)

- Note -

When tightening the reservoir tank, keep it from turning.

DISASSEMBLY

Disassemble the parts in the numerical order shown in the figure.

Fig. 9-44

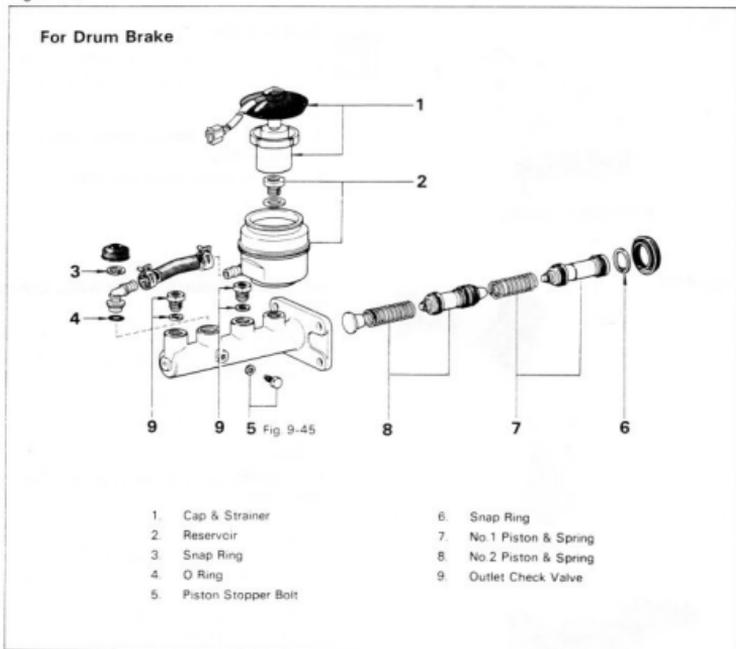


Fig. 9-45



Remove the piston stopper bolt with the pistons pushed in all the way.

Fig. 9-46

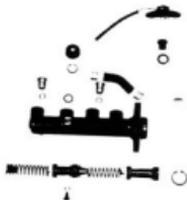


Fig. 9-47

**INSPECTION**

Inspect the all disassembled parts for wear or damage, and replace parts if necessary.

— Note —

1. Wash the disassembled parts with brake fluid.
2. Do not reuse the piston cap.

MASTER CYLINDER INNER WALL CLEANING

1. Use a thin wooden stick having soft white cloth wound on its tip and soak in the new brake fluid.
2. Insert the stick into the cylinder halfway and rotate to clean the inner wall.

— Note —

Do not push and pull the stick to clean the inner wall.

3. Fill the new brake fluid in the cylinder and shake to clean the inner wall.
4. Air blow to remove the fluid and dust in the master cylinder.
5. Make sure that there are no dust and scotch on the inner wall.

ASSEMBLY

Assemble the parts in the numerical order shown in the figure.

Fig. 9-48

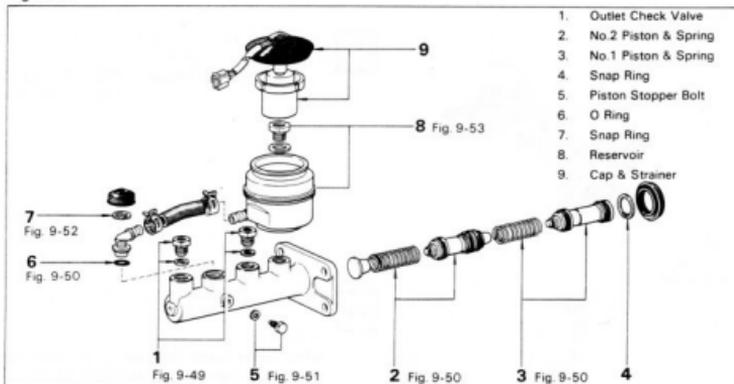
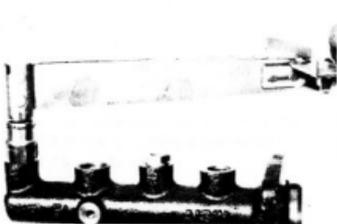


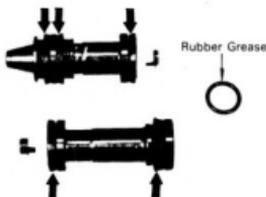
Fig. 9-49



Install the outlet check valve.

**Tightening torque: 3.5 – 5.5 kg-m
 (26 – 39 ft-lb)**

Fig. 9-50



Before assembly, coat rubber grease on the parts indicated by arrows.

Fig. 9-51



Install the piston stopper bolt with pistons pushed in all the way

**Tightening torque: 0.8 – 1.5 kg-m
(70 – 130 in.-lb)**

Fig. 9-52



Push in the elbow and install the snap ring.

— Note —

After assembling the snap ring, insert rubber grease between elbow and boots.

Fig. 9-53

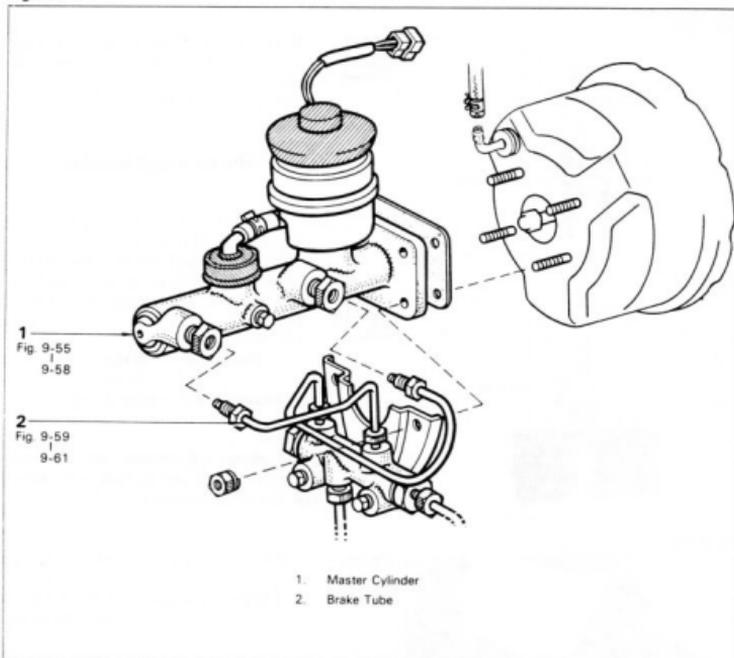
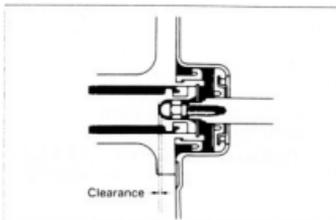


Install the master cylinder reservoir.

**Tightening torque: 2.0 – 3.0 kg-m
(15 – 21 ft.-lb)**

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 9-54**Fig. 9-55****Adjust The Booster Push Rod Length**

The length of booster push rod is adjusted to provide the specified clearance between the push rod end and the master cylinder piston.

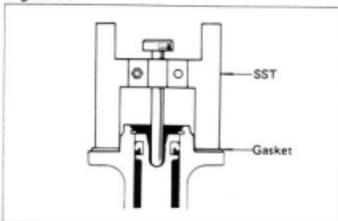
Clearance:

STD at Idling vacuum

0.1 – 0.5 mm

(0.004 – 0.020 in.)

Fig. 9-56



1. With the SST set as shown in the figure, push the pin until it contacts the piston rod.
SST [09737-00010]

— Note —

Measure with the gasket installed.

2. The internal booster should be at atmospheric pressure.
3. Then, with the SST placed upside down as shown in the figure, adjust the push rod length so that SST stands as high as the push rod.
SST [09737-00010]

Clearance: 0 mm
(0 in.)

Between SST and push rod

— Note —

By the above adjustment, the clearance will be 0.1 – 0.5 mm (0.004 – 0.020 in.) under the idling vacuum.

Fig. 9-57

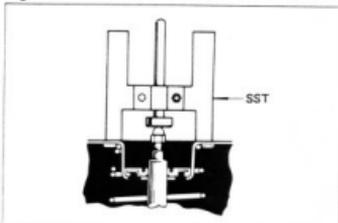


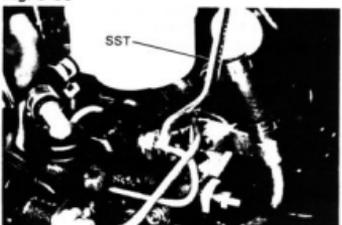
Fig. 9-58



4. Tighten the master cylinder mounting nuts.

Tightening torque: 1.0 – 1.6 kg-m
(8 – 11 ft-lb)

Fig. 9-59



Connect the brake tube with SST.

SST [09751-36011]

Tightening torque: 1.3 – 1.8 kg-m
(10 – 13 ft-lb)

Fig. 9-60

**SEE
BRAKE PEDAL
ADJUSTMENT
SECTION
Fig. 9-5**

Adjust the pedal height and play.

Fig. 9-61

**SEE
AIR BLEEDING
SECTION
Fig. 9-11 to 9-14**

Bleed the air from the system.

BRAKE BOOSTER**REMOVAL**

Remove the parts in the numerical order shown in the figure.

Fig. 9-62

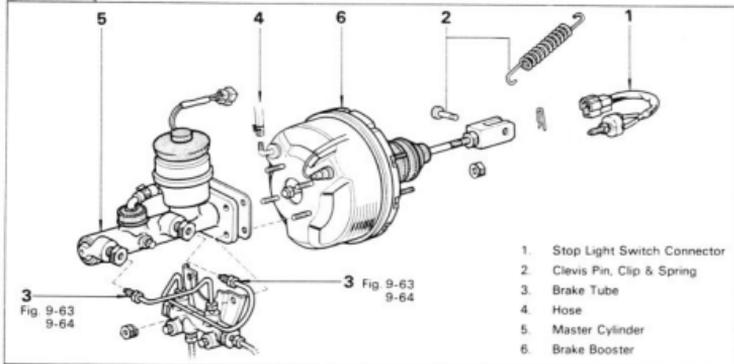
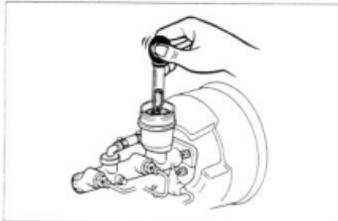
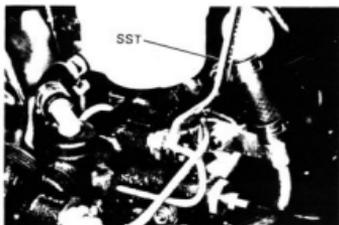


Fig. 9-63



Take out the fluid with a syringe or such.

Fig. 9-64



Disconnect the brake tube with SST.
 SST [09751-36011]

— Note —

Do not allow any brake fluid to get on painted surfaces.

DISASSEMBLY (7.5 in. SINGLE TYPE: AISIN)

Disassemble the parts in the numerical order shown in the figure.

Fig. 9-65

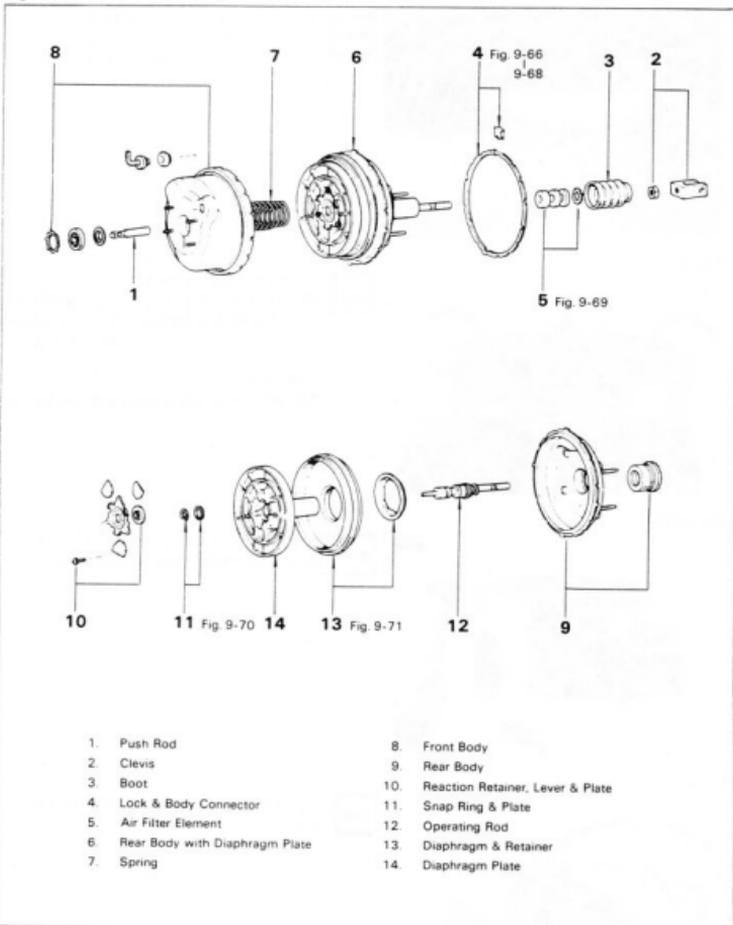
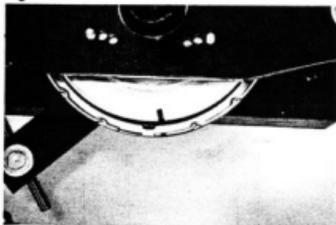
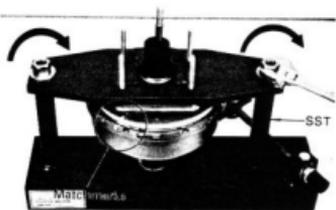


Fig. 9-66



1. Place matchmarks on the front body and rear body.
2. Pry out the lock with a screwdriver.

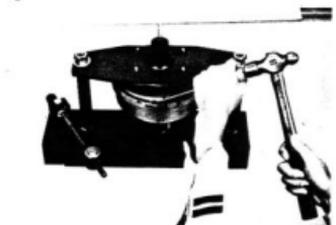
Fig. 9-67



- Set the booster to the SST.
SST (09753-00010) of set [09738-00020]
Tightening torque: 1.1 – 1.3 kg-m
(8 – 9 ft-lb)

– Note –
Tighten the left and right nuts uniformly.

Fig. 9-68



- Remove the body connector by turning it counterclockwise with a screwdriver.

Fig. 9-69



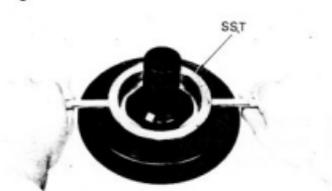
- Remove the snap ring and plate with snap ring pliers.

Fig. 9-70



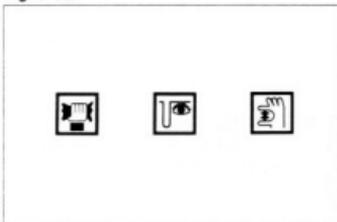
Pry out the circular ring with a screw driver and pull out the air valve together with the air filter elements.

Fig. 9-71



Remove the diaphragm retainer with SST. SST [09736-30020]

Fig. 9-72



INSPECTION & REPAIR

Inspect the disassembled parts on the following points and repair or replace if necessary.

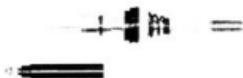
Fig. 9-73



Diaphragm & Booster Piston

Inspect the diaphragm and booster piston, for wear, damage or cracks.

Fig. 9-74

**Booster Air Valve & Piston Rod**

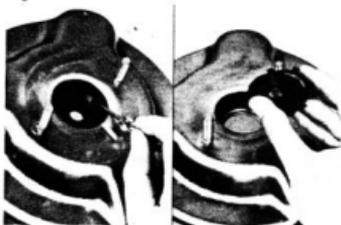
Inspect for wear, damage or bending.

Fig. 9-75

**Booster Body, Seal & Bearing**

Inspect the booster bodies, seal and bearing for wear or damage.

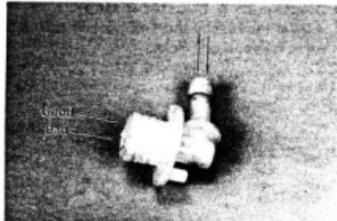
Fig. 9-76

**Replace The Seal**

1. Remove the seal from the shell by prying.
2. Install a new seal.



Fig. 9-77

**Vacuum Check Valve**

Check the operation of the valve.

ASSEMBLY

Assemble the parts in the numerical order shown in the figure.

Fig. 9-78

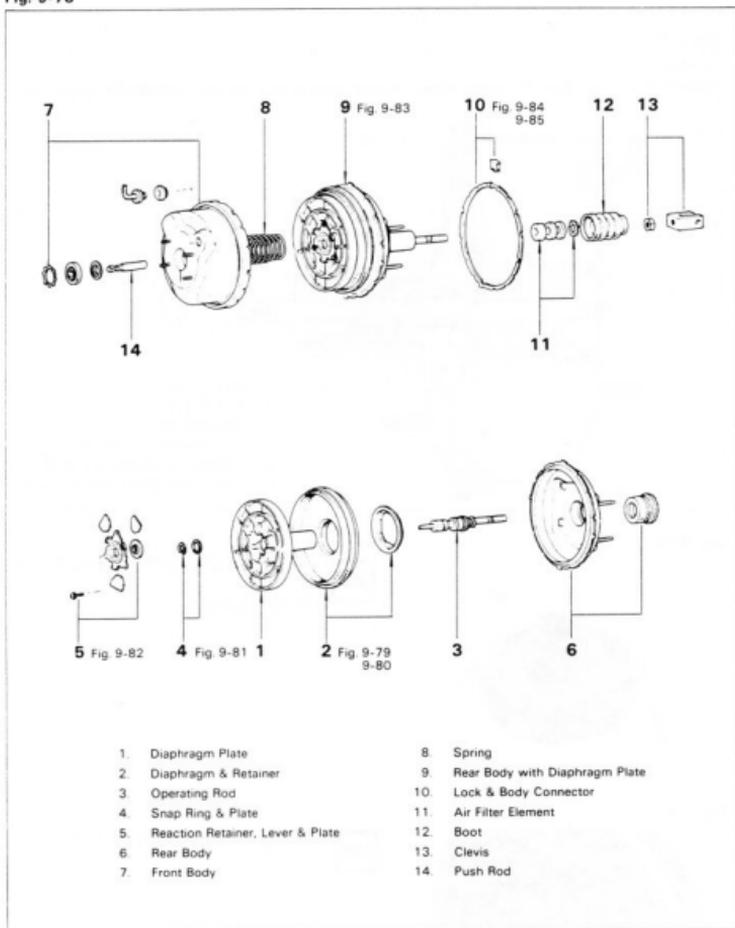


Fig. 9-79

— Note —

Before assembly, coat the parts shown below with silicon grease (furnished in repair kit).

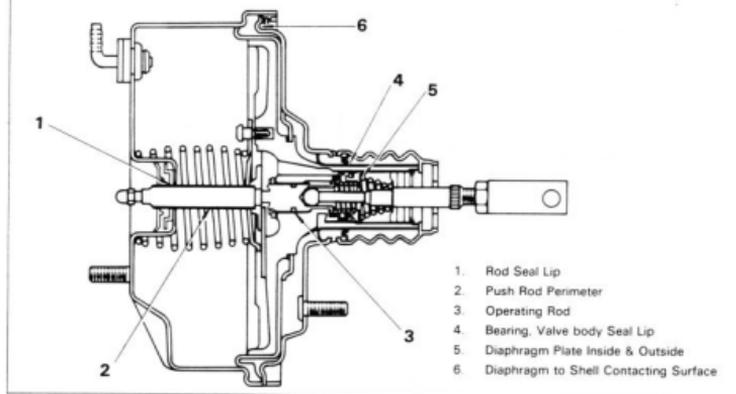


Fig. 9-80



Install the retainer by turning the SST about 45°.
SST [09736-30020]

Fig. 9-81



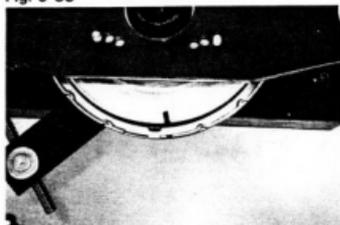
Install the snap ring onto the air valve.

Fig. 9-82



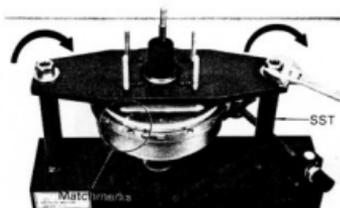
Install the reaction levers and plate with its protrusion directed upward.

Fig. 9-83



Face the body connector in the direction shown in the figure.

Fig. 9-84



Set the booster to SST.
SST (09753-00010) of set [09738-00020]

**Tightening torque: 1.1 – 1.3 kg-m
(8 – 9 ft-lb)**

– Note –

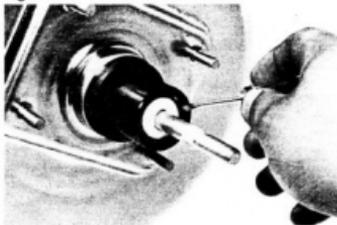
1. Align the matchmarks on the body.
2. Tighten the left and right nuts evenly.

Fig. 9-85



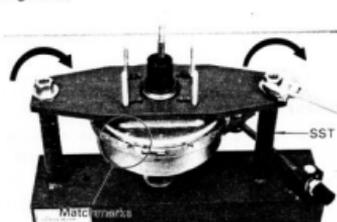
Turn the body connector clockwise with a screwdriver.

Fig. 9-87



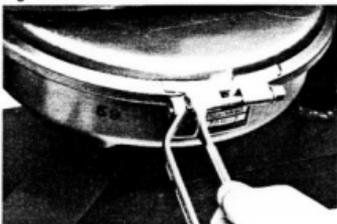
Remove the retainer and filter elements with a screwdriver.

Fig. 9-88



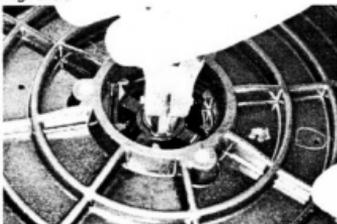
Place matchmarks on the front and rear body, and fix to the SST.
SST [09753-00010] of set [09738-00020]

Fig. 9-89



1. Remove the booster band lock nut.
2. Remove the booster band.

Fig. 9-90



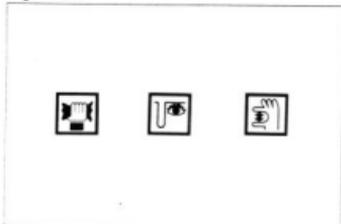
Remove the snap ring

Fig. 9-91



Remove the diaphragm and the diaphragm plate with SST.
SST [09736-30020]

Fig. 9-92

**INSPECTION & REPAIR**

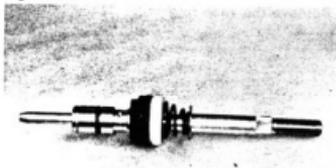
Inspect the disassembled parts on the following points, and repair or replace parts if necessary.

Fig. 9-93

**Diaphragm & Diaphragm Plate**

Inspect the diaphragm and diaphragm plate for wear, damage or cracks.

Fig. 9-94

**Valve Operating Rod**

Inspect the valve operating rod for wear or damage.

Fig. 9-95

**Body & Body Seal**

Inspect the seals for wear or damage.

Fig. 9-96

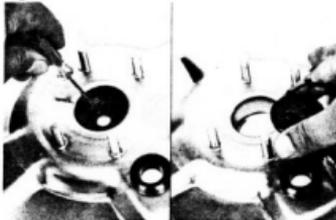
**Replace The Seal**Remove the seal from the shell.
Install the new seal.

Fig. 9-97

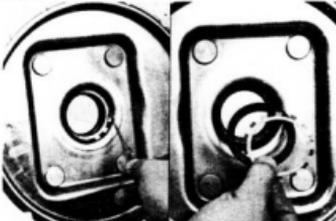
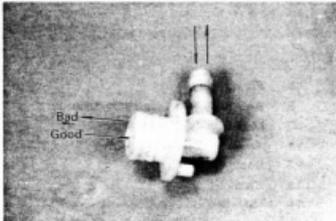
**Replace The Bearing**Remove the bearing from the shell and install
a new bearing.

Fig. 9-98

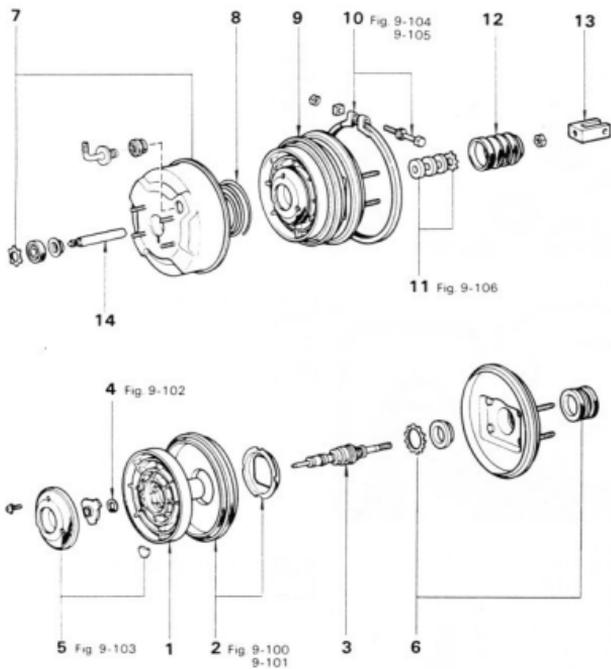
**Vacuum Check Valve**

Check the operation of the valve.

ASSEMBLY

Assemble the parts in numerical order shown in the figure.

Fig. 9-99

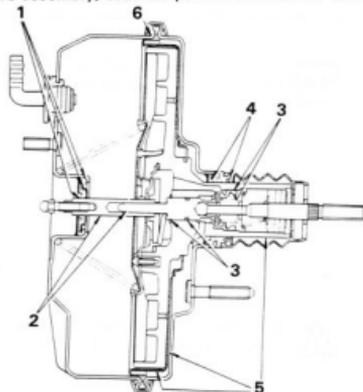


- | | | | |
|---|----------------------------------|----|--------------------------------|
| 1 | Diaphragm Plate | 8 | Spring |
| 2 | Diaphragm & Retainer | 9 | Rear Body with Diaphragm Plate |
| 3 | Operating Rod | 10 | Lock & Body Connector |
| 4 | Snap Ring & Plate | 11 | Air Filter Element |
| 5 | Reaction Retainer, Lever & Plate | 12 | Boot |
| 6 | Rear Body | 13 | Clevis |
| 7 | Front Body | 14 | Push Rod |

Fig. 9-100

— Note —

Before assembly, coat the parts shown below with silicon grease (furnished in repair kit).



1. Rod Seal Lip & Perimeter
2. Push Rod
3. Operating Rod & Seal
4. Bearing, Valve Body Seal Lip
5. Diaphragm Plate Inside & Outside
6. Diaphragm to Shell Contacting Surface & to Retainer Contacting Surface

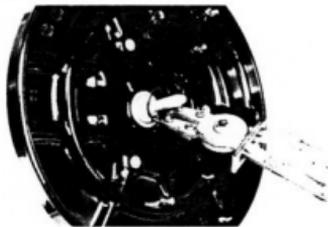
Fig. 9-101



Install the retainer by turning about 45° with SST.

SST [09736-30020]

Fig. 9-102



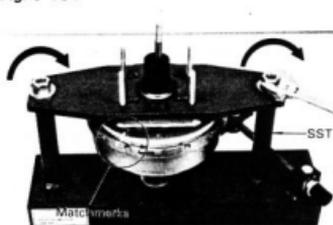
Install the plate and snap ring onto the valve operating rod.

Fig. 9-103



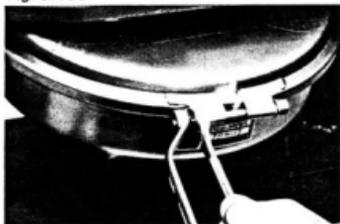
Install the reaction levers and plate with its protrusion directed upward.

Fig. 9-104



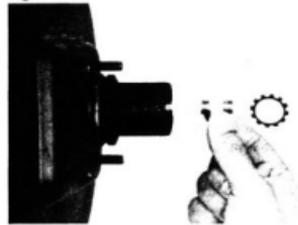
Align the matchmarks and fix to the SST. SST (09753-00010) of set [09738-00020]

Fig. 9-105



Install the booster band with SST. SST (09753-00010) of set [09738-00020]

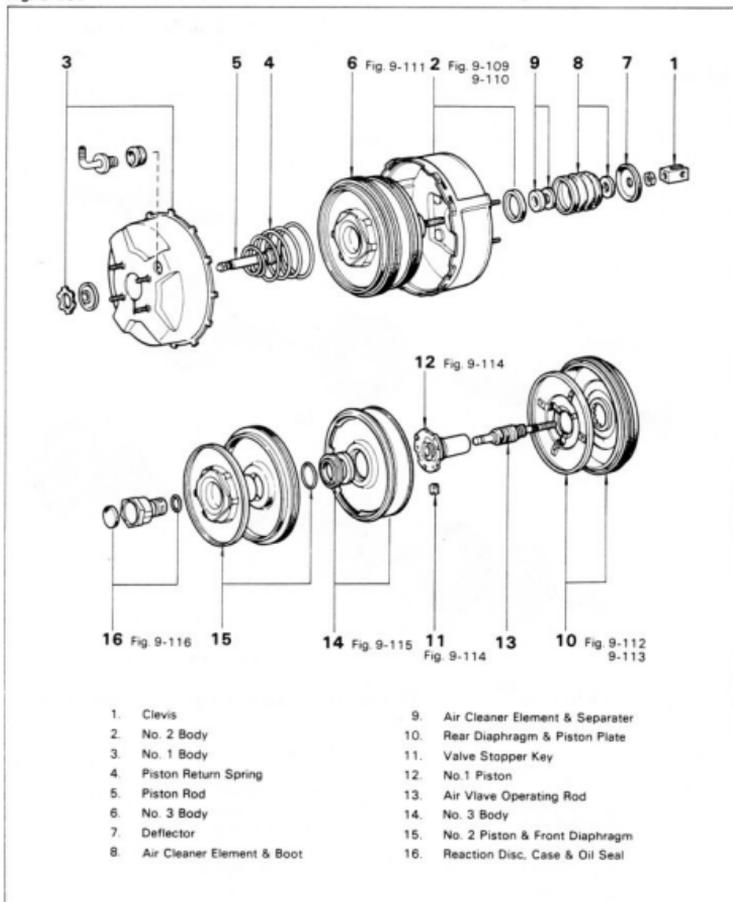
Fig. 9-106



Install the air filter elements and retainer.

DISASSEMBLY**(7.5 in. TANDEM TYPE : AISIN)**

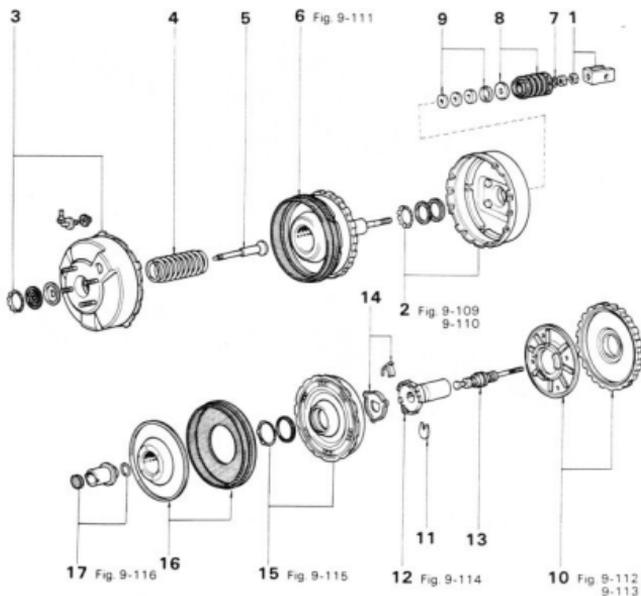
Disassemble the parts in the numerical order shown in the figure.

Fig. 9-107

(7.5 in. TANDEM TYPE : JKC)

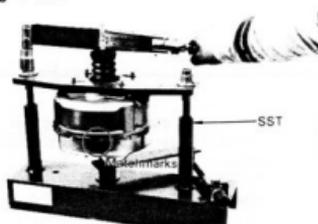
Disassemble the parts in the numerical order shown in the figure.

Fig. 9-108



- | | |
|------------------------------------|------------------------------------|
| 1. Clevis | 10. Rear Diaphragm & Piston Plate |
| 2. No. 2 Body | 11. Valve Stopper Key |
| 3. No. 1 Body | 12. No. 1 Piston |
| 4. Piston Return Spring | 13. Air Valve Operating Rod |
| 5. Piston Rod | 14. Clip & Retainer |
| 6. No. 3 Body | 15. No. 3 Body |
| 7. E Ring | 16. No. 2 Piston & Front Diaphragm |
| 8. Air Cleaner & Boot | 17. Reaction Disc, Case & Oil Seal |
| 9. Air Cleaner Element & Separator | |

Fig. 9-109



Disconnect the body.

1. Place matchmarks on the No.1 and No.2 body.
2. Install the booster to the SST and tighten the nut.
SST [09738-00020]

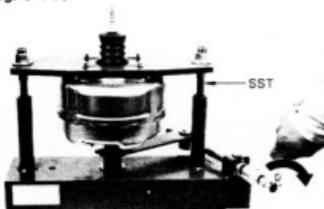
Tightening torque:

**1.3 - 1.8 kg-m
(10 - 13 ft-lb)**

— Note —

Tighten the right and left nuts evenly.

Fig. 9-110



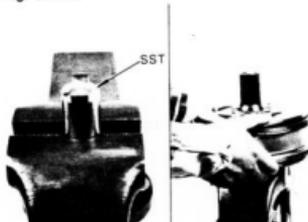
3. Turn the joint handle of the SST to separate No.1 body and No.2 body.
SST [09738-00020]

Fig. 9-111



With the valve operating rod facing downward, No.2 body and remove the No.3 body.

Fig. 9-112



Disassemble the No.3 body.

1. Clamp SST in a vise and insert the No.3 body into it.
SST [09738-00020]

Fig. 9-113



2. Of the 4 ribs, push in two diagonal ones with your finger and turn the piston plate counterclockwise. Then remove the diaphragm and piston plate.

Fig. 9-114



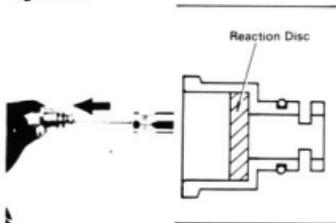
3. Push in the valve operating rod, pull out the valve stopper key and remove the piston No.1.

Fig. 9-115



4. Remove the No.3 body.

Fig. 9-116



- Remove the reaction disc from the case.

Fig. 9-117
AISIN TYPE



INSPECTION & REPAIR

Rear Diaphragm & Plate

Inspect for wear, damage or cracks.

JKC TYPE



Fig. 9-118
AISIN TYPE



Front Diaphragm & No.2 Piston

Inspect the diaphragm No.2 piston and oil seal for wear, damage or cracks.

JKC TYPE

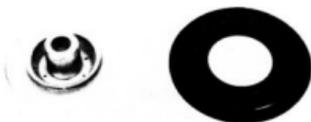


Fig. 9-119

**Replace The Seal & Bearing**

AISIN TYPE

1. Remove the seal and bearing from the No.3 body with SST.
SST [09726-35010] No.1
[09753-30020]
[09608-20011] No.2

Fig. 9-120



2. Install the seal and bearing to the No.3 body with SST.
SST [09726-35010] No.1
[09753-30020]

- Note -

1. Coat the outside of the oil seal with silicon grease.
2. Be careful not to crack the bearing during assembly.

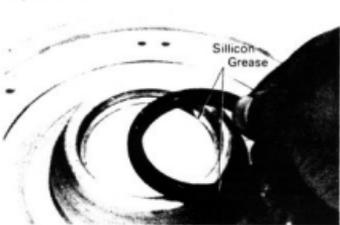
Fig. 9-121

**Replace The Seal & Bearing**

JKC TYPE

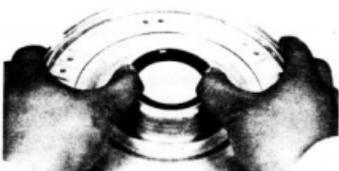
1. Remove the circular ring and seal from the No.3 body.

Fig. 9-122



2. Apply silicon grease onto the seal and install them into the No.3 Body.

Fig. 9-123



3. Install a circular ring into the No.2 piston.

Fig. 9-124

AISIN TYPE**Piston Rod**

Inspect for wear, damage or bend.

JKC TYPE

Fig. 9-125

**Booster Piston**

Inspect for scratches, cracks or deformation.

Fig. 9-126
AISIN TYPE



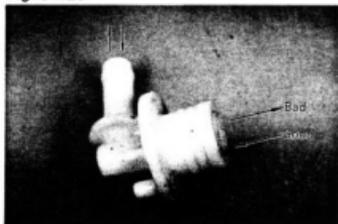
Air Valve Operating Rod

Inspect for wear or damage.

JKC TYPE



Fig. 9-127



Vacuum Check Valve

Check the operation of the valve

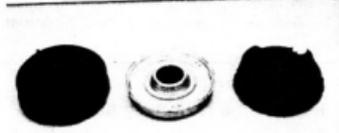
Fig. 9-128
AISIN TYPE



Booster Body, Seal & Bearing

Inspect the booster bodies, seals and bearing for wear or damage.

Fig. 9-129
JKC TYPE



Booster Body, Seal & Bearing

Inspect the booster bodies, seals and bearing for wear or damper.

Fig. 9-130



Replace The No.1 Body Seal

AISIN TYPE

1. Remove the circular ring and seal from the No.1 body seal.

Fig. 9-131



2. Apply silicon grease onto the seal and install them into the No.1 body.

Fig. 9-132



3. Install a circular ring into the No.1 body.

Fig. 9-133



Fig. 9-134



Fig. 9-135

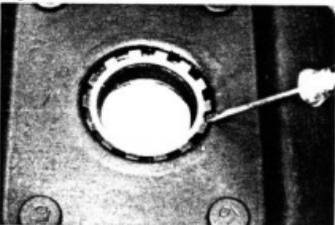


Fig. 9-136

**Replace The No.2 Body Seal**

AISIN TYPE

1. Remove the seal from the No.2 body with SST.
SST [09726-35010] No.1
[09753-30020]
[09608-20011] No.2



2. Install a new seal to the No.2 body seal with SST.

SST [09726-35010] No.1
[09608-35010]
[09753-30020]
[09608-20011] No.2

- Note -

Be careful not to crack the bearing during assembly.

**Replace The No.2 Body Seal**

JKC TYPE

1. Remove the circular ring and seal from the No.2 body seal.



2. Apply silicon grease onto the seal and install them into the No.2 body.

Fig. 9-137



3. Install a circular ring into the No.2 body.

Fig. 9-138

AISIN TYPE**Reaction Disc & Case**

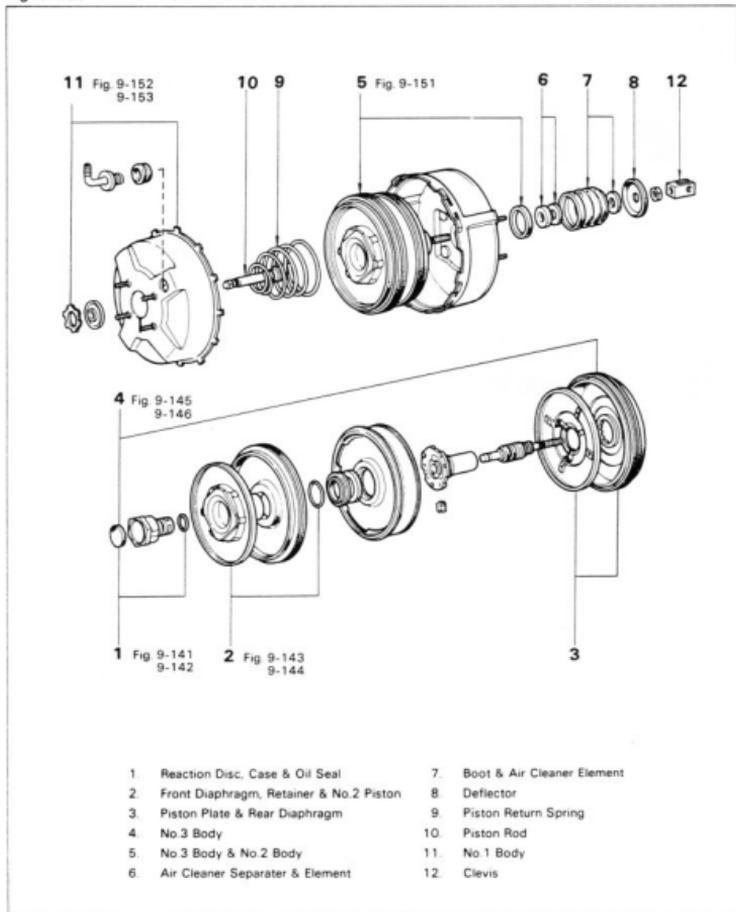
Inspect for wear, damage, cracks or corrosion.

JKC TYPE

ASSEMBLY (7.5 in. TANDEM TYPE : AISIN)

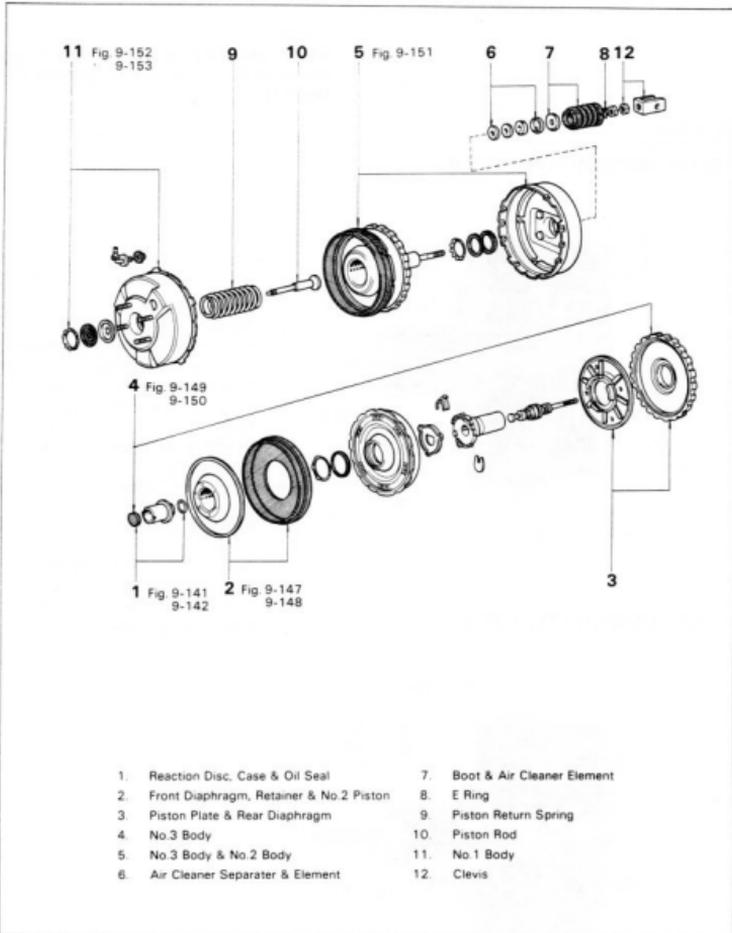
Assemble the parts in the numerical order shown in the figure.

Fig. 9-139



(7.5 in. TANDEM TYPE : JKC)

Assemble the parts in the numerical order shown in the figure.

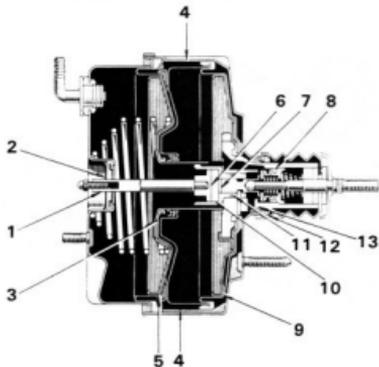
Fig. 9-140

— Note —

Before assembly, coat the parts shown below with silicon grease (furnished in repair kit).

Fig. 9-141

(7.5 in. TANDEM TYPE : AISIN)



1. Piston Rod Perimeter
2. Seal Lip
3. Inner Circumference of Front Diaphragm
4. Inner Surface of No.2 Body
5. Outer Circumference of No.2 Piston
6. Contact Surface of Piston Rod & Reaction Disc
7. Contact Surface of Reaction Disc & Operating Rod
8. Control Valve Perimeter
9. Piston Plate Perimeter
10. Reaction Disc Perimeter
11. O Ring
12. Contact Surface of Boot & No.2 Body
13. Contact Surface of No.1 Piston & Seal
14. Contact Surface of No.2 Piston & Seal & Bearing of No.3 body

(7.5 in. TANDEM TYPE : JKC)

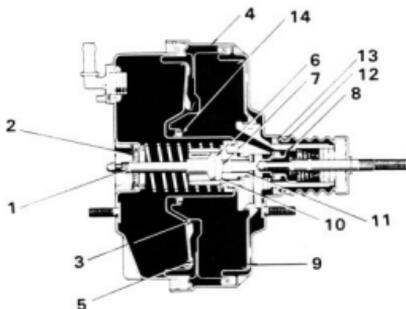
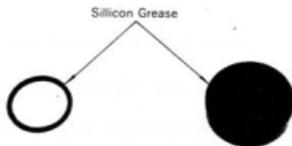
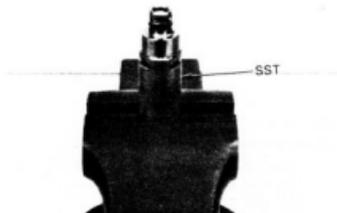


Fig. 9-142



Coat the outer surface of the reaction disc and O ring with silicon grease.

Fig. 9-143

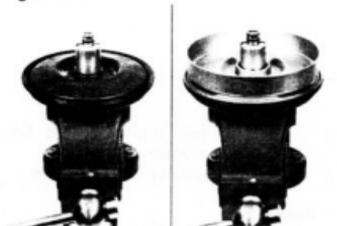


AISIN TYPE

Assemble the No.3 body

1. Clamp SST in a vise and install the reaction disc case.
SST [09753-30010]

Fig. 9-144

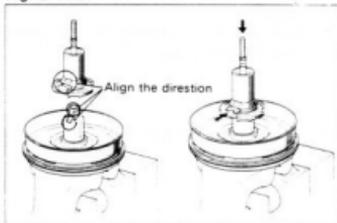


2. Install the front diaphragm and No.2 piston to the reaction disc case.
3. Install the No.3 body to the No.2 piston.

- Note -

1. Align the notched holes of the reaction disc case and No.2 piston in a right angle.
2. Coat the outer surface of the piston with silicon grease.

Fig. 9-145



4. Push in the valve operating rod and valve stop key, and install the No.1 piston and No.2 piston.

- Note -

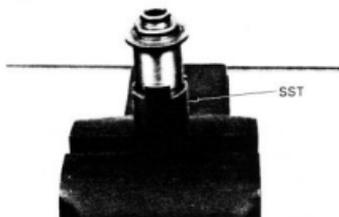
Align the reaction disc case, No.1 piston and No.2 piston in the same direction.

Fig. 9-146



5. Install the rear diaphragm and piston plate.
 - (1) When assembling, align the key hole of the No.1 piston with the round dent of the piston plate.
 - (2) Of the 4 ribs, turn two diagonal ones clockwise to assemble.

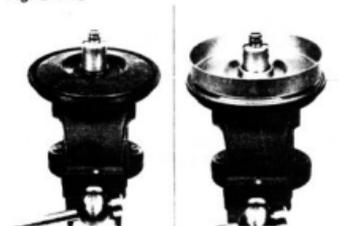
Fig. 9-147

**JKC TYPE**

Assemble the No.3 body.

1. Clamp SST in a vise and install the reaction disc case.
SST [09753-30010]

Fig. 9-148



2. Install the front diaphragm and No.2 piston to the reaction disc case.
3. Install the No.3 body to the No.2 Piston.

- Note -

1. **Align the notched holes of the reaction disc case and No.2 piston in a right angle.**
2. **Coat the outer surface of the piston with silicon grease.**

Fig. 9-149



- Install the retainer and clip as shown in the figure.

Fig. 9-150



Match the hole and crip.

Fig. 9-151



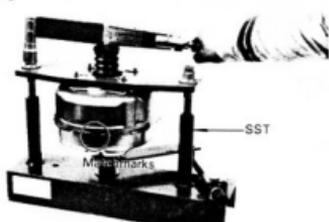
AISIN TYPE

Install the No.2 body to the No.3 body assembly.

— Note —

Coat the inner surface of the No.2 body with silicon grease.

Fig. 9-152



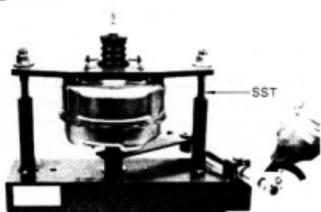
Install the No.1 body return spring, piston rod and No.2 body to SST and tighten the nut. SST [09738-00020]

**Tightening torque: 1.3 – 1.8 kg-m
(10 – 13 ft-lb)**

— Note —

1. Align the matchmarks on NO.1 body and No.2 body.
2. Tighten the both nuts evenly.

Fig. 9-153



Assemble the body by turning the joint handle of the SST. SST [09738-00020]

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 9-154

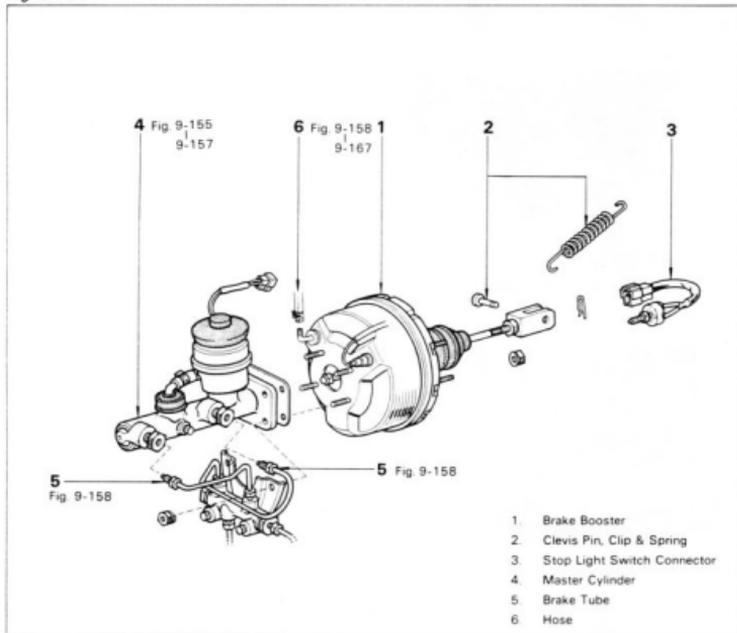
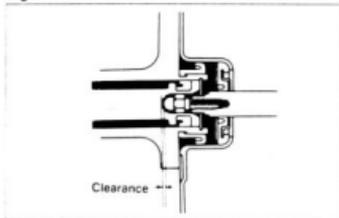


Fig. 9-155



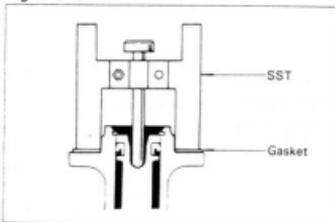
Adjust The Booster Push Rod Length

The length of booster push rod is adjusted to provide the specified clearance between the push rod end and the master cylinder piston.

Clearance:

STD at Idling vacuum
0.1 – 0.5 mm
(0.004 – 0.020 in.)

Fig. 9-156

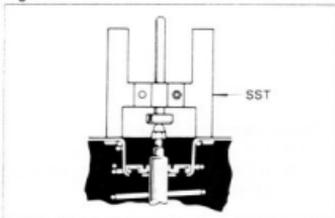


1. Set the SST on the master cylinder and push the pin until it contacts the piston.
SST [09737-00010]

—Note—

Measure the master cylinder together with the gasket.

Fig. 9-157



2. Turn the SST upside down and place it on the booster. Adjust the booster push rod length until the rod end contacts the pin head.
SST[09737-00010]

**Clearance: 0 mm
(0 in.)**

Between SST and push rod

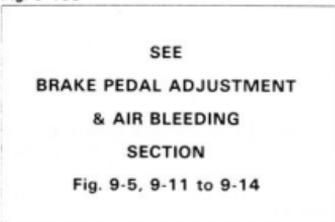
3. Adjust push rod length.
4. By the above adjustment, the clearance will be 0.1 – 0.5 mm (0.004 – 0.020 in.) under the vacuum.

Fig. 9-158



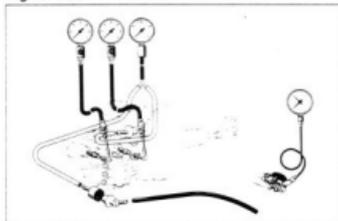
- Install the master cylinder and connect the brake tube with SST.
SST [09751-36011]

Fig. 9-159



After installing, adjust the pedal height and play, and bleed air from the system.

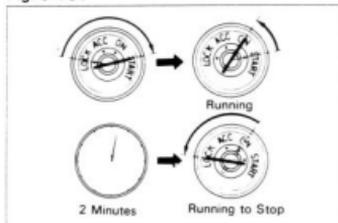
Fig. 9-160



ON-VEHICLE INSPECTION Inspect Booster Operating

Use the brake booster tester to inspect booster operating condition. If tester is not available check the brake booster by the following procedure. It is not necessary to pinpoint the exact place of trouble but sufficient to attain general knowledge of the condition.

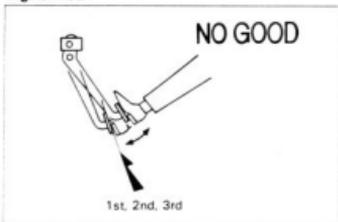
Fig. 9-161



Check The Air Tightness

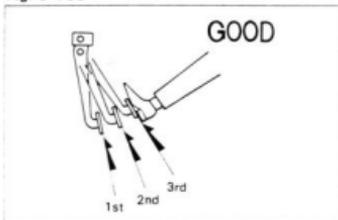
1. Start the engine.
2. Stop the engine after running for 1 or 2 minutes.

Fig. 9-162



3. Pump the brake pedal several times. If the pedal goes down deep the 1st time but gradually rises after the 2nd and 3rd times, it is in good condition.

Fig. 9-163

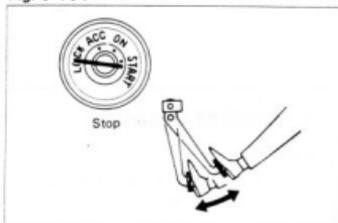


4. If there is no change in pedal height when depressed the 2nd and successive time, it is defective.

—Note—

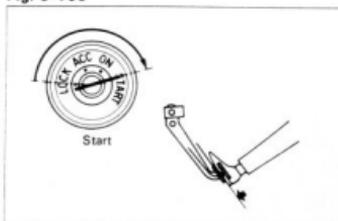
If defective, inspect the vacuum lines and sealing parts, and replace any faulty part. When this has been done repeat the entire test!

Fig. 9-164

**Check The Operation**

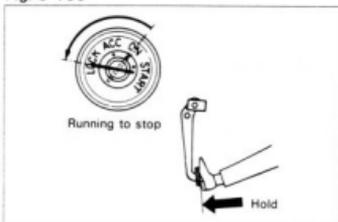
1. With the engine stopped, pump the brake pedal several times with the same pressure. Insure that the pedal height does not change.

Fig. 9-165



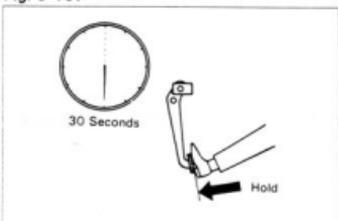
2. Start the engine while the brake pedal is depressed. If the pedal goes down slightly at this time, it is in good condition. If there is no change in pedal height, it is defective.

Fig. 9-166

**Check The Air Tightness Under The Load**

1. With the engine running, depress the brake pedal. Then stop the engine while keeping the brake pedal depressed.

Fig. 9-167



2. Hold depressed for 30 seconds. If the pedal height does not change, it is in good condition. If the pedal rises, it is defective.

VACUUM PUMP

REMOVAL

Remove the parts in the numerical order shown in the figure.

Fig. 9-168

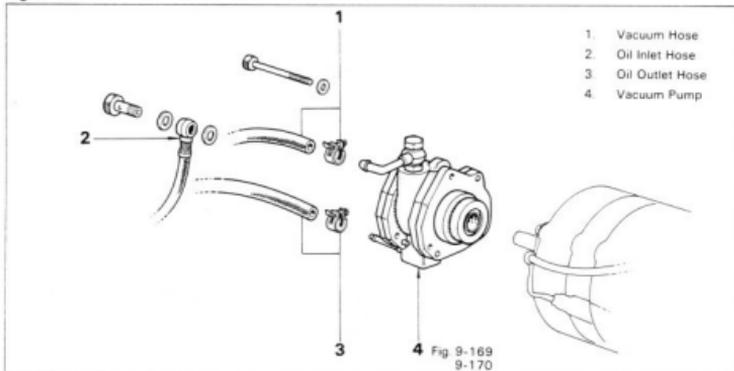
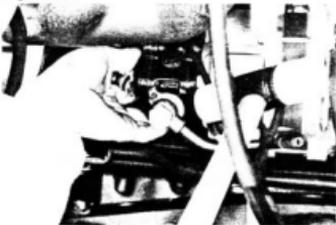


Fig. 9-169



Tap the pump with a plastic hammer until there is a clearance between it and the alternator surface.

Fig. 9-170



Pry with a screwdriver and remove the vacuum pump.

DISASSEMBLY

Disassemble the parts in the numerical order shown in the figure.

Fig. 9-171

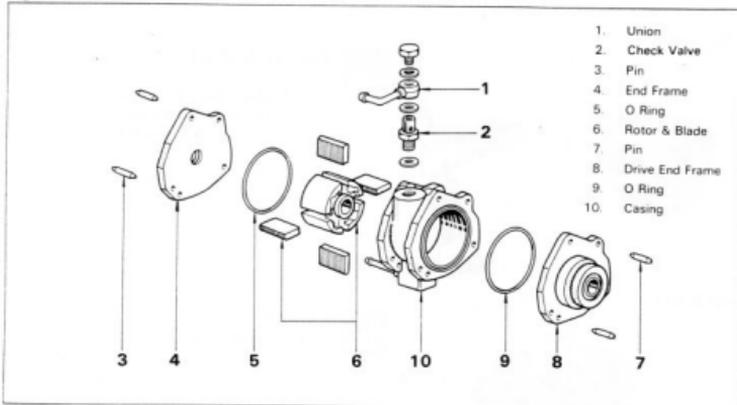


Fig. 9-172

**INSPECTION & REPAIR****Casing**

Inspect for wear or damage.



Fig. 9-173

**End Frame**

Inspect for wear or damage.



Fig. 9-174

**Bushing & Shaft**

Inspect for wear or damage.

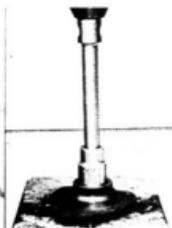
Bushing bore diameter:
Limit 16.14 mm
(0.6354 in.)

Fig. 9-175

**Oil Seal**

Inspect for wear or damage.

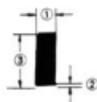
Fig. 9-176

**Replace The Oil Seal**

1. Remove the oil seal.
2. Drive in the oil seal with a socket wrench.



Fig. 9-177

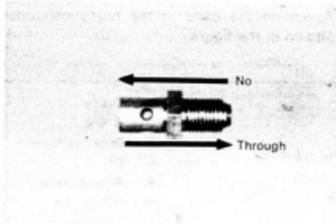
**Blade**

Inspect for wear or damage.

mm (in.)

Item	Series	2H, B
	① Height limit	
② Width limit		6.9 (0.272)
③ Length limit		34.9 (1.374)

Fig. 9-178

**Check Valve**

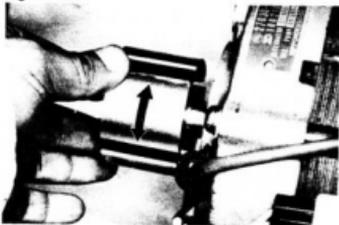
Check to see that the lead is in the direction shown in the figure.

Fig. 9-179

**Rotor**

1. Inspect for wear or damage.

Fig. 9-180



2. Inspect the rotor play.

Wear:

**Limit 2.4 mm
(0.094 in.)**

Fig. 9-181

**Spline**

Inspect for wear or damage.

ASSEMBLY

Assemble the parts in the numerical order shown in the figure.

Fig. 9-182

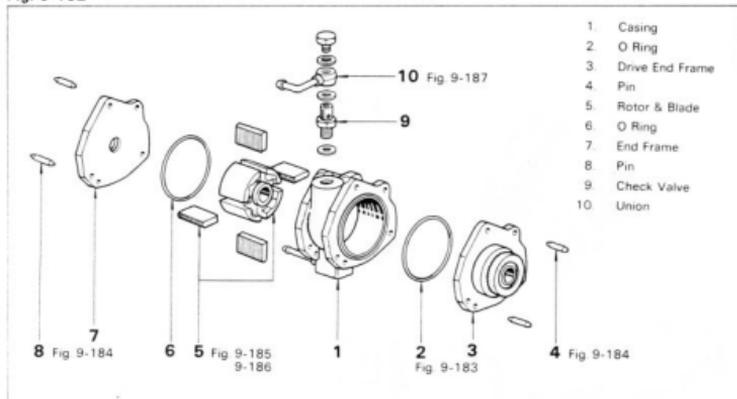


Fig. 9-183



Use new O ring

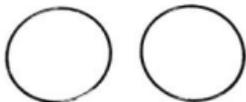


Fig. 9-184



Strike out 5 mm (0.20 in.)

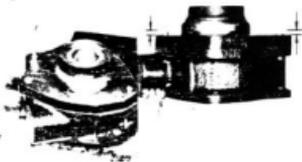


Fig. 9-185



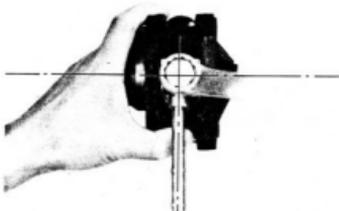
Face the rounded side toward the outside.

Fig. 9-186



Be sure that the blade and rotor surfaces are even.

Fig. 9-187



Face the union in the direction shown in the figure.

**Tightening torque: 1.2 - 1.6 kg-m
(9 - 11 ft-lb)**

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 9-188

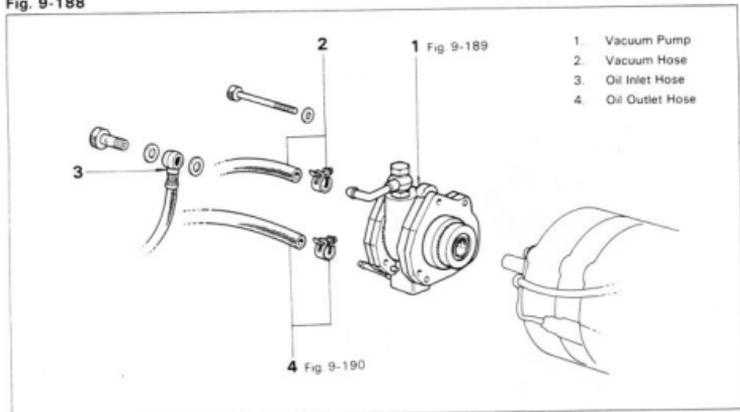


Fig. 9-189



Apply MP grease to the oil seal lip.

Fig. 9-190



While the engine is idling, loosen the outlet union bolt and confirm that oil leaks out.

FRONT BRAKE (DRUM TYPE)**REMOVAL**

Remove the parts in the numerical order shown in the figure.

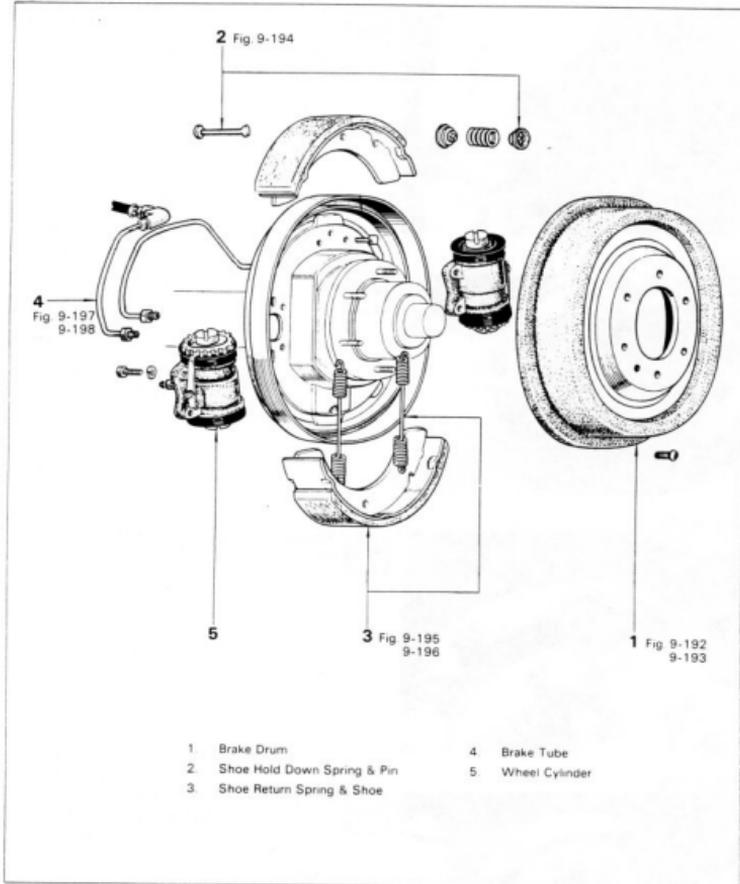
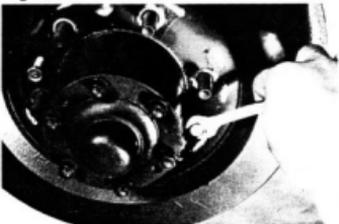
Fig. 9-191

Fig. 9-192



Return the wheel cylinder adjusting nut with SST.
SST [09704-10010]

Fig. 9-193



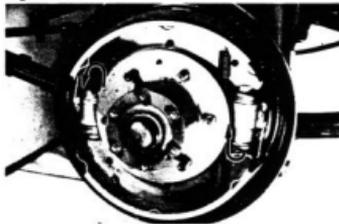
Remove the drum by screwing service bolt.

Fig. 9-194



Remove the snap ring with SST.
SST [09718-00010]

Fig. 9-195



Remove the shoes and return spring
1. Remove the shoes from the adjusting nut side first.

—Note—
Do not damage the boots.

Fig. 9-196



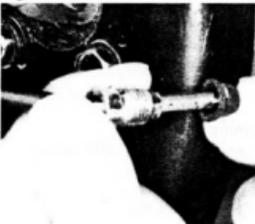
2. Remove the shoe return spring with driver.

Fig. 9-197



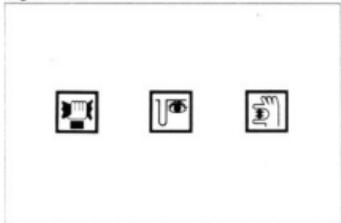
- Loosen the union nut with SST.
SST [09751-36011]

Fig. 9-198



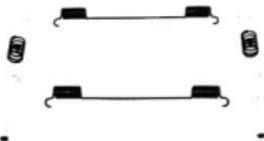
- Assemble the bleeder plug cap to the brake tube.

Fig. 9-199

**INSPECTION**

Inspect the disassembled parts on the following points and repair or replace parts if necessary.

Fig. 9-200

**Spring & Pin**

Inspect for damage or deformation.

Fig. 9-201

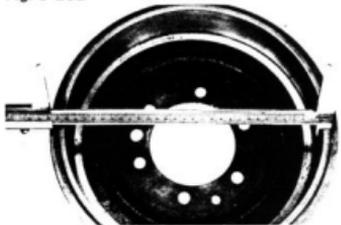
**Shoe & Lining**

Inspect for wear, damage or deformation.

Lining thickness:

Limit 1.5 mm
(0.059 in.)

Fig. 9-202

**Brake Drum**

Inspect for wear, damage or cracks.

Drum inner diameter:

STD 295 mm
(11.61 in.)

Limit 297 mm
(11.69 in.)

Fig. 9-203



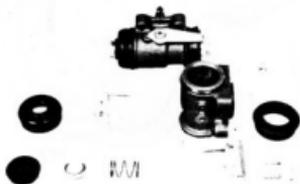
Inspect the brake lining and drum for proper contact.

Fig. 9-204



If the contact between brake lining and drum is improper, repair the lining with a brake shoe grinder, or replace the brake shoe assembly.

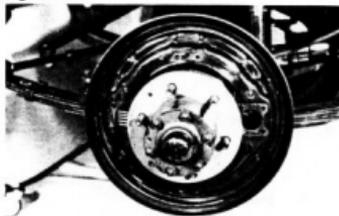
Fig. 9-205



Wheel Cylinder

1. Inspect the cups for damage or deformation.
2. Inspect the boots for damage or cracks.
3. Inspect the cylinder body bore and piston for wear, damage, rust, or corrosion.
4. Inspect the adjusting nut and bolt for damage or deformation.

Fig. 9-206



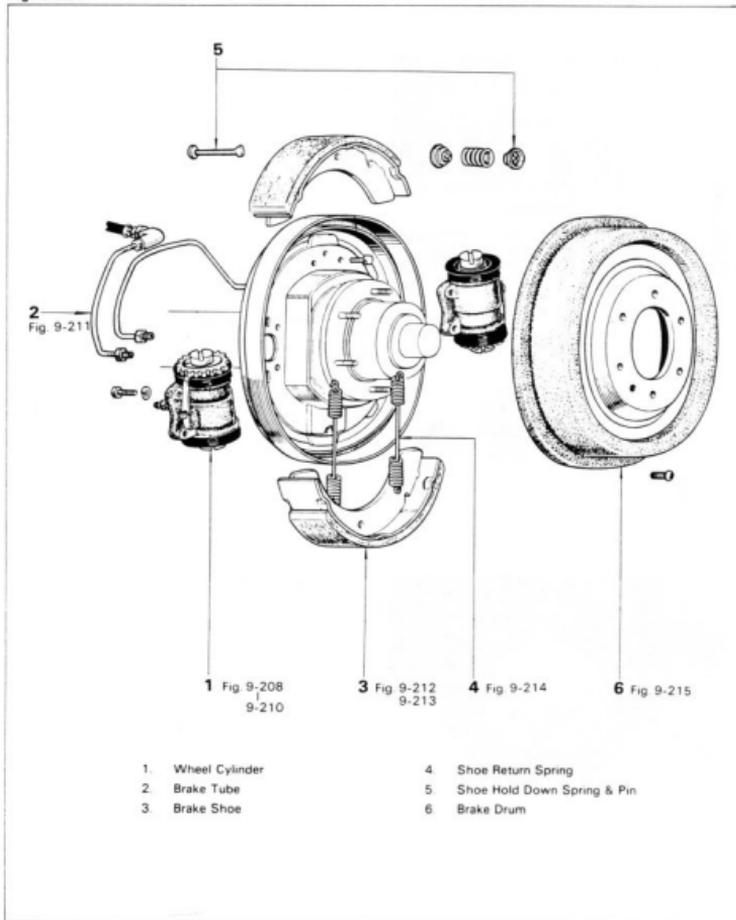
Backing Plate

Inspect for damage, cracks, or deformation. For removal and installation, refer to the Front Axle section installation.

INSTALLATION

Install the parts in the numerical order shown in the figure.

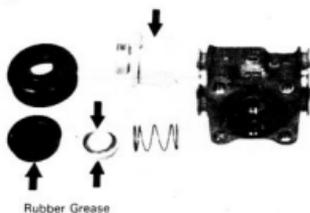
Fig. 9-207



1. Wheel Cylinder
2. Brake Tube
3. Brake Shoe

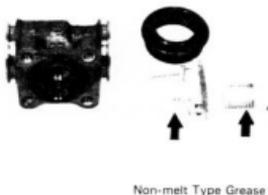
4. Shoe Return Spring
5. Shoe Hold Down Spring & Pin
6. Brake Drum

Fig. 9-208



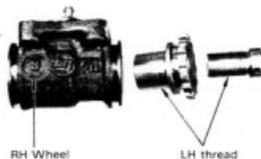
Coat the piston and cup with rubber grease.

Fig. 9-209



Coat the adjusting nut and bolt with non-melt type grease.

Fig. 9-210



Install the left hand thread adjusting nut and bolt at the RH wheel brake.

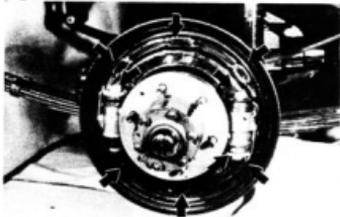
Fig. 9-211



Tighten the union nut with SST.
SST [09751-36011]

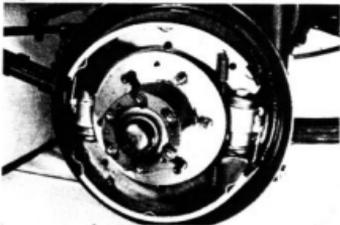
Tightening torque: 1.3–1.8 kg-m
(10–13 ft-lb)

Fig. 9-212



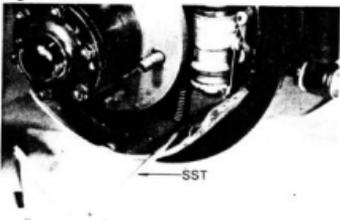
Apply non-melt type grease to the place indicated by the arrow.

Fig. 9-213



Install the shoe return spring as shown in the figure.

Fig. 9-214



Install the rear side return spring to the outer side with SST.
SST [09703-30010]

Fig. 9-215

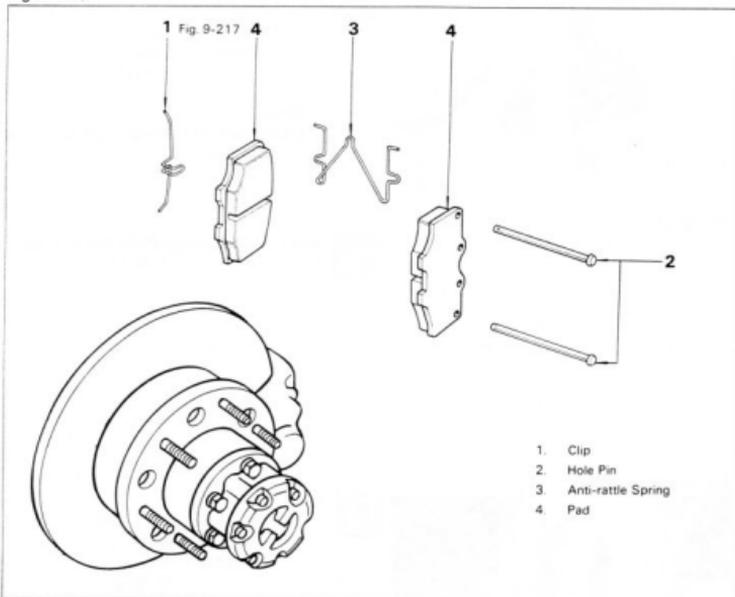
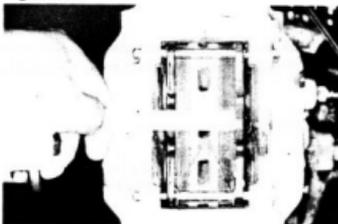
SEE
AIR BLEEDING & BRAKE
SHOE CLEARANCE
ADJUSTMENT SECTION

Fig. 9-5, 9-11 to 9-14

Bleed the air from the system.
Adjust the brake shoe clearance with SST.
SST [09704-10010]

FRONT BRAKE (DISC TYPE)**BRAKE PAD****REMOVAL**

Remove the parts in the numerical order shown in the figure.

Fig. 9-216**Fig. 2-217**

Check the brake pad thickness.

Brake pad lining thickness:

Limit 1.0 mm
(0.039 in.)

Fig. 9-218

**INSPECTION****Brake Pad**

Measure the lining thickness.

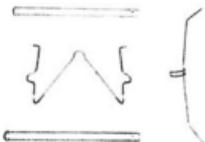
Lining thickness:

Limit 1.0 mm
(0.039 in.)

—Note—

Replace pads when the lining has one-sided or uneven wear.

Fig. 9-219

**Anti-rattle Spring, Hole Pin & Clip**

Inspect for damage or weakening.

Fig. 9-220

**Disc**

1. Measure the disc thickness.

Disc thickness:

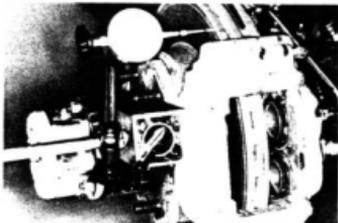
STD 20 mm
(0.79 in.)

Limit 19 mm
(0.75 in.)

—Note—

Check the lining contact surfaces for scoring. Repair or replace the disc as necessary.

Fig. 9-221



2. Measure the disc runout.

Runout:

Limit 0.12 mm
(0.0047 in.)

—Note—

Check the looseness of the front wheel bearing before measurement.

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 9-222

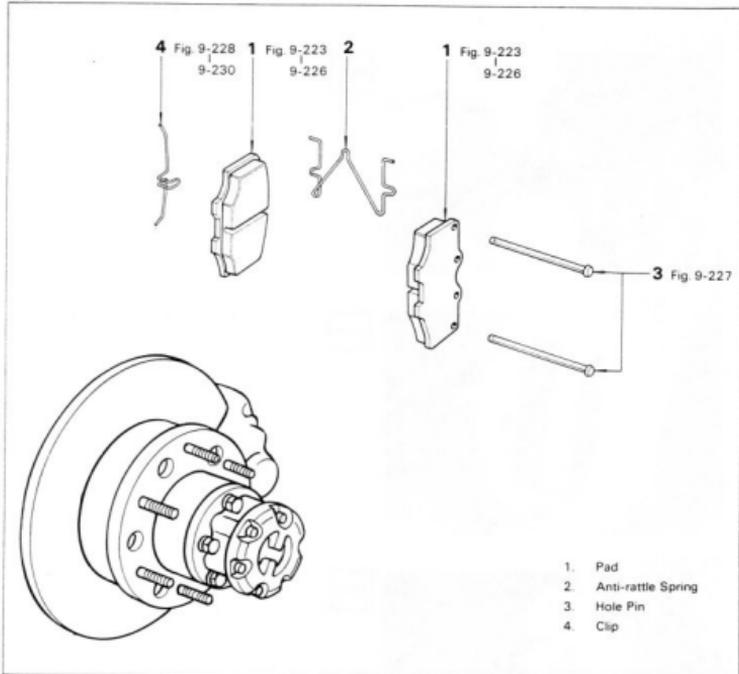
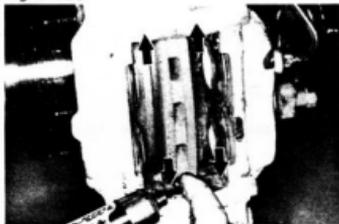


Fig. 9-223



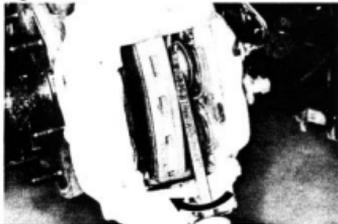
Coat disc brake grease on the disc brake cylinder that the pads slide on.

Fig. 9-224



Draw out a small amount of brake fluid from the reservoir.

Fig. 9-225



Push both pistons into the cylinder.

Fig. 9-226



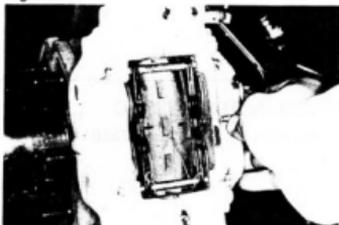
Install the pads.

Fig. 9-227



Install the pins through the anti-rattle spring.

Fig. 9-228



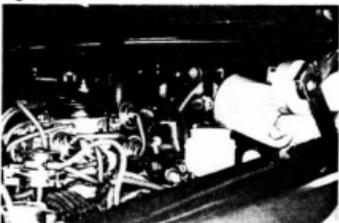
Install the clip.

Fig. 9-229



Depress the brake pedal.

Fig. 9-230



Replenish the brake fluid to the MAX line.

CYLINDER & DISC REMOVAL & DISASSEMBLY

Remove and disassemble the parts in the numerical order shown in the figure.

Fig. 9-231

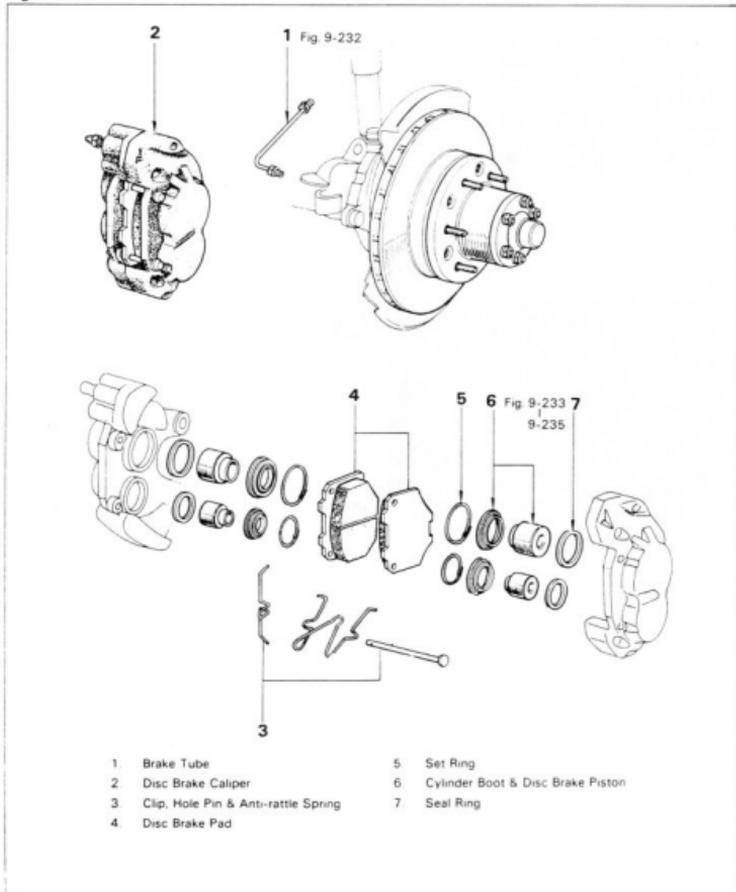
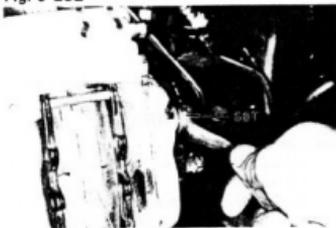


Fig. 9-232

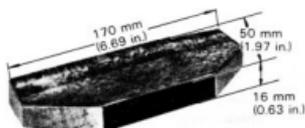


Disconnect the brake tube with SST.
SST [09751-36011]

—Note—

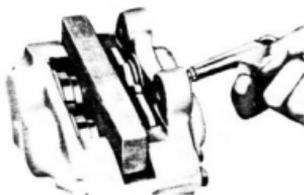
After disconnecting, install the air bleeder cap to the tube.

Fig. 9-233



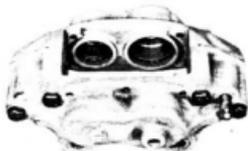
As shown in the figure, place a backing board into the caliper slot, and insert a pad at one side.

Fig. 9-234



Remove the pistons one at a time by compressed air.

Fig. 9-235



—Caution—

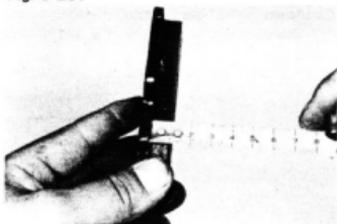
1. Do not loosen the caliper bolts.
2. Do not separate the caliper.

Fig. 9-236

**INSPECTION & REPAIR****Caliper & Piston**

1. Inspect the caliper for deformation or cracks.
2. Inspect the cylinder bore and piston for eccentric wear, damage or corrosion.

Fig. 9-237

**Pad**

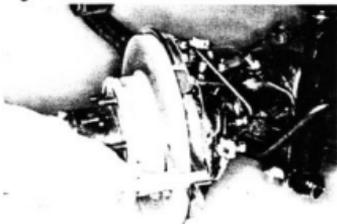
Inspect for thickness and one-sided wear.

Thickness:

STD at lining
10 mm
(0.39 in.)

Limit at lining
1.0 mm
(0.039 in.)

Fig. 9-238

**Disc**

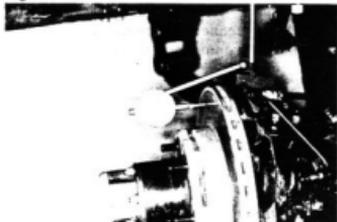
1. Inspect for thickness and runout.

Thickness:

STD 20 mm
(0.79 in.)

Limit 19 mm
(0.75 in.)

Fig. 9-239

**Runout:**

Limit 0.12 mm
(0.0047 in.)

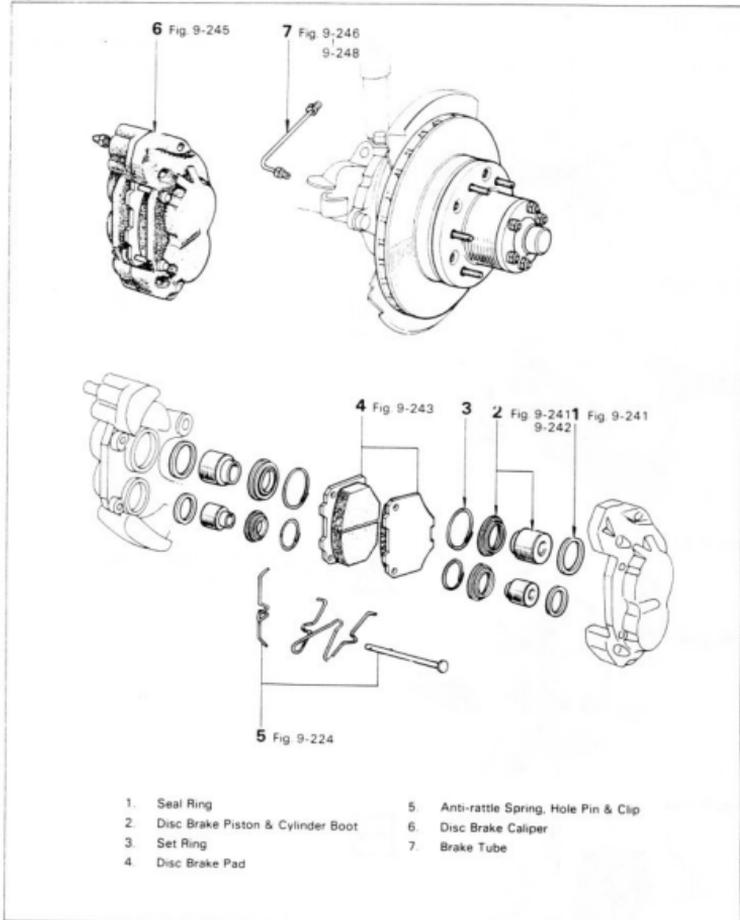
—Note—

There must not be any excessive looseness in the front wheel bearings when the runout is measured.

INSTALLATION

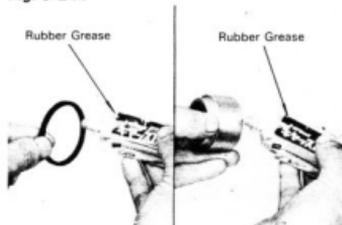
Install the parts in the numerical order shown in the figure.

Fig. 9-240



- | | |
|--------------------------------------|--|
| 1. Seal Ring | 5. Anti-rattle Spring, Hole Pin & Clip |
| 2. Disc Brake Piston & Cylinder Boot | 6. Disc Brake Caliper |
| 3. Set Ring | 7. Brake Tube |
| 4. Disc Brake Pad | |

Fig. 9-241



Apply rubber grease to the new seal and the piston.

Fig. 9-242



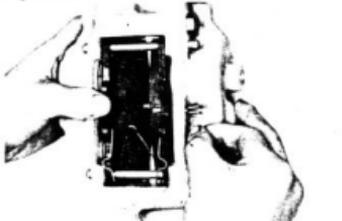
Do not pry the piston into the cylinder.

Fig. 9-243



Coat disc brake grease on the disc cylinder that the pads slide on.

Fig. 9-244



Install the clip.

Fig. 9-245



Tighten the caliper mounting bolts

Tightening torque: 10.0–15.0 kg-m
(73–108 ft-lb)

Fig. 9-246



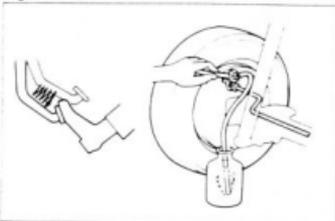
1. Connect the brake tube to the caliper with SST.

SST [09751-36011]

Tightening torque:

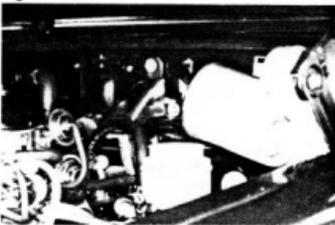
1.3 – 1.8 kg-m
(10 – 13 ft-lb)

Fig. 9-247



2. Bleed the air from the system.

Fig. 9-248



3. Replenish the brake fluid to the MAX line.

REAR BRAKE**REMOVAL & DISASSEMBLY**

Remove and disassemble the parts in the numerical order shown in the figure.

Fig. 9-249

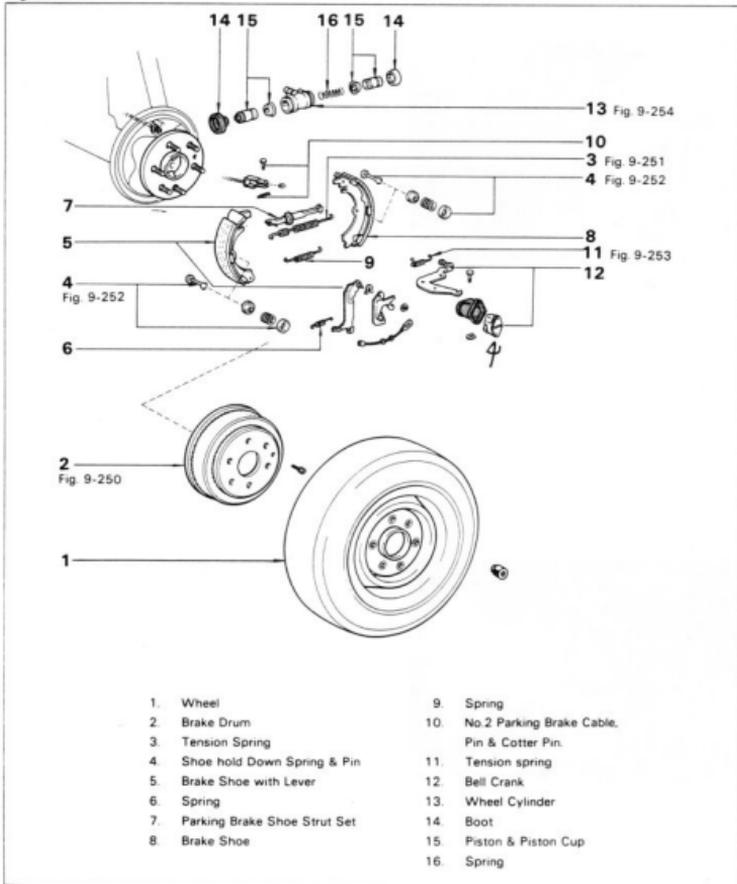
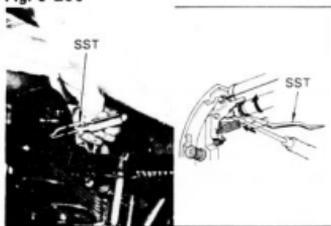


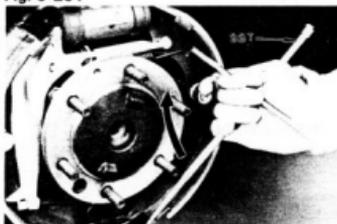
Fig. 9-250



The drum may be difficult to remove because of little clearance between it and the shoe. Always allow sufficient clearance before drum removal.

1. Push back the automatic adjuster lever with a screwdriver.
2. Shorten the adjuster with SST.
SST [09704-10010]

Fig. 9-251



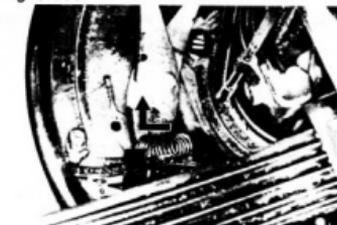
Remove the tension spring with SST.
SST [09703-30010]

Fig. 9-252



Remove the shoe hold down spring with SST.
SST [09718-00010]

Fig. 9-253



Remove the tension spring from the bell crank.

Fig. 9-254

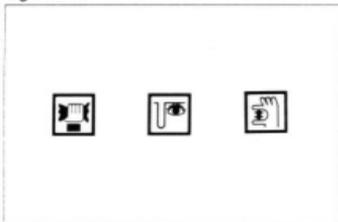


Disconnect the brake tube and remove the wheel cylinder with SST.
SST [09751-36011]

—Note—

Do not remove the wheel cylinder unless necessary.

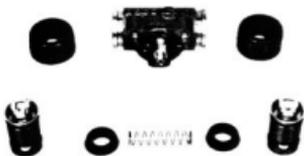
Fig. 9-255



INSPECTION & REPAIR

Inspect the disassembled parts on the following points and repair or replace parts if necessary.

Fig. 9-256



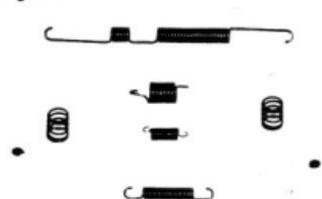
Wheel Cylinder

Inspect the wheel cylinder disassembled parts for wear, damage, crack or corrosion.

—Note—

1. Clean the wheel cylinder components parts with brake fluid.
2. Do not reuse the piston cups and the boots.

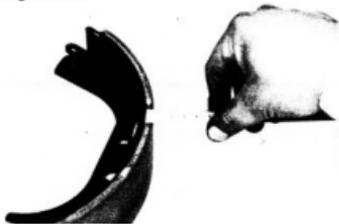
Fig. 9-257



Spring

Inspect for damage or weakening.

Fig. 9-258

**Brake Shoe & Lining**

1. Inspect for wear, damage or deformation.

Lining thickness:

**Limit 1.5 mm
(0.059 in.)**

—Note—

When any lining requires replacement, it should be replaced as a set for both rear wheels to maintain effective brakes.

Fig. 9-259



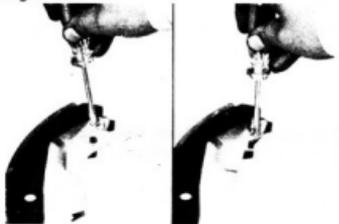
2. Inspect the brake lining and drum for proper contact.

Fig. 9-260



3. If the contact between the brake lining and drum is improper, repair the lining with a brake shoe grinder, or replace the brake shoe assembly.

Fig. 9-261

**Replace The Brake Shoe**

1. Remove the E ring and C washer

Fig. 9-262



2. Inspect for wear or damage.

Fig. 9-263



3. Stake a new C washer and E ring.

Fig. 9-264



4. Make sure that the lever moves smoothly.

Fig. 9-265



Parking Brake Shoe Strut Set

Inspect the strut set for wear or damage.

Fig. 9-266

**Bell Crank**

1. Inspect the pins and other fasteners for wear or damage.
2. Inspect the boot for wear or damage.
3. Inspect the bell crank for bending or damage.

Fig. 9-267

**Brake Drum**

1. Inspect the brake drum for wear, scoring or cracks.
2. Measure the brake drum inner diameter.

Drum inner diameter:

STD 295 mm
(11.61 in.)

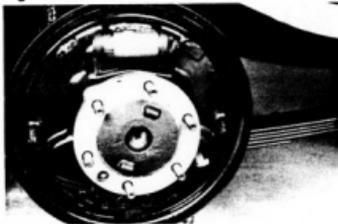
Limit 297 mm
(11.69 in.)

Fig. 9-268



3. Using a drum lathe, rebore the brake drum if necessary.

Fig. 9-269

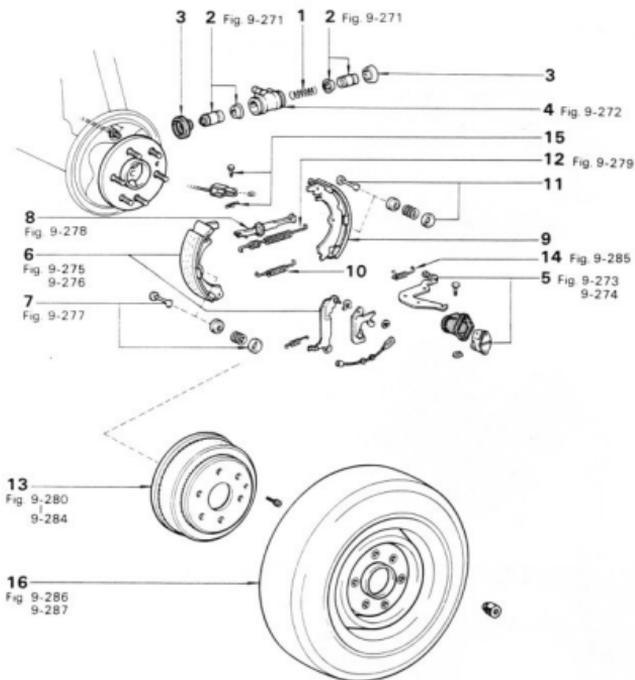
**Backing Plate**

Inspect for damage or weakening.

ASSEMBLY & INSTALLATION

Assemble and install the parts in the numerical order shown in the figure.

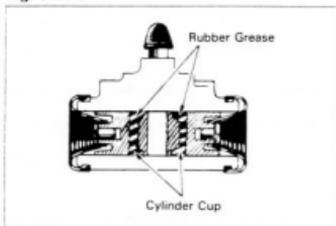
Fig. 9-270



- 1 Spring
- 2 Piston & Piston Cup
- 3 Boot
- 4 Wheel Cylinder
- 5 Bell Crank
- 6 Brake Shoe with Lever
- 7 Shoe Hold Down Spring & Pin
- 8 Parking Brake Shoe Strut Set

9. Brake Shoe
10. Spring
11. Shoe Hold Down Spring & Pin
12. Tension Spring
13. Brake Drum
14. Tension Spring
15. No. 2 Parking Brake Cable, Pin & Cotter Pin
16. Wheel

Fig. 9-271



Coat the cylinder cups with rubber grease. Be sure to install the cylinder cups in the correct direction.

Fig. 9-272



1. Install the wheel cylinder.

Tightening torque:

0.8 – 1.2 kg-m

(70 – 104 in.-lb)

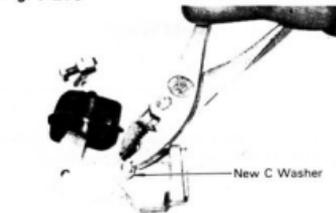
2. Connect the brake tube with SST [09751-36011]

Tightening torque:

1.3 – 1.8 kg-m

(10 – 13 ft-lb)

Fig. 9-273

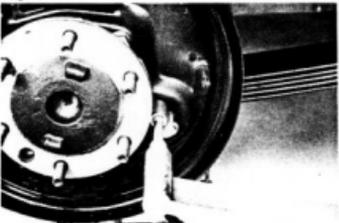


Install the bell crank to the bracket.

—Note—

A new C washer must be used.

Fig. 9-274



Tighten the bell crank bracket bolts.

Tightening torque: 1.0 – 1.6 kg-m

(7 – 11 ft-lb)

Install the parts as shown in the figure.

Fig. 9-275

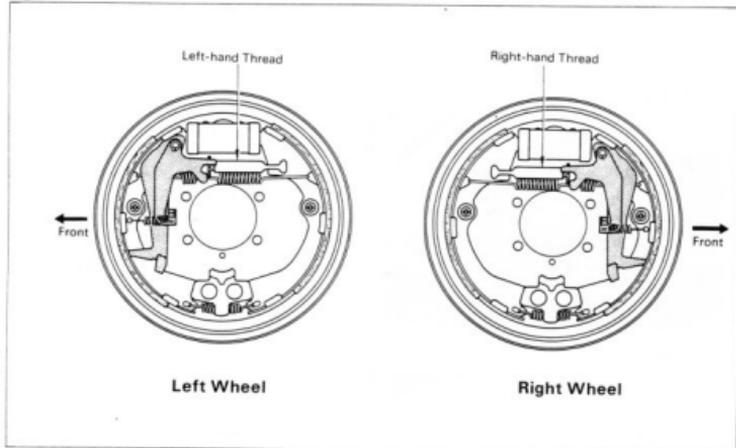
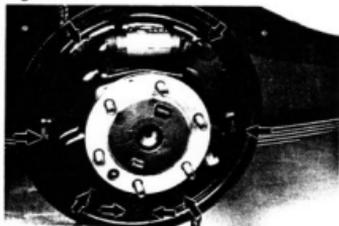


Fig. 9-276



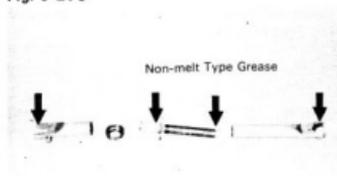
Coat non-melt type grease on the backing plate at surfaces contacting the shoes.

Fig. 9-277



Install the shoe hold down spring with SST.
SST [09718-00010]

Fig. 9-278



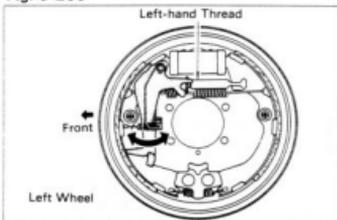
Coat on non-melt type grease to the adjuster bolt threads and insertion end.

Fig. 9-279



Install the spring to the shoe with SST.
SST [09703-30010]

Fig. 9-280



Check the operation of the automatic adjuster mechanism.

Fig. 9-281



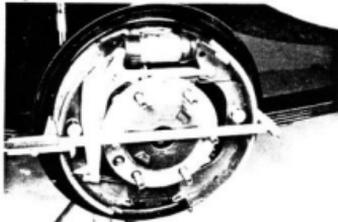
Polish the drum and shoe surfaces with sandpaper.

Fig. 9-282



Clean the inner drum with sandpaper, applying light pressure.

Fig. 9-283



Before installing the drum, adjust the clearance between the shoes and drum.

1. Measure the shoes outer diameter.

Fig. 9-284



2. Measure the inner diameter of drum.
3. Adjust the clearance by turning the adjuster bolt.

**Shoe clearance: 0.6 mm
(0.024 in.)**

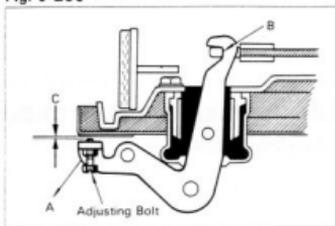
Fig. 9-285

SEE
AIR BLEEDING
SECTION

Fig. 9-11 to 9-14

Bleed the air from the system.

Fig. 9-286



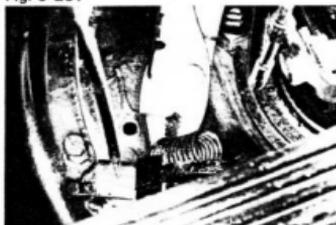
Adjust the bell crank.

1. Lightly pull the bell crank in direction A until there is no slack at part B. Under this condition, turn the adjusting bolt so that dimension C will be $0.4 - 0.8$ mm (0.016 - 0.031 in.)
2. After adjustment, lock the adjusting bolt with the lock nut.

Tightening torque:

**0.4 - 0.7 kg-m
(35 - 60 in.-lb)**

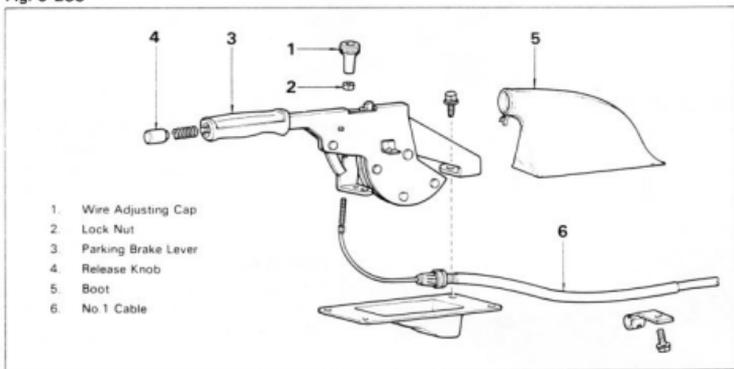
Fig. 9-287



3. Install the tension spring.

PARKING BRAKE PARKING BRAKE LEVER COMPONENTS

Fig. 9-288



NO. 2 PARKING BRAKE CABLE COMPONENTS

Fig. 9-289

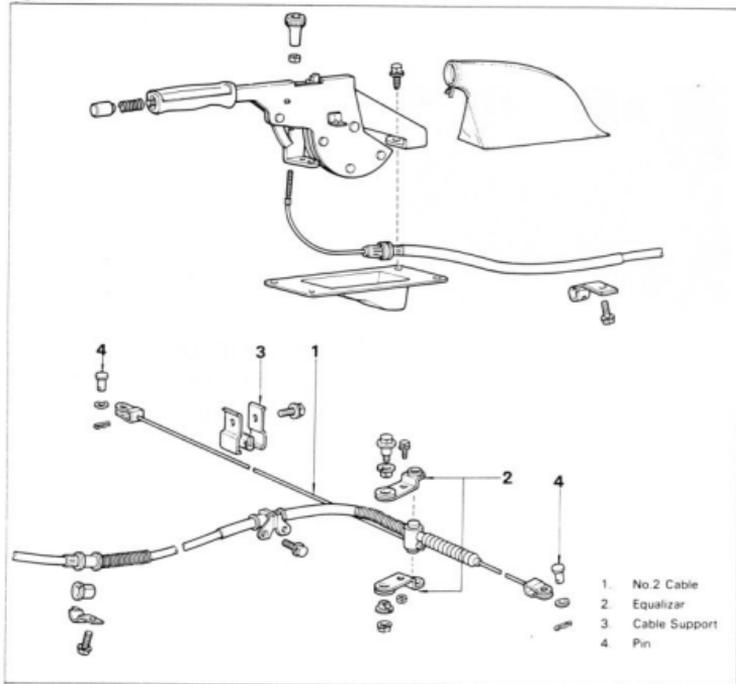
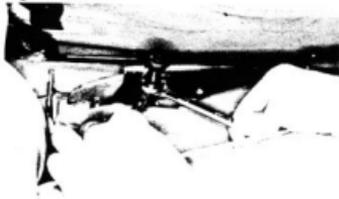


Fig. 9-290



REMOVAL

If the wire adjusting cap is tight and difficult to get loose, loosen in the manner shown in the figure.

Fig. 9-291



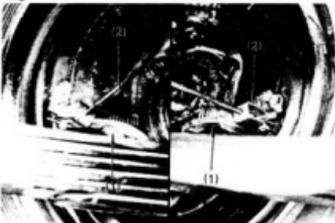
Remove the equalizer (1) and support lever (2).

Fig. 9-292



Disconnect the bell crank (1) and parking brake cable No. 2 (2).

Fig. 9-293



INSTALLATION

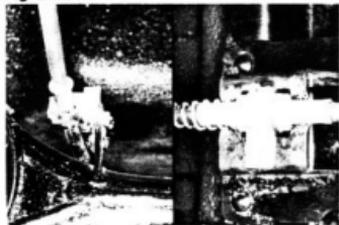
1. Connect the bell crank (1) and parking brake cable No. 2 (2).

Fig. 9-294



2. Install the equalizer and support lever.

Fig. 9-295



3. Install the cable bracket and clip.

Fig. 9-296

SEE
PARKING BRAKE
ADJUSTMENT
SECTION
Fig. 9-8 to 9-10

4. Adjust the parking brake control handle travel after installation.

CENTER BRAKE COMPONENTS

Fig. 2-297

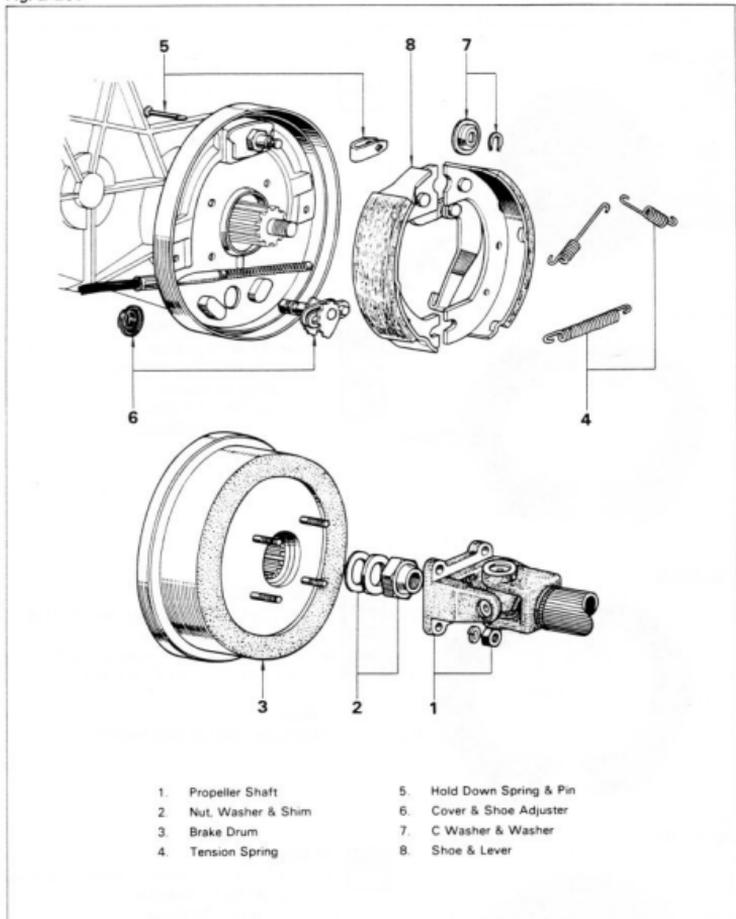
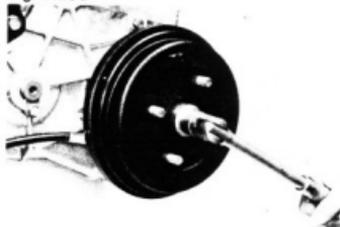
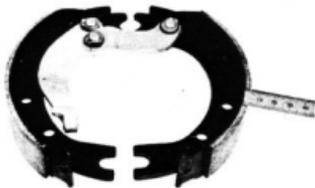


Fig. 9-298



1. With the vehicle in front drive, engage the parking brake and foot brake.
2. Remove the nut after unlocking its staked parts.

Fig. 9-299

**INSPECTION & REPAIR****Brake Shoe & Lining**

Inspect for wear, damage or deformation.

**Lining thickness:**

Limit 1.5 mm
(0.059 in.)

Fig. 9-300

**Replace The Shoe**

1. Remove the C washers and replace the shoe.
2. Coat non-melt type grease on the pins, and install the shoe assembly.

—Note—

Illustration shows LHD vehicle.

Fig. 9-301

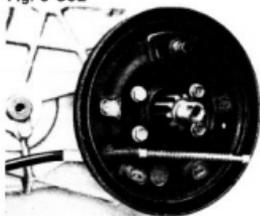
**Brake Drum**

Inspect the inner surface for wear or damage.

Drum inner diameter:

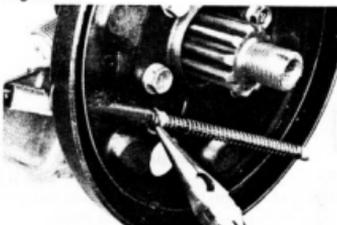
Limit 161 mm
(6.34 in.)

Fig. 9-302

**Backing Plate & Parking Brake Cable**

1. Inspect the backing plate for wear or cracks.
2. Inspect the parking brake cable for damage and its sliding condition.

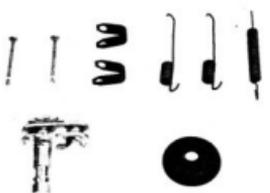
Fig. 9-303

**Replace The Parking Brake Cable**

1. At the backing plate, remove and reinstall the C washer.
2. At the parking brake lever, refer to the procedures described in Transmission Removal and Installation.

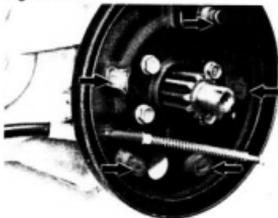


Fig. 9-304

**Adjuster, Spring & Pin**

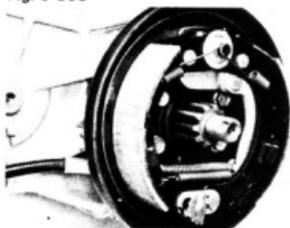
Inspect for wear or damage.

Fig. 9-305



Apply non-melt type grease to the place indicated by arrow.

Fig. 9-306



Install the lower side tension spring from the inner side.

Fig. 9-307



Tighten the nut at the specified torque, and stake the nut to prevent loosening.

**Tightening torque: 14 – 17 kg-m
(102 – 122 ft-lb)**

Adjust the parking brake after installation by methods described under Adjustment.

P & B VALVE (PROPORTIONING & BYPASS VALVE)

INSPECTION

Inspect on the following points.

1. Brake fluid leakage
2. Hydraulic pressure

Using two pressure gauges, measure the hydraulic pressures in the master cylinder and rear wheel cylinder. If they conform to the values shown in the diagrams below, the condition is good.

-Note-

1. Do not attempt to disassemble or adjust the P and B valve.
2. If the P valve is found to be defective, replace the entire P and B valve assembly.

Fig. 9-308

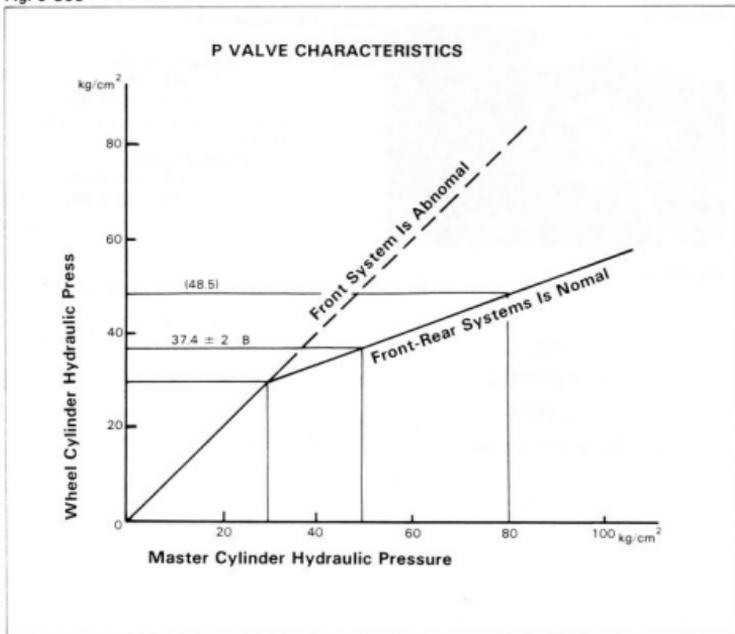


Fig. 9-309

**REMOVAL**

Remove the following parts.

1. Brake pipe
SST [09751-36011]
2. Bolt
3. P & B valve

Fig. 9-310

**INSTALLATION**

1. Install the P and B valve

Tightening torque:

0.4 – 1.0 kg-m
(35 – 86 in.-lb)

2. Connect the brake pipes with SST.
SST [09751-36011]

Tightening torque:

1.3 – 1.8 kg-m
(10 – 13 ft-lb)

Fig. 9-311

SEE
AIR BLEEDING
SECTION

Fig. 9-11 to 9-14

3. Bleed the air from the system.

LSPV (LOAD SENSING PROPORTIONING VALVE) COMPONENTS

Fig. 9-312

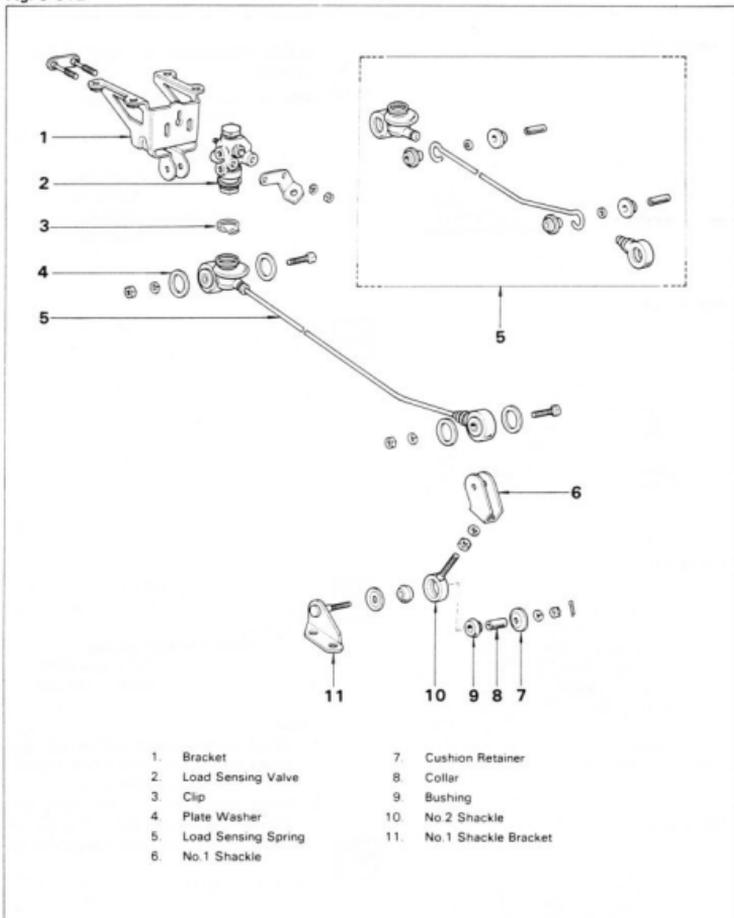
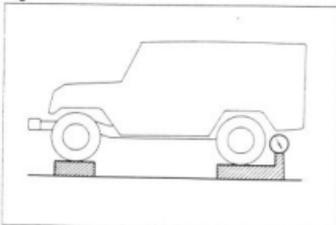


Fig. 9-313



FLUID PRESSURE INSPECTION & REPAIR

Inspect The Fluid Pressure

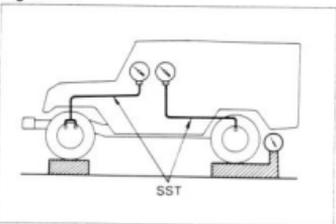
1. Set the rear axle load.

Rear axial load (include vehicle weight):

6_series 1,200 kg
(2,646 lb)

4_series 1,150 kg
(2,535 lb)

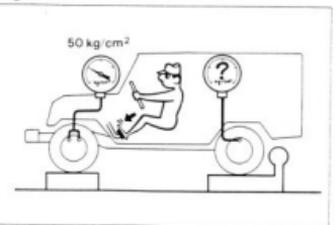
Fig. 9-314



2. Install the LSPV gauge (SST) and bleed the air.

SST [09709-29017]

Fig. 9-315



3. Raise the front brake pressure to 50 kg/cm² (711 psi) and check the rear brake pressure.

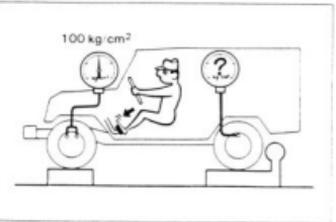
Rear brake pressure:

40 ± 5 kg/cm²
(569 ± 71 psi)

-Note-

1. Brake pedal should not be depressed twice and/or returned while setting to the specified fluid pressure.
2. Read the value of the rear wheel cylinder pressure two seconds after adjusting the specified fluid pressure.

Fig. 9-316



4. Raise the front brake pressure to 100 kg/cm² (1,422 psi) and check the rear brake pressure.

Rear brake pressure:

58 ± 7 kg/cm²
(825 ± 100 psi)

Fig. 9-317

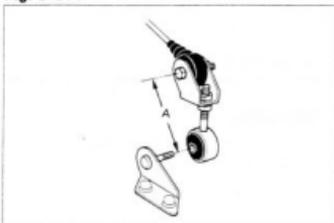


Fig. 9-318

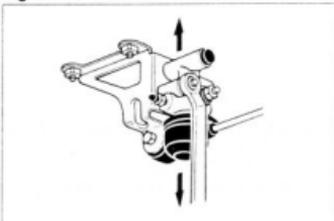


Fig. 9-319

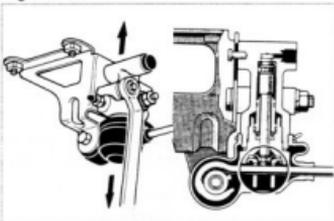
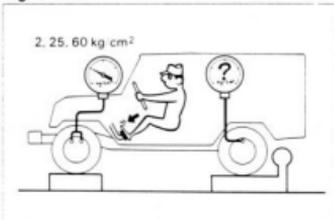


Fig. 9-320

**Adjust The Fluid Pressure**

- Adjust the length of the No. 2 shackle.
Low pressure — Lengthen A
High pressure — Shorten A

Model	Initial set	Adjusting range
F.J.B.J.HJ6...series	78 mm (3.07 in.)	72 — 84 mm (2.83 — 3.31 in.)
FJ40	90 mm (3.54 in.)	84 — 93 mm (3.31 — 3.66 in.)
F.J.B.J.HJ4...series except FJ40	120 mm (4.72 in.)	114 — 126 mm 4.49 — 4.96 in.)

**—Note—**

One turn of the No. 2 shackle changes the fluid pressure about 0.6 kg/cm² (8.5 psi).

- In event pressure cannot be adjusted by the No. 2 shackle, raise or lower the position of the valve body.

Low pressure — Lower
High pressure — Raise

Tightening torque:

**1.0 — 1.6 kg·m
(8 — 11 ft·lb)**

- Adjust the length of the No. 2 shackle again.

**Inspect The Load Sensing Valve**

If it cannot be adjusted, inspect the valve housing in the following manner.

- Assemble the valve body in the uppermost position.

—Note—

When the brakes are applied, the piston will move down about 1 mm (0.04 in.). Even at this time, the piston should not contact or move the load sensing spring.



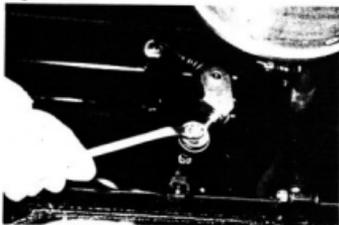
- In this position, check the rear wheel cylinder pressure.

kg/cm² (psi)

Front wheel	Rear wheel	
5 (71)	5	(71)
25 (356)	10.4 — 14.4	(148 — 205)
60 (835)	21.9 — 28.9	(312 — 411)

- If the measured value is not within standard, replace LSPV assembly.

Fig. 9-321

**REMOVAL**

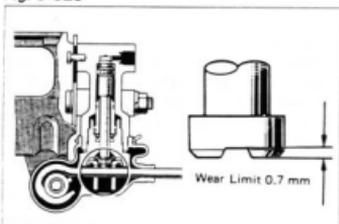
1. Disconnect the No. 2 shackle from the bracket.

Fig. 9-322



2. Disconnect the brake tube unions with SST.
3. Remove the load sensing valve bracket.

Fig. 9-323

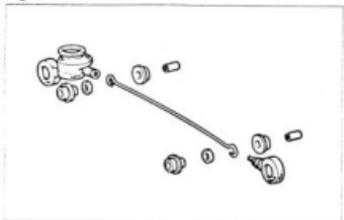
**INSPECTION**

1. Inspect the valve piston pin and load sensing spring contact surfaces for wear.

Wear:

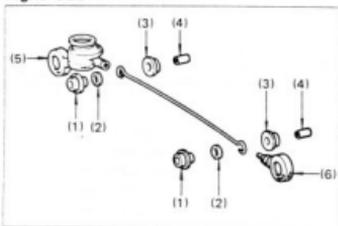
**Limit 0.7 mm
(0.028 in.)**

Fig. 9-324



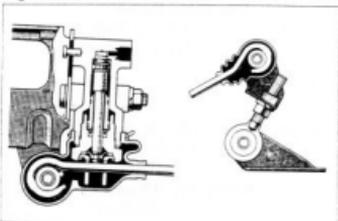
2. Inspect the load sensing spring, shackle bracket, etc. for any noticeable rust or damage.

Fig. 9-325

**INSTALLATION**

1. Assemble the following parts to the load sensing spring.
 - (1) Bushing
 - (2) Rubber plate
 - (3) Bushing
 - (4) Collar
 - (5) Load sensing valve boot
 - (6) Load sensing spring boot

Fig. 9-326

**-Note-**

1. Do not mistake the valve side for the shackle side of the load sensing spring.
2. Apply rubber grease to all rubbing areas.

Fig. 9-327

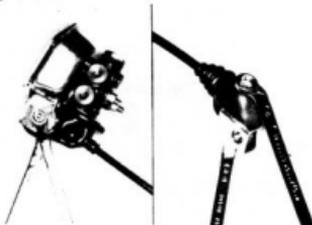


2. Assemble the LSPV to the bracket.

-Note-

Fingertighten the LSPV mounting bolts.

Fig. 9-328



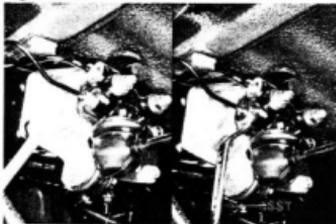
3. Connect the LSPV and No. 1 shackle to the load sensing spring.

Tightening torque:

1.5 - 2.2 kg-m

(11 - 15 ft-lb)

Fig. 9-329



4. Install the LSPV to the frame

Tightening torque:

1.5 – 2.2 kg-m

(11 – 15 ft-lb)

5. Connect the brake tube to the LSPV with SST

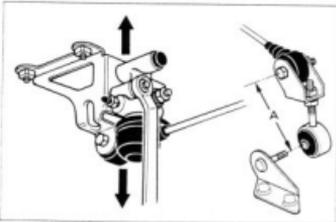
SST [09751-36011]

Tightening torque:

1.3 – 1.8 kg-m

(10 – 13 ft-lb)

Fig. 9-330



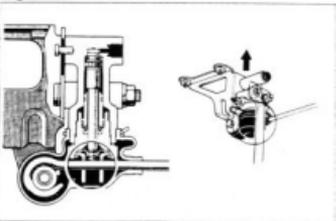
6. Assemble the No. 2 shackle to the No. 1 shackle and set the length of the No. 2 shackle

Initial set: 78 mm

(3.07 in.)

7. Connect the No. 2 shackle to the bracket.
8. Bleed the brake line. (Refer to AIR BLEEDING See Fig. 9-11 to 9-14).

Fig. 9-331



9. Set the LSPV body in the following procedure:

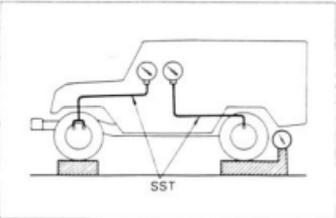
- (1) Set the rear axle load.
- (2) When pulling down the load sensing spring, confirm that the valve piston moves down smoothly.
- (3) Position the valve body so that the valve piston lightly contacts load sensing spring.
- (4) Tighten the valve body mounting nuts.

Tightening torque:

1.0 – 1.6 kg-m

(8 – 11 ft-lb)

Fig. 9-332



10. Install the LSPV gauge (SST) and bleed the air.
SST [09709-29017]
11. Inspect and adjust the LSPV fluid pressure.

FRONT WINCH

	Page
CUTAWAY VIEW	10-2
POWER TAKE OFF	10-4
MECHANICAL WINCH	10-11
ELECTRIC WINCH	10-17

CUTAWAY VIEW

Fig. 10-1

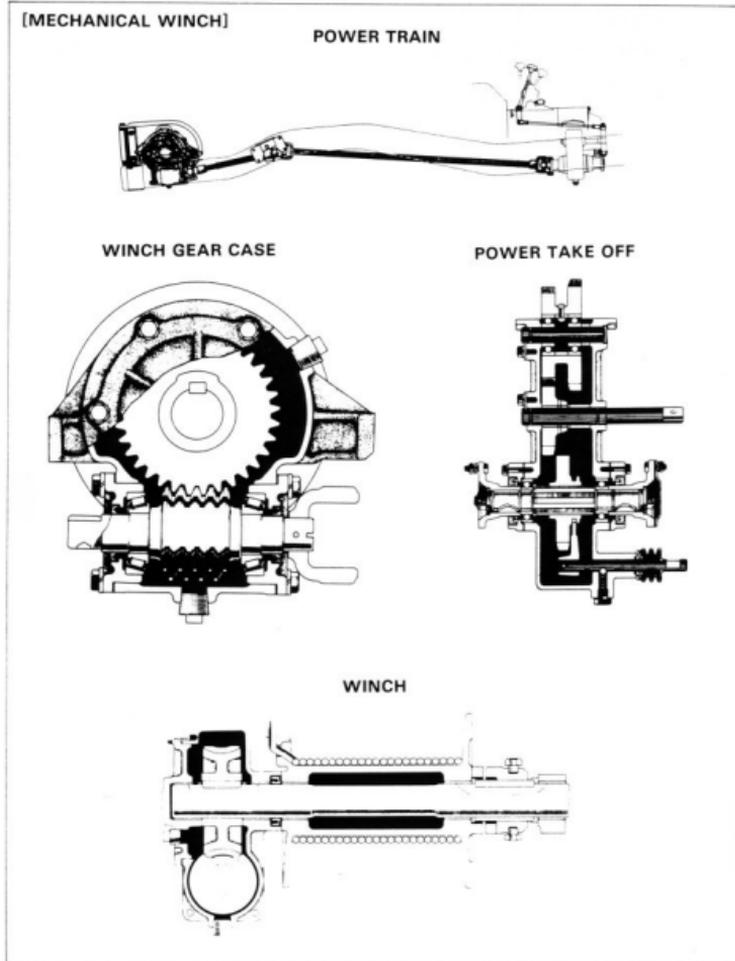
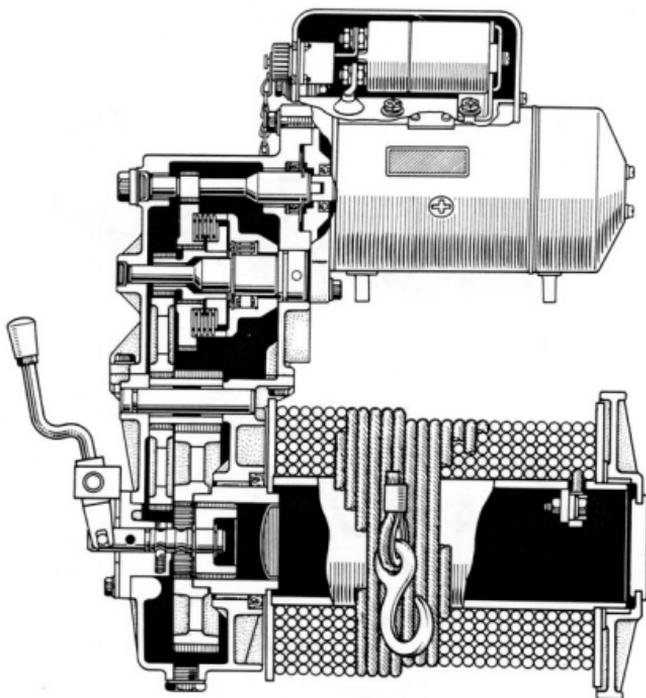


Fig. 10-2

[ELECTRIC WINCH]

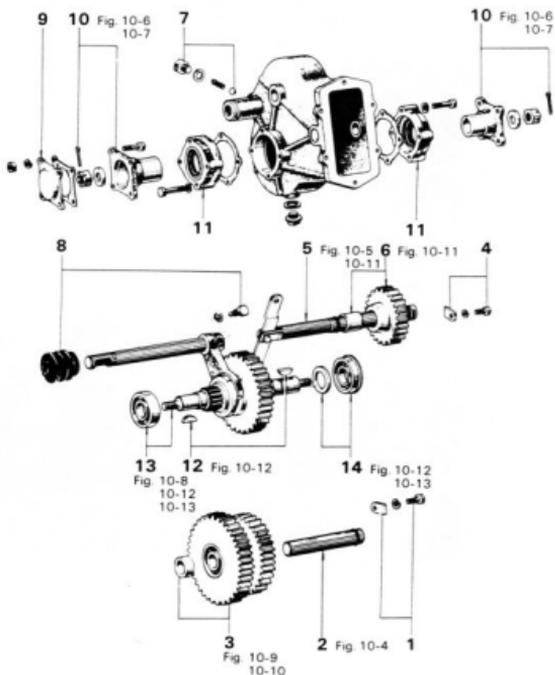


POWER TAKE OFF

DISASSEMBLY

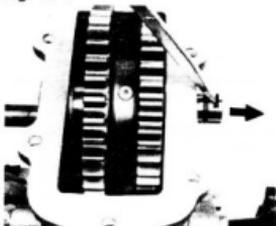
Disassemble the parts in the numerical order shown in the figure.

Fig. 10-3



- | | |
|---------------------------------|---|
| 1. Lock Plate | 8. Lock Bolt, Fork Shaft, Boot & Shift Fork |
| 2. Input Gear Shaft | 9. Retainer Cap |
| 3. Spacer, Input Gear & Bearing | 10. Nut, Plate & Joint Flange |
| 4. Lock Plate | 11. Bearing Retainer |
| 5. Reverse Idler Shaft | 12. Woodruff Key |
| 6. Reverse Idler Gear & Spacer | 13. Output Shaft & Bearing |
| 7. Lock Ball & Spring | 14. Spacer & Bearing |

Fig. 10-4



Remove the input gear shaft.

— Note —

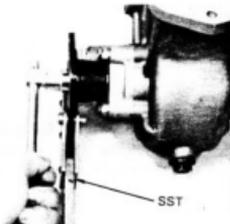
If difficult to remove the shaft, first tap the shaft lightly towards the front, and remove the expansion plug.

Fig. 10-5



Remove the reverse idler shaft assembly.

Fig. 10-6



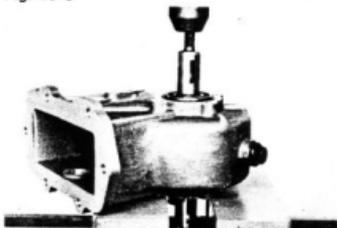
Remove the joint flange with SST.
SST [09330-00020]

Fig. 10-7



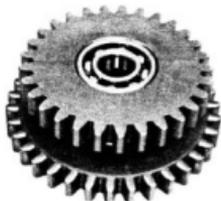
Remove the joint flange by lightly tapping its portion of woodruff key groove.

Fig. 10-8



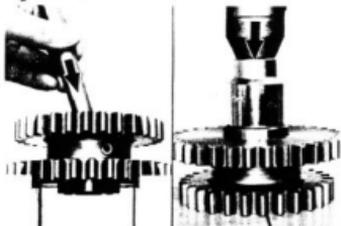
Remove the output shaft with the rear bearing using a press.

Fig. 10-9

**INSPECTION****Input Gear & Bearing**

1. Inspect the gears for teeth wear or damage.
2. Inspect the bearings for wear or damage.

Fig. 10-10

**Replace The Input Gear Bearing**

1. Remove the bearings with drift pin.
2. Install the bearings with socket wrench.



Fig. 10-11

**Reverse Idler Gear & Shaft**

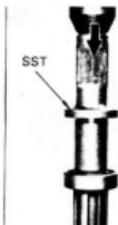
Inspect for wear or damage.

Fig. 10-12

**Output Gear, Shaft & Bearing**

1. Inspect for wear or damage.

Fig. 10-13

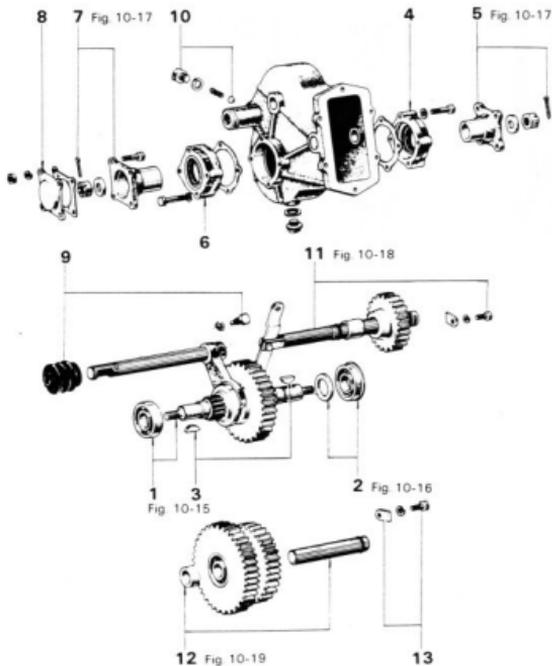
**Replace The Output Gear Bearing**

1. Remove the bearing with a press.
2. Install the bearing with a press and SST.
SST [09325-12010]

ASSEMBLY

Assemble the parts in the numerical order shown in the figure.

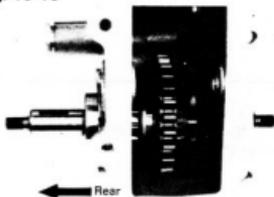
Fig. 10-14



- 1 Output Shaft & Bearing
- 2 Spacer & Bearing
- 3 Woodruff Key
- 4 Bearing Retainer
- 5 Joint Flange
- 6 Bearing Retainer
- 7 Joint Flange

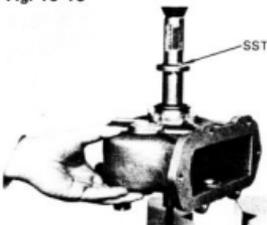
- 8 Retainer Cap
- 9 Shift Fork, Shaft & Boot
- 10 Lock Ball & Spring
- 11 Reverse Idler Gear, Spacer & Shaft
- 12 Input Gear & Shaft
- 13 Lock Plate

Fig. 10-15



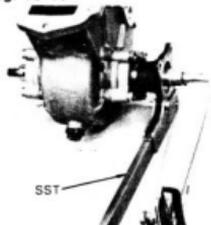
Position the output gear into the case with the shift fork groove towards the rear.

Fig. 10-16



Install the bearing with a press and SST. SST [09325-12010]

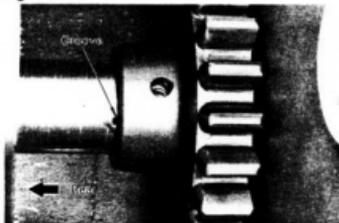
Fig. 10-17



Tighten the nut with SST. SST [09330-00020]

Tightening torque: 3.5 – 5.5 kg-m
(26 – 39 ft-lb)

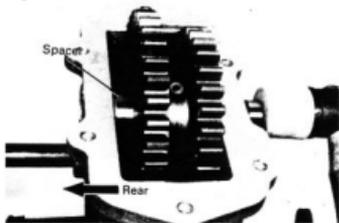
Fig. 10-18



Place the reverse idler gear and the idler gear spacer into the case with the gear hub to the rear side.

The spacer should be installed between the gear hub and the case.

Fig. 10-19



Install the input gear with the larger gear towards the rear.

MECHANICAL WINCH**DISASSEMBLY**

Disassemble the parts in the numerical order shown in the figure.

Fig. 10-20

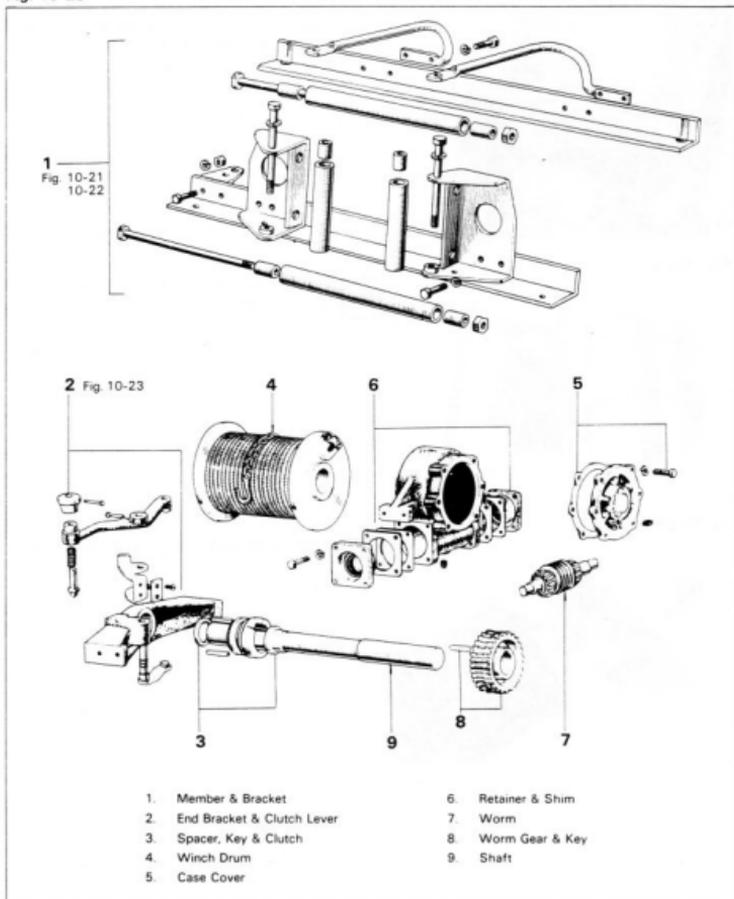
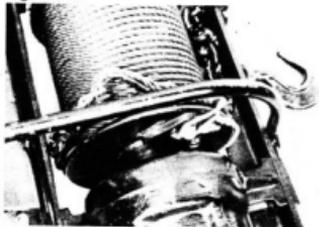
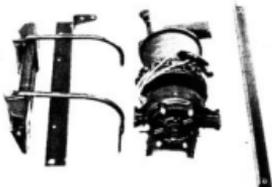


Fig. 10-21



Keep the wire rope end tied together with a wire as shown in the figure.

Fig. 10-22



Remove the front and rear base members, and the roller bracket supports.

Fig. 10-23



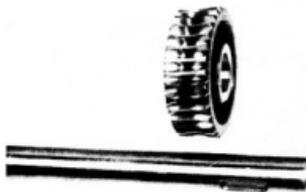
Remove the winch end bracket assembly.

Fig. 10-24

**INSPECTION****Worm & Bearing**

Inspect for wear or damage.

Fig. 10-25

**Worm Gear & Shaft**

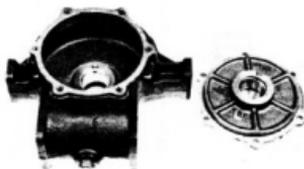
Inspect for wear or damage.

Fig. 10-26

**Clutch & Spacer**

Inspect for wear or damage.

Fig. 10-27

**Gear Case & Cover**

Inspect for cracks or wear.

ASSEMBLY

Assemble the parts in the numerical order shown in the figure.

Fig. 10-28

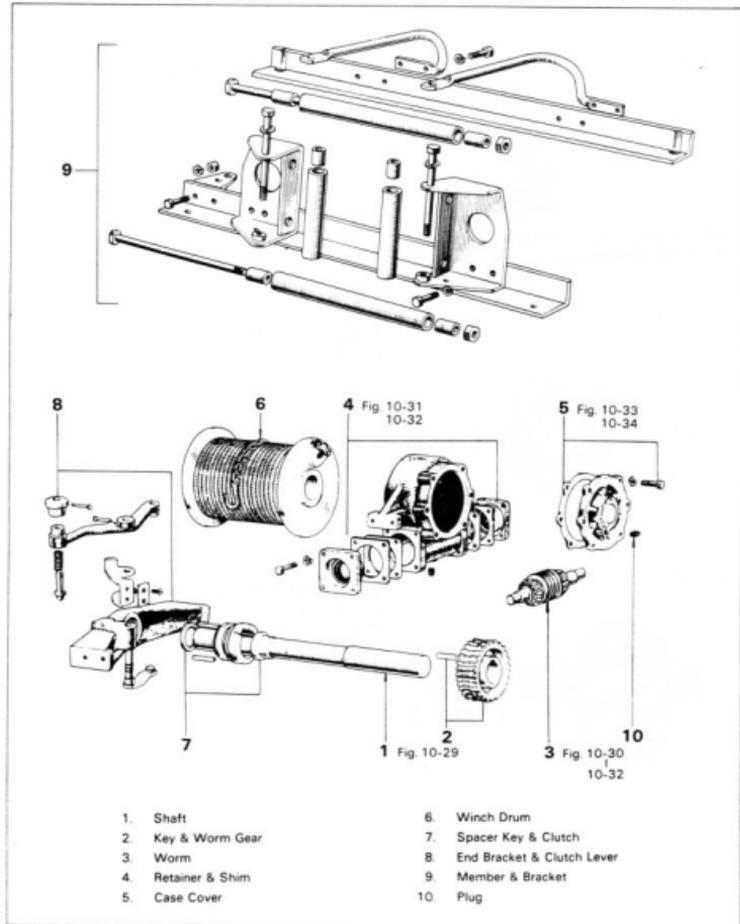
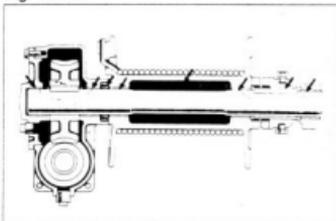


Fig. 10-29



Apply MP grease on all bushings, shaft and the clutch mechanism when assembling, and pack MP grease into the drum to about three-fourth of the drum volume.

Fig. 10-30



Place the worm into the case with the straight pin hole towards the rear.

Fig. 10-31



Install the worm bearing retainers with the adjusting shims and tighten the bearing retainer attaching bolts.

**Tightening torque: 1.9 – 3.1 kg-m
(14 – 22 ft-lb)**

– Note –

Apply liquid sealer onto the gasket surfaces to prevent oil leak.

Fig. 10-32



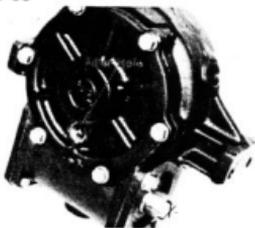
Rotate the worm, and check the condition for looseness or tightness, and also rock the worm to-and-fro, and check the worm end play.

The worm end play should be zero and it should rotate smoothly.

Adjusting shim thickness

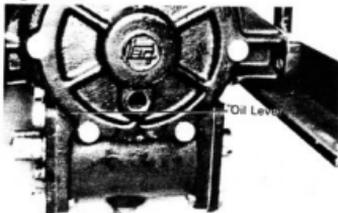
Part No.	Thickness	mm (in.)
38123-60010	0.228	(0.0090)
38124-60010	0.5	(0.020)

Fig. 10-33



Install the case cover with its filler hole positioned downward.

Fig. 10-34



Fill the gear case with gear oil.

Gear case oil capacity:

0.6 liter (0.6 US qt., 0.5 Imp.qt.)

Type: SAE 90, API GL-4

ELECTRIC WINCH

REMOVAL

Remove the parts in the numerical order shown in the figure.

Fig. 10-35

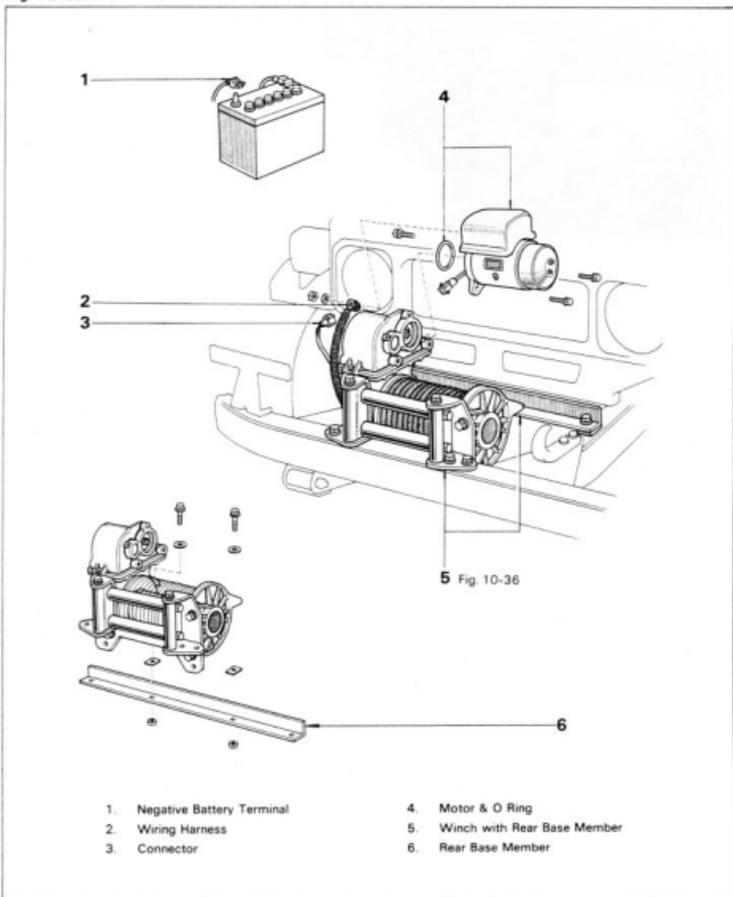


Fig. 10-36



Drain the fluid.

DISASSEMBLY

1. Disassemble the winch in the numerical order shown in the figure.

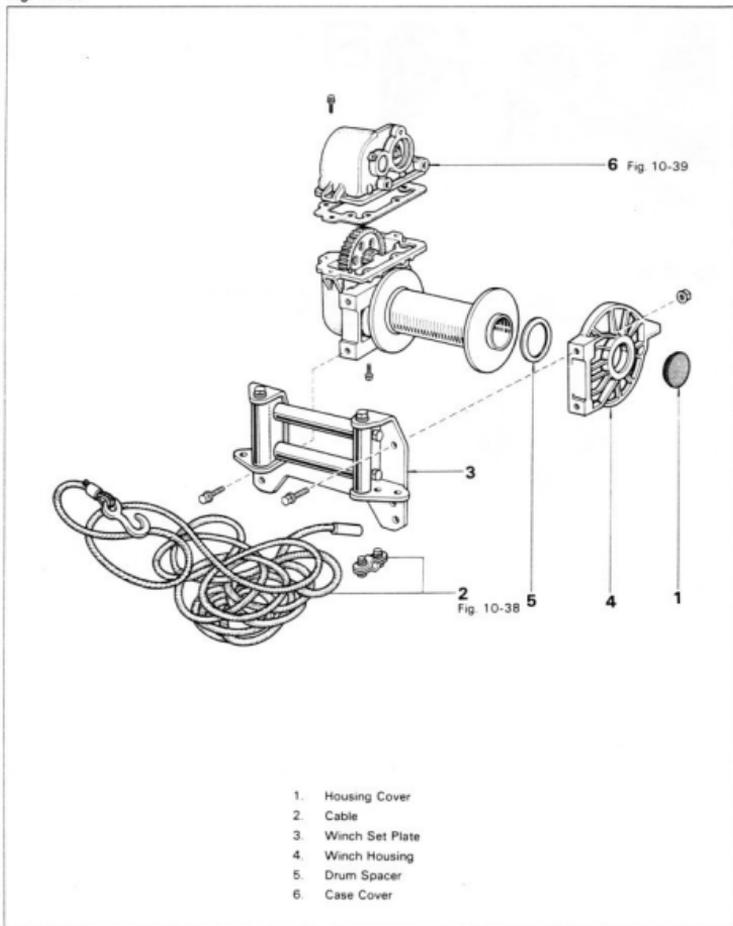
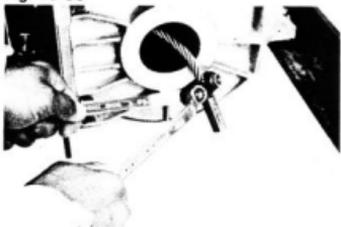
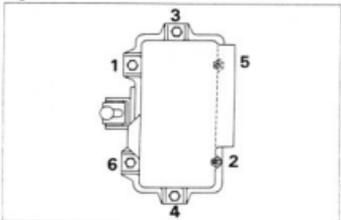
Fig. 10-37

Fig. 10-38



Remove the winch cable.

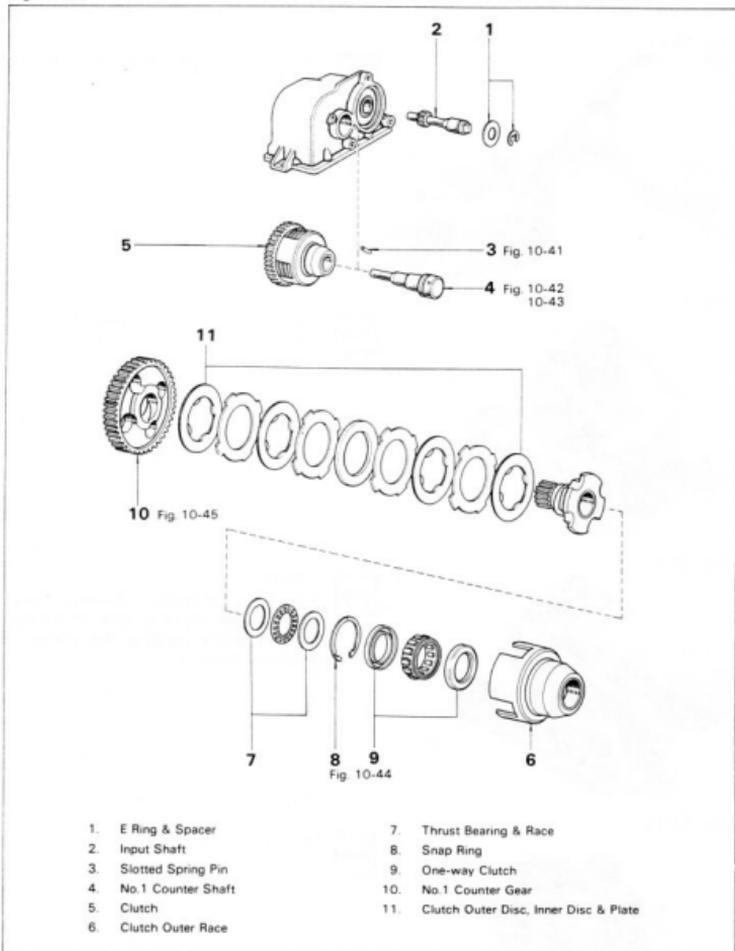
Fig. 10-39



Loosen each bolt a little at a time, and in the sequence shown in figure.

2. Disassemble the case cover in the numerical order shown in the figure.

Fig. 10-40



1. E Ring & Spacer
2. Input Shaft
3. Slotted Spring Pin
4. No.1 Counter Shaft
5. Clutch
6. Clutch Outer Race

7. Thrust Bearing & Race
8. Snap Ring
9. One-way Clutch
10. No.1 Counter Gear
11. Clutch Outer Disc, Inner Disc & Plate

Fig. 10-41



Remove the slotted spring pin with a pin punch.

Fig. 10-42



Tap the case cover with a plastic hammer and remove the No.1 counter shaft.

Fig. 10-43



— Note —
If No.1 counter shaft is difficult to remove, lightly tap out the case cover with a plastic hammer while rotating the clutch sub-assembly by hand.

Fig. 10-44



Remove the snap ring.

Fig. 10-45



Remove No.1 counter gear.

3. Disassemble the winch case in the numerical order shown in the figure.

Fig. 10-46

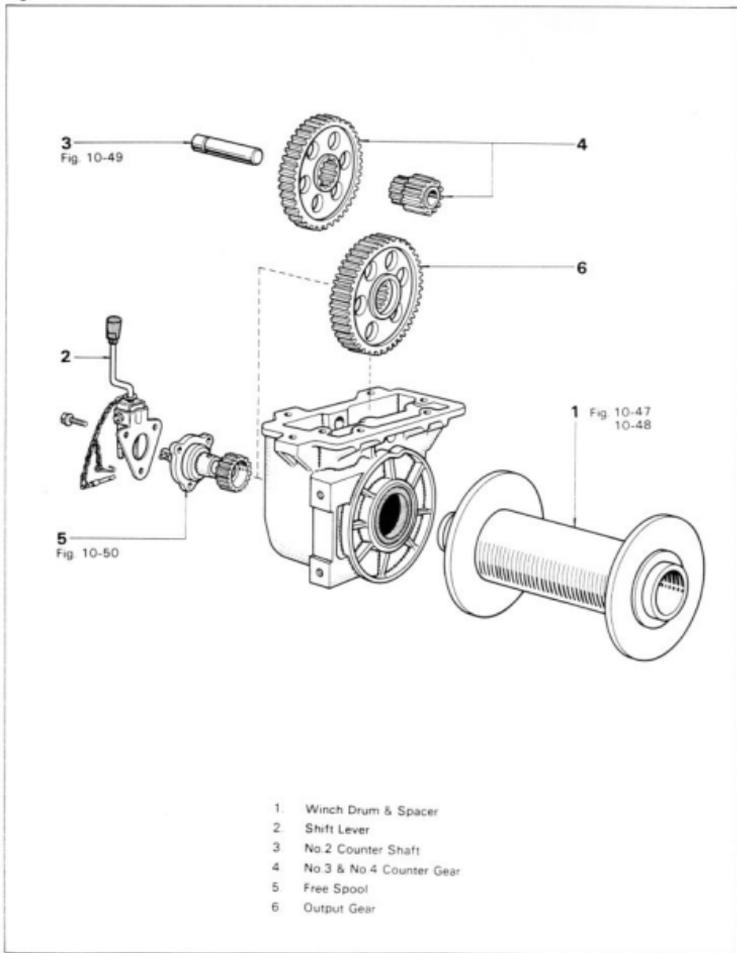


Fig. 10-47



Before removing the winch drum, shift the lever to the lock position.

Fig. 10-48



Remove the winch drum.

Fig. 10-49



Tap out No.2 counter shaft.

Fig. 10-50



— Note —
Be careful when removing the shift retainer as the steel ball may fly out.

Fig. 10-51

**INSPECTION & REPAIR****Case Cover**

Check for damage.

Fig. 10-52



Check the slotted spring hole for bits of debris.

Fig. 10-53



Thoroughly remove all debris from the hole as it will cause damage to the O ring.

Fig. 10-54

**Oil Seal**

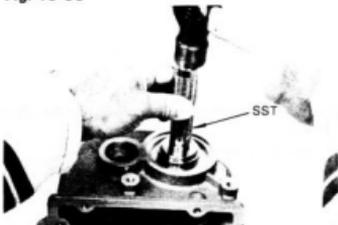
1. Check the lip for wear or damage.

Fig. 10-55



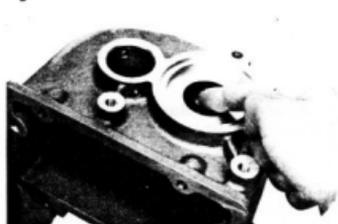
2. Replace the oil seal.
(1) Remove the oil seal.

Fig. 10-56



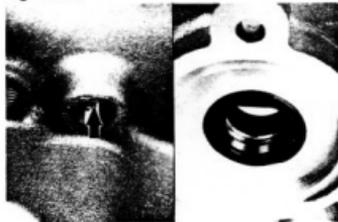
- (2) Install the oil seal with SST.
SST [09608-30021]

Fig. 10-57



3. Coat the lip with MP grease.

Fig. 10-58



- Bushing**
Check for wear or damage. If found, replace the case cover.

Fig. 10-59

**Input Shaft**

Check for wear or damage.

Fig. 10-60

**No.1 Counter Shaft & Slotted Spring Pin**

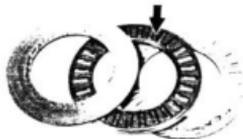
Check for wear or damage.

Fig. 10-61

**Outer Race & Bushing**

Check for wear or damage.

Fig. 10-62

**Thrust Bearing & Race**

Check for burning, wear or damage.

Fig. 10-63

**One-way Clutch**

Check for wear or damage.

Fig. 10-64

**No.1 Counter Gear**

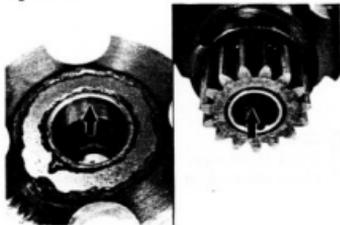
Check for wear or damage.

Fig. 10-65

**No.2 Counter Gear**

1. Check for wear or damage.

Fig. 10-66



2. Check the bushing for wear or damage.

Fig. 10-67

**Clutch Outer Disc**

Check for burning, wear or damage.

Fig. 10-68

**Clutch Inner Disc & Plate**

Check for burning, wear or damage.

ris.

Fig. 10-69

**Winch Drum**

Check for damage.

le as

Fig. 10-70

**Shift Lever**

Check for damage.

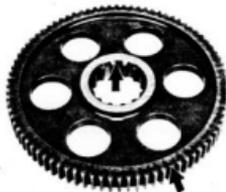
Check the bushing for wear or damage.

Fig. 10-71

**No.2 Counter Shaft**

Check for wear or damage.

Fig. 10-72

**No.3 Counter Gear**

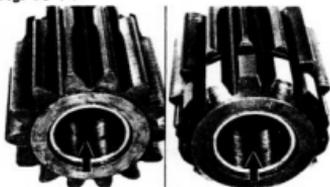
Check for wear or damage.

Fig. 10-73

**No.4 Counter Gear**

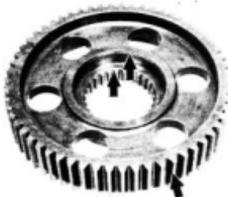
1. Check for wear or damage.

Fig. 10-74



2. Check the bushing for wear or damage.

Fig. 10-75

**Output Gear**

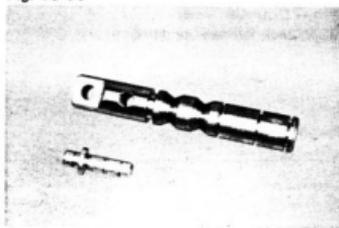
Check for wear or damage.

Fig. 10-76

**Shift Shaft Retainer, Spring & Ball**

Check for wear or damage.

Fig. 10-77

**Sleeve Shift Shaft & Pin**

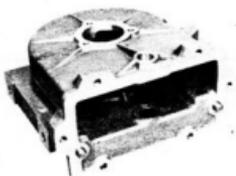
Check for wear or damage.

Fig. 10-78

**Inner Hub**

Check for wear or damage.

Fig. 10-79

**Winch Case**

1. Check for wear or damage.

Fig. 10-80



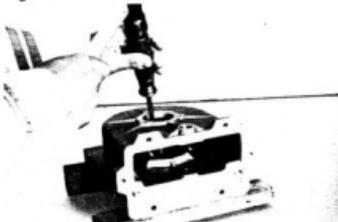
2. Check the bushing for wear or damage.

Fig. 10-81



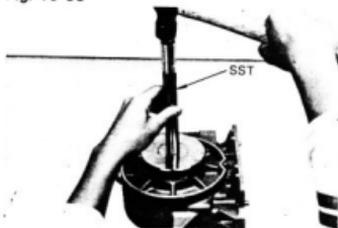
3. Check the oil seal for wear or damage.

Fig. 10-82

**Replace The Oil Seal**

1. Remove the oil seal.

Fig. 10-83



2. Install a new oil seal with SST.
SST [09550-55010]

Fig. 10-84



3. Coat the oil seal with MP grease.

ASSEMBLY

1. Assemble the case cover in the numerical order shown in the figure.

Fig. 10-85

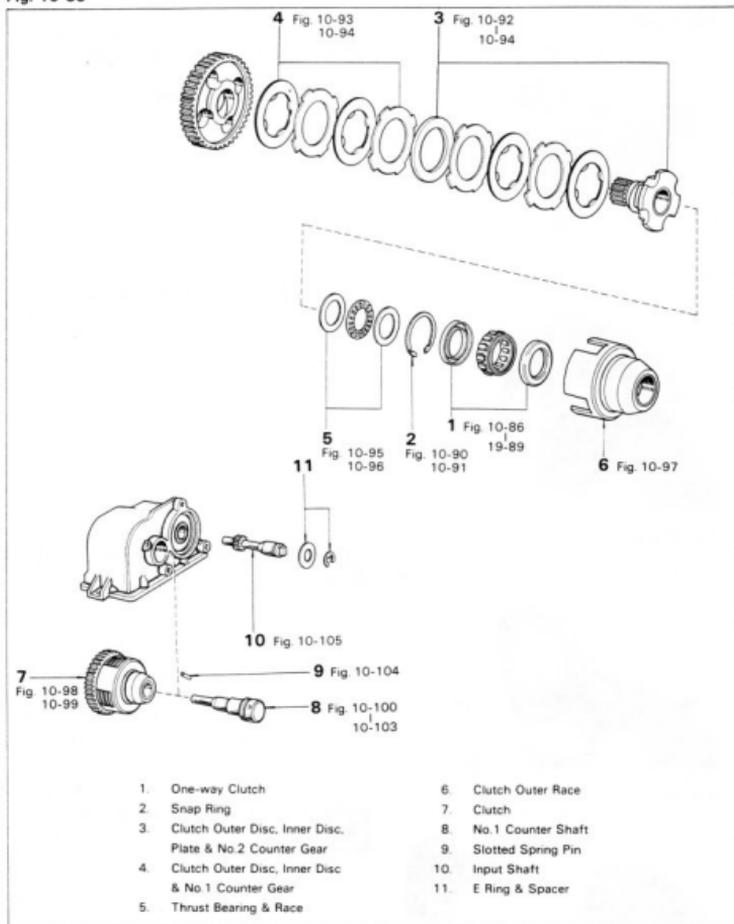
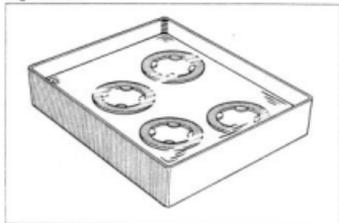


Fig. 10-86



Before assembling new inner discs, soak them in automatic transmission fluid, for at least 30 minutes.

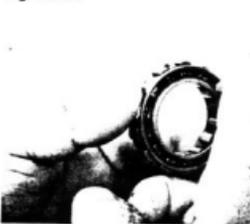
Fluid ATF Type F

Fig. 10-87



Coat the outer race bushing with MP grease.

Fig. 10-88



Coat the one-way clutch with MP grease.

Fig. 10-89



Assemble the one-way clutch as shown in the figure.

Fig. 10-90



Install the snap ring.

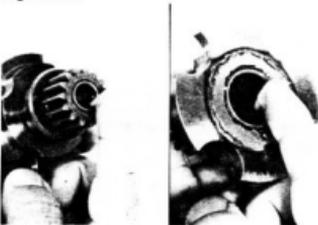
— Note —
Confirm that the snap ring is securely installed.

Fig. 10-91



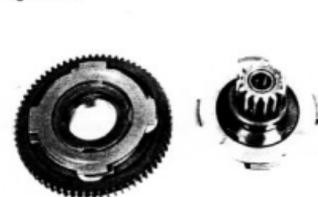
Check the one-way clutch.

Fig. 10-92



Coat the No.2 counter gear with MP grease.

Fig. 10-93



Align the notch and tab and assemble the clutch disc to the counter gear.

Fig. 10-94



Hold the clutch disc and plate by hand and assemble the No.1 and No.2 counter gears as shown in the figure.

Fig. 10-95



Coat the thrust bearing and race with MP grease.

Fig. 10-96



Before assembling the outer race, set up the disc flukes.

Fig. 10-97



Turn the No.2 counter gear clockwise and lock.

Fig. 10-98



Confirm that the thrust bearing and race are aligned in the center.

Fig. 10-99



Coat the bearing parts of the case cover with MP grease.

Fig. 10-100



Install a new O ring and coat with MP grease.

Fig. 10-101



Hold No.1 counter gear by hand and push in No.1 counter shaft

Fig. 10-102



— Note —

At this time, align the case cover hole and counter shaft hole.

Fig. 10-103



After assembling No.1 counter shaft if the holes are not aligned, rotate the outer race counterclockwise and align the holes.

Fig. 10-104



Tap in the slotted spring pin with a pin punch.

Fig. 10-105



Before assembling the input shaft, wrap the gear with tape.

2. Assemble the winch case in the numerical order shown in the figure.

Fig. 10-106

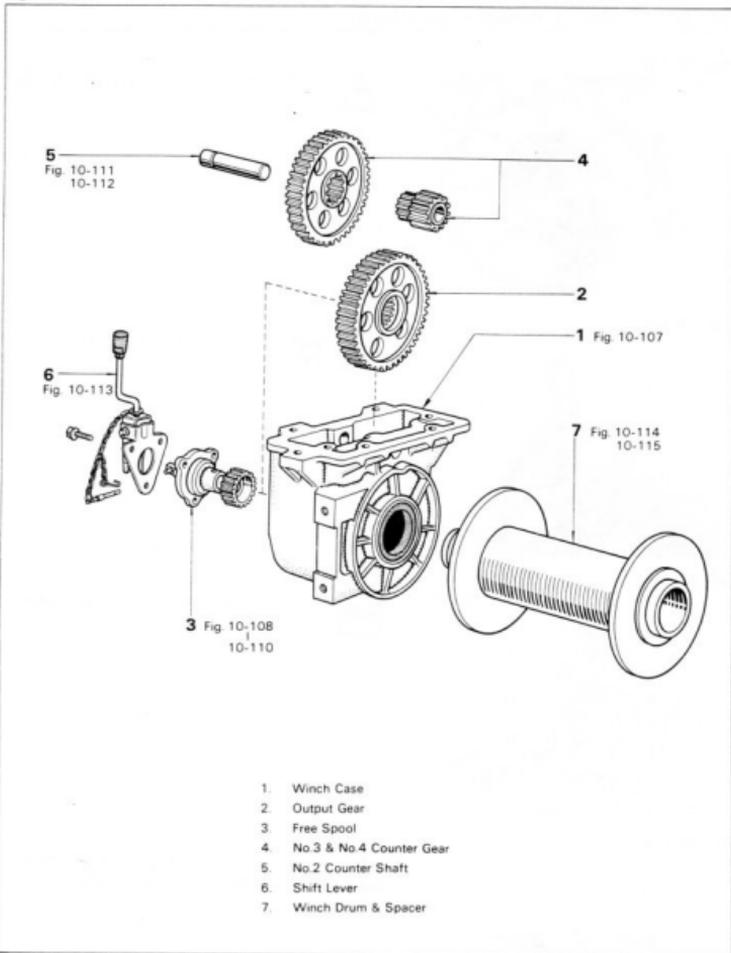


Fig. 10-107



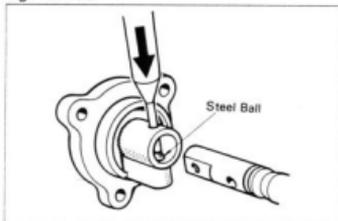
Coat the winch case bushing with MP grease.

Fig. 10-108



Coat the sleeve shift shaft and O ring with MP grease.

Fig. 10-109



Install the shift shaft retainer and steel ball.

Fig. 10-110



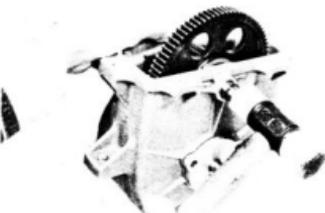
Make sure that the position of the shift shaft retainer is as shown in the figure.

Fig. 10-111



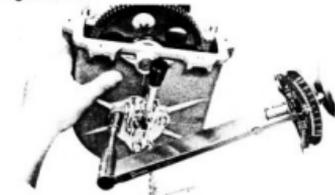
Coat No.2 counter shaft and a new O ring with Mp grease.

Fig. 10-112



Tap in No.2 counter shaft.

Fig. 10-113



Tighten the shift lever support.

**Tightening torque: 1.5 - 2.2 kg-m
(11 - 15 ft-lb)**

Fig. 10-114



Coat the spacer with MP grease.

Fig. 10-115



Install the winch drum.

3. Assemble the winch in the numerical order shown in the figure.

Fig. 10-116

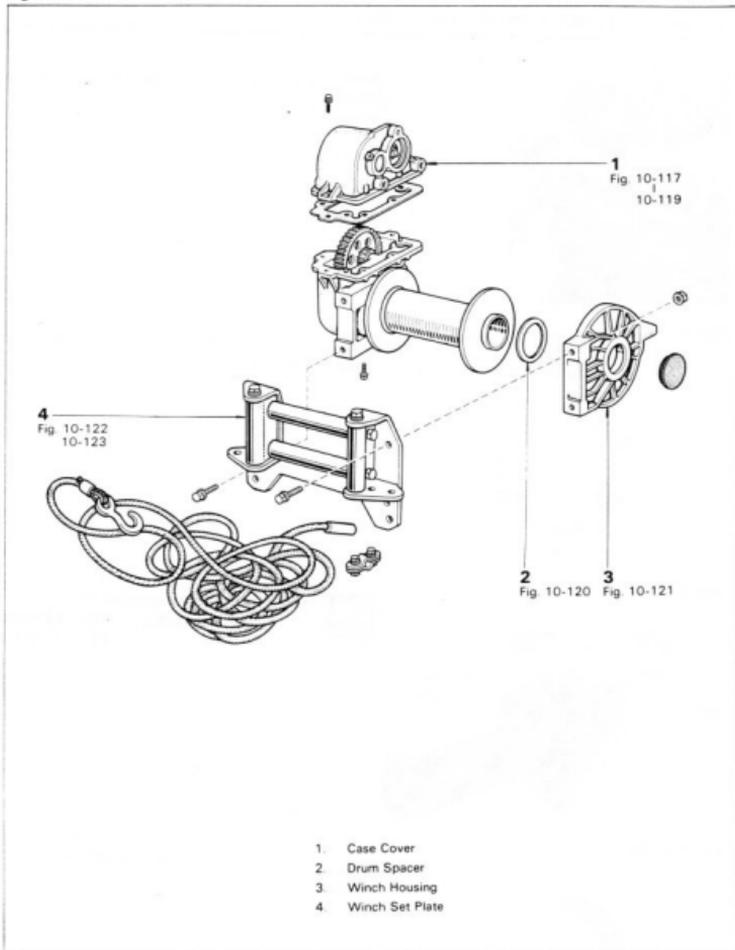
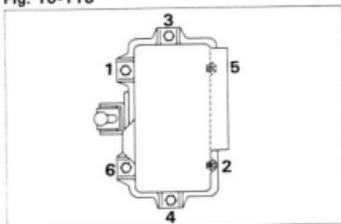


Fig. 10-117



First, install the bolt in the place shown in the figure.

Fig. 10-118



Tighten each bolt a little at a time, in the sequence shown in the figure.

Fig. 10-119



Tighten the bolts to specified torque.

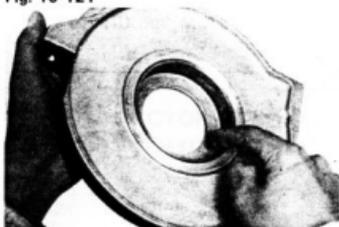
**Tightening torque: 1.5 – 2.2 kg-m
(11 – 15 ft-lb)**

Fig. 10-120



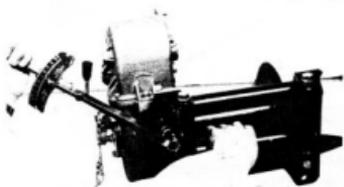
Coat the drum spacer with MP grease.

Fig. 10-121



Coat the bushing of the housing with MP grease.

Fig. 10-122



Tighten the bolts to specified torque.

Tightening torque: 5.0 – 8.0 kg-m
(37 – 57 ft-lb)

Fig. 10-123



Check that the drum rotates smoothly.

WINCH MOTOR MOTOR SYSTEM CIRCUIT

Fig. 10-124

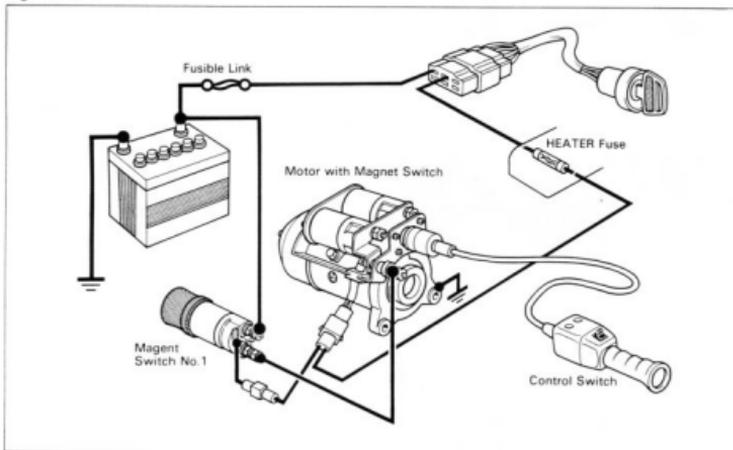
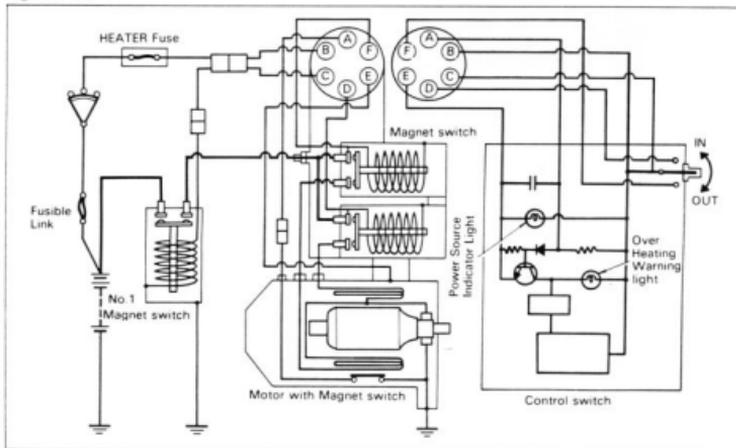


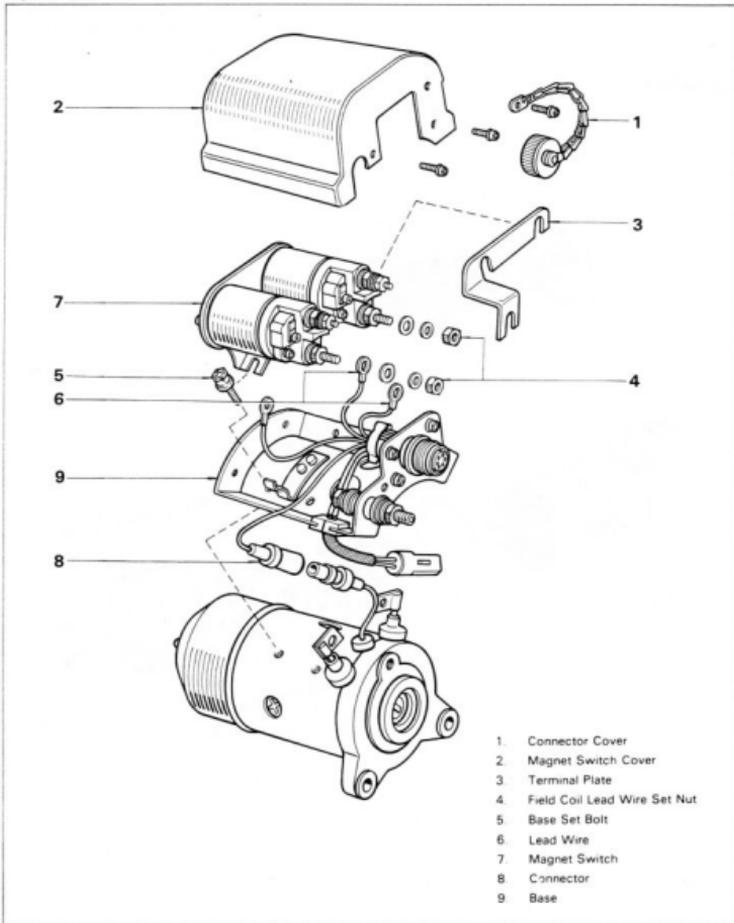
Fig. 10-125



DISASSEMBLY

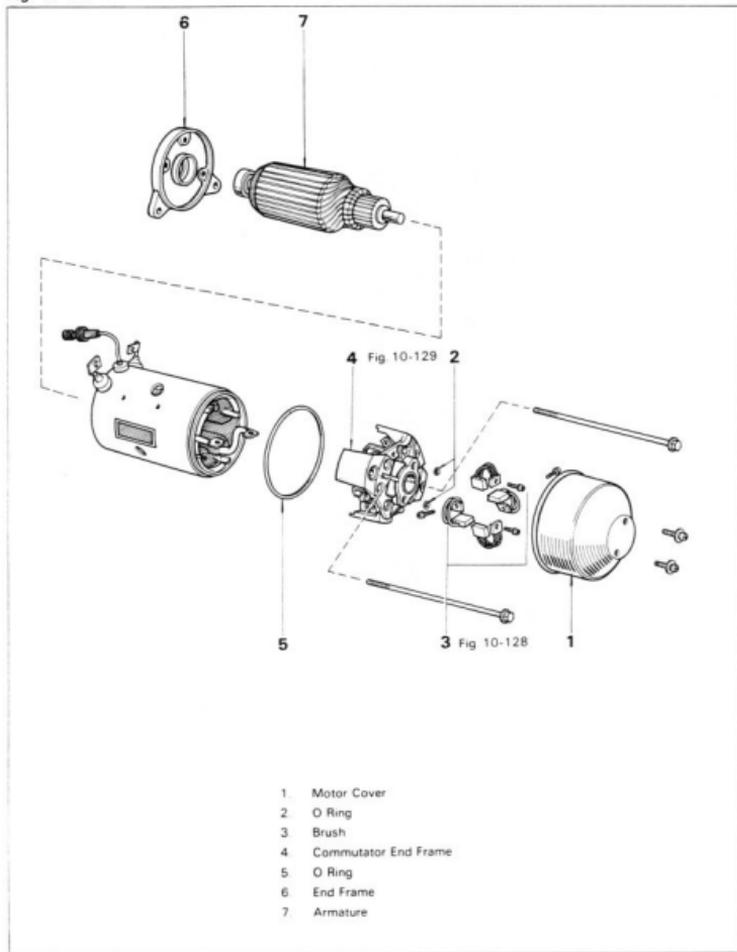
1. Disassemble the parts in the numerical order shown in the figure.

Fig. 10-126



2. Disassemble the parts in the numerical order shown in the figure.

Fig. 10-127



1. Motor Cover
2. O Ring
3. Brush
4. Commutator End Frame
5. O Ring
6. End Frame
7. Armature

Fig. 10-128



Take off the brushes and remove the screw.

Fig. 10-129



Measure the armature shaft thrust clearance.

Thrust clearance:

0.05 – 0.50 mm
(0.0020 – 0.0197 in.)

Thrust washer thickness:

1.6 mm
(0.063 in.)

Fig. 10-130

**INSPECTION & REPAIR****Armature Shaft**

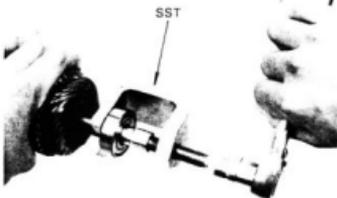
Check for wear or damage.

Fig. 10-131

**Bearing**

1. Check to see that there is no drag on the bearing when it is turned with force.

Fig. 10-132

**2. Replace the bearing**

- (1) Remove the bearing with SST.
SST [09611-12010]

Fig. 10-133



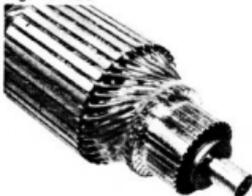
- (2) Install the bearing with a press.

Fig. 10-134



- (3) Check the bearing condition.

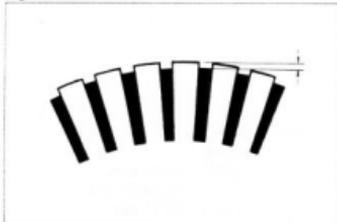
Fig. 10-135

**Commutator**

Check for following items and repair or replace.

1. Dirty or burnt surface.
Correct by sandpaper if necessary.

Fig. 10-136



2. Depth of segment mica.

Mica depth:

STD 0.7 mm
(0.028 in.)

Limit 0.3 mm
(0.012 in.)

Fig. 10-137



3. Correct with a hacksaw blade.
After correcting, eliminate chips using sandpaper.

Fig. 10-138



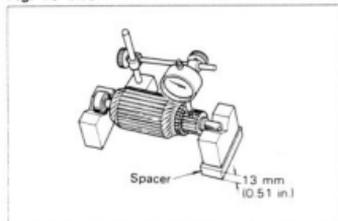
4. Smooth out the edge with a hacksaw blade.

Fig. 10-139



5. Use #400 sandpaper.

Fig. 10-140



6. Measure the runout.

Runout:

STD 0.05 mm
(0.0020 in.)

Limit 0.20 mm
(0.0079 in.)

Fig. 10-141



7. Surface wear: If below the limit, replace armature.

Outer diameter:

STD 43 mm
(1.69 in.)

Limit 41 mm
(1.61 in.)

Fig. 10-142



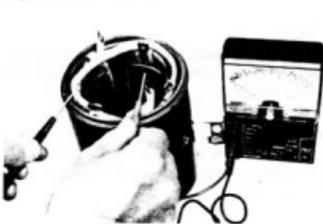
Fig. 10-143



Fig. 10-144



Fig. 10-145

**Armature Coil**

1. Ground test
Check commutator and armature coil core. If there is continuity, armature is grounded and must be replaced.



2. Open circuit test
Check for continuity between the segments. If there is no continuity at any test point, there is an open circuit and armature must be replaced.

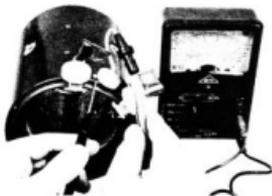
**Field Coil**

1. Open-circuit test
Check for continuity between lead wire and field coil brush soldered connection. If there is no continuity, there is an open-circuit in field coil and it should be replaced.



2. Ground test
Check for continuity between field coil end and field frame. If there is continuity, repair or replace field coil.

Fig. 10-146

**Thermo Switch**

Check for continuity shown in the figure.

Fig. 10-147

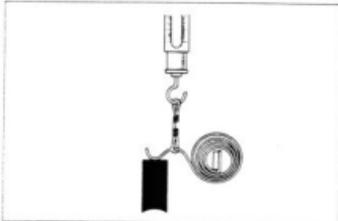
**Brush**

Measure brush length and replace if below limit.

Brush length:

STD	22 mm (0.87 in.)
Limit	15 mm (0.59 in.)

Fig. 10-148

**Brush Spring**

Measure the brush spring load with a pull scale.

If the reading is below standard, replace the spring.

Tension:	3.2 – 4.0 kg (7.1 – 8.8 lb)
----------	--------------------------------

– Note –

Take the pull scale reading at the very instant the brush spring separates from the brush.

Fig. 10-149

**Brush Holder**

Check insulation between (–) brush holder and (+) brush holder. Repair or replace if continuity is indicated.

Fig. 10-150

**Magnetic Switch**

1. Push in plunger and release it. Plunger should return quickly to its original position.

Fig. 10-151



2. Check for continuity.

Fig. 10-152



3. Check for no continuity.

Fig. 10-153



4. Push in the plunger until it stops. Check for continuity.

— Note —

Perform a switch operation test after assembling it to the motor.

ASSEMBLY

1. Assemble the parts in the numerical order shown in the figure.

Fig. 10-154

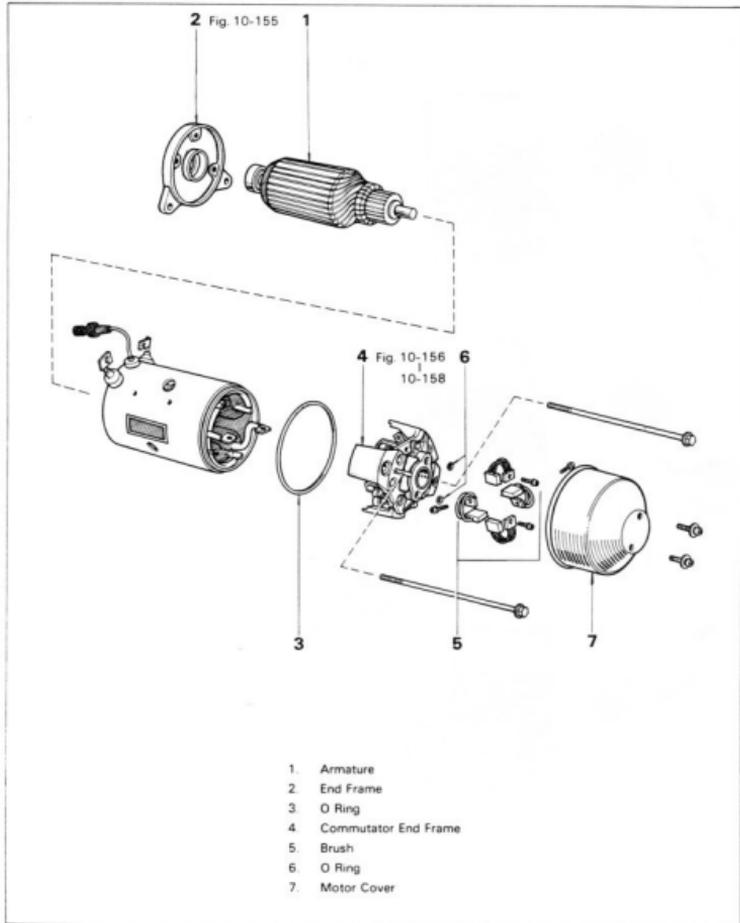
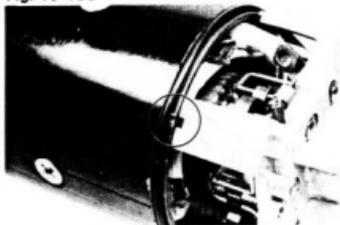


Fig. 10-155



Align yoke dowel with center bearing hole.

Fig. 10-156



Align yoke edge dowel with groove on commutator end frame.

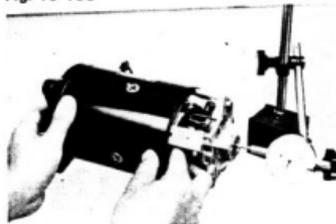
Fig. 10-157



Apply retaining compound to the bolts.

— Note —
Use Lock-Tight.

Fig. 10-158



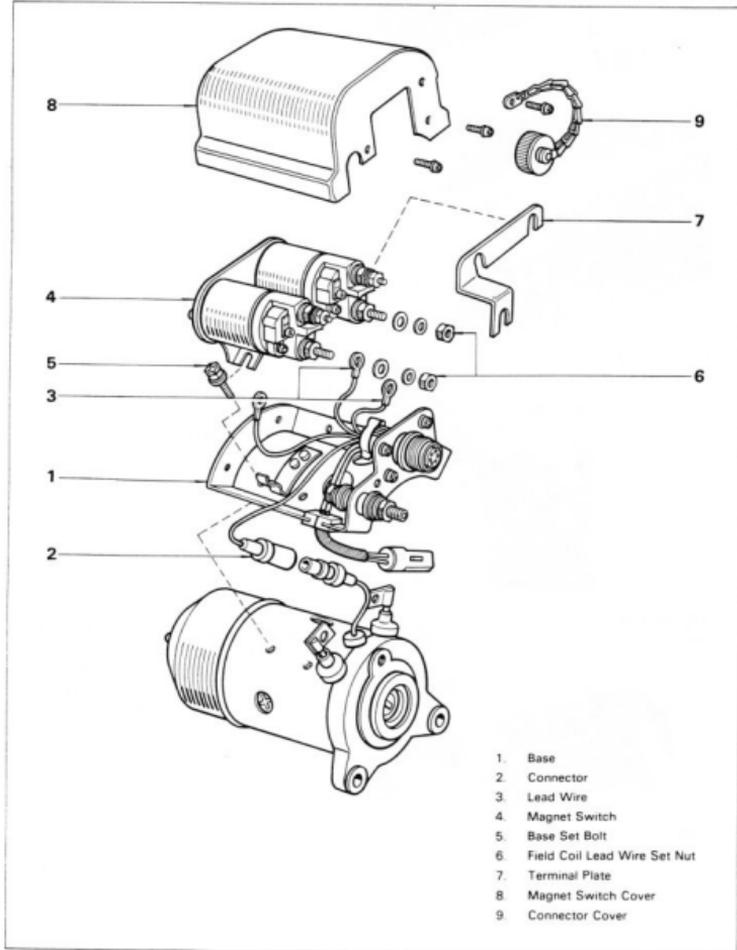
Recheck armature shaft thrust clearance.

Thrust clearance:
0.05 – 0.50 mm
(0.0020 – 0.0197 in.)

Thrust washer thickness:
1.6 mm
(0.063 in.)

2. Assemble the parts in the numerical order shown in the figure.

Fig. 10-159



INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 10-160

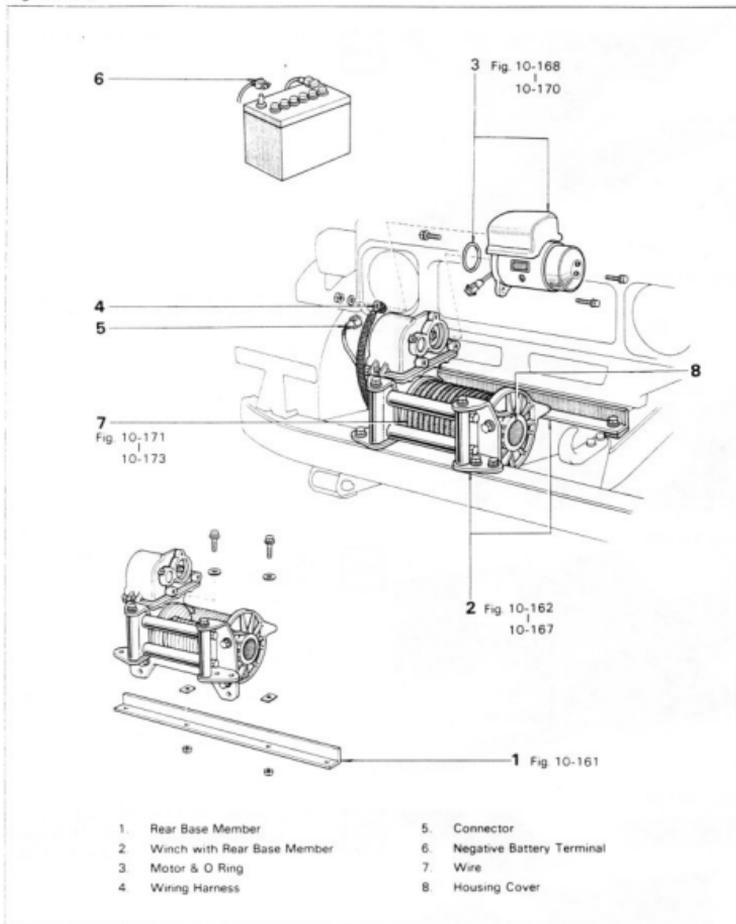
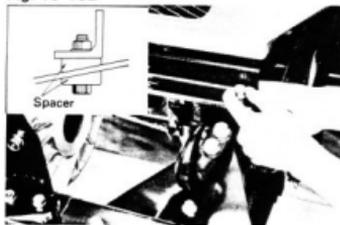


Fig. 10-161



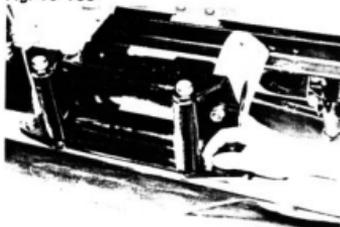
Temporarily install the rear base member.

Fig. 10-162



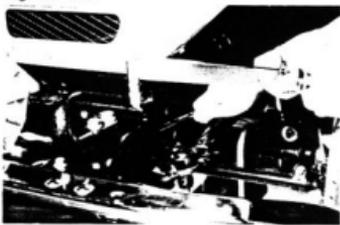
Install the winch mounted on the rear base member through a spacer to the frame.

Fig. 10-163



Install the winch front mounting bolt and temporarily tighten.

Fig. 10-164



Tighten the rear base member mounting bolts.

Tightening torque: 5.0 – 8.0 kg-m
(37 – 57 ft-lb)

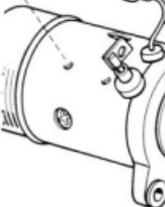
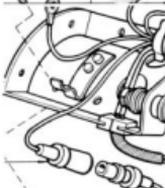
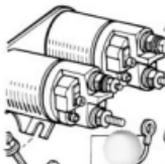
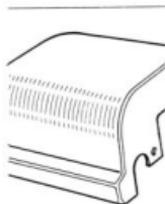
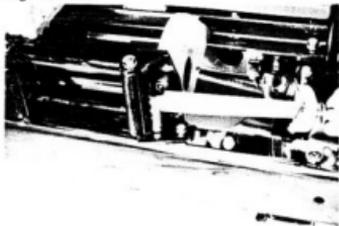


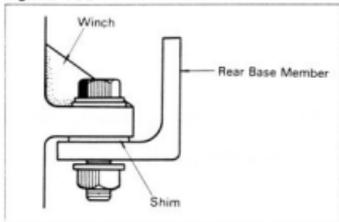
Fig. 10-165



Tighten the winch front mounting bolts.

Tightening torque: 3.0 – 4.5 kg-m
(22 – 32 ft-lb)

Fig. 10-166



Check the clearance between the rear base member and winch rear mount.
If there is clearance, insert shims.

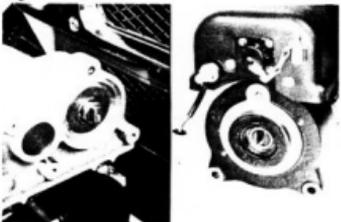
Fig. 10-167



Tighten the winch rear mounting bolts.

Tightening torque: 3.0 – 4.5 kg-m
(22 – 32 ft-lb)

Fig. 10-168



Align the protrusion and groove, and install the motor.

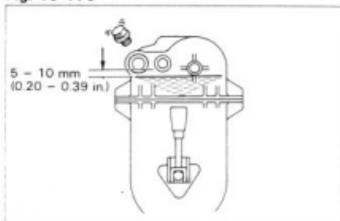
Fig. 10-169



Tighten the motor mounting bolts.

Tightening torque: 1.5 – 2.0 kg-m
(11 – 14 ft-lb)

Fig. 10-170



Fill with about 2 liters of automatic transmission fluid.

Fluid ATF Type F

Fig. 10-171



Insert the cable into the drum hole, install the cable lock plate and tighten the bolts.

Tightening torque: 1.5 – 2.0 kg-m
(11 – 14 ft-lb)

Fig. 10-172



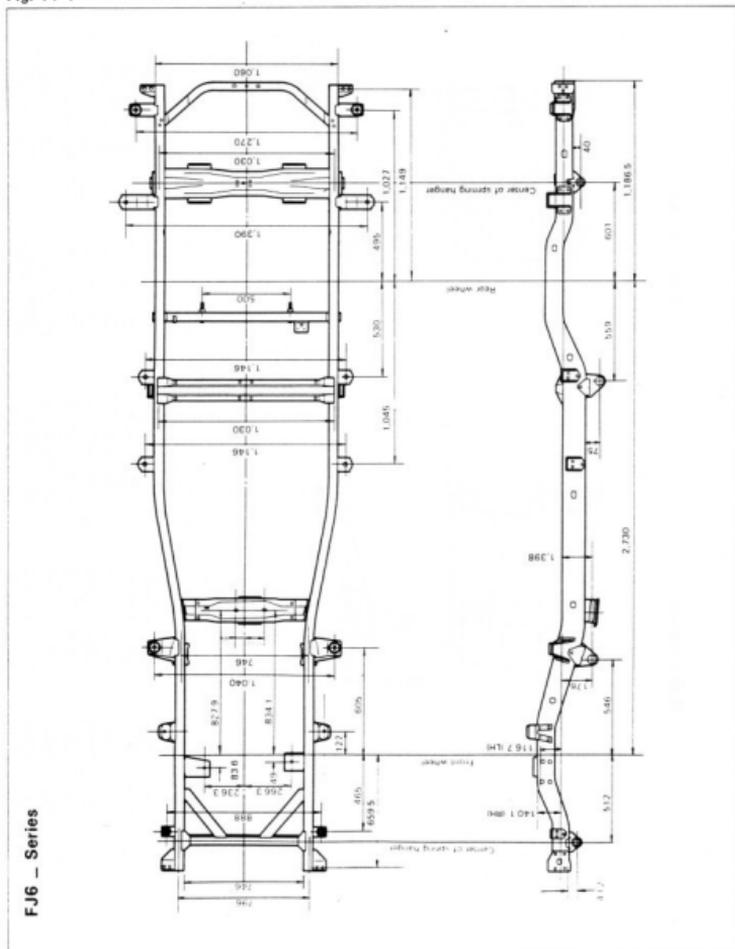
Shift the lever to the lock position.

FRAME DIMENSION

	Page
FJ, BJ, HJ6 – SERIES	11-2
FJ40, BJ40-42 SERIES	11-4
FJ43, BJ43-46 SERIES	11-6
FJ45, BJ45, HJ47 SERIES	11-8

FJ, BJ, HJ6-SERIES

Fig. 11-1



FJ40, BJ40 · 42 SERIES

Fig. 11-3

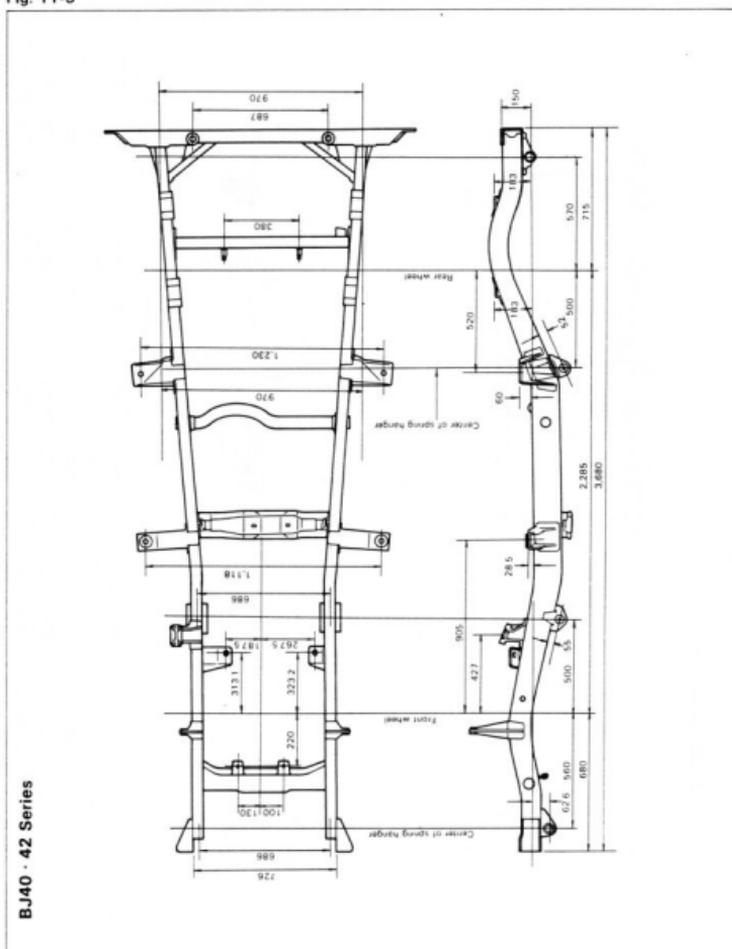


Fig. 11-4

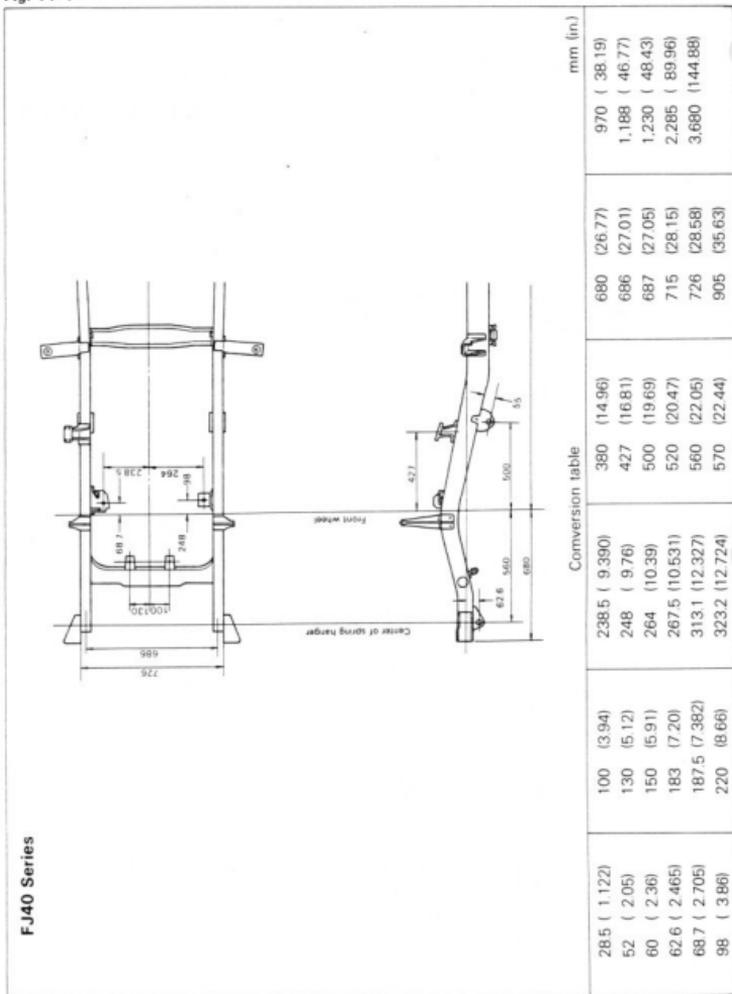
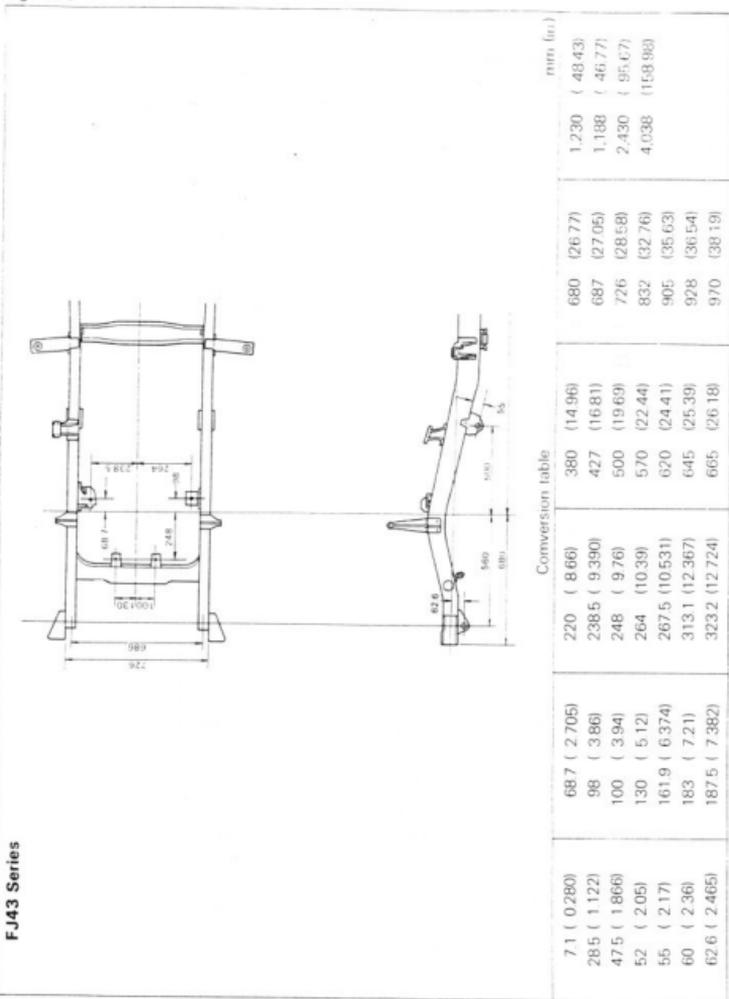


Fig. 11-6



FJ45, BJ45, HJ47 SERIES

Fig. 11-7

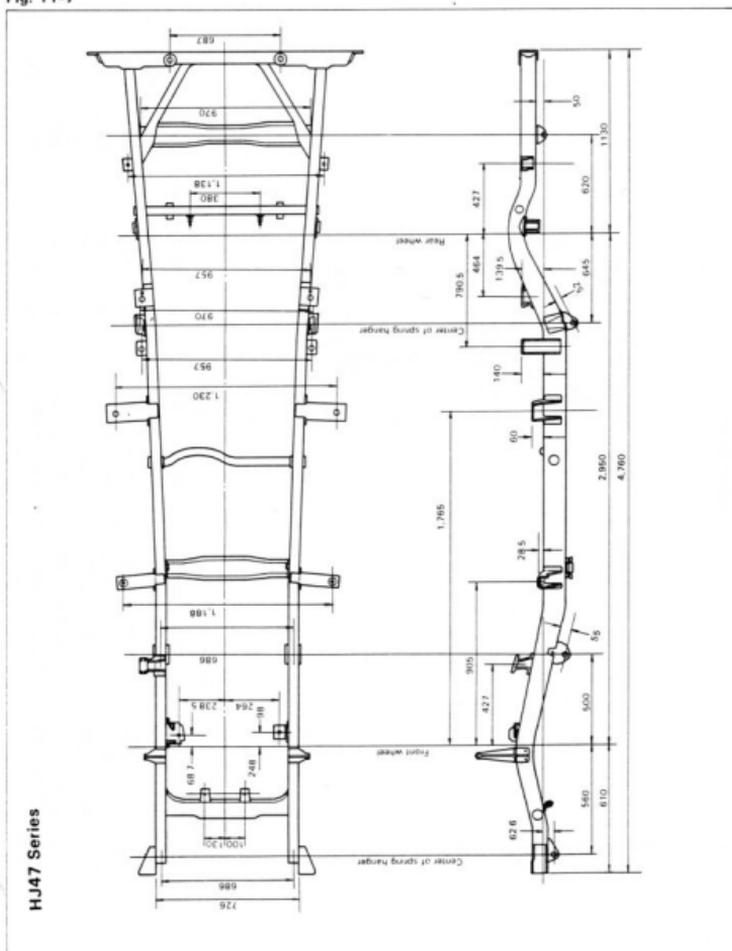
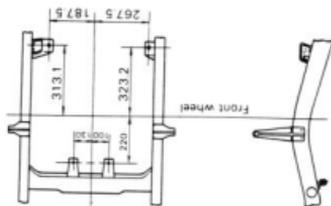


Fig. 11-8

BJ45 Series



Conversion table

	Conversion table		mm (in.)
285 (1 122)	98 (3 86)	238.5 (9.390)	686 (27 01)
50 (1 97)	100 (3 94)	248 (9 76)	687 (27 05)
52 (2 05)	130 (5 12)	264 (10 39)	726 (28 59)
55 (2 17)	139.5 (5.492)	267.5 (10 53)	790.5 (31 122)
60 (2 36)	140 (5 51)	313.1 (12 327)	905 (35 63)
62.6 (2 46)	187.5 (7 382)	323.2 (12 724)	957 (37 68)
68.7 (2 70)	220 (8 66)	380 (14 96)	970 (38 19)
		427 (16 81)	1,130 (44 49)
		464 (18 27)	1,138 (44 80)
		500 (19 69)	1,188 (46 77)
		560 (22 05)	1,230 (48 43)
		610 (24 02)	1,265 (49 49)
		620 (24 41)	2,950 (116 14)
		645 (25 39)	4,760 (187 40)

BODY

[FJ , BJ , HJ6-SERIES]

	Page
ENGINE HOOD, HINGE, LOCK & HOOD LOCK CONTROL CABLE	12-2
FRONT DOOR	12-4
REAR DOOR	12-22
BACK DOOR (LIFT GATE)	12-44
SWING OUT DOOR	12-52
WINDSHIELD	12-66
SIDE WINDOW	12-71
BACK DOOR GLASS	12-77
INSTRUMENT PANEL	12-82
ROOF HEADLINING	12-91

[FJ , BJ4-SERIES]

HOOD	12-96
DOOR	12-97

BODY [FJ, BJ, HJ6_SERIES] ENGINE HOOD, HINGE, LOCK & HOOD LOCK CONTROL CABLE

COMPONENTS

Fig. 12-1

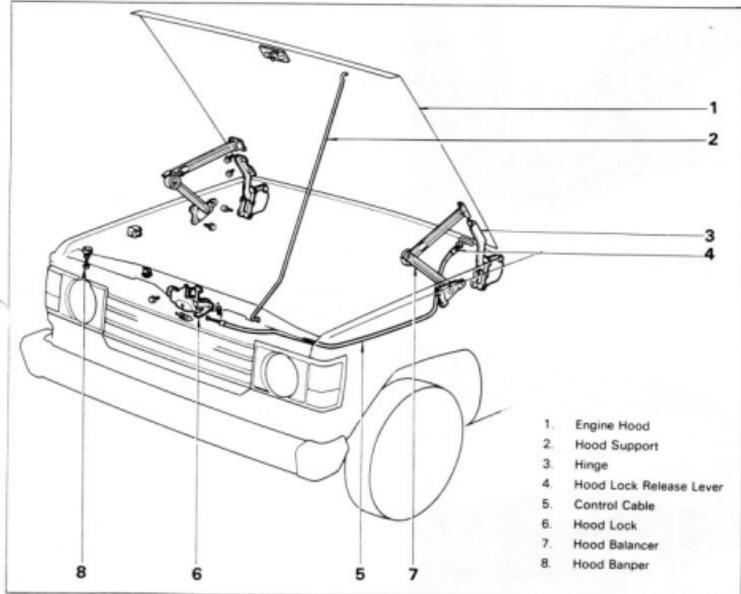
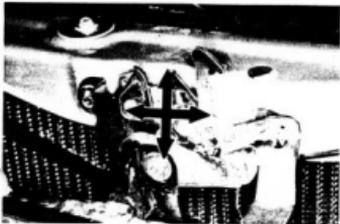


Fig. 12-2



ADJUSTMENT

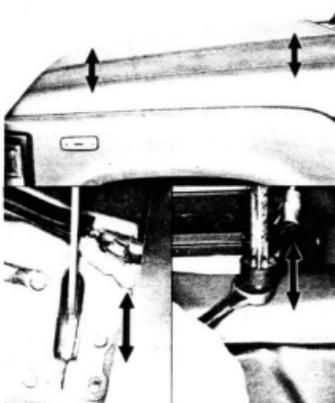
Loosen the 3 bolts and move the hood lock horizontally or vertically to adjust the hood.

Fig. 12-3



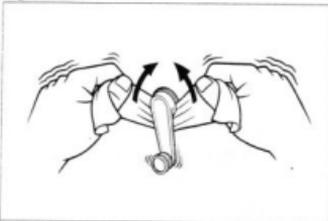
Adjust so that the left and right clearances between the fender and hood are equal.

Fig. 12-4



Adjust so that the heights of the fender and hood are equal.

Fig. 12-6



Before removing the handle, pull off the snap ring with a piece of cloth and remove the window regulator handle.

Fig. 12-7

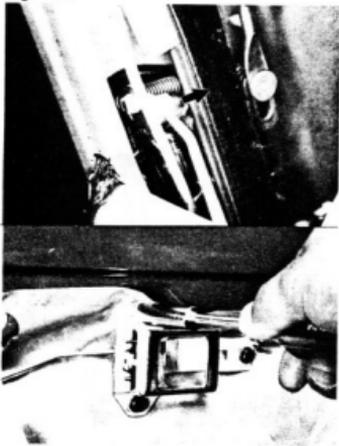


Insert a screwdriver between the door panel and retainers and pry out.

—Note—

Tape the screwdriver tip before use.

Fig. 12-8



Disconnect the control link and remove the inside handle.

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 12-9

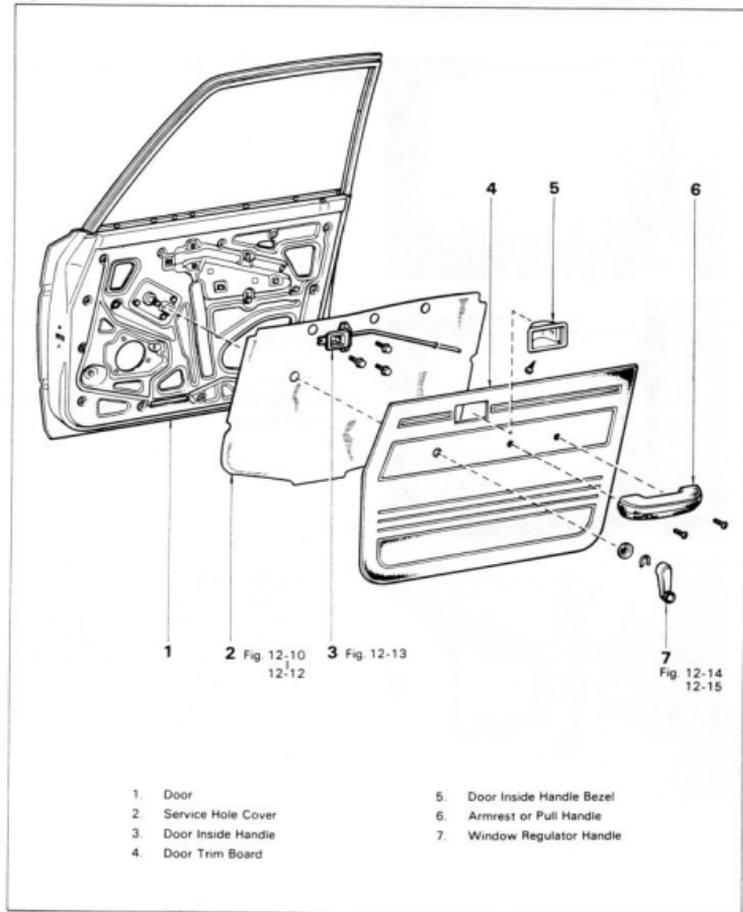
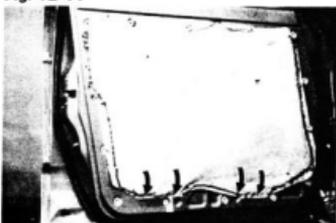


Fig. 12-10



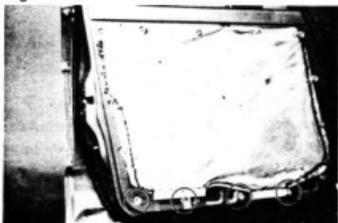
Seal the service hole cover with adhesive.

Fig. 12-11



Insert the lower edge of the service hole cover into the panel slit.

Fig. 12-12

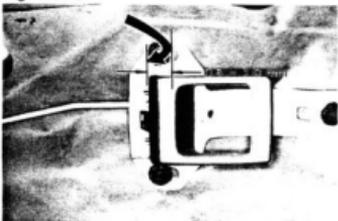


Seal the service hole cover with cotton-covered tape.

-Note-

Do not block the trim board clip seating with the tape.

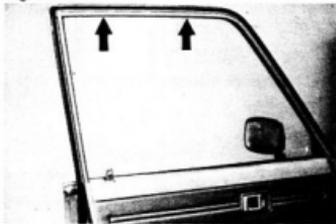
Fig. 12-13



Adjust the link play.

1. Loosen the screws.
2. Move the handle forward to the point where strong resistance is felt.
3. Move handle back 0.5 - 1.0 mm (0.020 - 0.039 in.) and tighten.

Fig. 12-14



Raise the window to the fully closed position.

Fig. 12-15



Install the door inside handle as shown in the figure.

DOOR GLASS**REMOVAL**

1. Remove the door trim and service hole cover.
(See Fig. 12-5 to 12-8)
2. Remove the parts in the numerical order shown in the figure.

Fig. 12-16

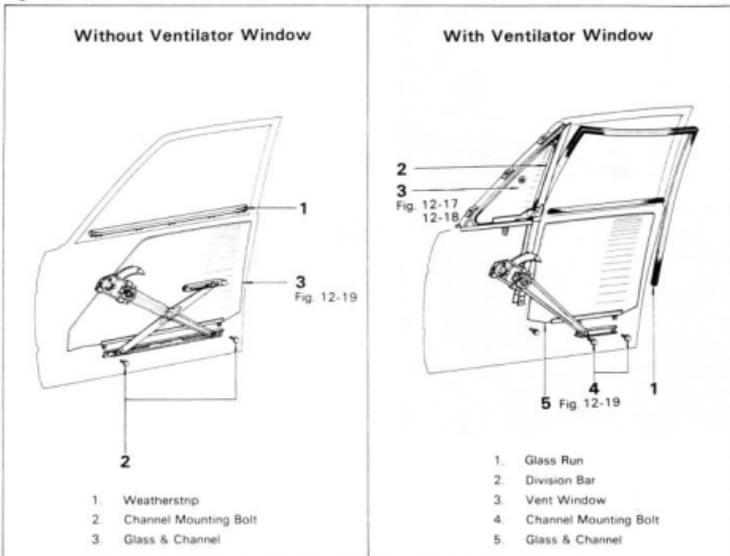
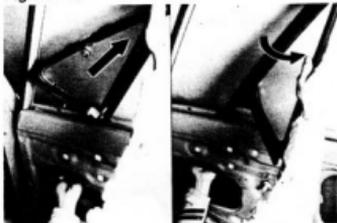


Fig. 12-17



 [Ventilator Window]
Remove the bolt

Fig. 12-18

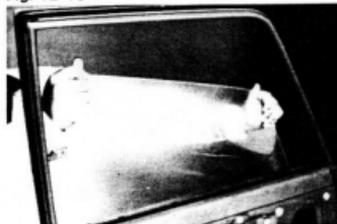


[Ventilator Window]

Take out the ventilator window.

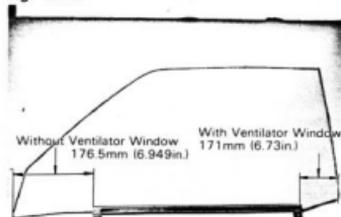
1. Pull up the ventilator window.
2. Turn the ventilator window to the left.

Fig. 12-19



Pull the glass upward to remove.

Fig. 12-20

**REPLACEMENT**

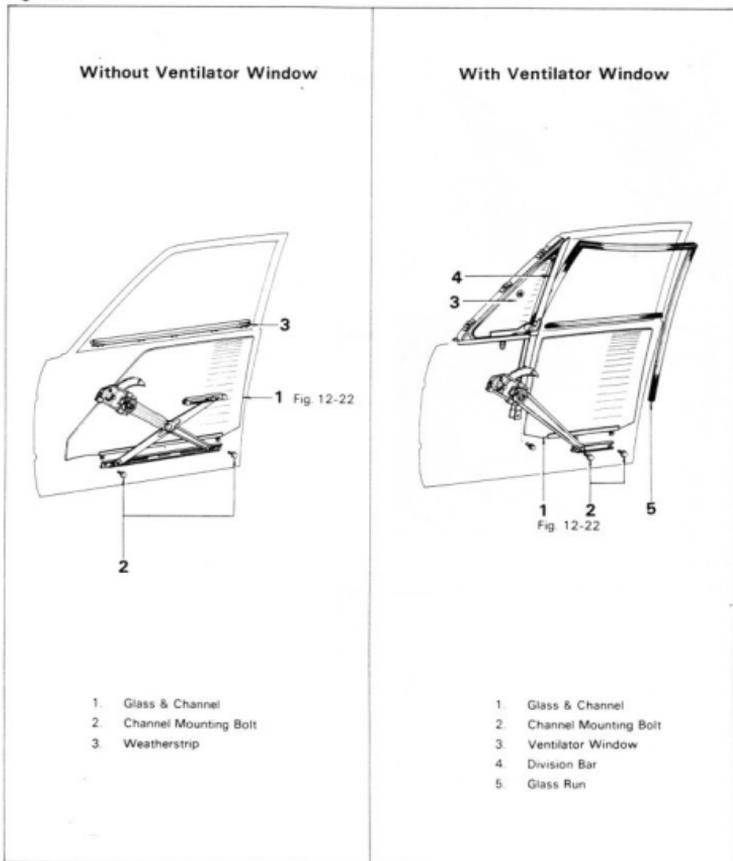
1. Remove the glass channel with a screwdriver or such.
2. Apply soapy water to the inside of the weatherstrip.
3. Install the channel by tapping it with a plastic hammer.



INSTALLATION

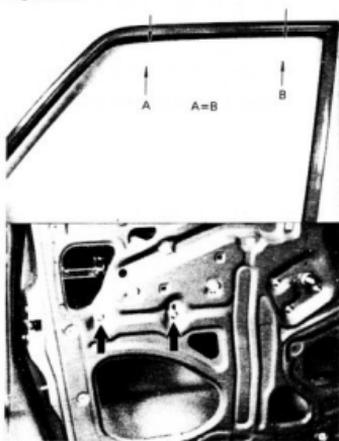
1. Install the parts in the numerical order shown in the figure.

Fig. 12-21



2. Install the service hole cover and door trim.
(See Fig 12-9 to 12-15)

Fig. 12-22



With the door glass in position as shown in the figure, tighten the equalizer arm bracket.

WINDOW REGULATOR**REMOVAL**

1. Remove the door trim and service hole cover.
(See Fig 12-5 to 12-8)
2. Remove the parts in the numerical order shown in the figure.

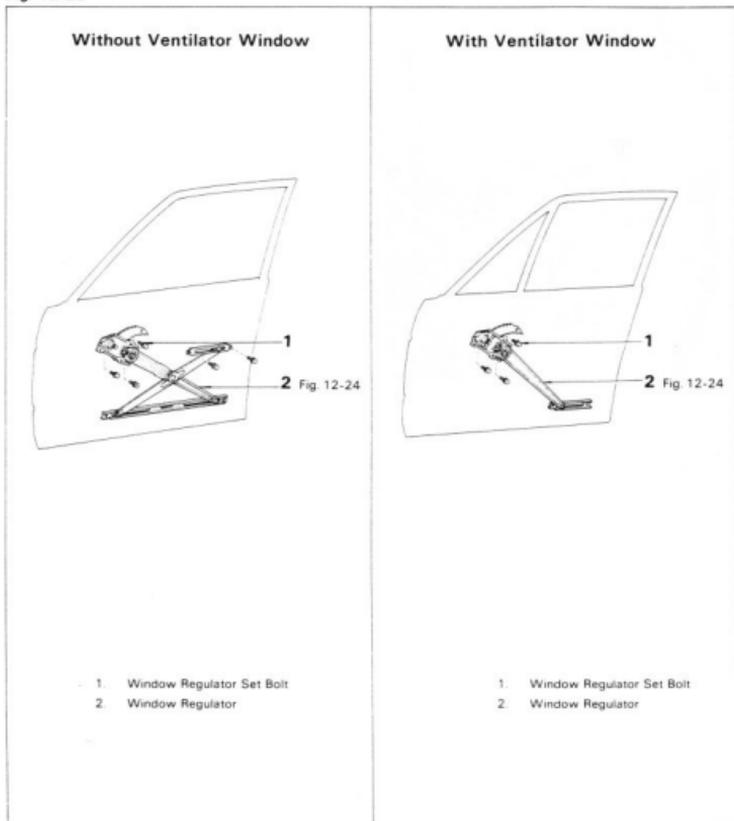
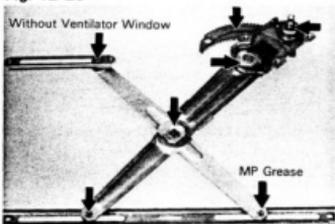
Fig. 12-23

Fig. 12-24



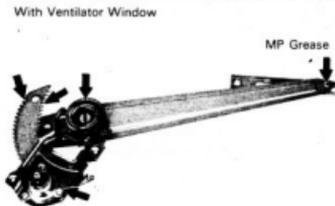
Remove the window regulator through the service hole.

Fig. 12-25

**INSPECTION**

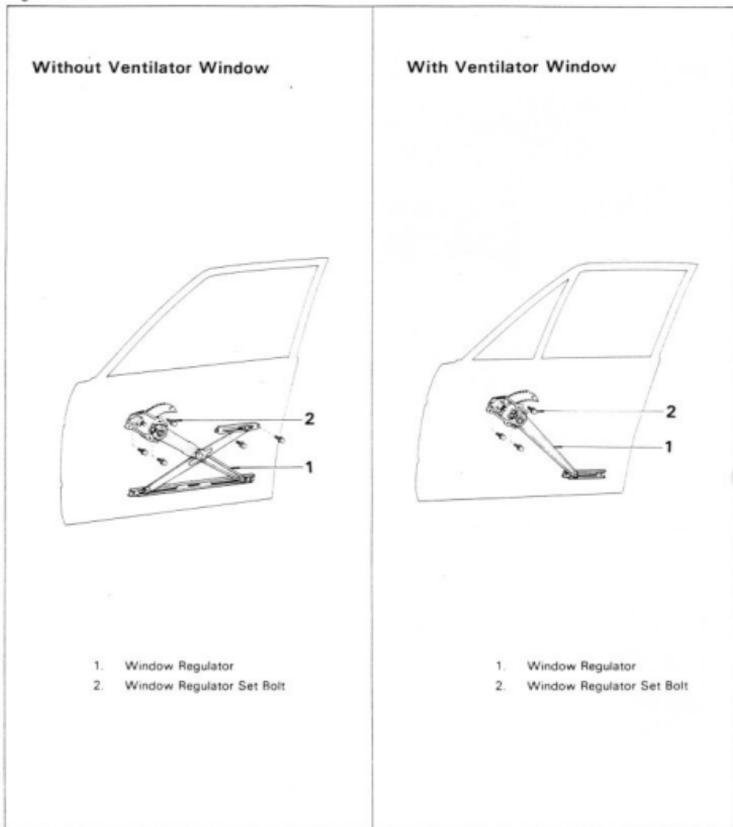
Check the following.

1. Gears for wear or damage
2. Spring for deterioration or breaks
3. Lubrication of regulator sliding parts



INSTALLATION

1. Install the parts in the numerical order shown in the figure.

Fig. 12-26

2. Install the service hole cover and door trim.
(See Fig. 12-9 to 12-15)

DOOR LOCK INSIDE HANDLE OUTSIDE HANDLE DOOR LOCK STRIKER

REMOVAL

1. Remove the door trim and service hole cover. (See Fig. 12-5 to 12-8)
2. Remove the parts in the numerical order shown in the figure.

Fig. 12-27

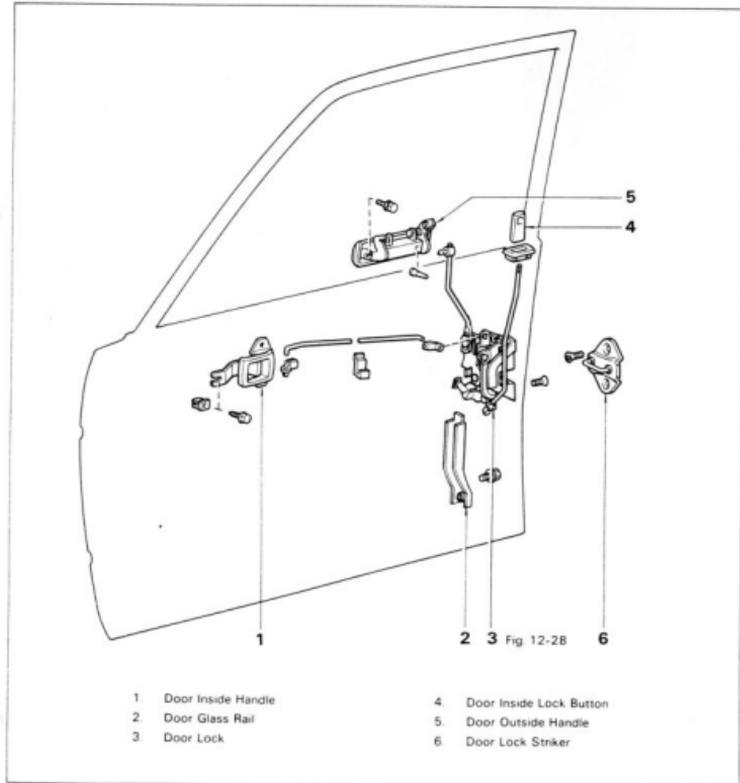
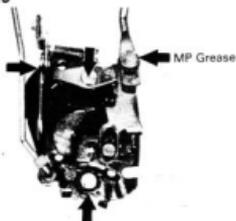


Fig. 12-28



Remove the door lock through the service hole.

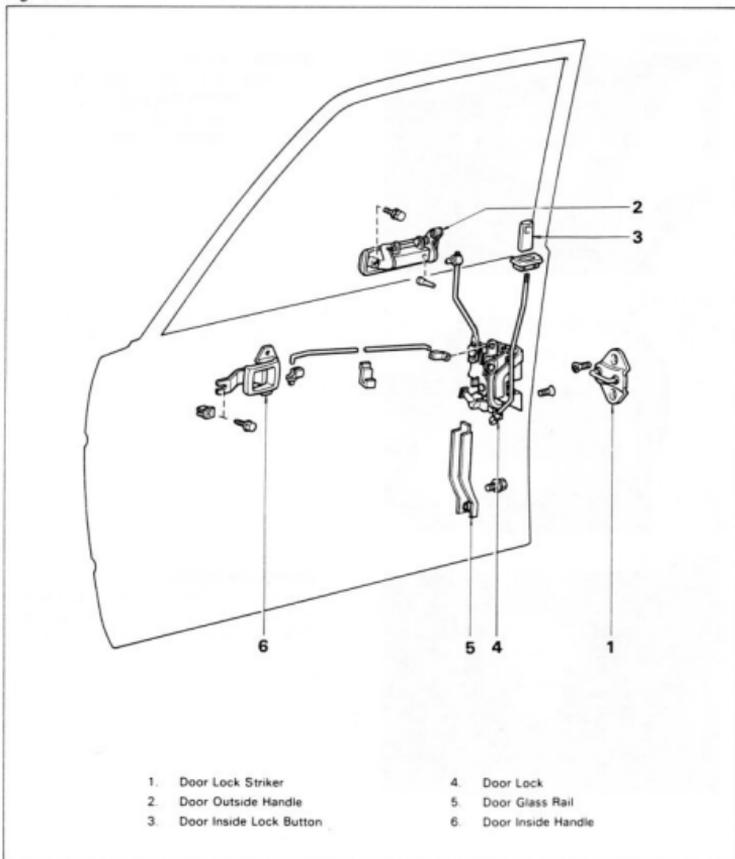
Fig. 12-29

**INSPECTION**

1. Operation of moving parts
2. Lubrication of lock sliding parts

INSTALLATION

1. Install the parts in the numerical order shown in the figure.

Fig. 12-30

2. Install the service hole cover and door trim.
(See Fig. 12-9 to 12-15)

Fig. 12-31

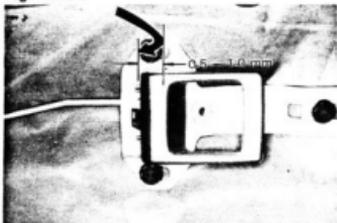


Fig. 12-32



Fig. 12-33

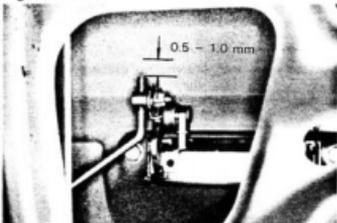
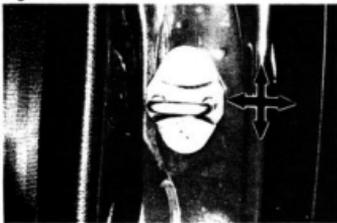


Fig. 12-34



ADJUSTMENT

Inside Handle

1. Loosen the screws.
2. Move the handle forward to the point where strong resistance is felt.
3. Move handle back 0.5 - 1.0 mm (0.020 - 0.039 in.) and tighten.

Outside Handle

1. Check the outside handle play.

Control link play:

0.5 - 1.0 mm

(0.020 - 0.039 in.)

2. Adjust the control link play to within 0.5 - 1.0 mm (0.020 - 0.039 in.).

Door Lock Striker

Open and close the door by the outside handle and adjust so that the door lock does not contact the striker.

DOOR PANEL & HINGE**REMOVAL**

Remove the parts in the numerical order shown in the figure.

Fig. 12-35

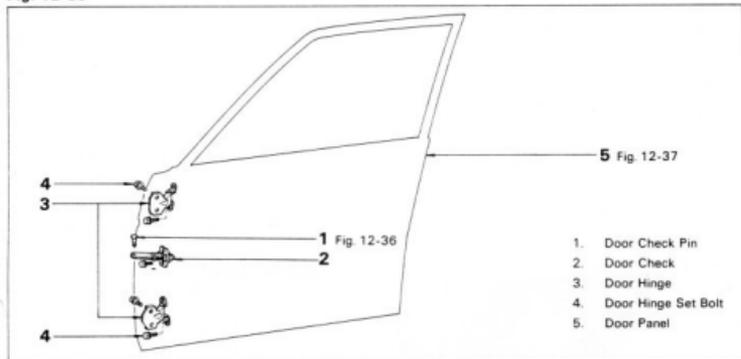


Fig. 12-36

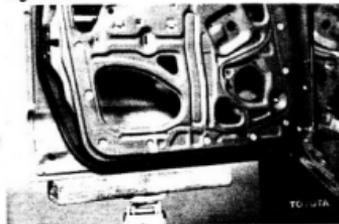


Push in the claw and pull up the pin.

— Note —

After removal, leave the claw raised.

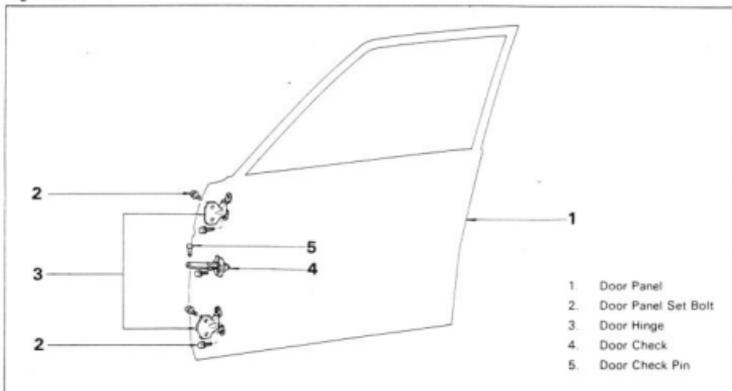
Fig. 12-37



Place a wooden block and cloth under the door panel and support it with a jack.

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 12-38**Fig. 12-39****Fig. 12-40****ADJUSTMENT**

1. Loosen the body hinge bolts with SST and adjust the door forward-rearward and up-down positions.
SST [09812-22010]
2. Loosen the door hinge bolts and adjust the left-right and up-down positions of the door.

REAR DOOR DOOR TRIM & SERVICE HOLE COVER

REMOVAL

Remove the parts in the numerical order shown in the figure.

Fig. 12-41

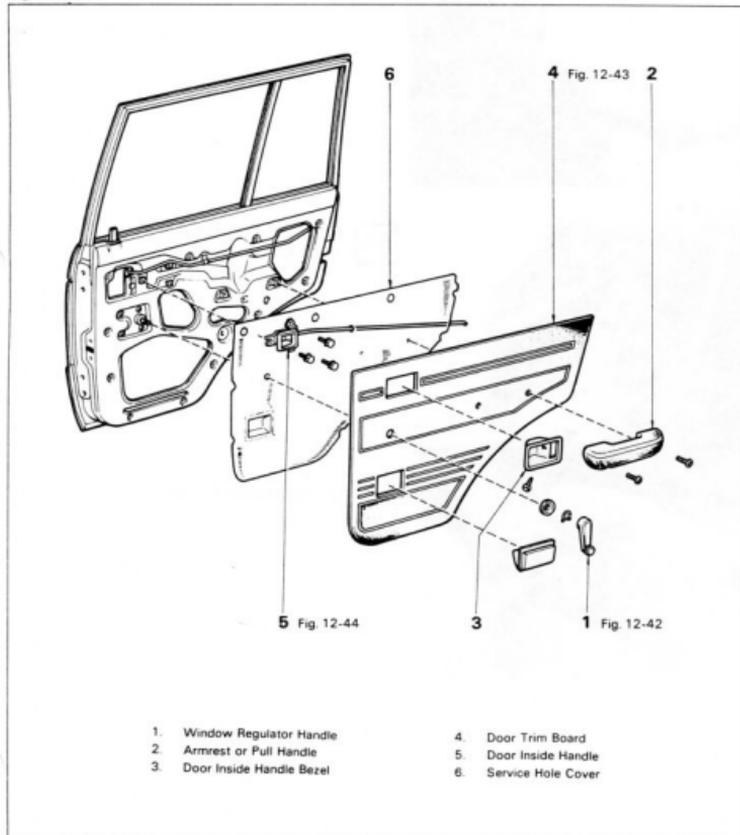
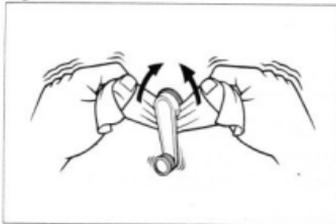


Fig. 12-42



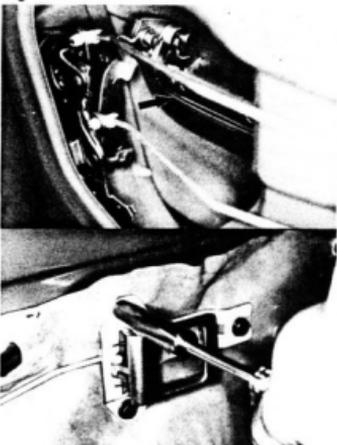
Before removing the handle, pull off the snap ring with a cloth and remove the window regulator handle.

Fig. 12-43



Insert a screwdriver between the panel and panel retainers and pry out.

Fig. 12-44



Remove the inside handle.

1. Disconnect the link.

2. Remove the handle.

INSTALLATION

Install the parts in numerical order shown in the figure.

Fig. 12-45

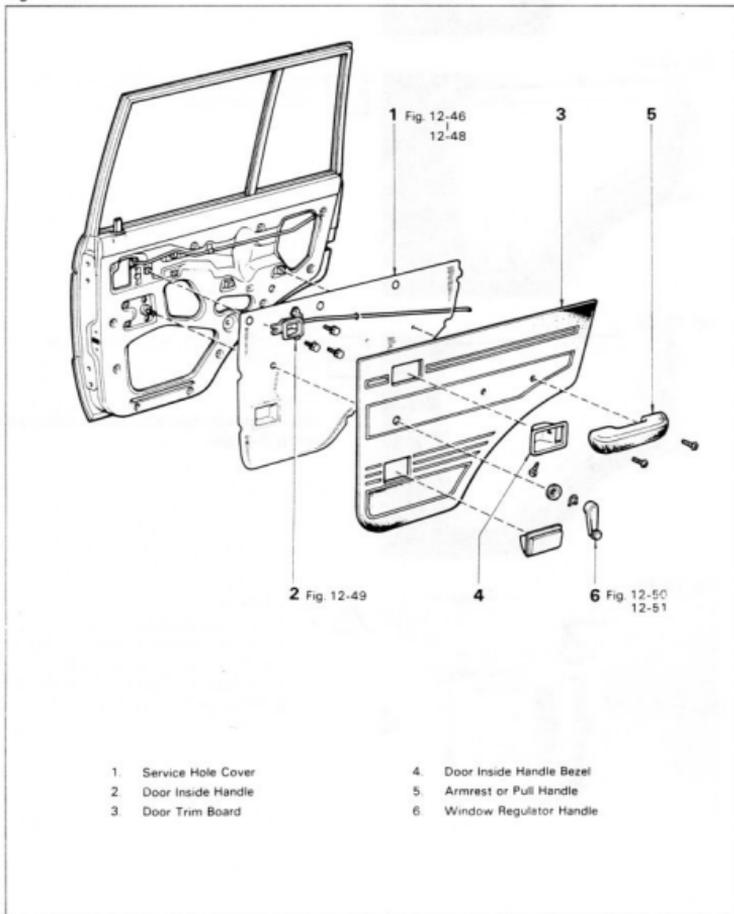
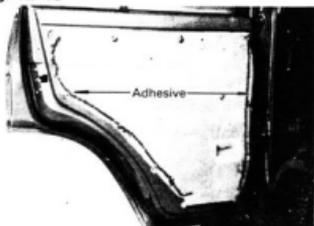
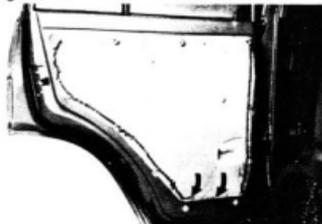


Fig. 12-46



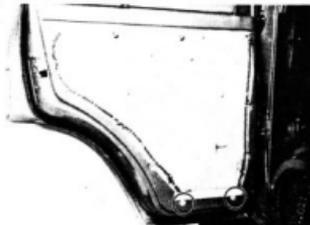
Seal the service hole cover with adhesive.

Fig. 12-47



Insert the lower edge of the service hole cover into the panel slit.

Fig. 12-48

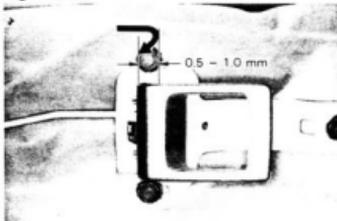


Seal the service hole cover with cotton-covered tape.

— Note —

Do not block the trim board clip seating with the tape.

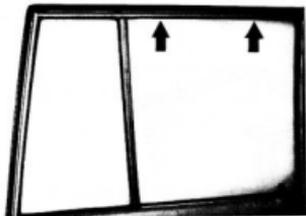
Fig. 12-49



Adjust the link play

1. Loosen the screws.
2. Move the handle forward to the point where strong resistance is felt.
3. Move handle back 0.5 - 1.0 mm (0.020 - 0.039 in.) and tighten.

Fig. 12-50



Raise the window to the fully closed position.

Fig. 12-51



Install the door inside handle as shown in the figure.

DOOR GLASS**REMOVAL**

1. Remove the door trim and service hole cover. (See Fig. 12-41 to 12-44)
2. Remove the parts in the numerical order shown in the figure.

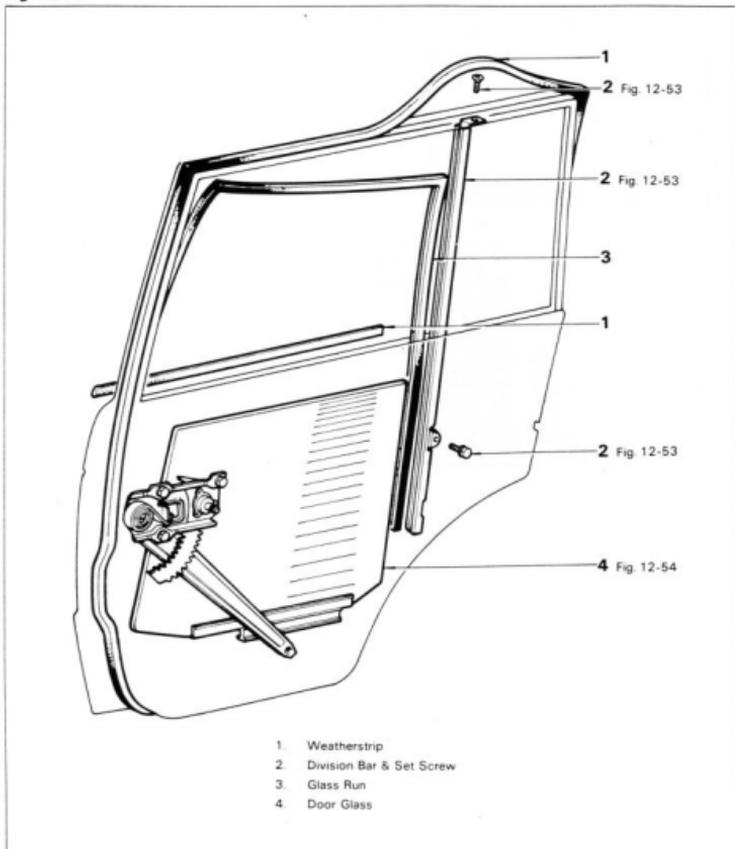
Fig. 12-52

Fig. 12-53



Remove the division bar and glass run.

Fig. 12-54



1. Remove the door glass from the regulator roller.
2. Pull the glass upward to remove.

Fig. 12-55

127.5 mm
(5.020 in.)



REPLACEMENT

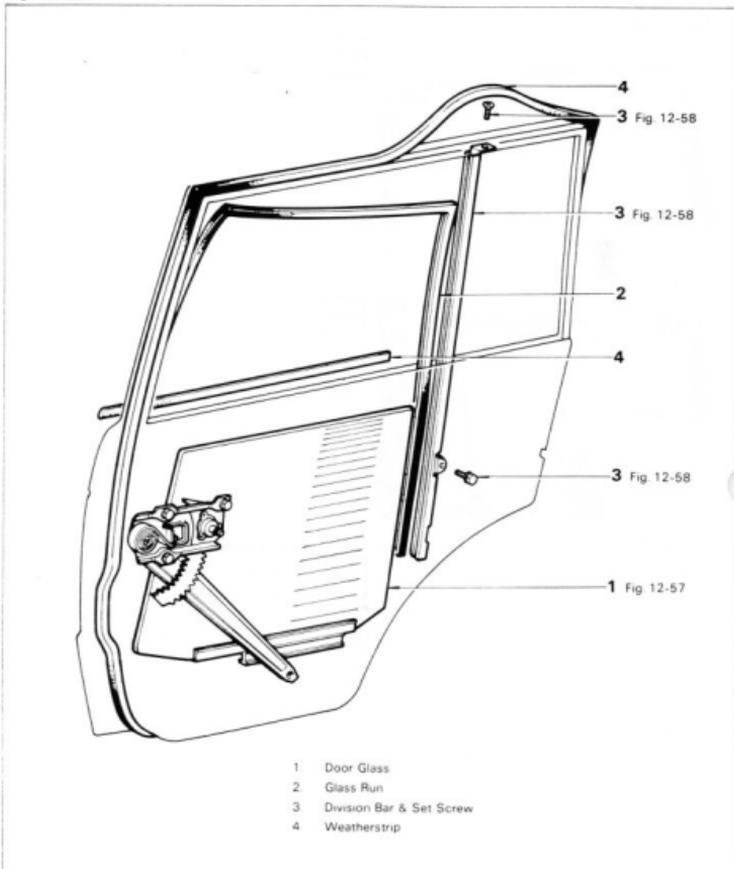


1. Remove the glass channel from the glass with a screwdriver.
2. Apply soapy water to weatherstrip.
3. Install the new glass by tapping it with a plastic hammer.

INSTALLATION

1. Install the parts in the numerical order shown in the figure.

Fig. 12-56



2. Install the service hole cover and door trim (See Fig 12-46 to 12-51)

Fig. 12-57



Install the door glass into the regulator roller.

Fig. 12-58



Install the division bar.

QUARTER WINDOW GLASS**REMOVAL**

1. Remove the door trim, service hole cover and door glass. (See Fig. 12-41 to 12-44)
2. Remove the parts in the numerical order shown in the figure.

Fig. 12-59

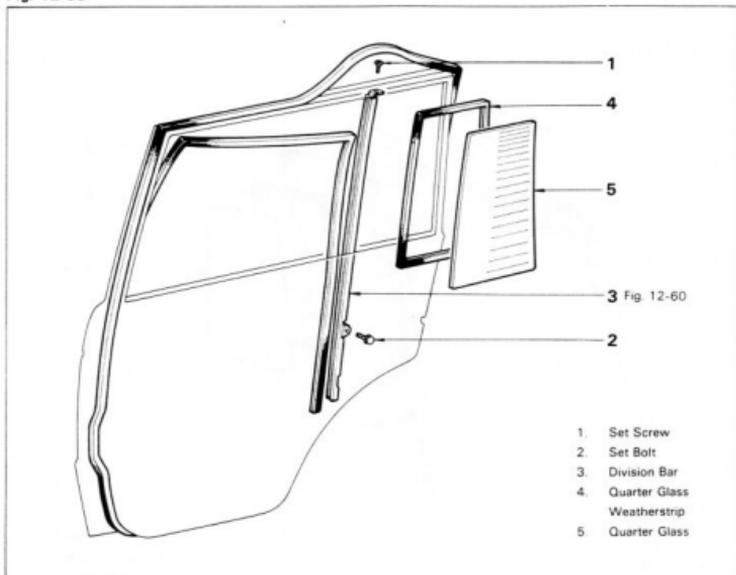


Fig. 12-60

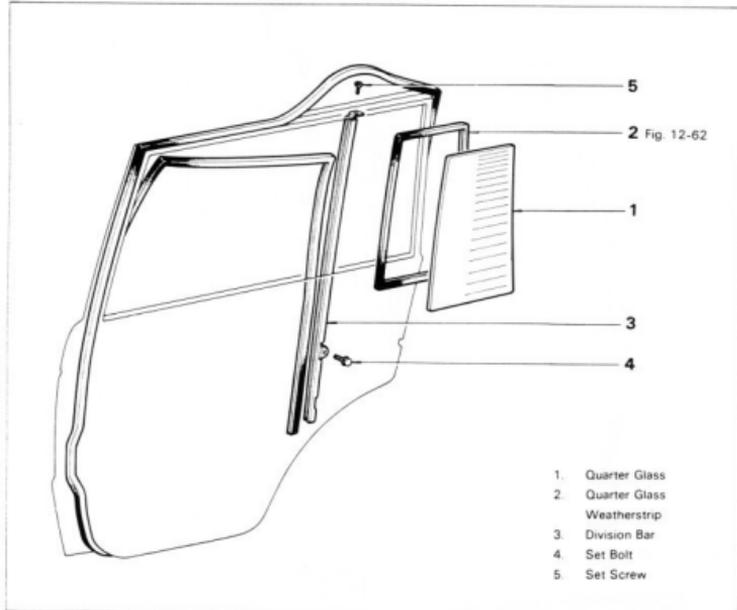


Remove the glass run and the division bar

INSTALLATION

1. Install the parts in the numerical order shown in the figure.

Fig. 12-61



2. Install the service hole cover and door trim.
 (See Fig. 12-45 to 12-51)

Fig. 12-62



Install the quarter window glass.

— Note —

Apply soapy water to the weatherstrip.

WINDOW REGULATOR**REMOVAL**

1. Remove the door trim and service hole cover.
(See Fig. 12-41 to 12-44)
2. Remove the parts in the numerical order shown in the figure.

Fig. 12-63

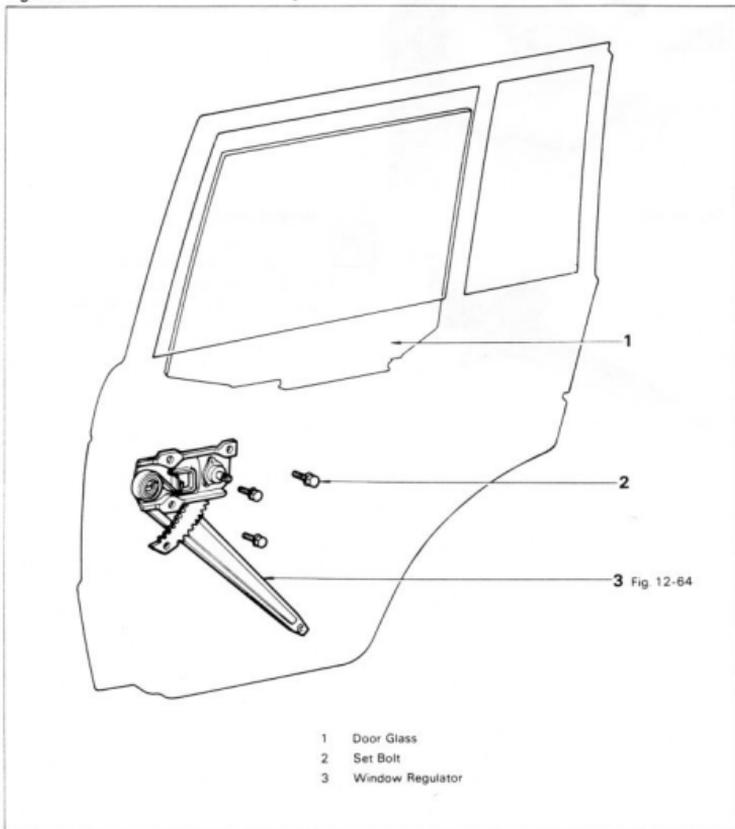
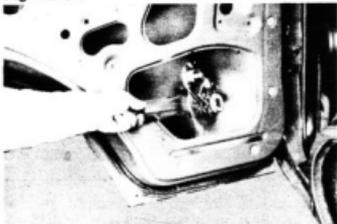


Fig. 12-64



After separating the glass from the regulator roller, raise the glass and remove the regulator from the service hole.

Fig. 12-65



INSPECTION

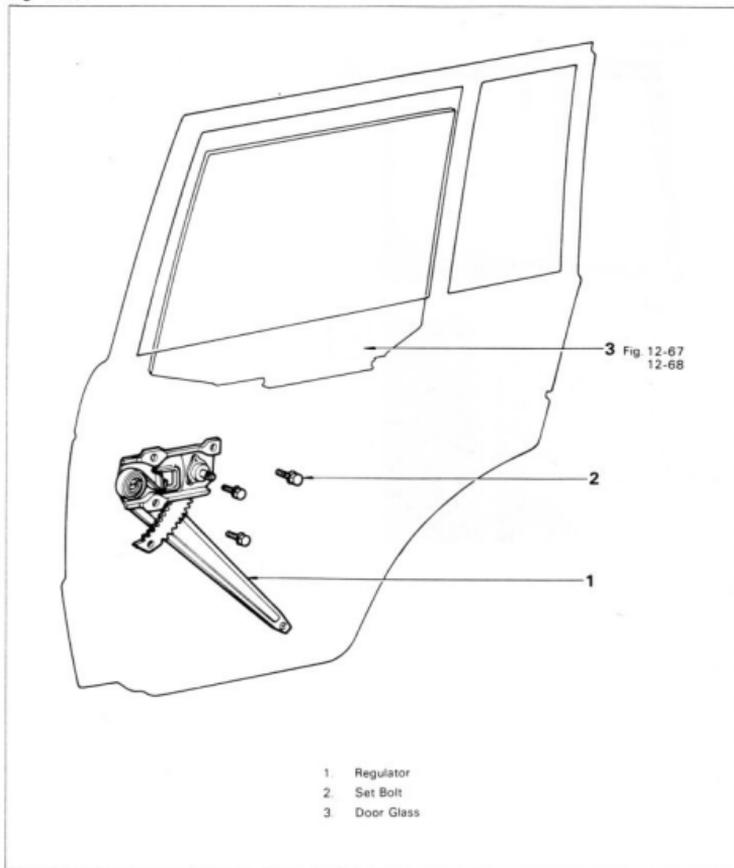
Check the following.

1. Gears for wear or damage
2. Spring for deterioration
3. Other components for damage
4. Lubrication of sliding parts

INSTALLATION

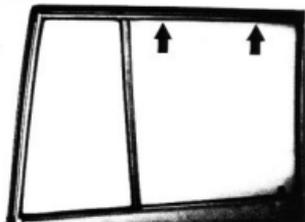
1. Install the parts in the numerical order shown in the figure.

Fig. 12-66



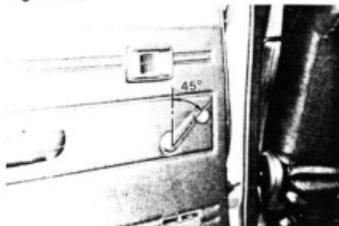
2. Install the service hole cover and door trim.
(See Fig. 12-45 to 12-51)

Fig. 12-67



Raise the window to the fully closed position.

Fig. 12-68



Install the regulator handle in position as shown in the figure.

**DOOR LOCK
INSIDE HANDLE
OUTSIDE HANDLE
DOOR LOCK STRIKER
COMPONENTS**

Fig. 12-69

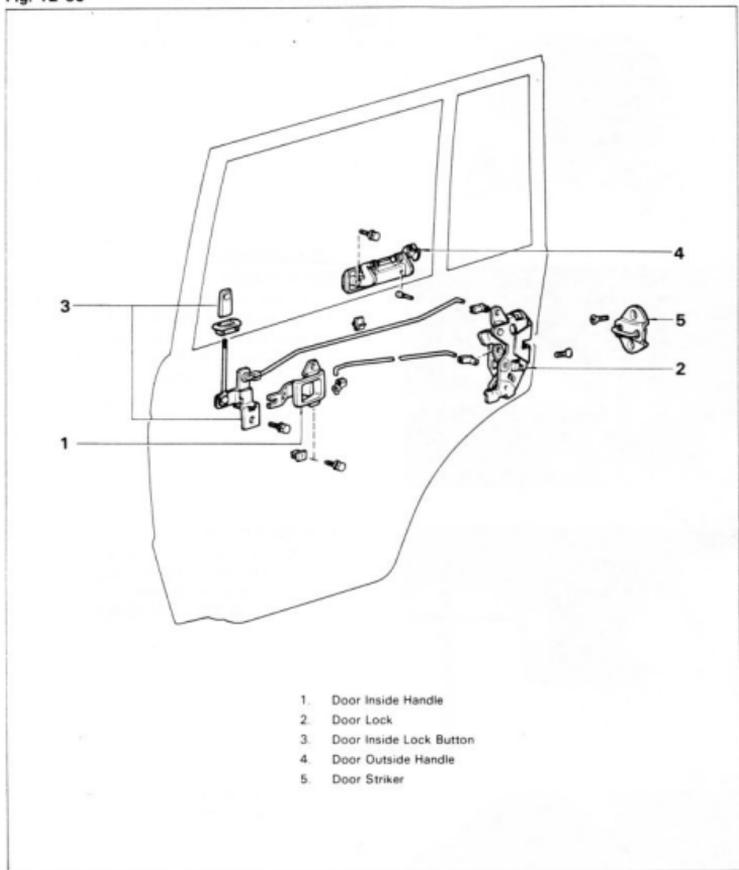
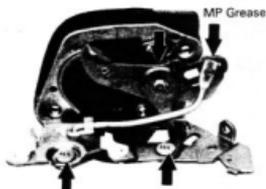
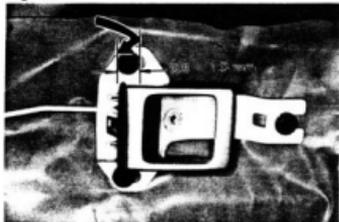


Fig. 12-70

**INSPECTION**

1. Operation of moving parts
2. Lubrication of lock sliding parts

Fig. 12-71

**ADJUSTMENT****Inside Handle**

1. Loosen the screws.
2. Move the handle forward to the point where strong resistance is felt.
3. Turn backward 0.5 - 1.0 mm (0.020 - 0.039 in.) and tighten.

Fig. 12-72

**Outside Handle**

1. Check the outside handle play.

Handle and lever gap:

0.5 - 1.0 mm

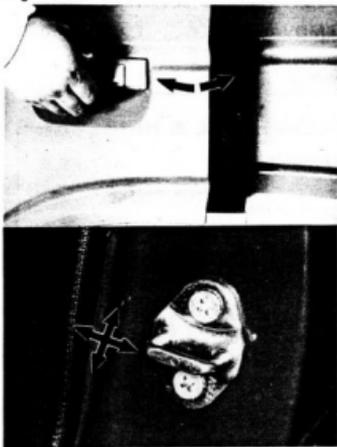
(0.020 - 0.039 in.)

Fig. 12-73



2. Set the outside handle and lever so that the gap between them is 0.5 - 1.0 mm (0.020 - 0.039 in.).

Fig. 12-74

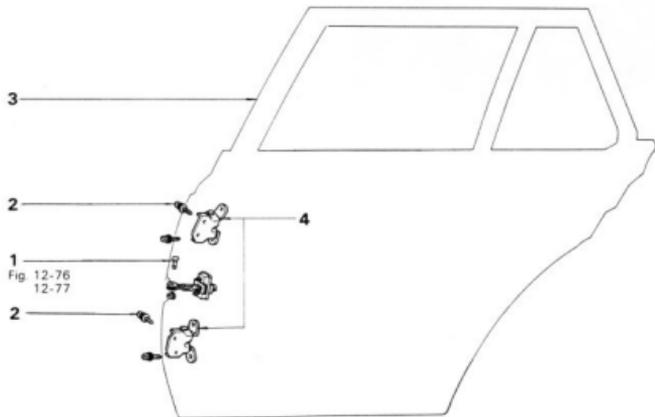
**Door Lock Striker**

Open and close the door with the outside handle and insure that the door lock does not contact the striker.

DOOR PANEL & HINGE**REMOVAL**

Remove the parts in the numerical order shown in the figure.

Fig. 12-75



1. Door Check Pin
2. Door Set Bolt
3. Door Panel
4. Hinge

Fig. 12-76



Place a wooden block under the door panel and support it with a jack.

Fig. 12-77



Depress the claws and pull out the pin.

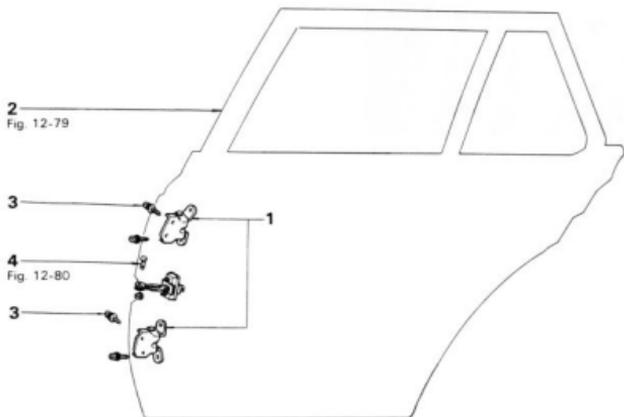
— Note —

Replace the pin if the claw is bent.

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 12-78



1. Hinge
2. Door Panel
3. Door Panel Set Bolt
4. Door Check Pin

Fig. 12-79



Place a wooden block under the panel and support it with a jack.

Fig. 12-80



Apply MP grease to the areas indicated by the arrow before installing the pin.

Fig. 12-81

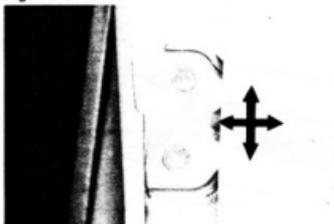
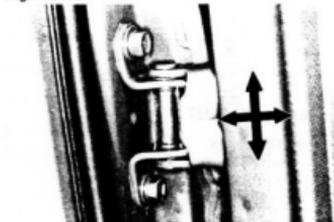


Fig. 12-82



ADJUSTMENT

1. Adjust the door forward-rearward and vertical directions by loosening the body side hinge bolts.
2. Adjust the door left-right and vertical directions by loosening the door side hinge bolts.

**BACK DOOR (LIFT GATE)
DAMPER STAY
GATE STAY
DOOR TRIM
COMPONENTS**

Fig. 12-83

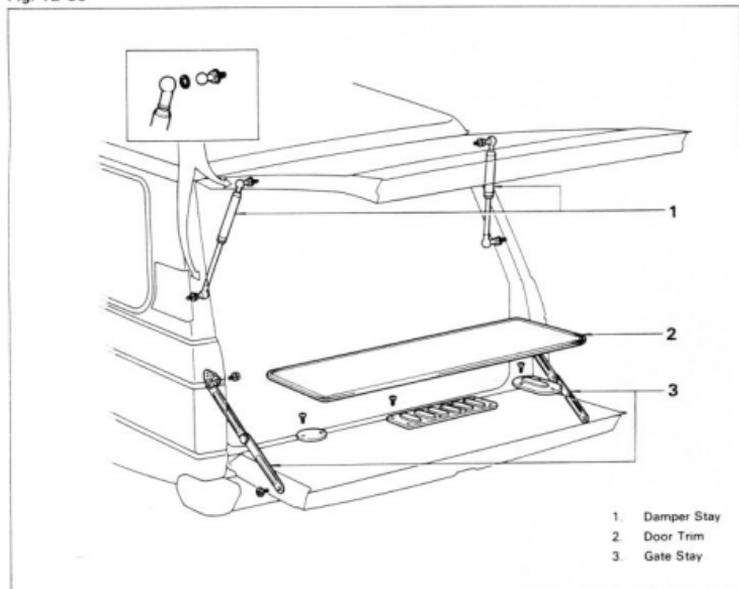
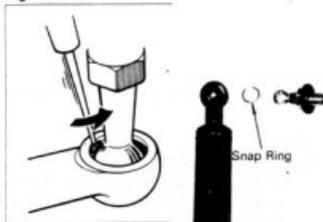


Fig. 12-84

**REPLACEMENT****Damper Stay**

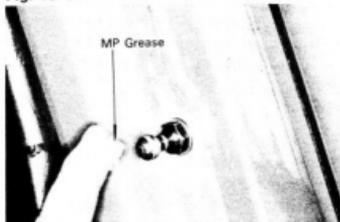
1. Remove the stud and stay together.

Fig. 12-85



2. Remove the snap ring and separate the stud from the stay.

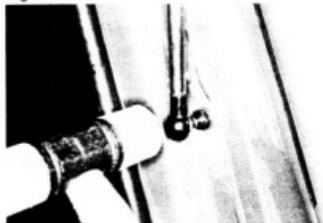
Fig. 12-86



3. Install the stud.

– Note –
Apply MP grease to the stud.

Fig. 12-87



4. First insert the snap ring and then tap with a plastic hammer.

Fig. 12-88



5. If the damper is being replaced, drill a 2 – 3 mm (0.08 – 0.12 in.) hole in the bottom of the removed damper cylinder to completely release the high pressure gas. (The gas is colourless, odorless and not poisonous. However, when drilling, chips may fly out. Work carefully!)

Fig. 12-89



- Note -

Handling the back door damper.

1. Do not disassemble the damper because the cylinder is filled with gas.
2. When working, handle the damper carefully. Never score or scratch the exposed part of the piston rod, and never allow paint or oil to adhere to it.
3. Do not turn the piston rod and cylinder with the damper fully extended.

Fig. 12-90

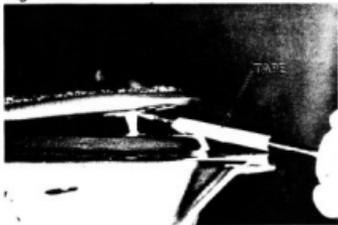


Gate Stay

Check the following.

1. Spring for deterioration
2. Other components for damage
3. Lubrication of sliding parts

Fig. 12-91



Door Trim

Remove the clips by prying with a screwdriver.

**DOOR LOCK
DOOR HANDLE
DOOR LOCK
DOOR LOCK STRIKER
LINK TURN BLOCK**

COMPONENTS

Fig. 12-92

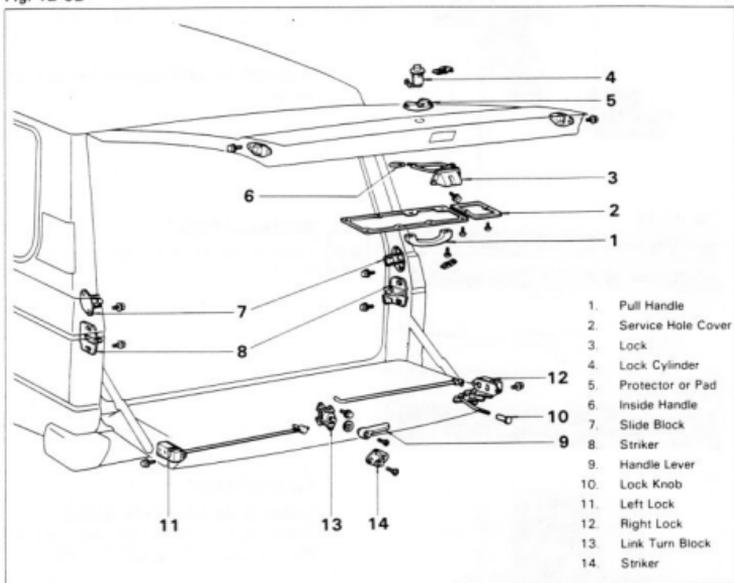


Fig. 12-93



INSPECTION



Lift Door Lock

1. Operation of moving parts
2. Lubrication of lock sliding parts

Fig. 12-94

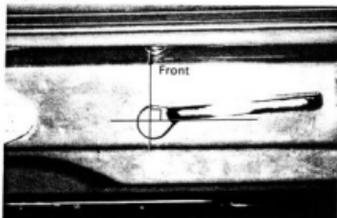
**Gate Door Lock**

1. Operation of moving parts
2. Lubrication of lock sliding parts

— Note —

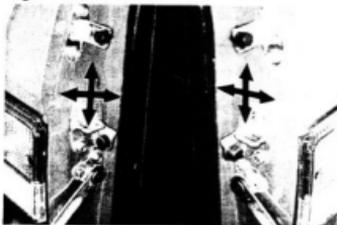
Assemble the child protector lever in a free state.

Fig. 12-95

**INSTALLATION**

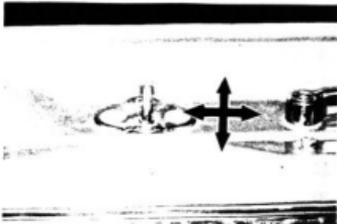
Install the door inside handle as shown in the figure.

Fig. 12-96

**ADJUSTMENT****Lower Gate Door Lock Striker**

Open and close the door and adjust so that the door lock does not contact the striker.

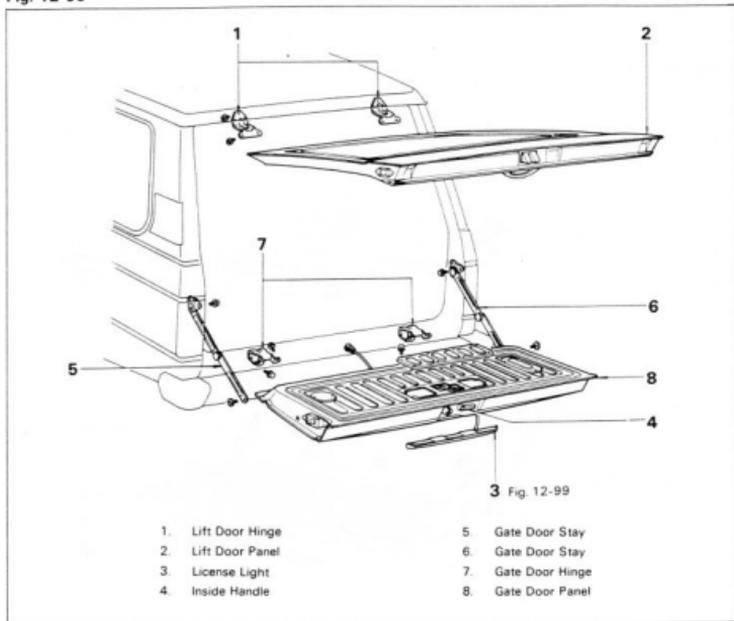
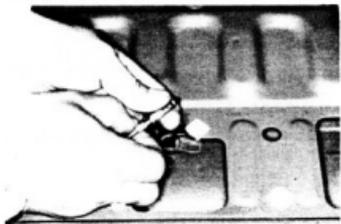
Fig. 12-97

**Upper Lift Door Lock Striker**

Open and close the door and adjust so that the door lock does not contact the striker.

DOOR PANEL & HINGE**REMOVAL**

Remove the parts in the numerical order shown in the figure.

Fig. 12-98**12-99**

Before removing the panel, disconnect the license light connector.

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 12-100

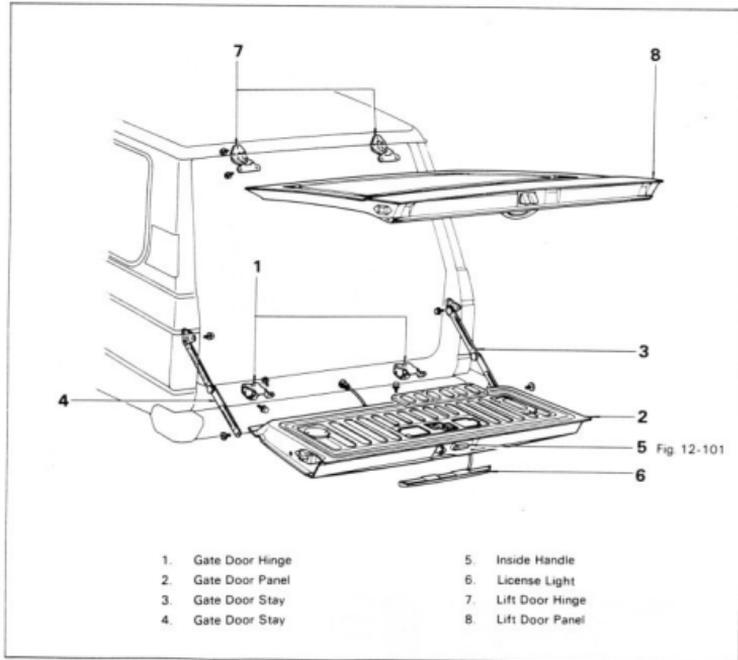
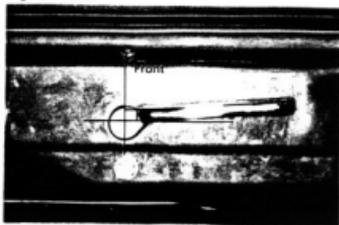
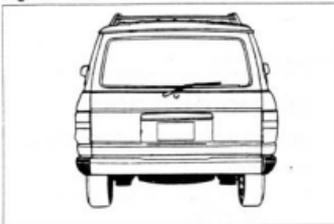


Fig. 12-101

**INSTALLATION**

Install the door inside handle as shown in the figure.

Fig. 12-102

**ADJUSTMENT**

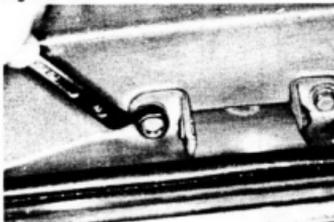
Check the door framework.

Fig. 12-103



Loosen the body hinge bolts and adjust the back door left-right and up-down positions.

Fig. 12-104



Loosen the door hinge bolts and adjust the left-right and forward-backward positions of the door.

Fig. 12-105

**SEE
BACK DOOR STRIKER
ADJUSTMENT
SECTION
Fig. 12-96 & 12-97**

Adjust the door lock striker

SWING OUT DOOR RIGHT BACK DOOR LOCK REMOVAL

Remove the parts in the numerical order shown in the figure.

Fig. 12-106

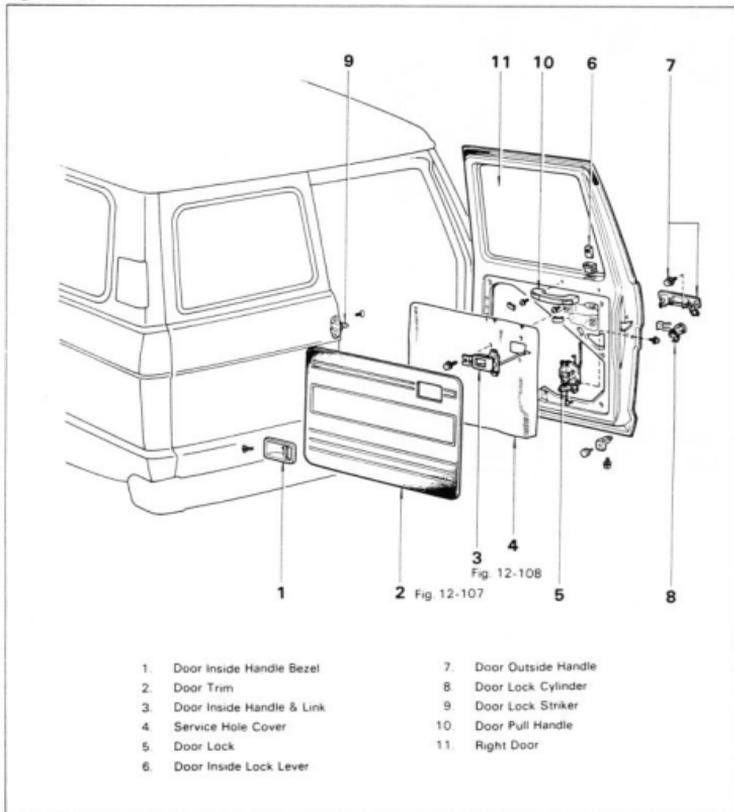
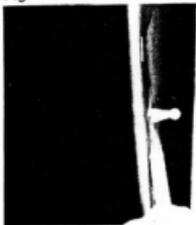


Fig. 12-107



Insert a screwdriver between the door panel and retainers and pry out.

— Note —
Tape the screwdriver before use.

Fig. 12-108



Remove the inside handle.

Fig. 12-109

MP Grease



INSPECTION

1. Operation of moving parts
2. Lubrication of lock sliding parts

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 12-110

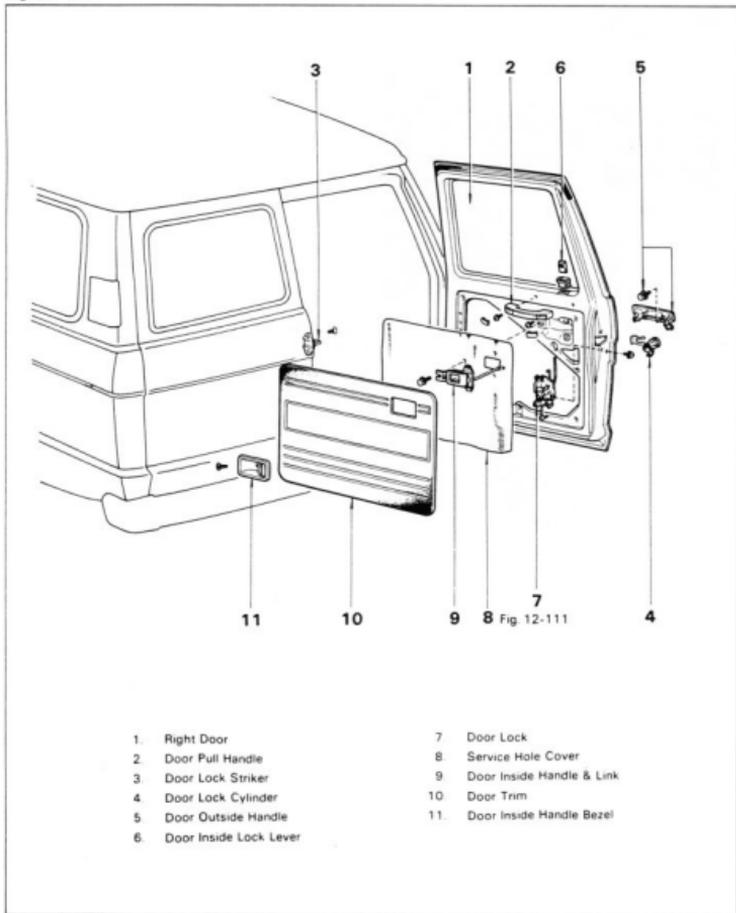
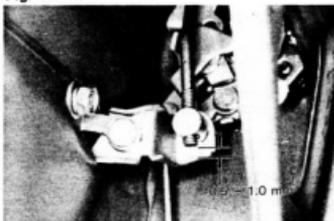


Fig. 12-111



Seal the service hole cover with adhesive.

Fig. 12-112



ADJUSTMENT

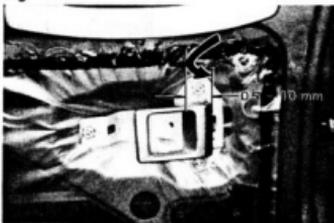
Outside Handle

1. Check the outside handle play.

Control link play:
0.5 - 1.0 mm
(0.020 - 0.039 in.)

2. Adjust the control link play.

Fig. 12-113



Inside Handle

1. Loosen the screws.
2. Move the handle forward to the point where strong resistance is felt.
3. Turn backward 0.5 - 1.0 mm (0.020 - 0.039 in.) and tighten.

Fig. 12-114



Door Lock Striker

Open and close the door by the outside handle and adjust so that the door lock does not contact the striker.

LEFT BACK DOOR LOCK REMOVAL

Remove the parts in the numerical order shown in the figure.

Fig. 12-115

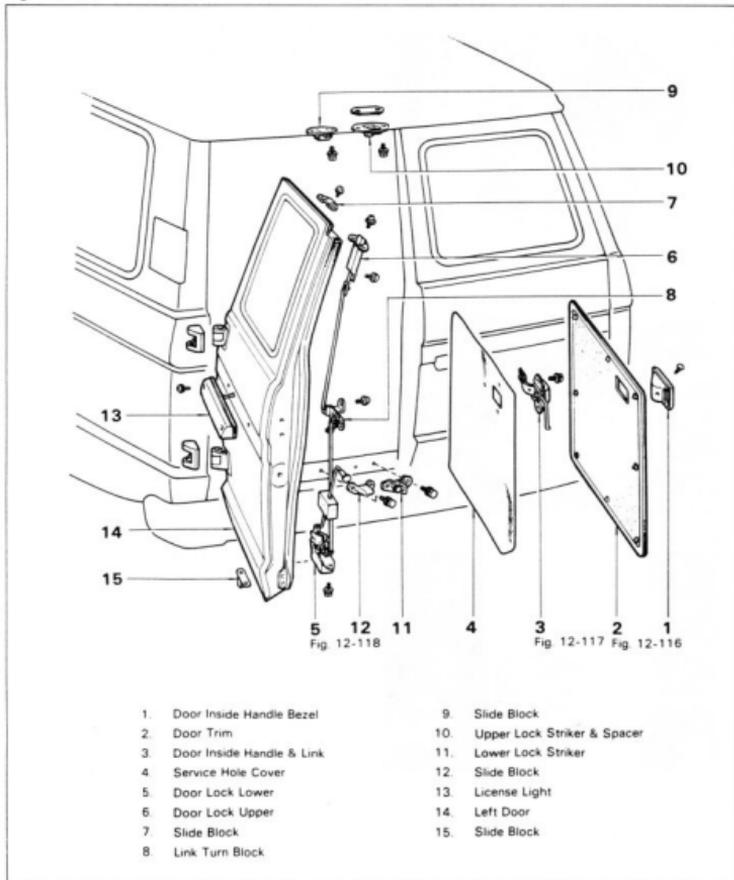


Fig. 12-116

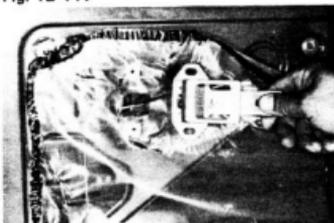


Insert a screwdriver between the door panel and retainers and pry out.

– Note –

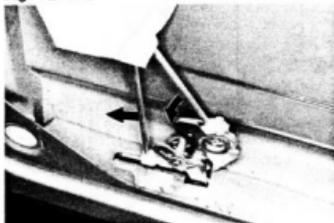
Tape the screwdriver tip before use.

Fig. 12-117



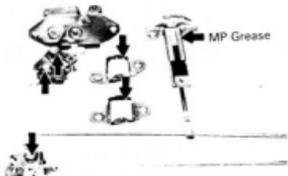
Remove the inside handle.

Fig. 12-118



Remove the link.

Fig. 12-119



INSPECTION

1. Operation of moving parts
2. Lubrication of lock sliding parts

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 12-120

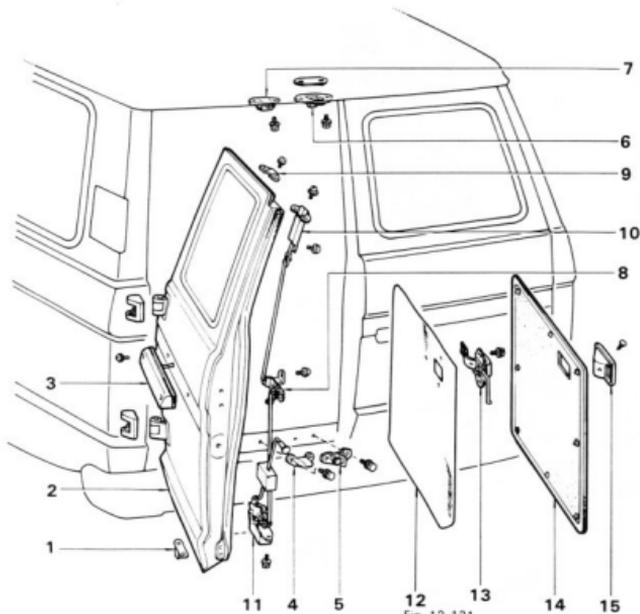
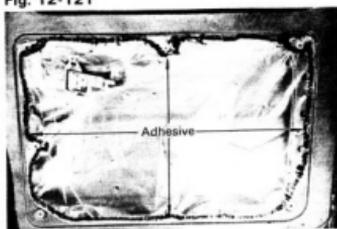


Fig. 12-121

- | | |
|-----------------------|-------------------------------|
| 1. Slide Block | 9. Slide Block |
| 2. Left Door | 10. Door Lock Upper |
| 3. License Light | 11. Door Lock Lower |
| 4. Slide Block | 12. Service Hole Cover |
| 5. Lower Lock Striker | 13. Door Inside Handle & Link |
| 6. Upper Lock Striker | 14. Door Trim |
| 7. Slide Block | 15. Door Inside Handle Bezel |
| 8. Link Turn Block | |

Fig. 12-121



Seal the service hole cover with adhesive.

Fig. 12-122

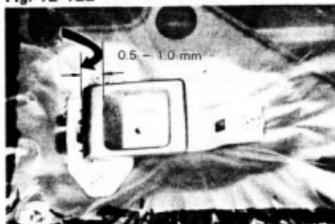


Fig. 12-123

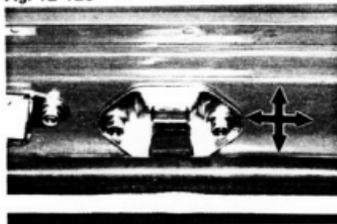
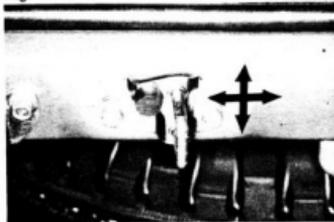


Fig. 12-124



ADJUSTMENT

Inside Handle

1. Loosen the screws.
2. Move the handle forward to the point where strong resistance is felt.
3. Turn backward 0.5 - 1.0 mm (0.020 - 0.039 in.) and tighten.

Door Lock Striker (Upper)

Loosen set screws and adjust so that the door closes softly.

— Note —

1. When closing the door be careful of the door upper indentations.
2. When opening the door be sure that there is no interference between the door check and upper lock.
If there is interference adjust the up-down direction.

Door Lock Striker (Lower)

Loosen the set screws and adjust so the door closes softly.

— Note —

1. When closing the door be careful of the door indentations.
2. If there is a door sag, adjust with the door hinge, not with the door lock striker.

Fig. 12-125

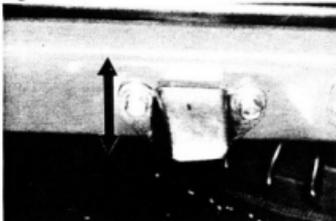


Fig. 12-126

**Slide Block**

Loosen the set screws and adjust so the door closes softly.

- Note -

1. When closing the door be careful of the door lower indentations.
2. When opening the door be sure that there is no interference between the door check and upper lock.
If there is interference, adjust the upper lock protrusion.

Door Lock Upper

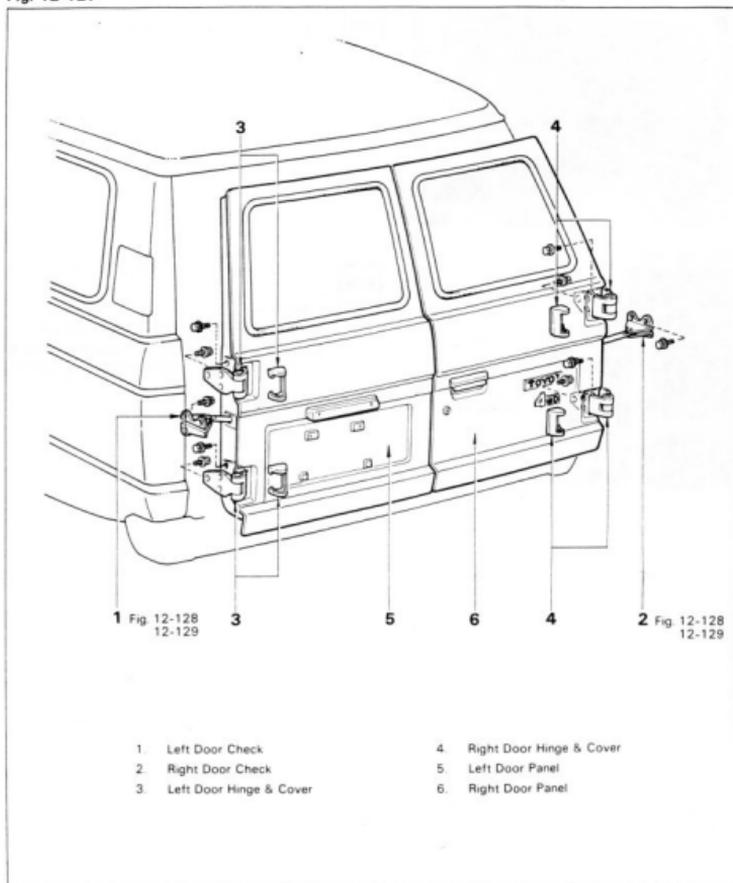
Before installing, turn the door upper lock rod and adjust the lock protrusion.

Protrusion:

Limit 14.5 ± 1.5 mm
(0.571 ± 0.059 in.)

DOOR PANEL**REMOVAL**

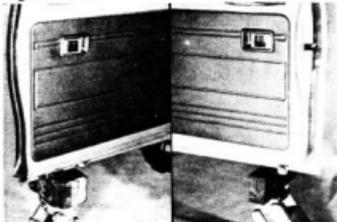
Remove the parts in the numerical order shown in the figure.

Fig. 12-127

1. Left Door Check
2. Right Door Check
3. Left Door Hinge & Cover

4. Right Door Hinge & Cover
5. Left Door Panel
6. Right Door Panel

Fig. 12-128



Place a wooden block under the door panel and support it with a jack. Then remove the hinge body mounting bolts.

Fig. 12-129



Push in the claw and pull up the pin.

— Note —

1. After removal, leave claw raised.
2. Apply MP grease to the area indicated by the arrow before installing the pin.

INSTALLATION

Install the parts in the numerical order shown in the figure.

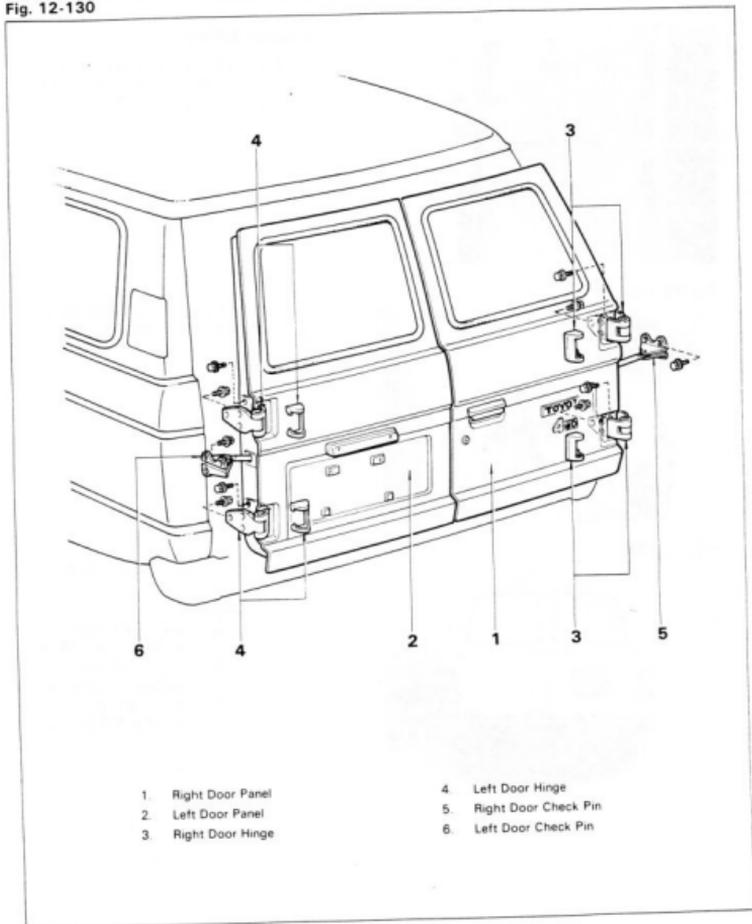
Fig. 12-130

Fig.12-131

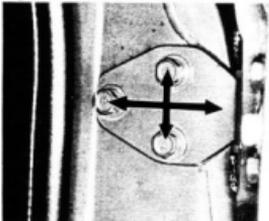


Fig. 12-132



Fig. 12-133

**ADJUSTMENT**

1. Adjust the door forward-rearward and vertical directions by loosening the body side hinge bolts.
2. Adjust the door left-right and vertical directions by loosening the door side hinge bolts.
3. Check back the door framework.

Clearance:

- | | |
|---|-------------------------------------|
| A | 5.8 ± 2.0 mm
(0.228 ± 0.079 in.) |
| B | 0.2 - 2.0 mm
(0.008 - 0.079 in.) |
| C | 0.2 - 2.0 mm
(0.008 - 0.079 in.) |

WINDSHIELD**REMOVAL**

Remove the parts in the numerical order shown in the figure.

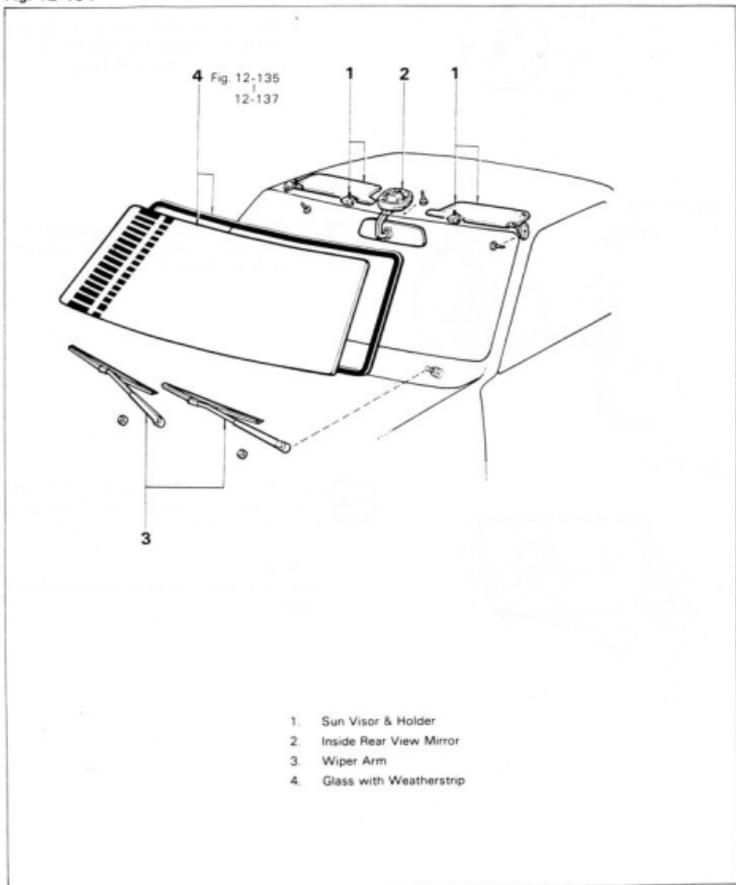
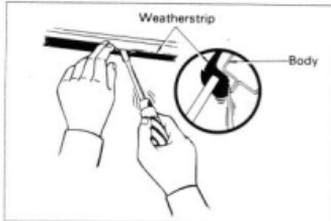
Fig. 12-134

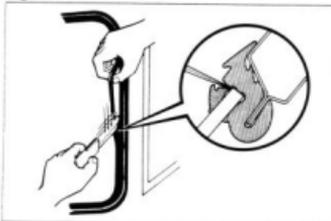
Fig. 12-135



Remove the glass by one of the following two methods.

1. When reusing the weatherstrip.
Working from the vehicle inside with a screwdriver push the weatherstrip lip to the outside of the body flange.

Fig. 12-136



2. When not reusing the weatherstrip.
From the outside cut off the weatherstrip lip with a knife.

Fig. 12-137



Push the glass surface near the upper side of the weatherstrip toward the outside and remove the glass.

- Note -

Use a uniform force when pushing out glass.

INSTALLATION

Install the parts in the numerical order shown in the figure.

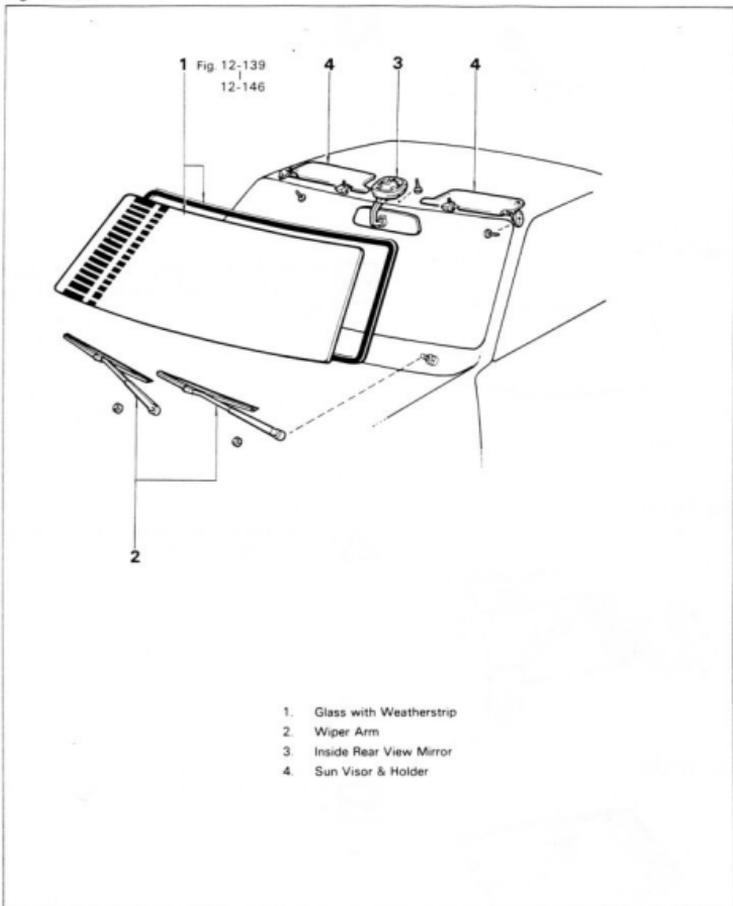
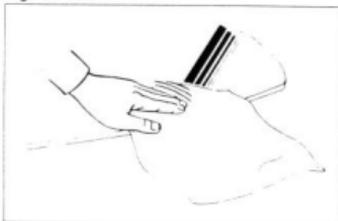
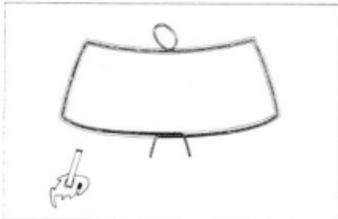
Fig. 12-138

Fig. 12-139



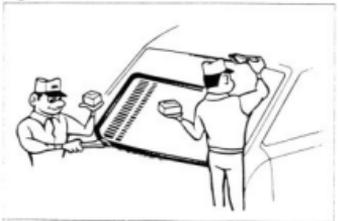
Wipe off any adhesive left on the body or glass with alcohol or white spirits.
(For windshield glass only)

Fig. 12-140



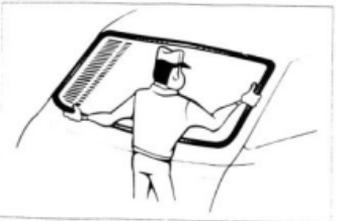
Mount the weatherstrip on the glass, and fit the installation cord in the weatherstrip body groove.

Fig. 12-141



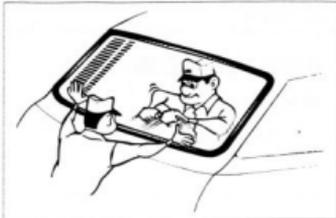
Apply soapy water to the weatherstrip and body contacting surfaces.

Fig. 12-142



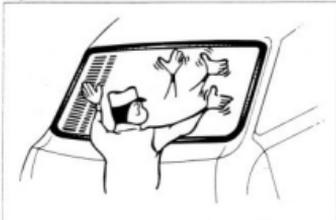
Position the windshield accurately on the body.

Fig. 12-143



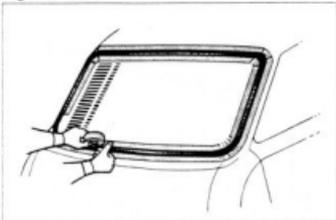
Pull the cords from inside and, at the same time, tap the glass surface near the weatherstrip with the palm of the hand from the outside. Begin installation from the lower center.

Fig. 12-144



After installing the glass, tap it from the outside with the palm of the hand until it is fully seated.

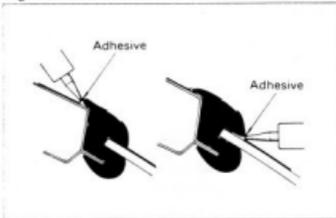
Fig. 12-145



Put adhesive between the weatherstrip and vehicle body and between weatherstrip and glass.

1. Before putting on adhesive, place masking tape on the glass and vehicle body to allow easy removal of excess adhesive that oozes out.

Fig. 12-146



2. Fill in the adhesive from the outside.

SIDE WINDOW**REMOVAL**

Remove the parts in the numerical order shown in the figure.

Fig. 12-147

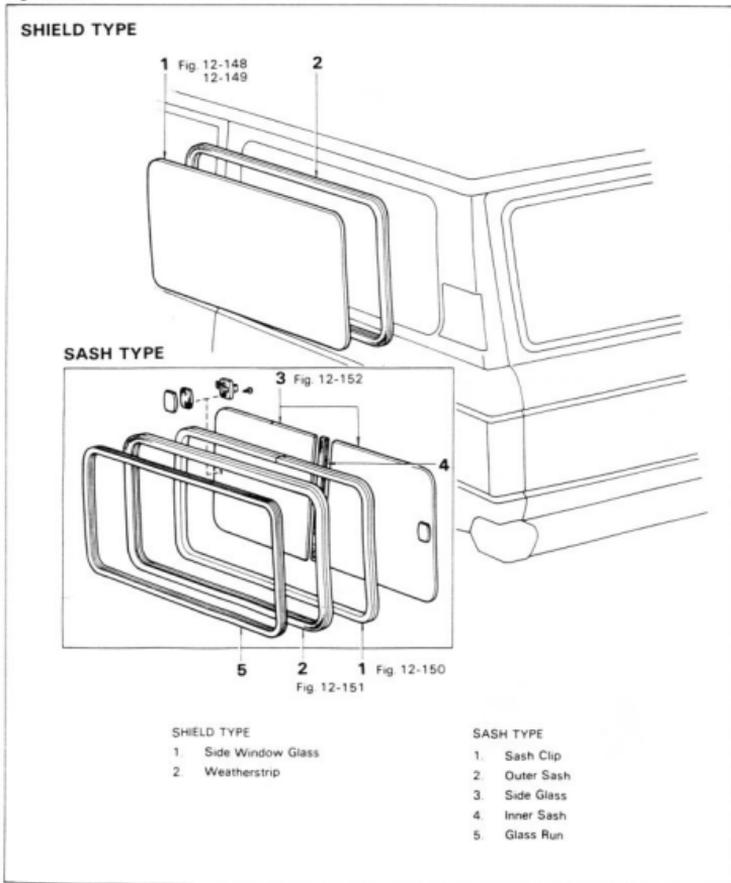
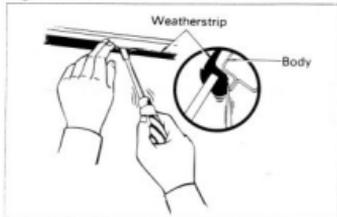


Fig. 12-148

**[SHIELD TYPE]**

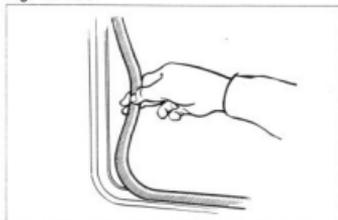
Remove the weatherstrip adhesive from the body with a scraper.

Fig. 12-149



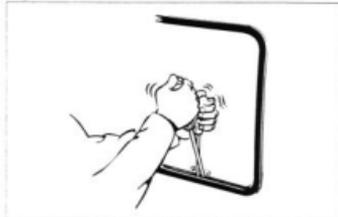
From inside push out the weatherstrip lip with a screwdriver.

Fig. 12-150

**[SASH TYPE]****REMOVAL**

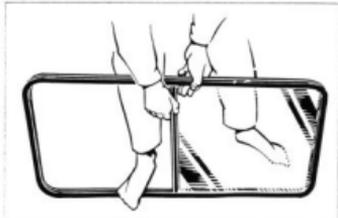
Remove the window frame clips.

Fig. 12-151



Remove the window frame by cutting the adhesive with screwdrivers or such.

Fig. 12-152

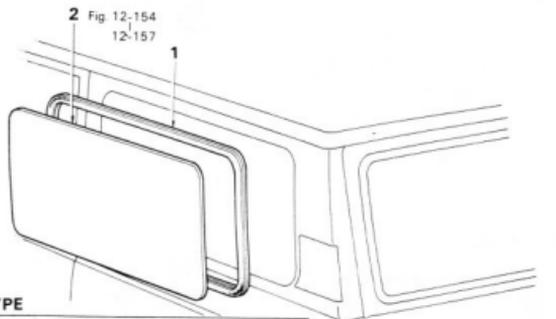
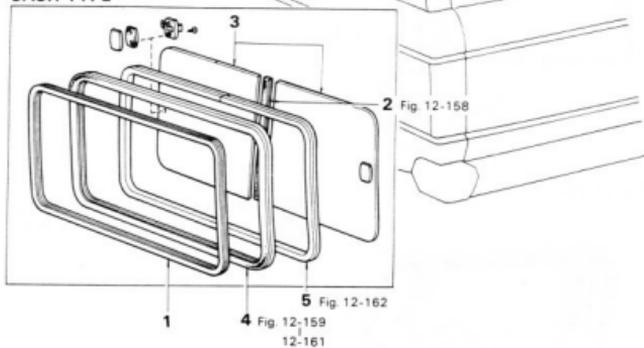


Spread the upper and lower portions of the frame center and take out glass.

- Note -**To prevent glass from dropping, support it with fingers.**

INSTALLATION

Install the parts in the numerical order shown in the figure.

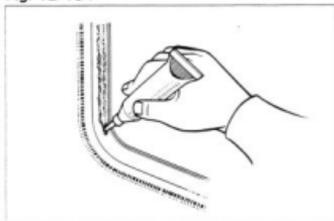
Fig. 12-153**SHIELD TYPE****SASH TYPE****SHIELD TYPE**

1. Weatherstrip
2. Side Window

SASH TYPE

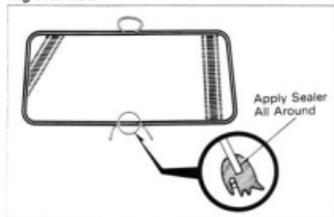
1. Glass Run
2. Inner Sash
3. Side Glass
4. Outer Sash
5. Sash Clip

Fig. 12-154



Apply adhesive to the body side.

Fig. 12-155

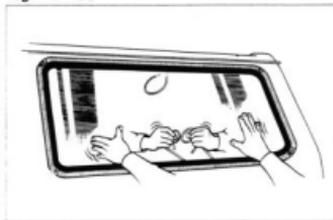


Attach string as shown in the figure.

— Note —

Apply adhesive to the weatherstrip inside.

Fig. 12-156



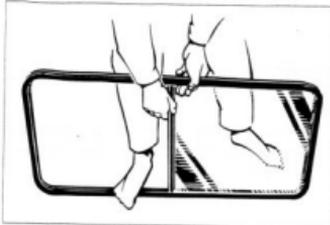
Install glass by pushing from the outside and pulling the string from the inside.

Fig. 12-157



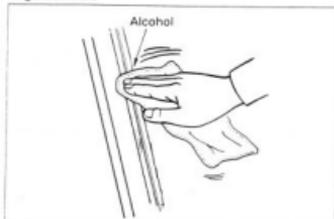
Tap the glass from the outside to work in the weatherstrip.

Fig. 12-158

**[SASH TYPE]**

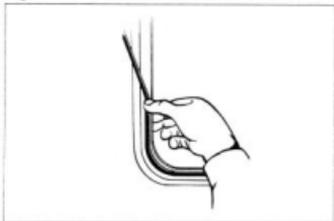
Pull a part the sash and install the inner sash.

Fig. 12-159



Clean the body side.

Fig. 12-160



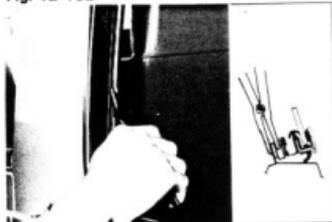
Apply adhesive tape around the body.

Fig. 12-161



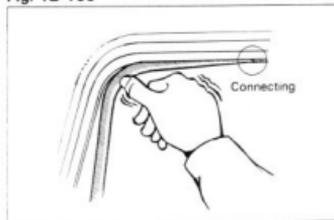
Install the window frame.

Fig. 12-162



To compress the adhesive tap squeeze the frame and body edge portion together with a pair pliers.

Fig. 12-163



Install the clips on the body and frame edge.

BACK DOOR GLASS COMPONENTS

Fig. 12-164

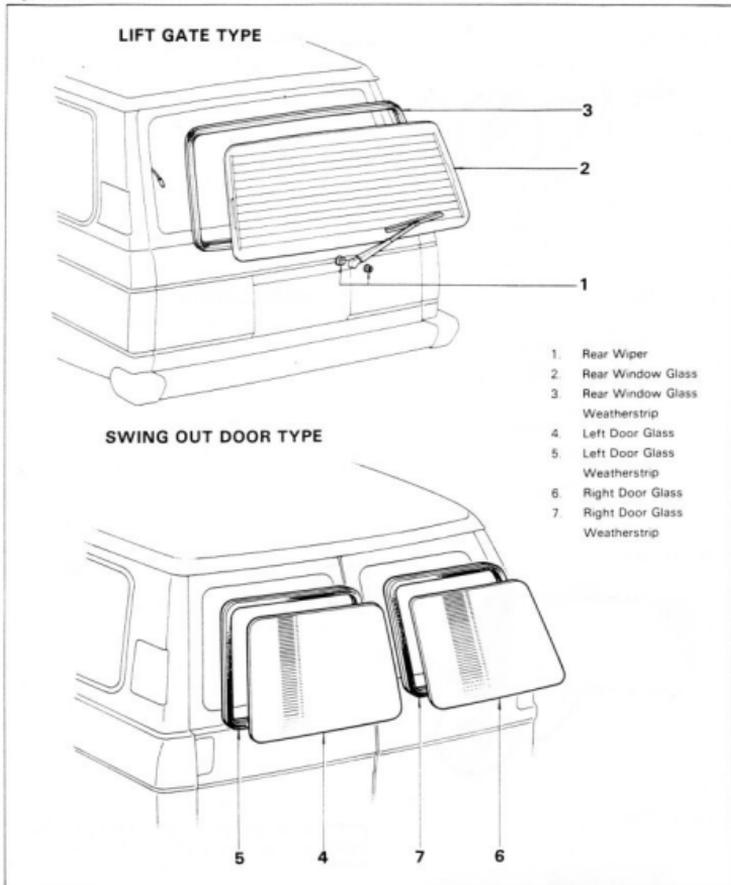
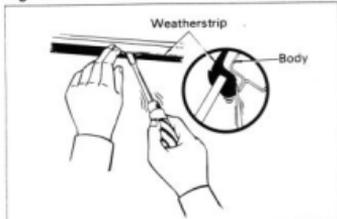
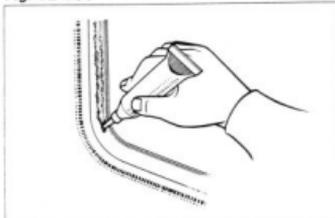


Fig. 12-165

**REMOVAL**

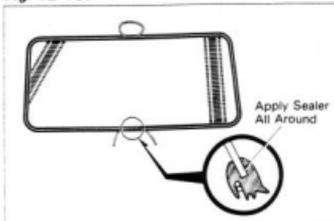
From inside push out weatherstrip lip with screwdriver.

Fig. 12-166

**INSTALLATION**

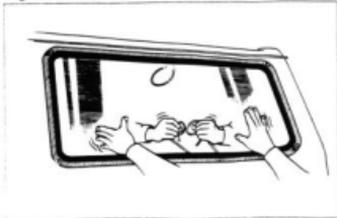
Apply adhesive to the body side.

Fig. 12-167



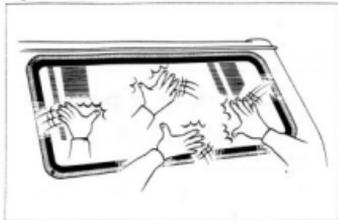
Attach string as shown in the figure.

Fig. 12-168



Install glass by pushing from the outside and pulling the string from the inside.

Fig. 12-169



Tap the glass from the outside to work in the weatherstrip.

INSTRUMENT PANEL**METER CLUSTER****REMOVAL**

Remove the parts in the numerical order shown in the figure.

Fig. 12-170

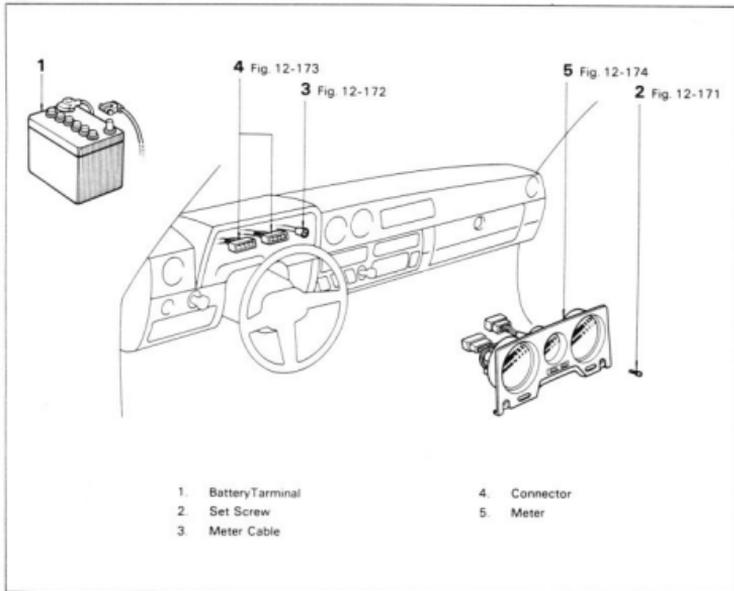
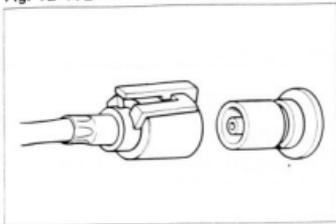


Fig. 12-171



Remove the mounting screws.

Fig. 12-172



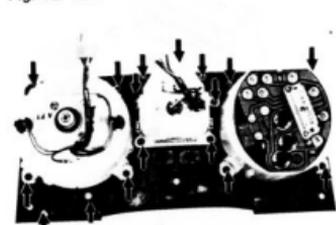
Pull out cable while depressing in on lock lever.

Fig. 12-173



Disconnect the combination meter connector.

Fig. 12-174



Remove the mounting screws.

INSTALLATION

Follow the removal procedures in reverse order.

CENTER CLUSTER

REMOVAL

Remove the parts in the numerical order shown in the figure.

Fig. 12-175

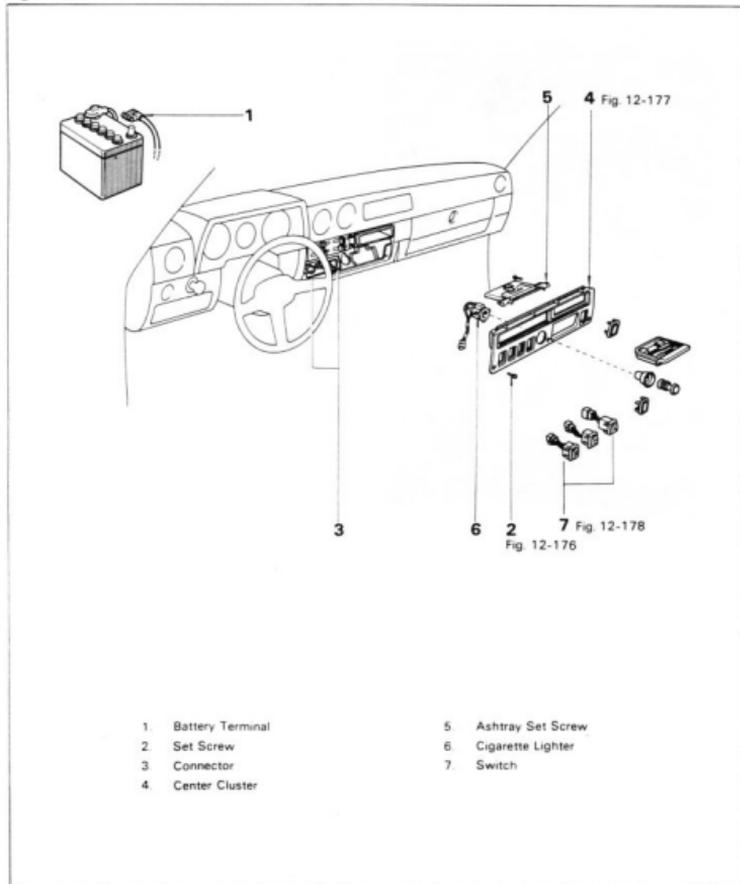
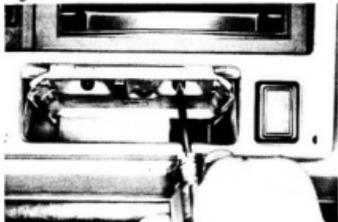


Fig. 12-176



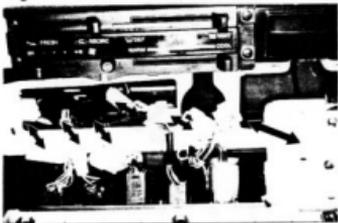
Remove the mounting screw.

Fig. 12-177



Remove the ashtray set screws.

Fig. 12-178

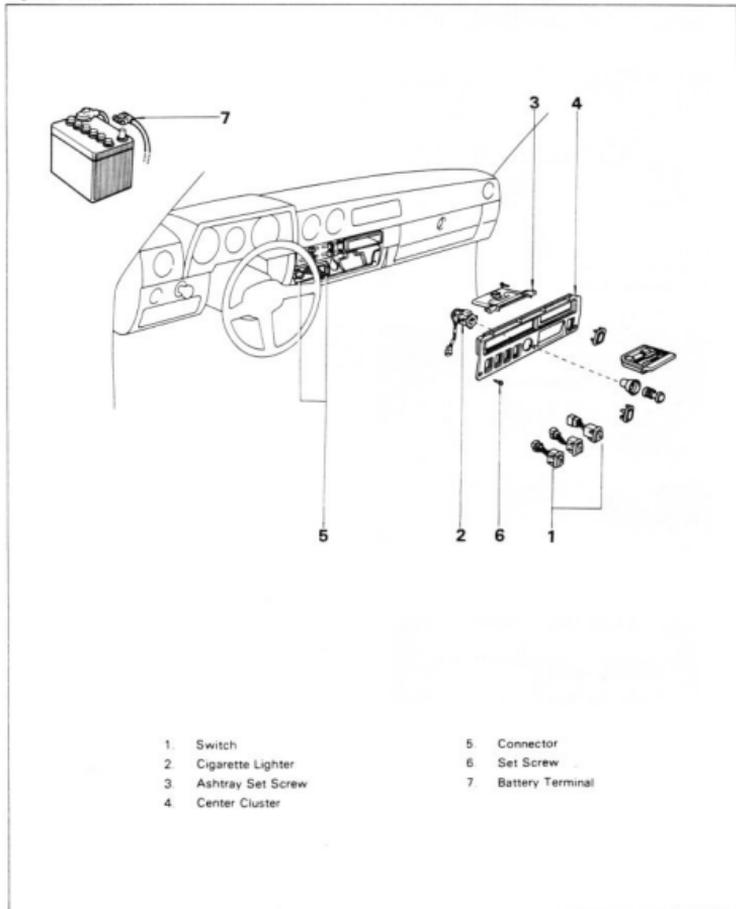


Disconnect the wiring connectors and remove the switches and cigarette lighter.



INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 12-179

SAFETY PAD & INSTRUMENT PANEL

REMOVAL

1. Remove the meter cluster.
(Refer to Fig. 12-170)
2. Remove the center cluster.
(Refer to Fig. 12-175)
3. Remove the parts in the numerical order shown in the figure.

Fig. 12-180

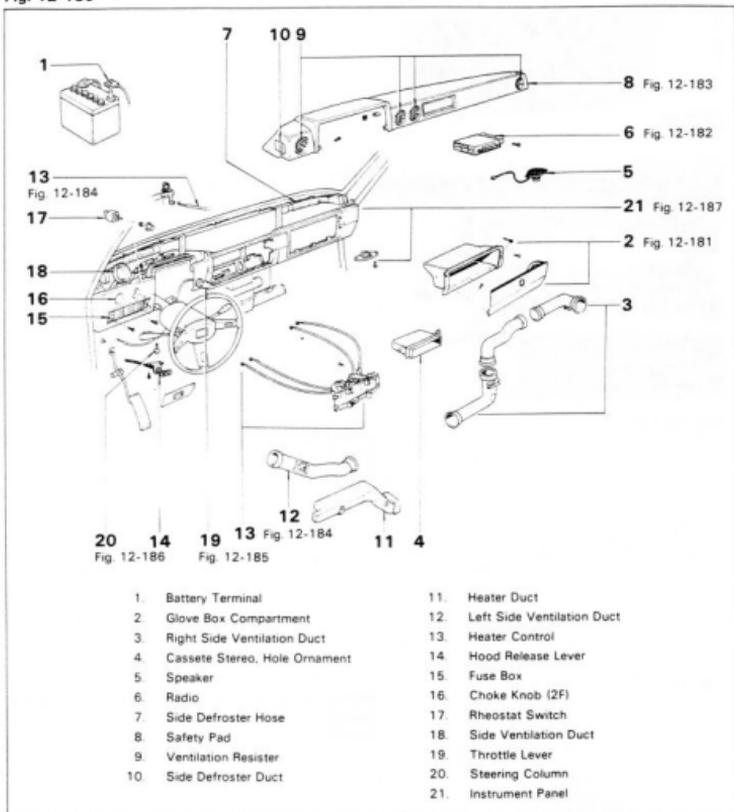
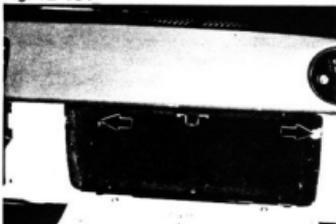
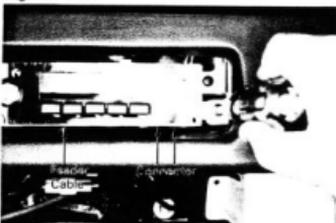


Fig. 12-181



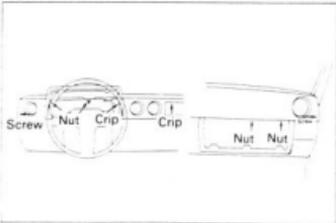
Remove the glove box light and switch.

Fig. 12-182



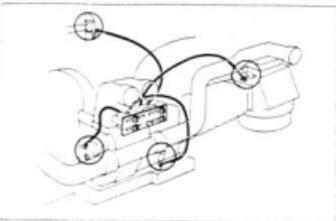
Remove the radio.

Fig. 12-183



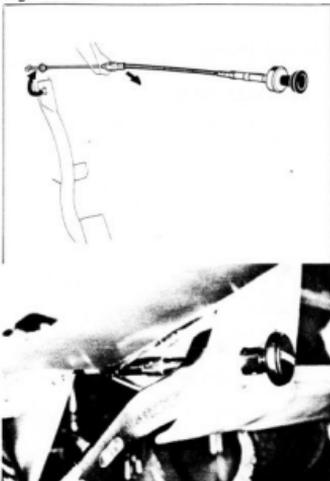
Remove the set nuts, screws and clips.

Fig. 12-184



Disconnect the heater control cable as shown in the figure.

Fig. 12-185



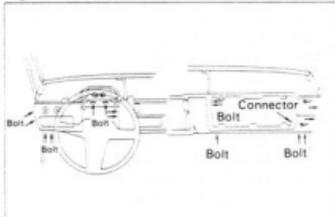
Remove the throttle cable.

Fig. 12-186



Remove the steering column.

Fig. 12-187

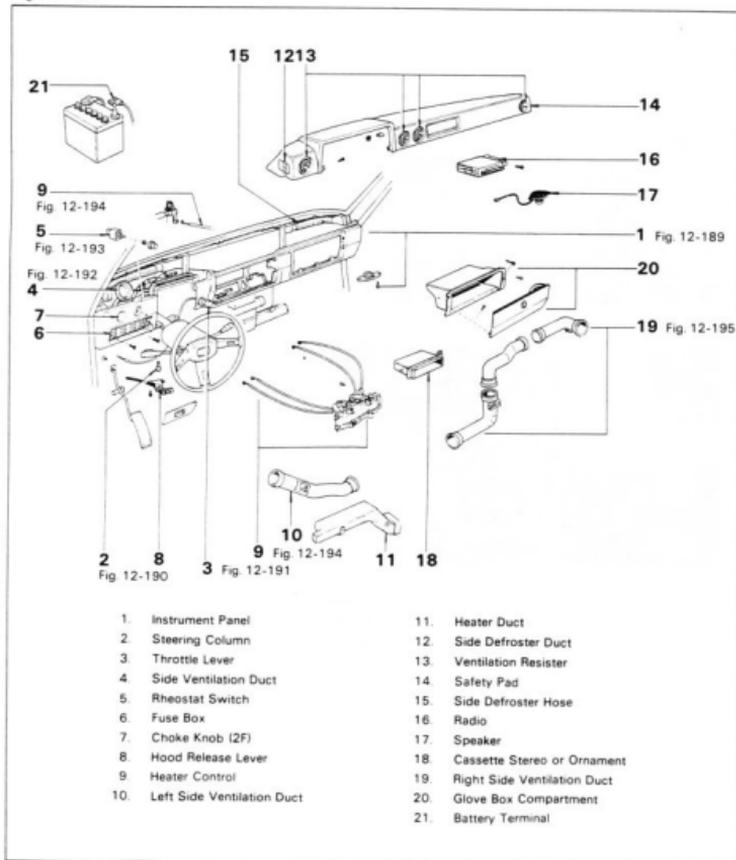


Remove the instrument panel.

INSTALLATION

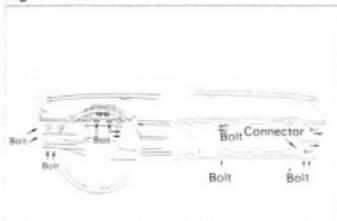
1. Install the parts in the numerical order shown in the figure.

Fig. 12-188



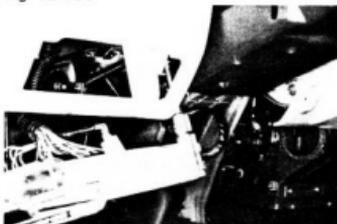
2. Install the center cluster.
3. Install the meter cluster.

Fig. 12-189



Install the instrument panel.

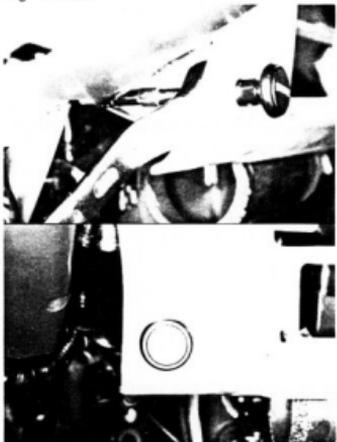
Fig. 12-190



Install the steering column bracket.

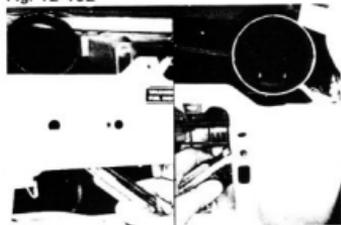
Tightening torque: 1.9 – 3.1 kg-m
(14 – 15 ft-lb)

Fig. 12-191



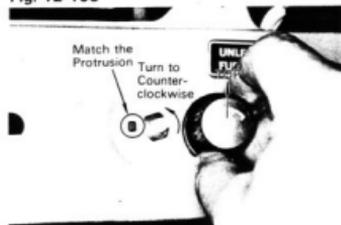
Install and check the throttle knob.

Fig. 12-192



Install the side ventilation duct.

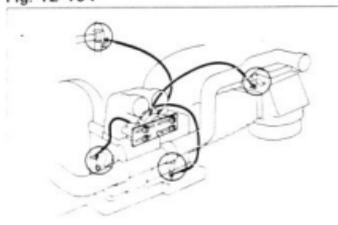
Fig. 12-193



Align the protrusion on the switch to the hole of the panel.

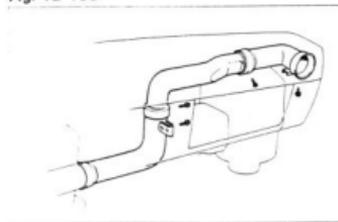
Turn on the switch shaft to counterclockwise and install the knob as shown in the figure.

Fig. 12-194



Connect the heater control wire as shown in the figure.

Fig. 12-195



Install the right side ventilation duct as shown in the figure.

ROOF HEADLINING

REMOVAL

Remove the parts in the numerical order shown in the figure.

Fig. 12-196

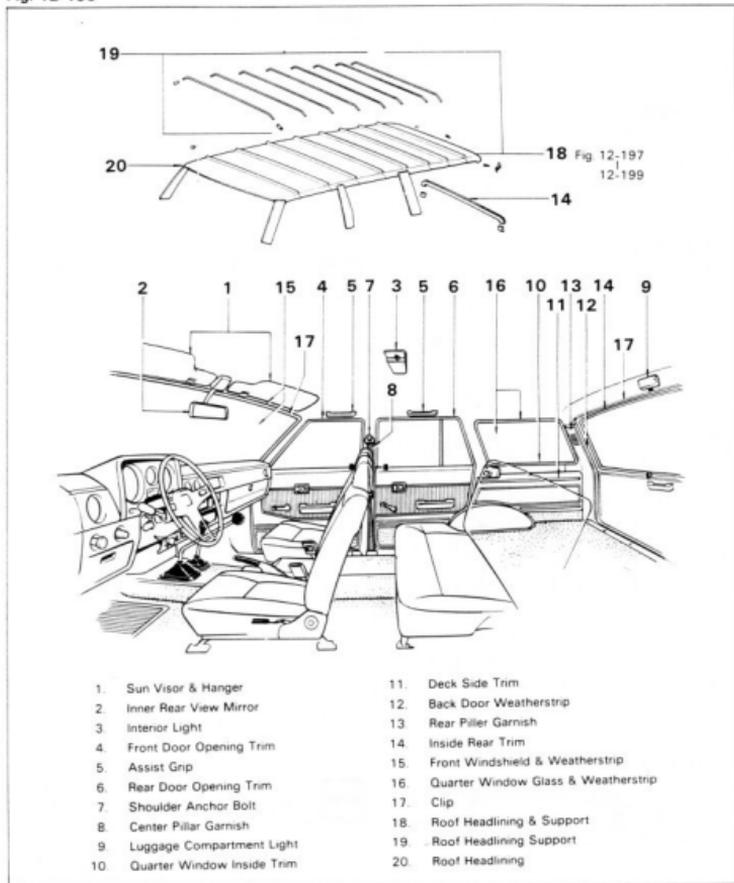
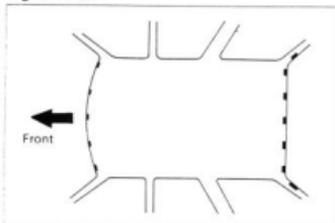
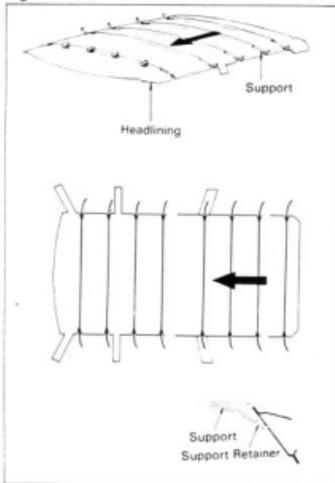


Fig. 12-197



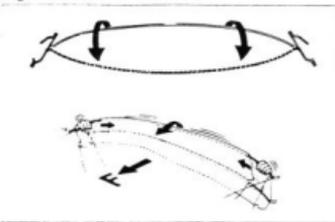
Remove the clips as shown in the figure.
Peel off the glued parts of the headlining.

Fig. 12-198



Remove the supports in turn, beginning with the rear.

Fig. 12-199



Compress the support inward at both ends,
turn it 180° forward and remove it from the
hole.

— Note —

Do not turn the support more than 180°.

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 12-200

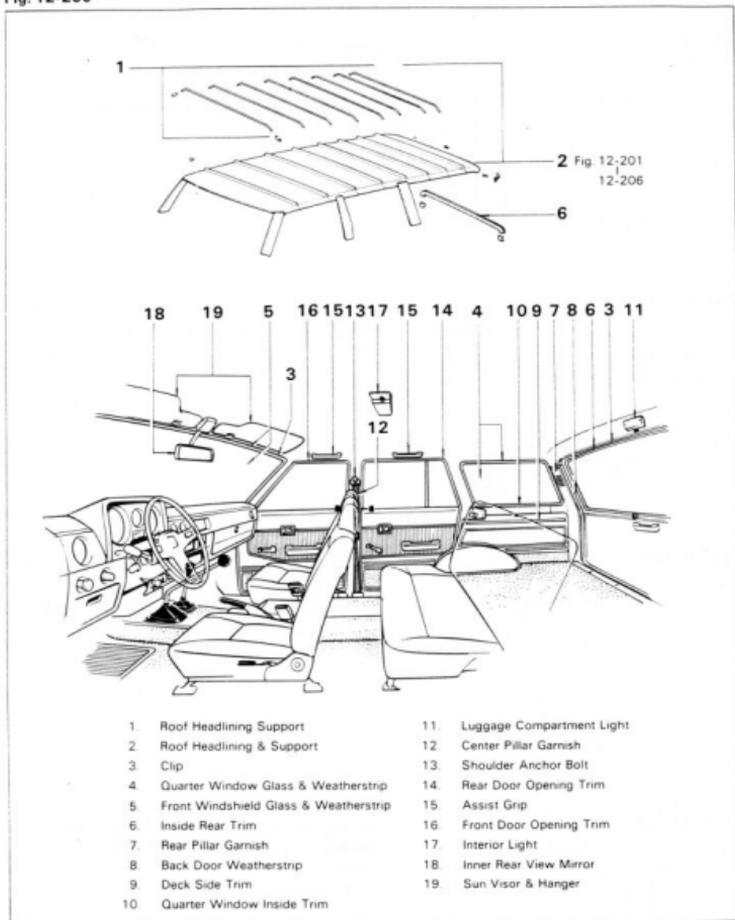
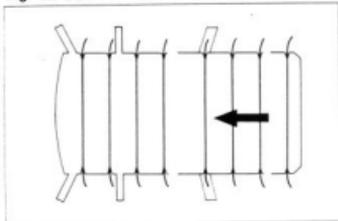


Fig. 12-201

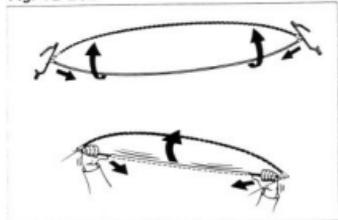


Install from the rear to front.

— Note —

Be sure the rear is in position.

Fig. 12-202



Insert the support with retainer into the hole, revolve 180° upward and install.

Fig. 12-203

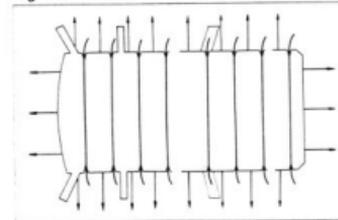


Apply adhesive to the headlining circumference.

Apply adhesive to the body and headlining.

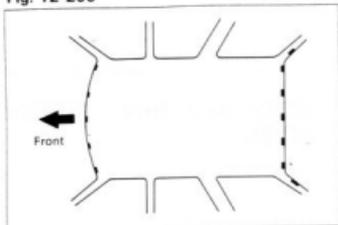
Weatherstrip adhesive:
Part No. [08704-00010]

Fig. 12-204



Attach the headlining by stretching it out in the directions shown by arrows.

Fig. 12-205



Install the clips.

Fig. 12-206



If there are any wrinkles remaining, use an infrared light for a short time while pressing out the wrinkles.

— Note —

Be careful not to overheat the area.

BODY [FJ, BJ4_SERIES] HOOD

COMPONENTS

Fig. 12-207

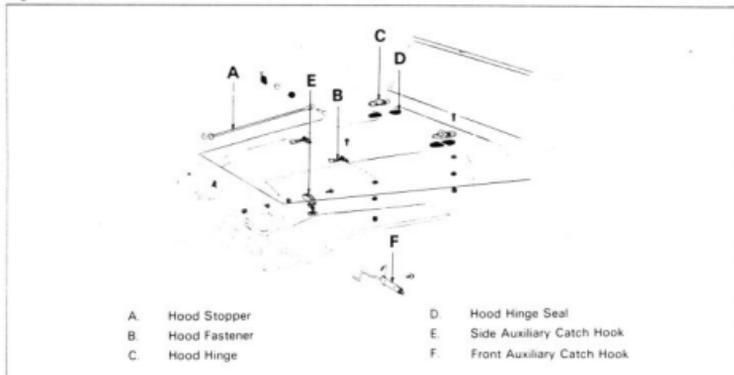
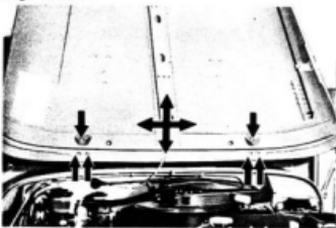


Fig. 12-208

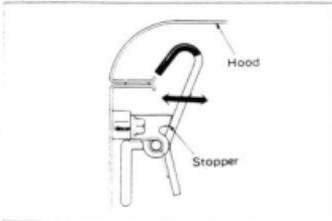


ADJUSTMENT

Hood

Adjust the hood in front-rear direction by loosening the nuts at the hood.

Fig. 12-209



Hood Auxiliary Catch Hook

If the catch hook does not latch on properly, correct by bending the stopper.

DOOR**REMOVAL
Door Window Glass, Regulator &
Glass Run**

Remove the parts in the numerical order shown in the figure.

Fig. 12-210

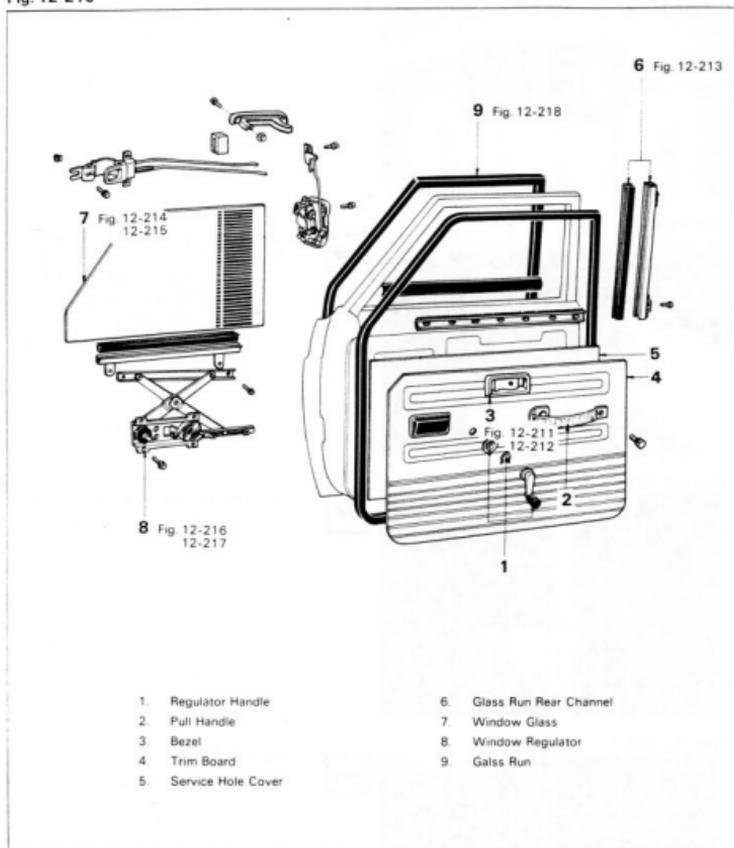
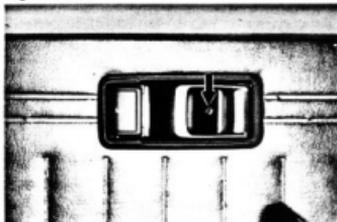
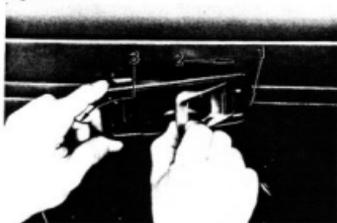


Fig. 12-211



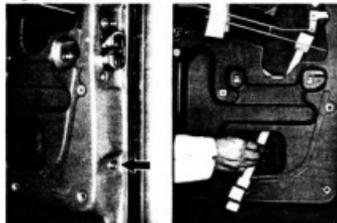
1. Remove the bezel.
 - (1) Remove the screws.

Fig. 12-212



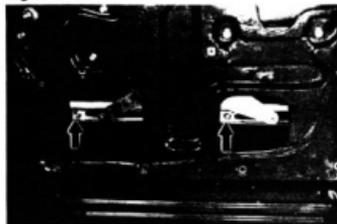
- (2) Remove in the order of arrow marks.
 - 1. Pull out the rear end.
 - 2. Pull the bezel toward the rear.
 - 3. Remove by pulling out the front end.

Fig. 12-213



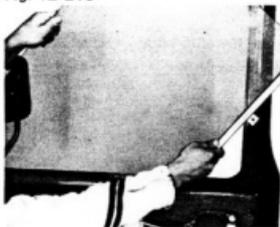
2. Remove the glass run rear channel.

Fig. 12-214



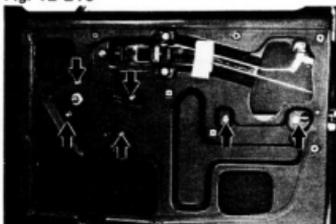
3. Remove the glass.
 - (1) Remove the bolts.

Fig. 12-215



- (2) Remove the glass with the glass holder.

Fig. 12-216



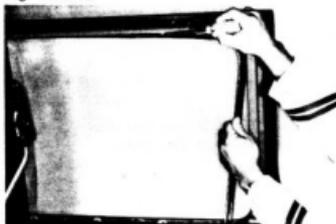
4. Remove the window regulator.
(1) Remove the bolts.

Fig. 12-217



- (2) Take out the regulator.

Fig. 12-218



5. Remove the glass run.

Fig. 12-219



Fig. 12-220

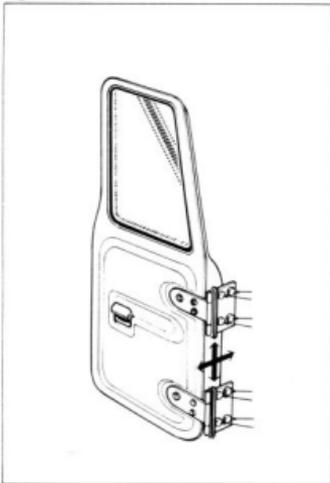


Fig. 12-221

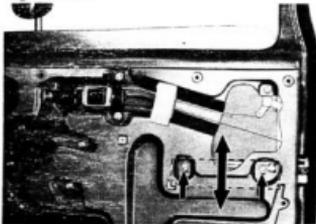


ADJUSTMENT

Door

1. Adjust the door front-rear and vertical directions by loosening the door hinges at the door.
2. Adjust the surface difference with fender and in vertical direction by loosening the door hinges at the body.
3. Correct improper door closure by adjusting the door lock striker.

Fig. 12-222



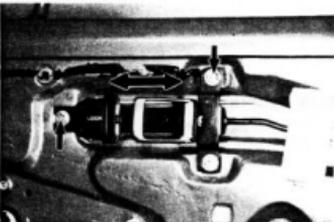
4. Adjust the window glass tilt.

Fig. 12-223



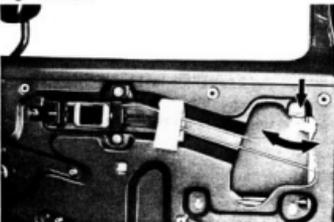
5. Adjust door outside handle play.

Fig. 12-224



6. Adjust door inside handle play.

Fig. 12-225



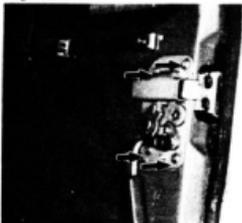
7. Adjust the door lock.

Fig. 12-226

**REMOVAL****Tail Gate Lock & Handle**

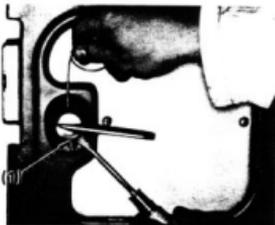
1. Remove the tail gate handle (1) by unscrewing the mounting nuts.

Fig. 12-227



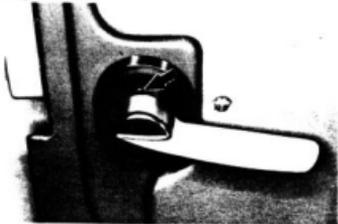
2. Remove the tail gate lock by removing the screws.

Fig. 12-228

**Back Door Inside Handle**

1. Pull out the lock pin (1) with a wire or other means, and take off the handle.

Fig. 12-229

**INSTALLATION**

Perform the removal in reverse order.

— Note —

Install the back door inside handle with the slot in the handle (shown by arrow) positioned upward.

Fig. 12-230

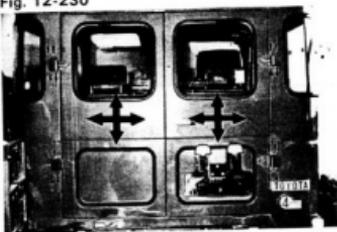


Fig. 12-231

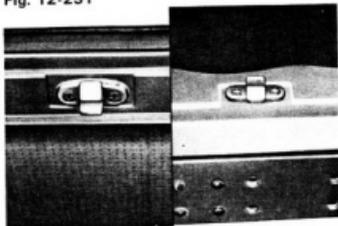


Fig. 12-232

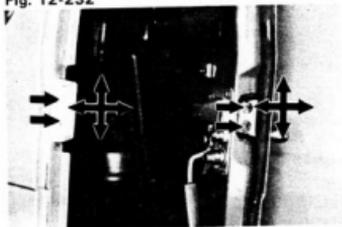
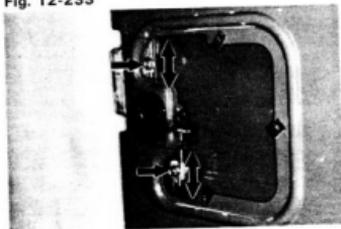


Fig. 12-233

**ADJUSTMENT**

1. Adjust the door alignment by shifting the positions of the door hinges at the body.
 - (1) Door on right side.
 - (2) Door on left side.
2. Adjust the door closing response.
 - (1) Door on right side.
 - (2) Door on left side.
3. Adjust the inside handle play.

BODY ELECTRICAL

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WIRING COLOR CODE & BULKHEAD TYPE CONNECTOR HANDLING & INSPECTION

1. WIRING COLOR CODE

Wire colors are indicated by an alphabetical code.

The 1st letter indicates the basic wire color and the 2nd indicates the stripe color.

B = Black	Br = Brown	G = Green
Gr = Grey	L = Light Blue	Lg = Light Green
O = Orange	P = Pink	R = Red
W = White	Y = Yellow	

Example: RG indicates a Red wire with a Green line.

2. BULKHEAD TYPE CONNECTOR HANDLING & INSPECTION

To remove the connector, push the lock levers shown in Fig. 13-1 and pull out.

When checking the continuity or voltage with a circuit tester, insertion of the test probe into the receptacle connector may open the fitting to the connector and result in poor contact. Therefore, insert the test probe only from the wire harness side as shown in Fig. 13-2.

Fig. 13-1

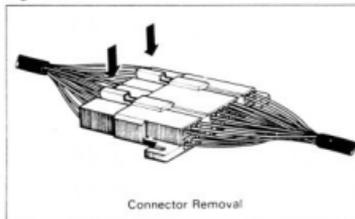


Fig 13-2

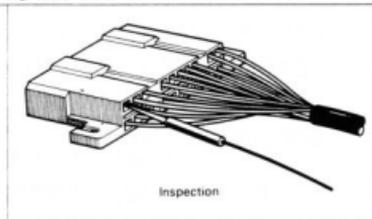


Fig. 13-3

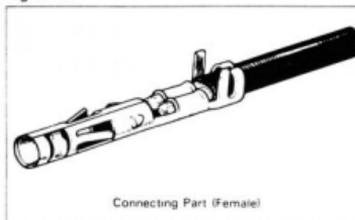
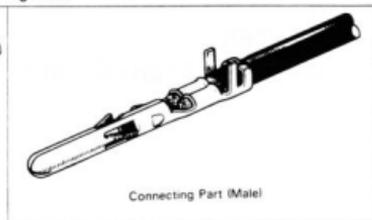


Fig 13-4



SWITCHES & RELAYS LOCATION

Fig. 13-5

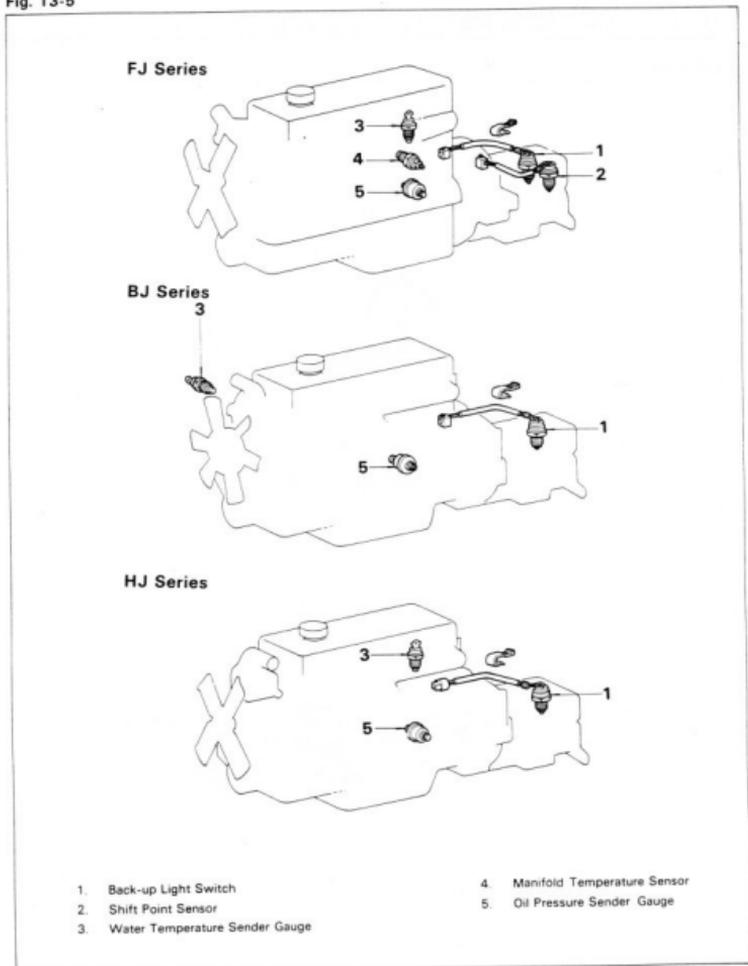
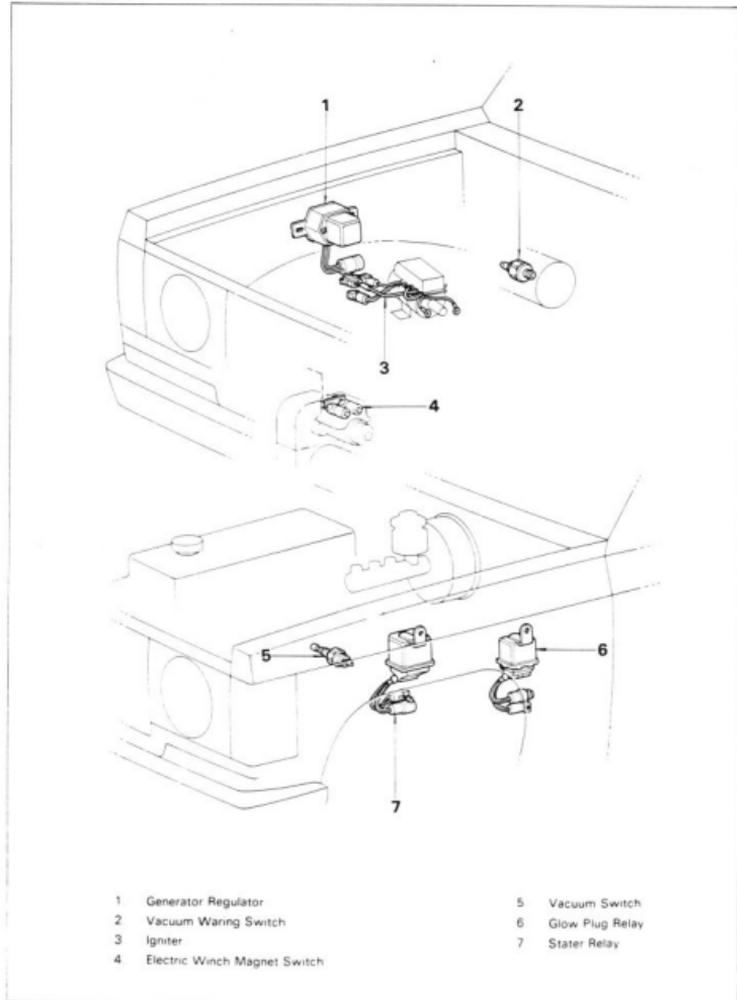


Fig. 13-6



- 1 Generator Regulator
- 2 Vacuum Warning Switch
- 3 Igniter
- 4 Electric Winch Magnet Switch

- 5 Vacuum Switch
- 6 Glow Plug Relay
- 7 Stator Relay

Fig. 13-7

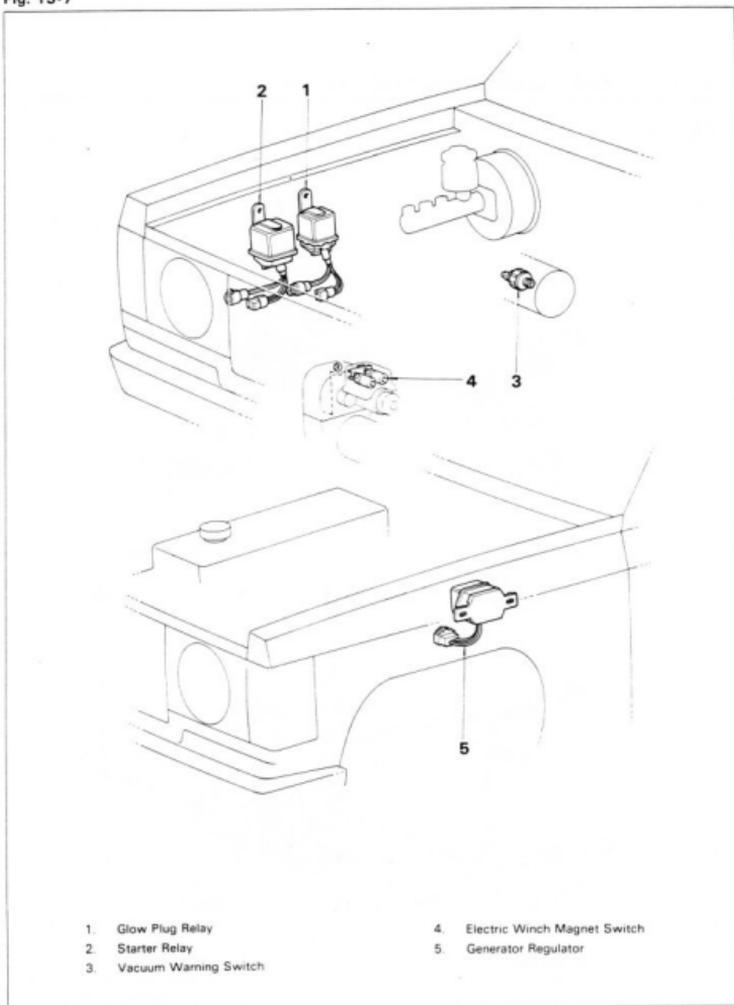
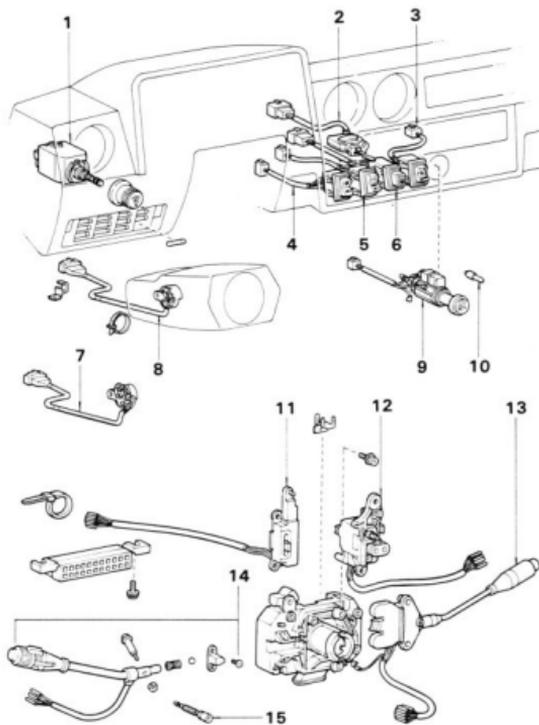


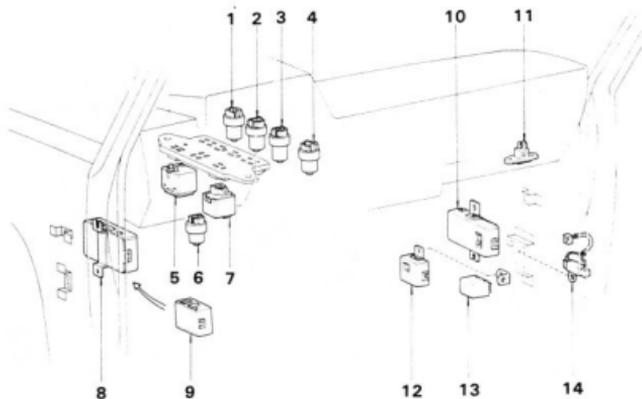
Fig. 13-8



- 1 Light Control Rheostat
- 2 Front Heater Blower Switch
- 3 Antenna Switch
- 4 Windshield Wiper Switch
- 5 Rear Heater Blower Switch
- 6 Defogger Switch
- 7 Starter Switch
- 8 Ignition Switch

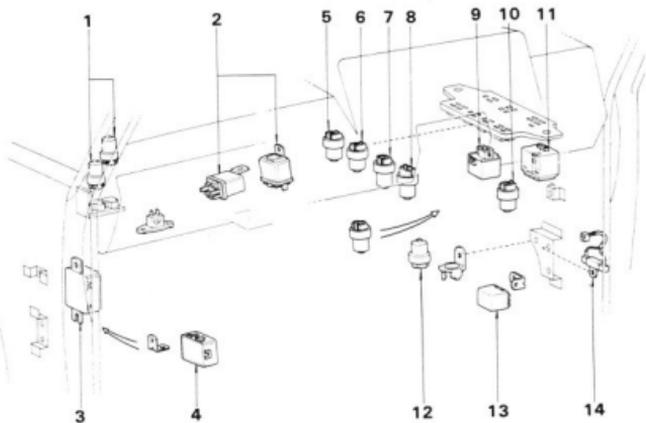
- 9 Cigarette Lighter
- 10 Cigarette Lighter Bulb
- 11 Hazard Warning Signal Switch
- 12 Headlight Dimmer Switch
- 13 Windshield Wiper Switch
- 14 Light Control Switch
- 15 Horn Contact Plate

Fig. 13-9



- | | |
|------------------------------|---|
| 1. Ignition Control Relay | 8. Emission Control Computer |
| 2. Light Control Relay | 9. Pre-heating Timer |
| 3. Tail Light Control Relay | 10. Cooling Fan Computer (USA & Canada) |
| 4. Heater Blower Motor Relay | 11. No 1 Inspection Light Socket |
| 5. Windshield Wiper Relay | 12. Seat Belt Warning Computer |
| 6. Cooling Fan Relay | 13. Charge Light Warning Relay |
| Headlight Dimmer Relay (ECE) | 14. Pilot Light Resistor |
| 7. Turn Signal Flasher | |

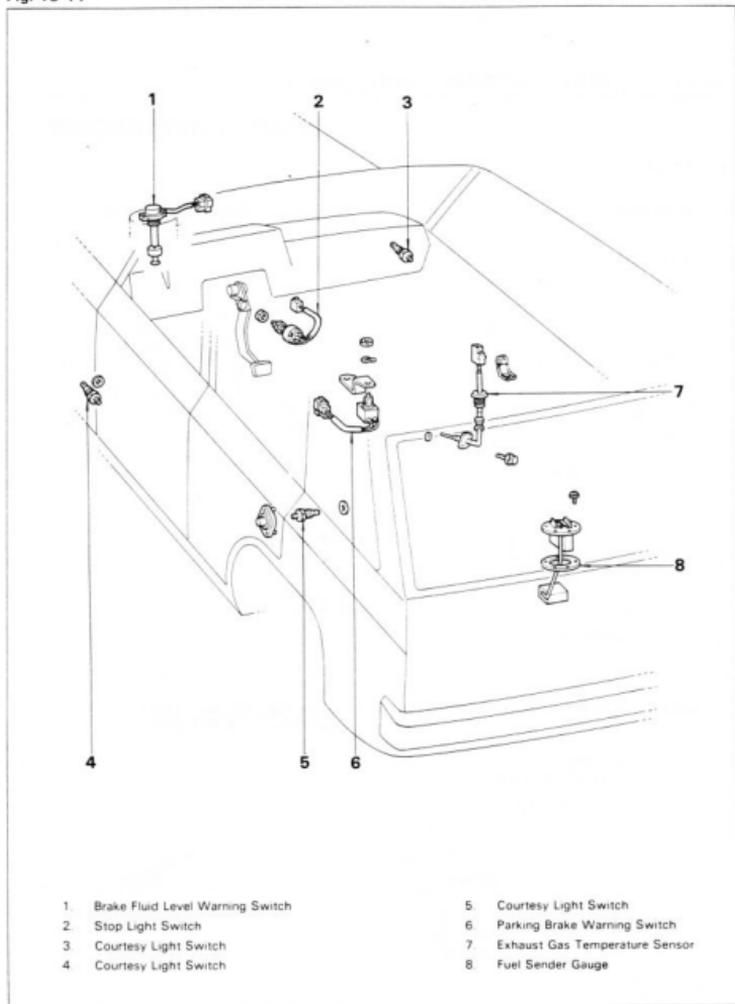
Fig. 13-10



- 1 Turn Signal Cancelling Relay
- 2 Windshield Wiper Relay
- 3 Emission Control Computer
- 4 Pre-heating Timer
- 5 Heater Blower Motor Relay
- 6 Tail Light Control Relay
- 7 Light Control Relay

- 8 Ignition Control Relay
- 9 Turn Signal Flasher
- 10 Headlight Dimmer Relay (ECE)
- 11 Valve Check Relay (ARL)
- 12 Windshield Wiper Relay
- 12 Red Indicator Relay
- 13 Charge Light Warning Relay
- 14 Pilot Light Resistor

Fig. 13-11



LIGHT COMPONENTS

Fig. 13-12

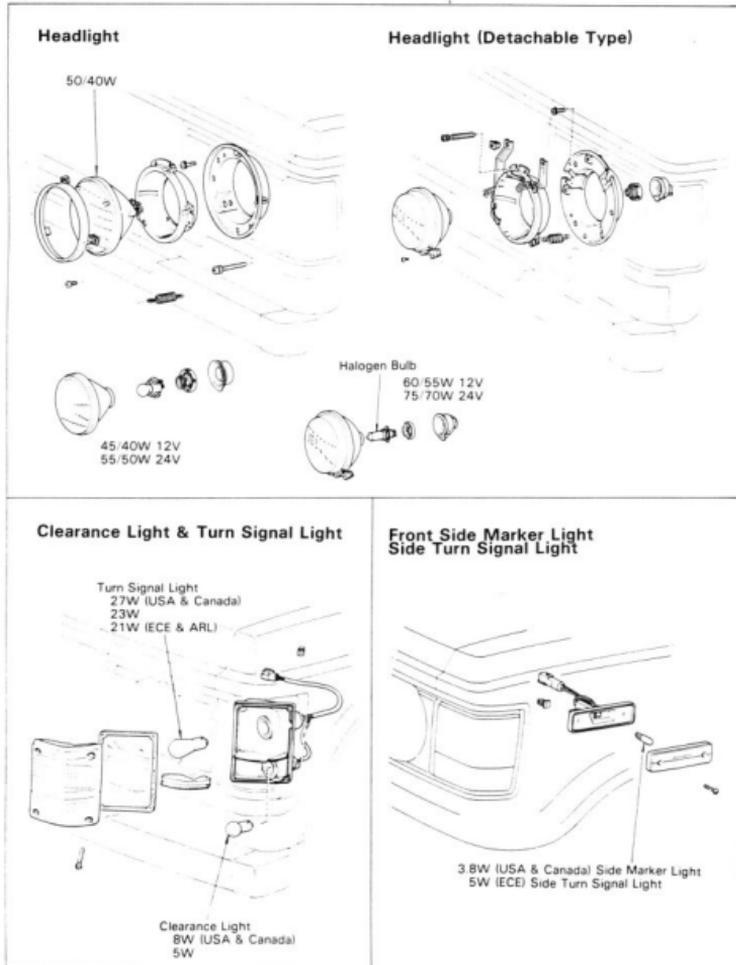


Fig. 13-13

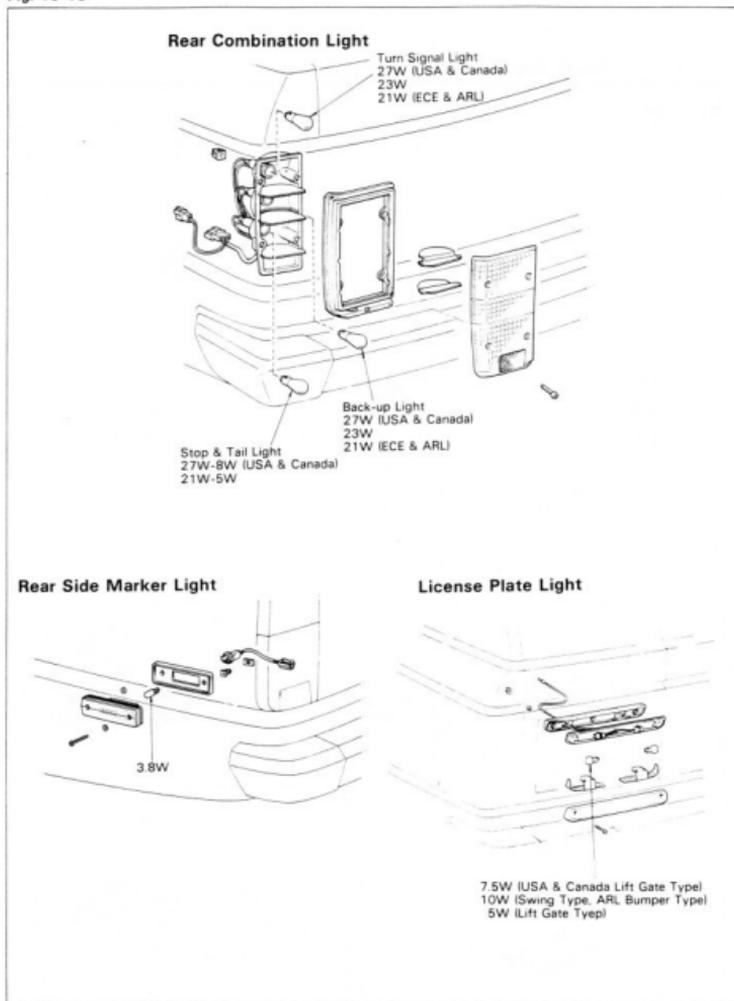
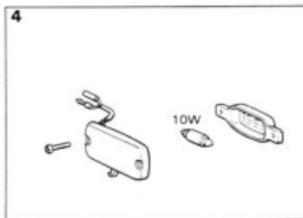
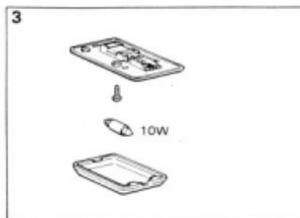
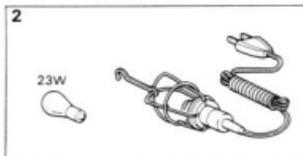
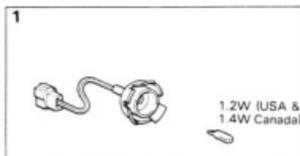
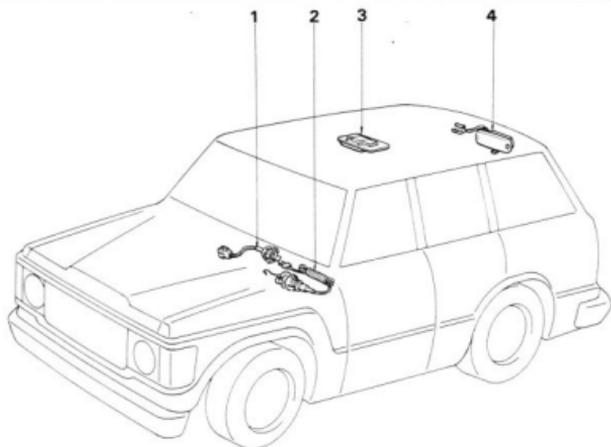


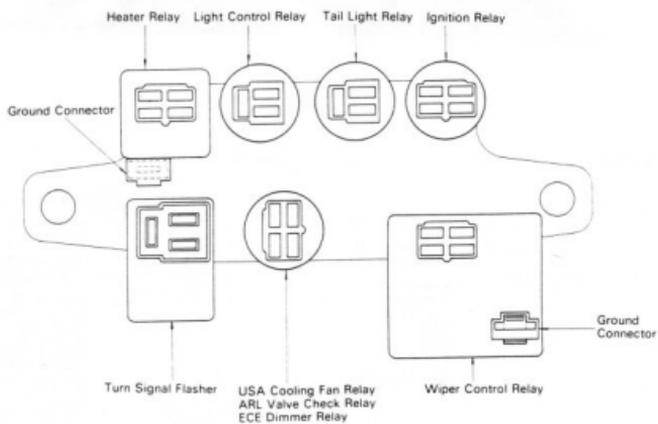
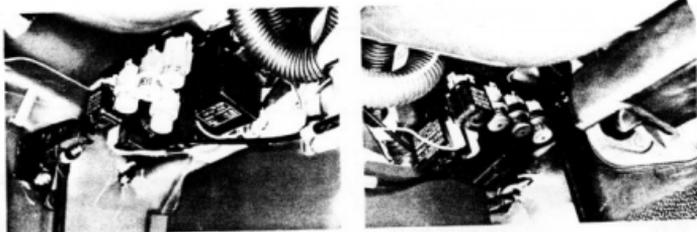
Fig. 13-14



1. Glovebox Light
2. Inspection Light
3. Interior Light
4. Luggage Compartment Light

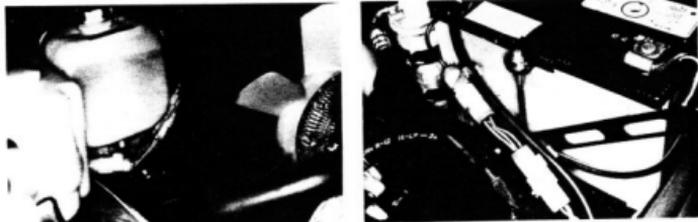
RELAY BLOCK

Fig. 13-15

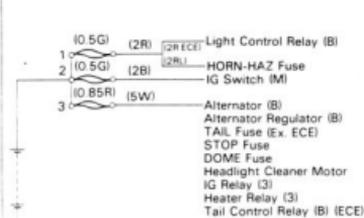


FUSIBLE LINK

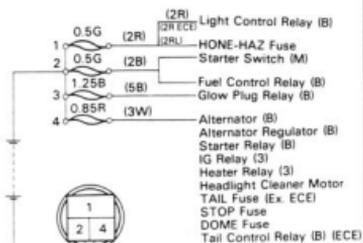
Fig. 13-16



FJ Series

Fusible Side
Terminal Position

BJ, HJ Series

Fusible Side
Terminal Position

FUSE BLOCK

REPLACE FUSE

Install new fuse with correct amperage rating.

— Caution —

Turn off all electrical components and ignition switch before replacing a fuse. Do not exceed the fuse amp rating.

If a fuse continues to blow, a short circuit is indicated. The system must be checked by a qualified technician.

FUSE BLOCK LOCATION

Fig. 13-17

MAIN FUSE BLOCK

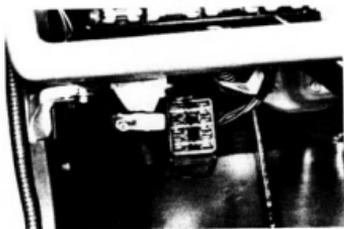
LHD



RHD



SUB FUSE BLOCK



Fuses & Circuits

Each fuse is connected to the following circuit:

FJ Series

[From IG SWITCH (IG)]

GAUGES 5A

Oil Pressure Gauge
Water Temperature Gauge
Fuel Gauge
Bolt Gauge
Tachometer
Charge Light
Brake Fluid Level Indicator Light
IG Relay
Heater Relay
Brake Warning Light (ARL)
Parking Brake Indicator Light (ARL)

CHARGE 5A

Charge Light
Alternator Regulator (LI)

CHARGE 5A (W/IC Regulator)

Alternator (LI)
Charge Light Relay (AI)

TURN 10A

Turn & Hazard Switch (B.)

WIPER 15A

Fr. Wiper Switch (B)
Wiper Control Relay (B)
Fr. Wiper Motor (B)
Fr. Washer Motor
Rr. Wiper Switch
Rr. Wiper Motor
Back up Light Switch
Rr. Heater Blower Motor
Headlight Cleaner
E-wiper Switch Control Switch (B)

[From IG SWITCH (ACCI)]

RADIO 5A

Radio
Stereo

CIGL 15A

Cigarette Lighter
M. S. Antenna

[From FUSIBLE LINK (IO 5) G]

HORN HAZ 10A

Turn & Hazard Switch (B.)
Horn

[From FUSIBLE LINK (IO 85) R]

TAIL 15A

Tail Light Relay
To
Headlight Cleaner Control Relay
Glovebox Light
Tail Light
Clearance Plate Light
License Light
Fr. Side Marker Light
Rr. Side Marker Light
Defogger Light
Speedometer Light
Combination Meter Light
Tachometer Light
Heater Control Light
Cigarette Lighter Light

STOP 10A

Stop Light Switch

DOME 5A

Inspection Socket
Interior Light
Luggage Compartment Light
Cooling Fan Computer (USA)
Cooling Fan Relay (USA)

[From HEATER RELAY]

A/C 10A

Air Conditioner

[From IG RELAY]

ENGINE 10A

Outlet Valve
Fuel Cut Solenoid
Alternator Regulator (IG)
Charge Light Relay (IG)
Seat Belt Warning Relay
Emission Control Computer
Cooling Fan Computer (USA)

DEFOG 20A

Defogger Switch

[From LIGHT RELAY]

HEAD LH 10A

Headlight LH

HEAD RH 10A

Headlight RH

[From DIMMER RELAY]

(ECE)

HEAD (LH) Lo (10A)

Headlight LH Lo

HEAD (RH) Lo (10A)

Headlight RH Lo

HEAD (LH) Hi (10A)

Headlight LH Hi

HEAD (RH) Hi (10A)

Headlight RH Hi

[From TAIL LIGHT CONTROL RELAY]
(ECE)

TAIL LH (10A)

Tail Light LH

TAIL RH (10A)

Clearance Light LH

TAIL RH (10A)

Headlight Cleaner Control Relay

Tail Light (RH)

Clearance Light (RH)

License Plate Light

Speedometer Light

Cigarette Lighter Light

Glovebox Light

Heater Control Light

Combination Meter Light

Tachometer Light

BJ, HJ Series**[From STARTER SWITCH (G)]****GLOW 5A**

Glow Plug Relay (G)
Glow Indicator Light
Glow Timer

[From STARTER SWITCH (ST)]**STARTER 5A**

Glow Plug Relay (ST)
Fuel Control Relay (ST B)
Starter Relay (ST)
Brake Warning Valve Check
Relay (ARL)

[From IG RELAY]**ENGINE 15A**

Alternator Regulator (IG)
Oil Pressure Gauge
Water Temperature Gauge
Fuel Gauge
Bolt Gauge
Sediment Indicator Light
Tachometer
Charge Light
Brake Indicator Light
Seat Belt Warning Relay (Canada)
Brake Warning Light (ARL)
PKD Light
Alternator (G) W/IC
Charge Light Relay (G) Regulator

CHARGE 5A**(W/O IC Regulator)**

Charge Light
Alternator Regulator (L)

CHARGE 5A**(W/IC Regulator)**

Alternator (L)
Charge Light Relay (A)

[From STARTER (ON)]**TURN 10A**

Turn & Hazard Switch (B)

WIPER 15A

Fr. Wiper Switch (B)
Fr. Wiper Motor
Fr. Washer Motor
Rr. Wiper Switch (B)
Rr. Wiper Motor
Rr. Washer Motor
Back-up Switch
Rr. Heater Blower Motor
Electric Winch Control Switch (B)

[From STARTER SWITCH (ACC)]**RADIO 5A**

Resister 24V only
Radio
Stereo

CIGL 15A

Cigarette Lighter
Motor Antenna

[From FUSIBLE LINK (0.85)]**TAIL 15A**

Tail Light Relay
To
Glovebox Light
Tail Light
Clearance Light
License Plate Light
Fr. Side Marker
Rr. Side Marker Light
Defogger Light
Speedometer Light
Combination Light
Tachometer Light
Heater Control Light
Cigarette Lighter Light

STOP 10A

Stop Light Switch

DOME 5A

Inspection Socket
Interior Light
Luggage Compartment Light

[From FUSIBLE LINK (0.5)]

HORN-HAZ 10A

Turn & Hazard Switch (B)

[From HEATER RELAY]

A/C 10A

Air Conditioner

[From IG RELAY]

DEFOG 20A

Defogger Relay

[From LIGHT CONTROL RELAY]

HEAD LH 10A

Headlight LH

HEAD RH 10A

Headlight RH

[From DIMMER RELAY]

(ECE)

HEAD (LH) Lo (10A)

Headlight LH Lo

HEAD (RH) Lo (10A)

Headlight RH Lo

HEAD (LH) Hi (10A)

Headlight LH Hi

HEAD (RH) Hi (10A)

Headlight RH Hi

[From TAIL LIGHT CONTROL RELAY]

(ECE)

TAIL LH (10A)

Tail Light LH
Clearance Light LH

TAIL RH (10A)

Headlight Cleaner Relay
Tail Light (RH)
Clearance Light (RH)
License Plate Light
Speedometer Light
Cigarette Lighter Light
Glovebox Light
Heater Control Light
Combination Meter Light
Tachometer Light
Voltage Converter (24V)

IC Resistor

IGNITION SWITCH CIRCUIT DIAGRAM

Fig. 13-18

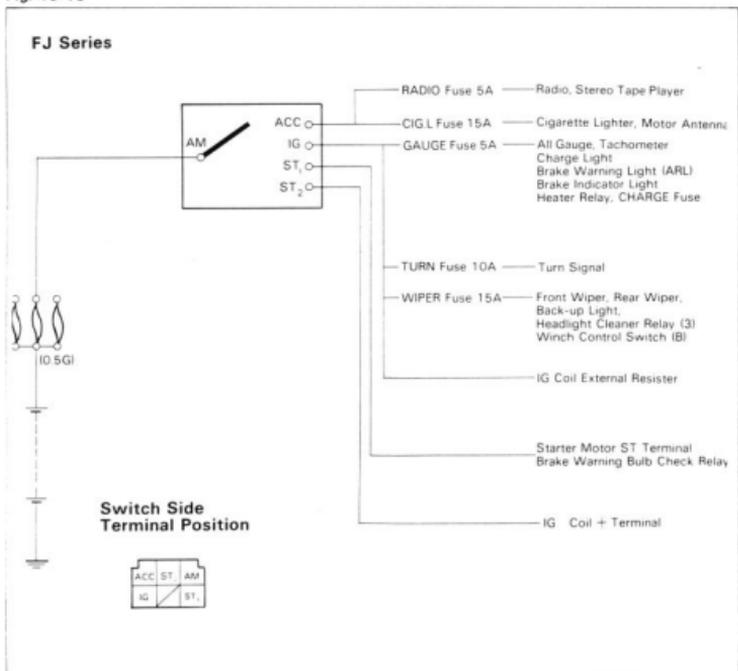
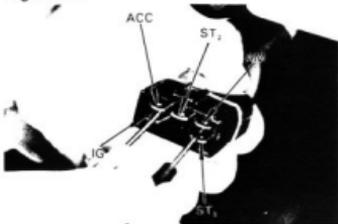


Fig. 13-19



ON-VEHICLE INSPECTION

Check continuity between terminals

Terminal Position	AM	ACC	IG	ST1	ST2
LOCK					
ACC	○—○				
ON		○—○			
START			○—○	○—○	○—○

CIRCUIT DIAGRAM

Fig. 13-20

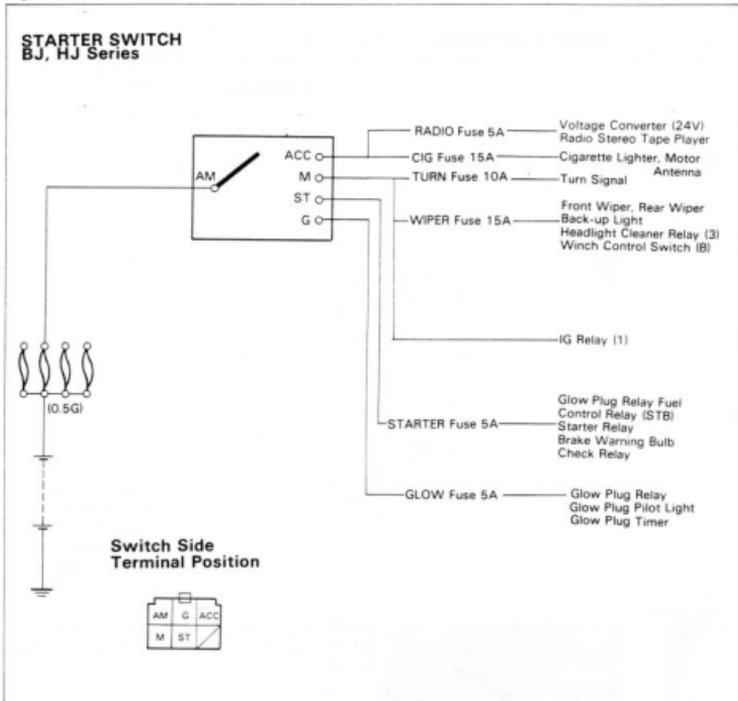
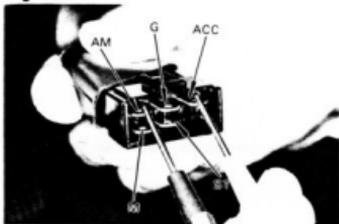


Fig. 13-21



ON-VEHICLE INSPECTION

Check continuity between terminals.

Terminal Position	AM	ACC	M	G	ST
LOCK					
ACC	○	○			
ON	○	○	○		
GLOW	○	○	○	○	
START	○	○	○		○

REMOVAL

Remove the parts in the numerical order shown in the figure.

Fig. 13-22

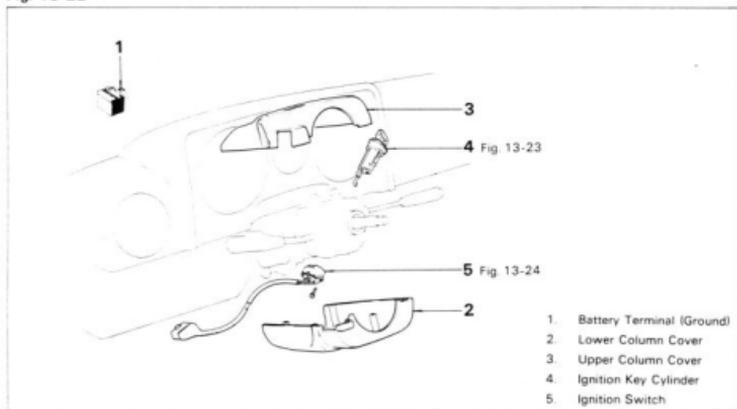


Fig. 13-23



Turn ignition key to ACC and with the pin pushed in with a wire, pull out the key cylinder.

Fig. 13-24



Remove the ignition switch set screw.

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 13-25

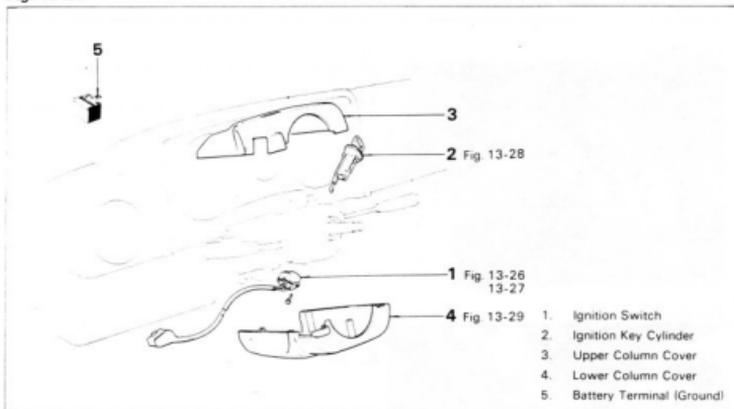
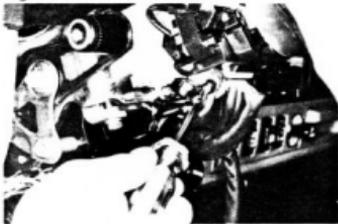


Fig. 13-26



Install the ignition switch with the switch recess and the bracket tab correctly positioned.

Fig. 13-27



Install the ignition switch.

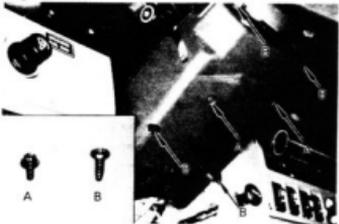
Fig. 13-28



Position the bracket as shown in the left figure.

With the key in the ACC position, install the key cylinder.

Fig. 13-29

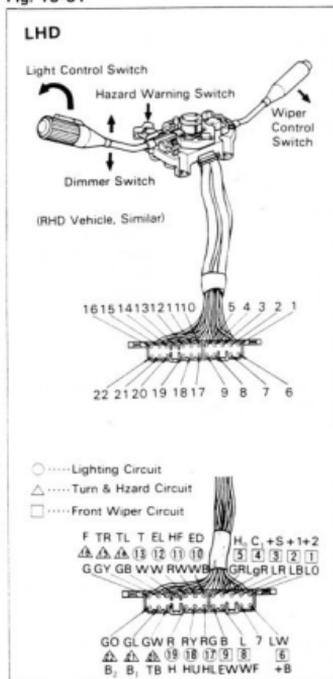


Install the cover set screws as shown in the figure.

Fig. 13-30



Fig. 13-31



COMBINATION SWITCH

INSPECTION

Remove the following parts.

1. Column cover
2. Wiring connector
3. Connector

Check the continuity between the terminals. If there is continuity between the terminals as shown in the table below, the switch is in good condition.

Light control & dimmer switch

Switch position	Terminal (Wire color) (No.)						
	T (W) (12)	H (R) (19)	EL (W) (13)	ED (W/B) (18)	HU (R/Y) (16)	HL (R/G) (17)	HF (R/W) (21)
Light control	OFF						
	ONE STEP	○	○				
	TWO STEP	○	○				
Dimmer	Headlight U			○			
	Headlight L				○		
	Headlight F					○	

Turn signal & hazard warning switch

Switch Position	Terminal (Wire color) (No.)					
	TR (L) (14)	TR (R) (20)	TR (L/R) (15)	B1 (G/L) (21)	F (G) (16)	B2 (G/O) (22)
Turn Signal	R	○	○		○	
	L			○	○	
Hazard	○	○	○		○	

Wiper control switch

Switch position	Terminal (Wire color) (No.)						
	B (L/W) (6)	+S (L/R) (3)	+1 (R/Y) (2)	+2 (L/O) (1)	Co (LgR) (4)	Ew (R/B) (9)	Wl (L) (8)
OFF		○	○				
*INT		○	○			○	
LO		○	○				
HI		○	○	○			
WASHER							○

*...Intermittent Type

REMOVAL

Remove the parts in the numerical order shown in the figure.

Fig. 13-32

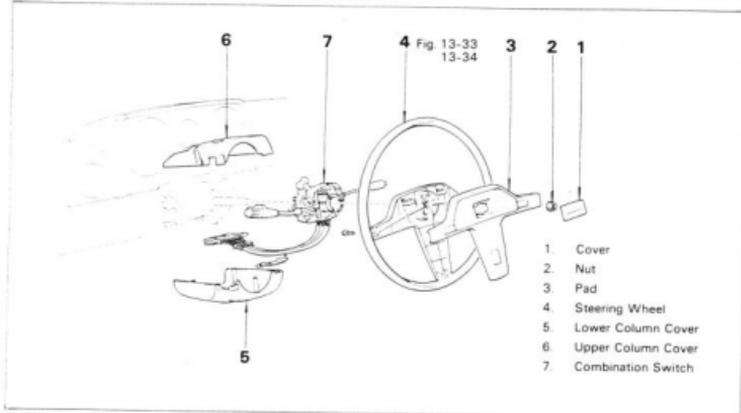
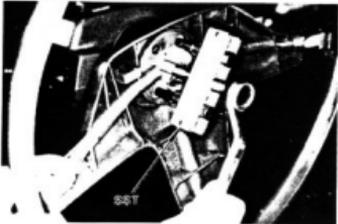


Fig. 13-33



Place matchmarks on the steering wheel and the steering shaft.

Fig. 13-34

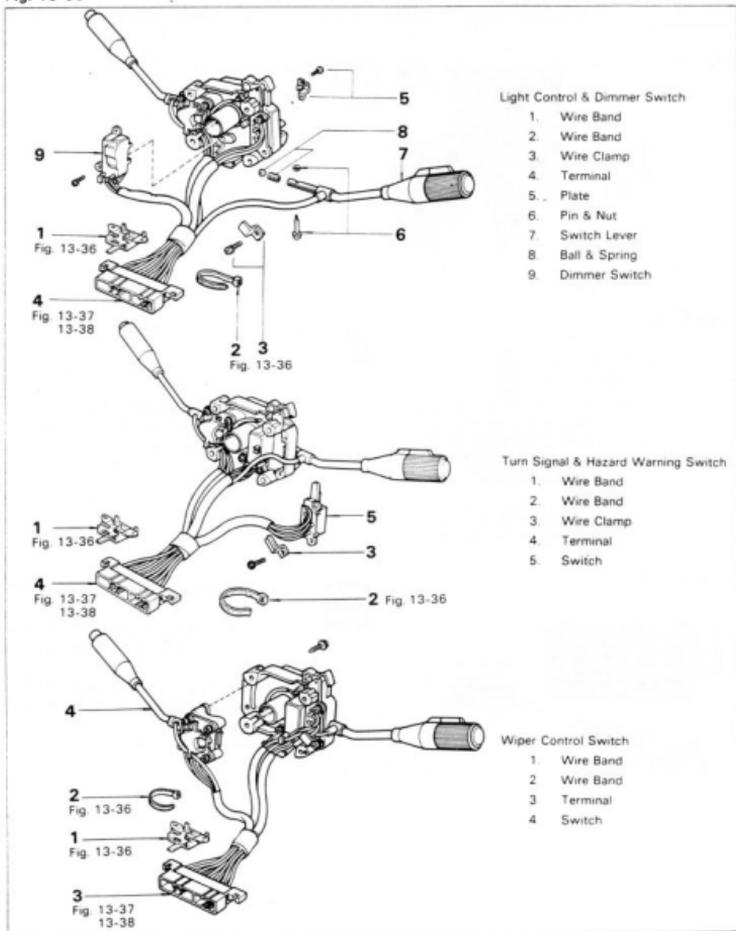


Remove steering wheel with SST.
SST [09609-20010]

DISASSEMBLY

Disassemble the parts in the numerical order shown in the figure.

Fig. 13-35



ASSEMBLY

Assemble the parts in the numerical order shown in the figure.

Fig. 13-39

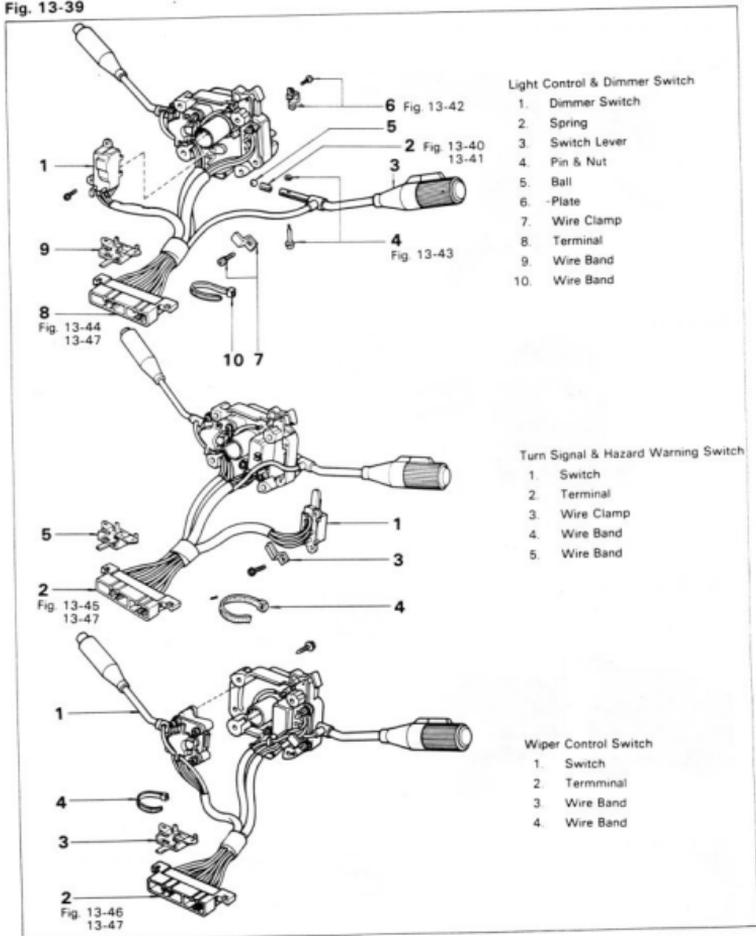


Fig. 13-40



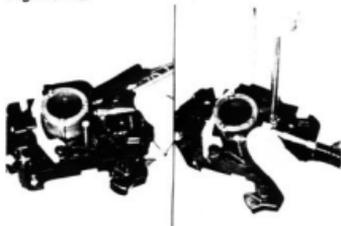
Install the spring into the lever.

Fig. 13-41



Place the spring position as shown in the figure when installing the switch lever.

Fig. 13-42



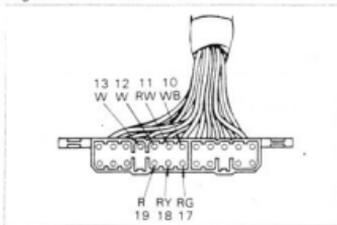
Put on the steel ball on the spring and install the plate while turn on the lever in the Hi beam side.

Fig. 13-43



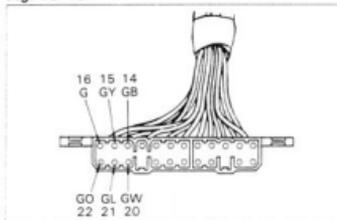
Insure that the switch operates smoothly.

Fig. 13-44



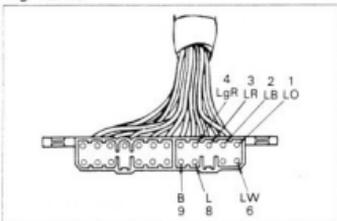
Install the lighting circuit terminals as shown in the figure.

Fig. 13-45



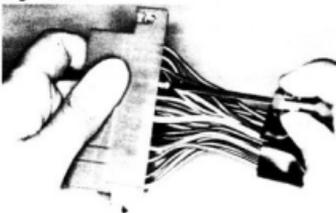
Install the turn signal and hazard warning circuit terminals as shown in the figure.

Fig. 13-46



Install the front wiper circuit terminals as shown in the figure.

Fig. 13-47



Insert the terminal until terminal is caught on a projection in the connector. Make sure that terminal is not removal.

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 13-48

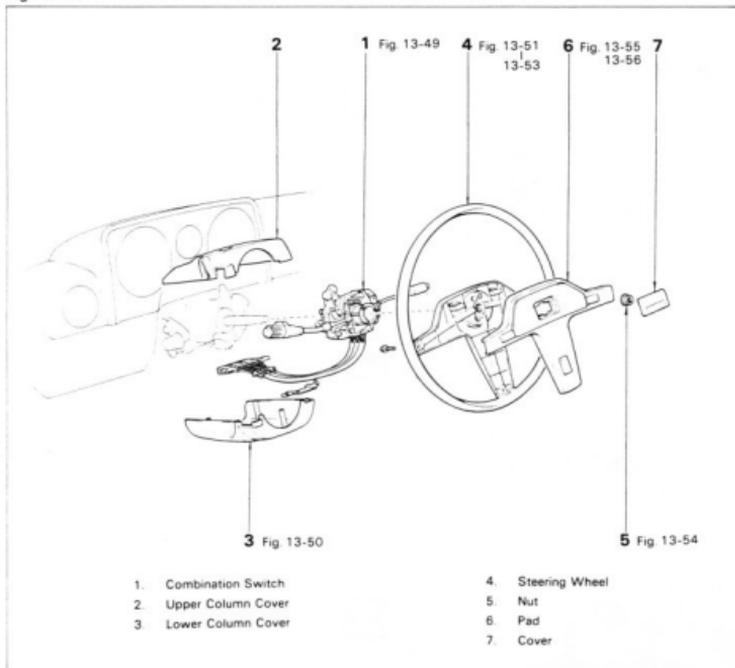
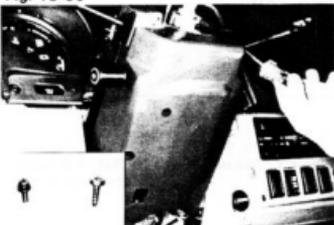


Fig. 13-49



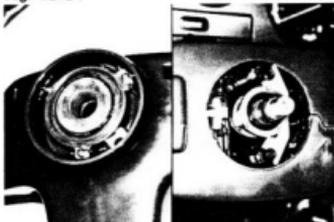
Install the wire harness band and connector.

Fig. 13-50



Install the cover.

Fig. 13-51



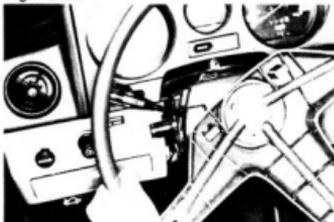
Align auto-cancel mechanism pin and hole.

Fig. 13-52



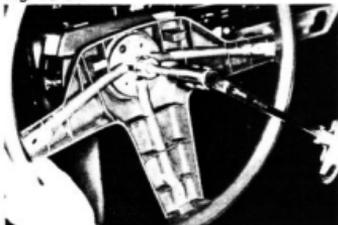
Align the matchmarks on main shaft and steering wheel.

Fig. 13-53



Check auto-cancel action.

Fig. 13-54



Tighten the nut.

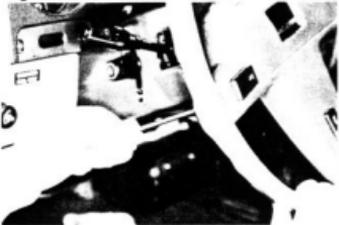
Tightening torque: 3.0-4.0 kg-m
(22-28 ft-lb)

Fig. 13-55



Connect the horn terminal.

Fig. 13-56



Install the pad set screw facing the back side.

LIGHTING CIRCUIT DIAGRAM

Fig. 13-57

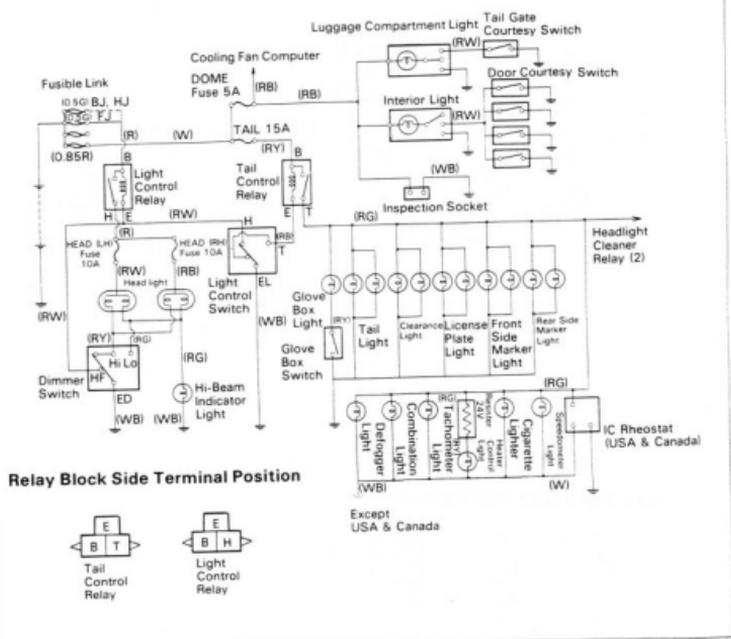
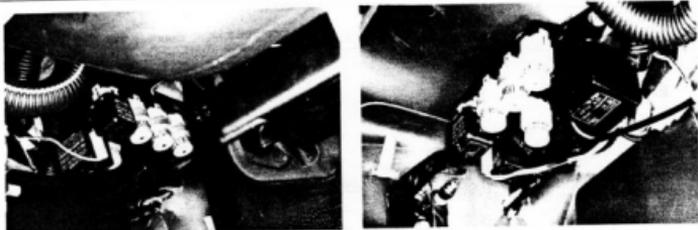


Fig. 13-58

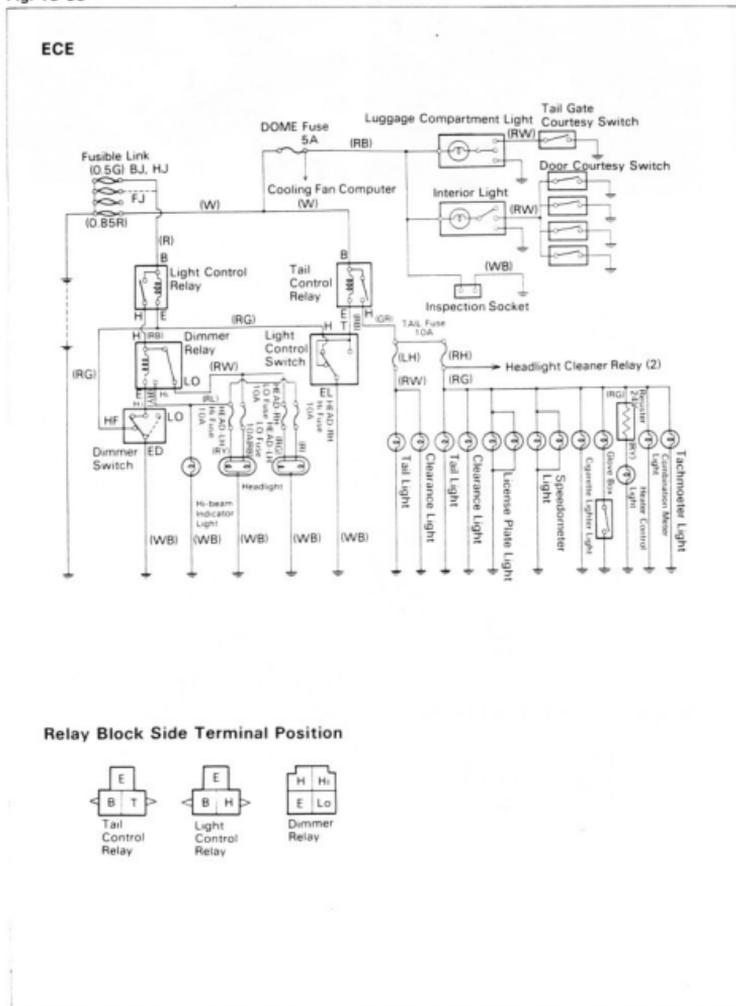


Fig. 13-59



Fig. 13-60

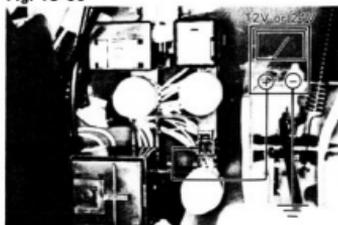


Fig. 13-61

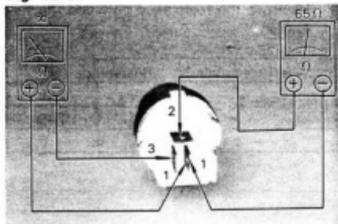
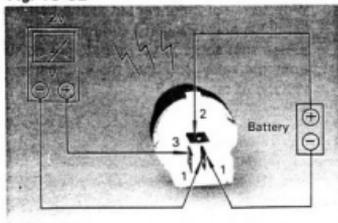


Fig. 13-62



TAIL LIGHT CONTROL RELAY ON-VEHICLE INSPECTION



1. Turn on the switch, check to see that there is an operational noise.



2. Battery voltage should be on terminal.



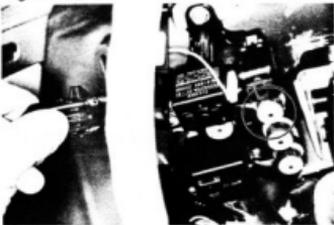
3. Measure the resistance between the terminals.

Between terminal	Resistance (Ω)	
	1 — 2	12V
	65	245
1 — 3	∞	



4. With terminal 2 connected to the battery (+) cable and terminal 1 grounded, check to see that there is an operational noise from the relay and that there is battery voltage at terminal 3.

Fig. 13-63



HEADLIGHT CONTROL RELAY ON-VEHICLE INSPECTION

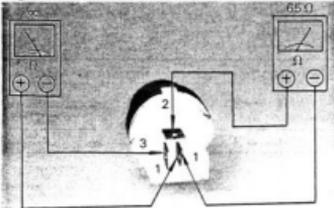
1. Turn on the switch, check to see that there is an operational noise.

Fig. 13-64



2. Battery voltage should be on terminal 1.

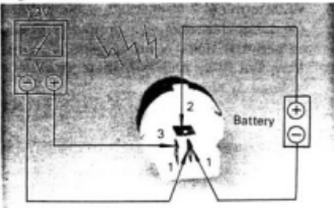
Fig. 13-65



3. Measure the resistance between the terminals.

Between terminals	Resistance (Ω)	
1 — 2	12V	24V
	65	245
1 — 3	∞	

Fig. 13-66



4. With terminal 2 connected to the battery (+) cable and terminal 1 grounded, check to see that there is an operational noise from the relay and that there is battery voltage at terminal 3.

Fig. 13-67

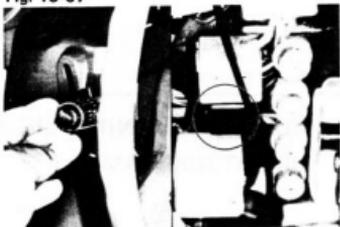


Fig. 13-68

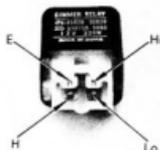
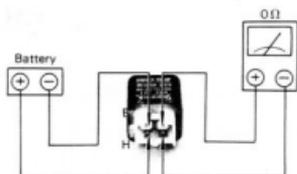


Fig. 13-69



HEADLIGHT DIMMER RELAY (Only Europe)



Turn on the dimmer switch check to see that there is an operating noise from the relay.



2. Measure resistance between terminals.

Between Terminals	Resistance (Ω)	
	12V	24V
H-E	15	226
H-Hi	∞	∞
H-Lo	0	0



3. With terminal H connected to the battery (+) cable and terminal E grounded. Check to see that there is an operating noise from the relay and that there is battery voltage at terminal H.

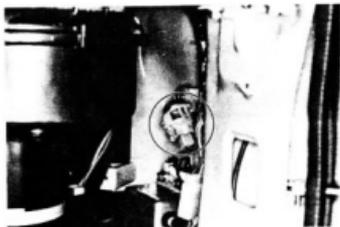
TURN SIGNAL & HAZARD WARNING LIGHT CIRCUIT DIAGRAM

Fig. 13-70

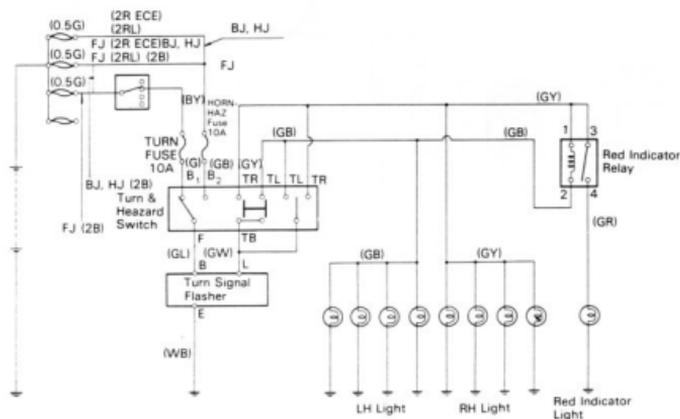
WITH 12V BATTERY



TURN SIGNAL FLASHER



RED INDICATOR LIGHT RELAY



Relay Block Side Terminal Position

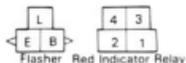


Fig. 13-71

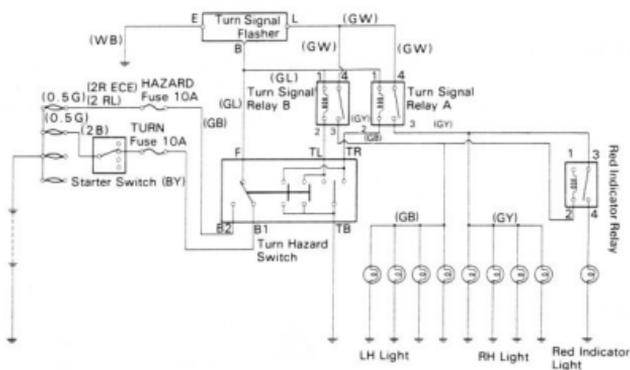
WITH 24V BATTERY



TURN SIGNAL RELAY



RED INDICATOR LIGHT RELAY



Relay Block Side Terminal Position

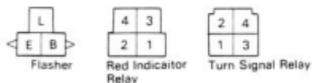
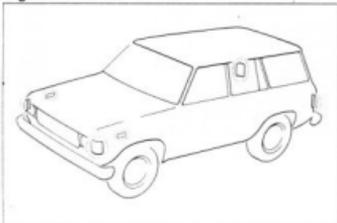
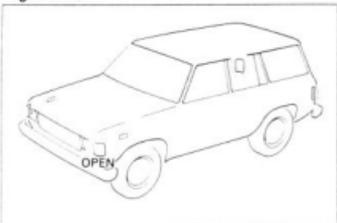


Fig. 13-72



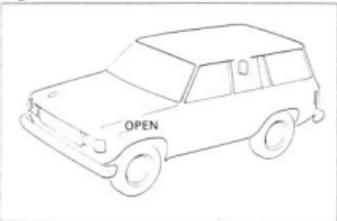
1. The turn signal lights should flash 70 – 100 times per minute.

Fig. 13-73



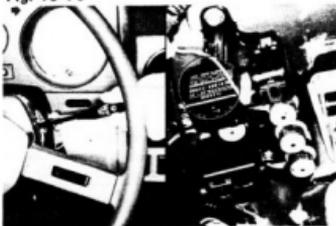
2. If one of the front or rear turn signal lights has an open circuit, the number of flashes should be more than 120 per minute.

Fig. 13-74



3. If one of the side turn signal lights has an open circuit, the number of flashes should increase by about 10 per minute.

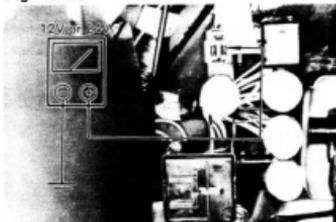
Fig. 13-75



TURN SIGNAL FLASHER INSPECTION

1. Turn on the switch, check to see that there is an operational noise.

Fig. 13-76



2. Battery voltage should be on terminal B.

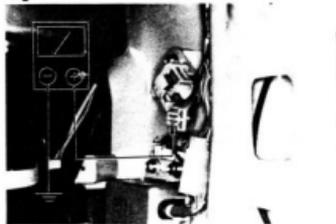
Fig. 13-77



RED INDICATOR RELAY INSPECTION

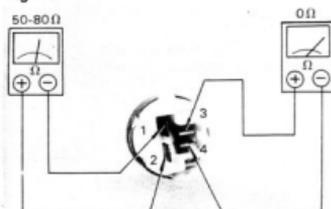
1. Turn on and off the hazard warning switch, check to see that there is an operational noise.

Fig. 13-78



2. Battery voltage should be on terminal 1, 2 and 4.

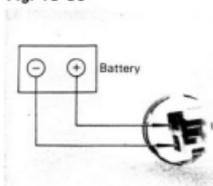
Fig. 13-79



3. Check the resistance between terminals. If each resistance value as shown below, the relay is in good condition.

Between terminals	Resistance (Ω)
1 — 2	approx. 50—80
3 — 4	0

Fig. 13-80



4. With terminal 1 connected to the battery (+) cable and terminal 2 (-) cable, check to see that there is an operational noise.

Fig. 13-81



TURN SIGNAL RELAY (With 24V Battery)

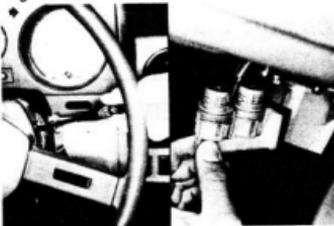
The relays were installed near the glove compartment.

Fig. 13-82



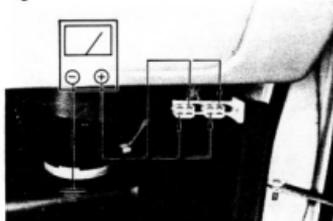
Remove the relays and bracket together.

Fig. 13-83


INSPECTION

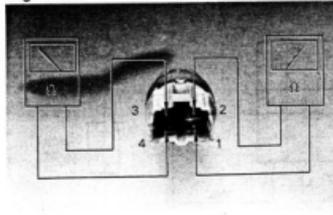
1. Turn on and off the switch, check to see that there is an operational noise.

Fig. 13-84



2. Battery voltage should be on terminal 1 and 4.

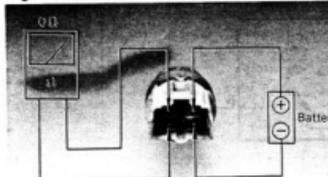
Fig. 13-85



3. Check the resistance between terminals.

Between terminals	Resistance (Ω)	
	12V	24V
1 — 2	75	245
3 — 4	0	0

Fig. 13-86



4. With terminal 2 connected to the battery (+) cable and terminal 1 cable, check to see that there is an operational noise from the relay.

Fig. 13-88

WITH 24V BATTERY



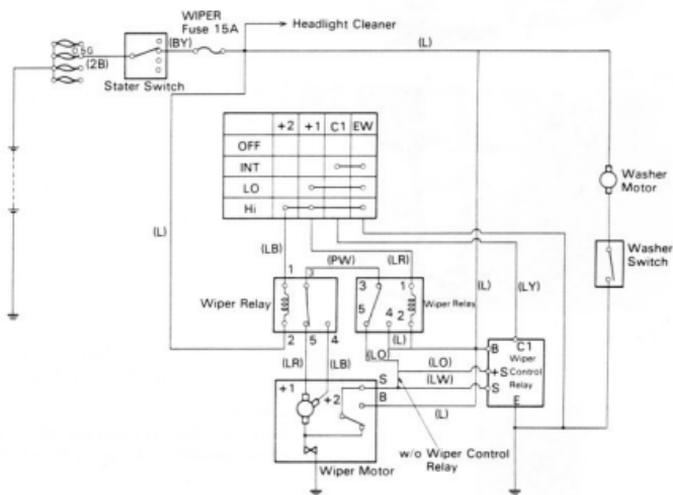
Wiper Control Relay



Without Relay



Wiper Relay



Wiring Side Terminal Position



Wiper Control Relay

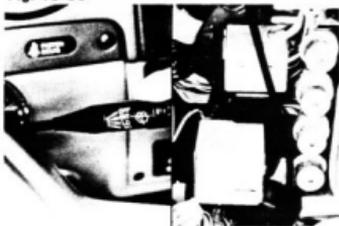


Wiper Motor



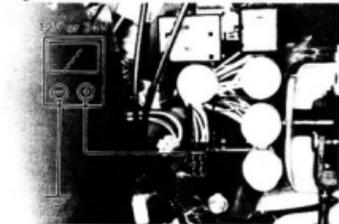
Wiper Relay (A & B)

Fig. 13-89

**WIPER CONTROL RELAY****INSPECTION**

1. Turn wiper switch to INT. and verify wiper control relay noise.

Fig. 13-90



2. Battery voltage should be on terminal B.

Fig. 13-91



3. If no defects are found in the above inspection replace the wiper control relay.

— Note —

If wipers, other than the intermittent wiper, do not operate properly, repair beforehand.

Fig. 13-92

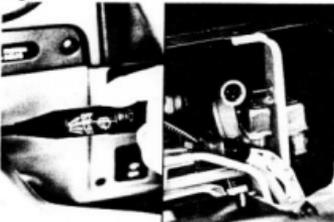
**WIPER RELAY (for 24V)**

Remove the combination meter.

— Note —

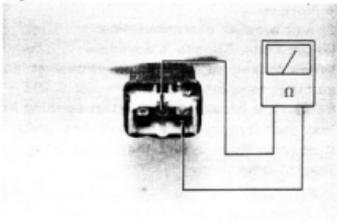
The relays were installed behind the combination meter.

Fig. 13-93

**INSPECTION**

1. Turn on the switch, check that there is an operating noise.

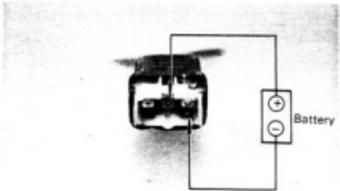
Fig. 13-94



2. Check continuity between terminals.

Between Terminals	Resistance (Ω)
1 — 2	240
3 — 4	∞
3 — 5	0

Fig. 13-95



3. With terminal 1 connected to the battery (+) terminal and terminal 2 connected to the battery (-) terminal, check that there is relay operational noise.

Fig. 13-96

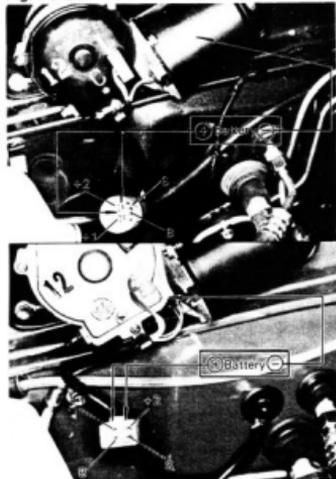
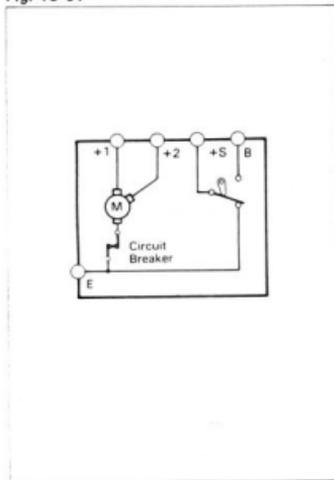


Fig. 13-97



WIPER MOTOR & LINK



INSPECTION

With terminal +2 or +1 connected to the battery (+) terminal and motor body connected to the battery (-) terminal, confirm that the motor rotates smoothly.



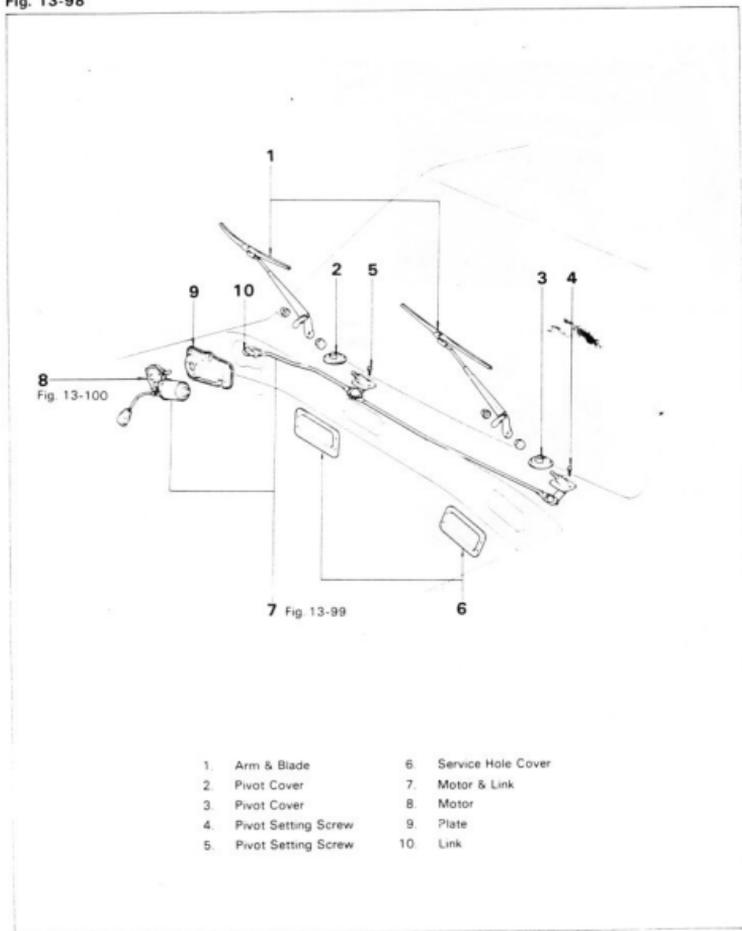
— Note —

Circuit breaker characteristics:
(Frigid Zone, Canada & Sweden)

When locked in low speed circuit at an ambient temperature of 20 – 30°C (68 – 86°F): The breaker should start opening in less than five minutes the 1st time tried. It should return in less than three minutes the 1st time tried.

REMOVAL

Remove the parts in the numerical order shown in the figure.

Fig. 13-98

- | | |
|------------------------|-----------------------|
| 1. Arm & Blade | 6. Service Hole Cover |
| 2. Pivot Cover | 7. Motor & Link |
| 3. Pivot Cover | 8. Motor |
| 4. Pivot Setting Screw | 9. Plate |
| 5. Pivot Setting Screw | 10. Link |

Fig. 13-99



Remove the motor and link together.

Fig. 13-100



Pry the link with screwdriver and disconnect the link from the motor.

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 13-101

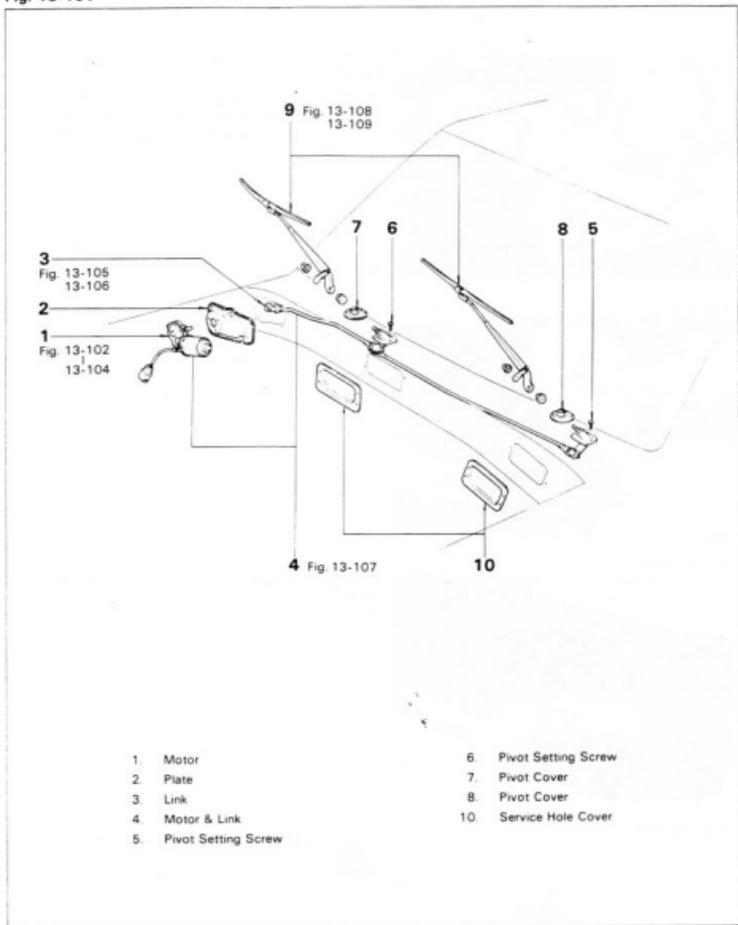
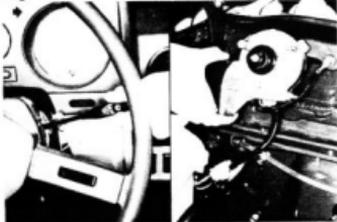


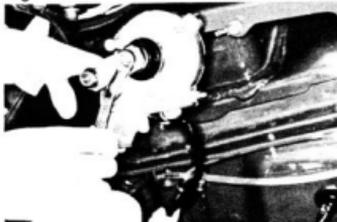
Fig. 13-102



Before installing the motor, connect the motor link.

1. Temporarily connect the connector.
2. Turn on the wiper switch and stop the motor at the automatic stop position.

Fig. 13-103



3. Install the motor arm.

Fig. 13-104



4. Install the motor link as shown in the figure.

Fig. 13-105



Coat MP grease at the joint parts.

Fig. 13-106



After connecting the motor and link, install the motor.

Fig. 13-107



Install the link under the reinforcement.

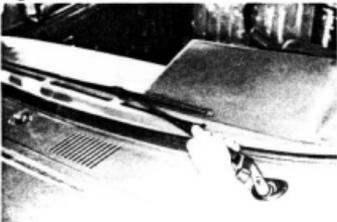
Fig. 13-108



Install the wiper arm.

1. Place the wire motor in the automatic stop position.

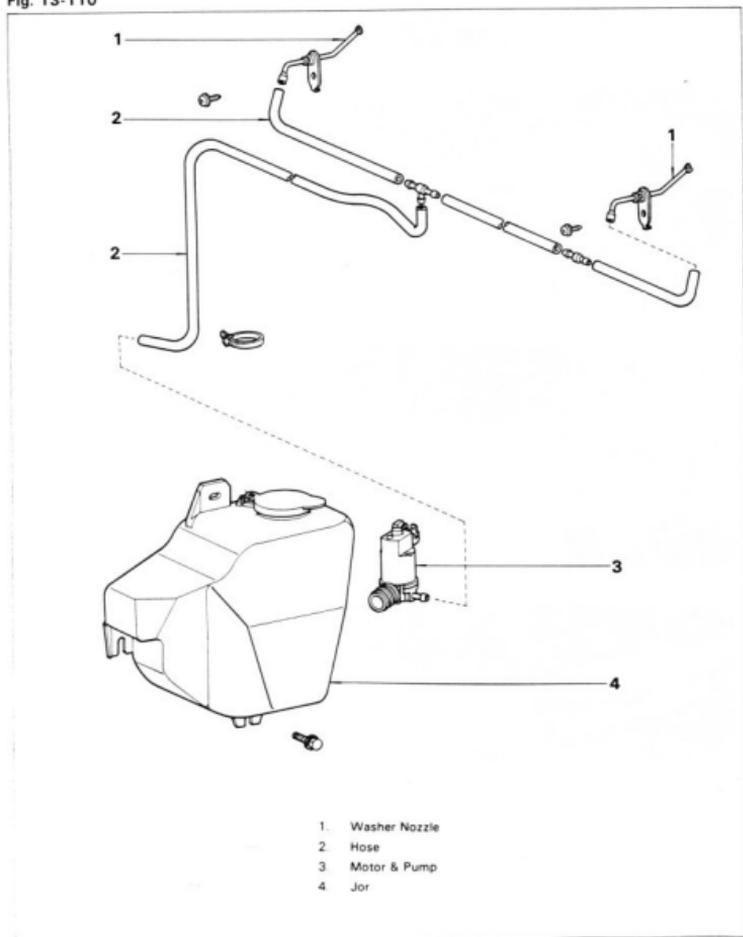
Fig. 13-109



2. Install the wiper arm at the lower position.

FRONT WASHER COMPONENTS

Fig. 13-110



REAR WIPER & WASHER CIRCUIT DIAGRAM

Fig. 13-111

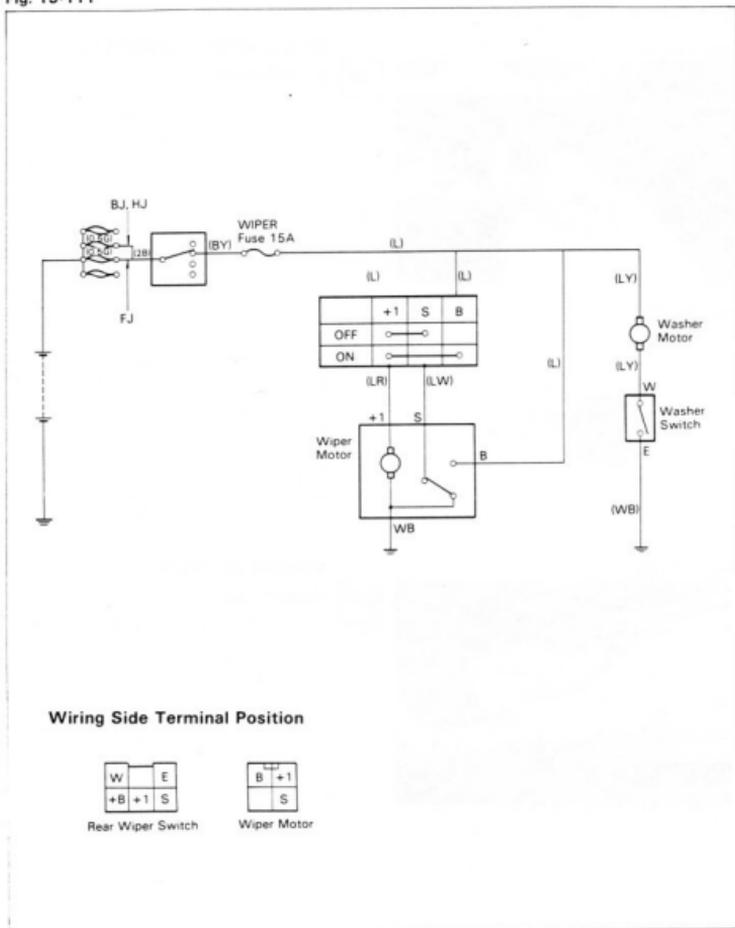


Fig. 13-112



Fig. 13-113

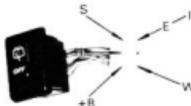
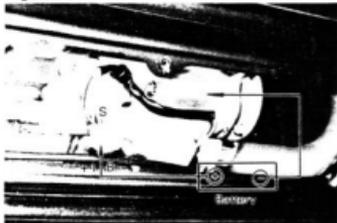


Fig. 13-114



REAR WIPER SWITCH

INSPECTION

1. Remove the switch.
2. Remove the center panel.
3. Disconnect the connector.



4. Check the continuity between the terminals.

		S	+1	+B	E	W
Wiper	OFF	○—○				
	ON		○—○			
Washer					○—○	

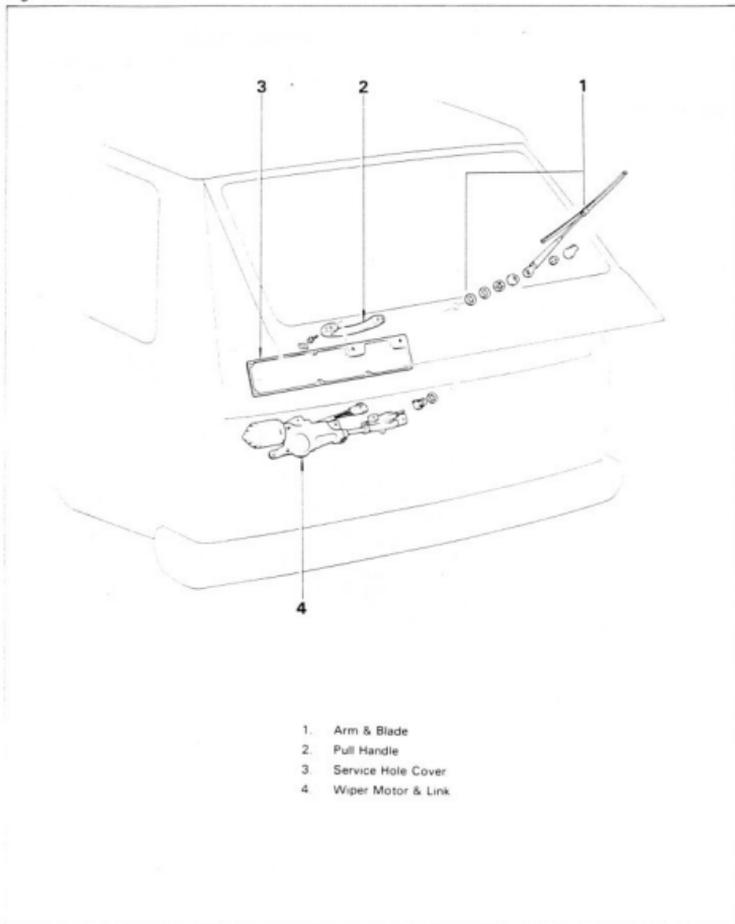
WIPER MOTOR

INSPECTION

With terminal (+1) connected to the battery (+) terminal and motor body connected to the battery (-) terminal. Confirm that the motor rotates smoothly.

REMOVAL

Remove the parts in the numerical order shown in the figure.

Fig. 13-115

1. Arm & Blade
2. Pull Handle
3. Service Hole Cover
4. Wiper Motor & Link

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 13-116

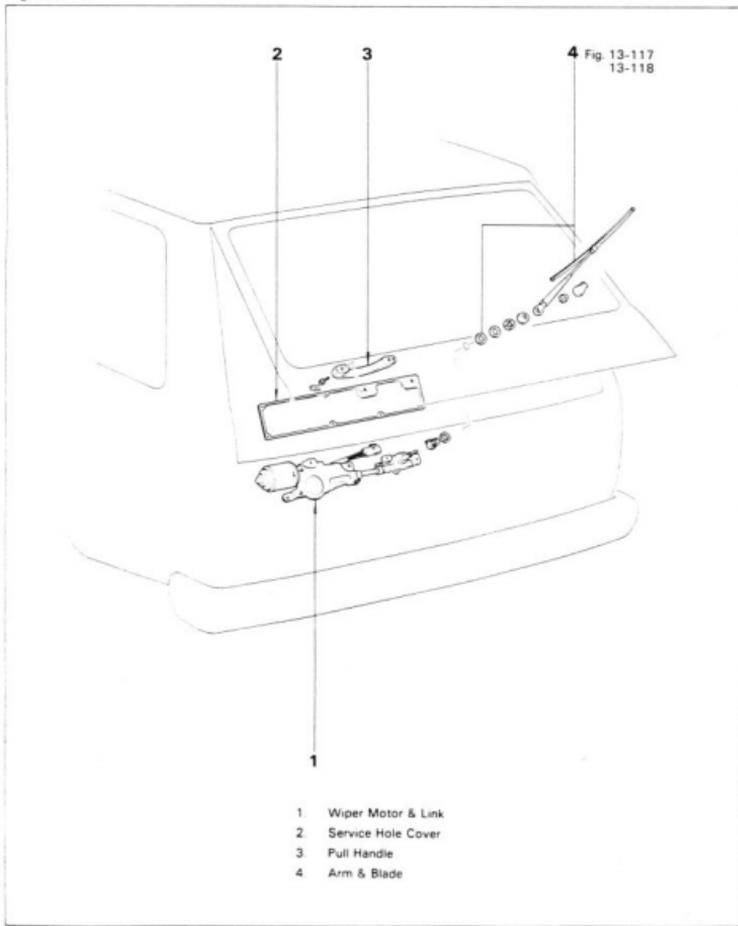


Fig. 13-117



Before installing the wiper arm, place the wiper motor in the automatic stop position.

Fig. 13-118



Install the wiper arm with lower position.

REAR WINDOW WASHER COMPONENTS

Fig. 13-119

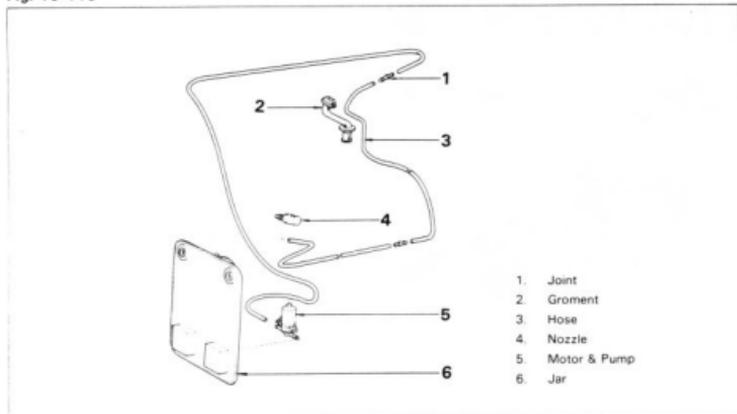
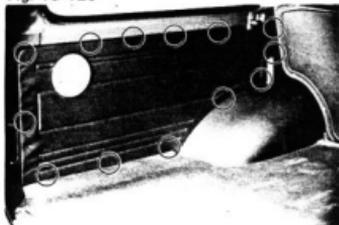


Fig. 13-120



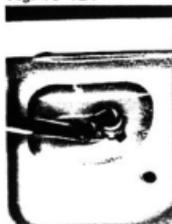
REMOVAL

The clips are located as shown in the figure.

— Note —

The washer tank is installed behind the trim.

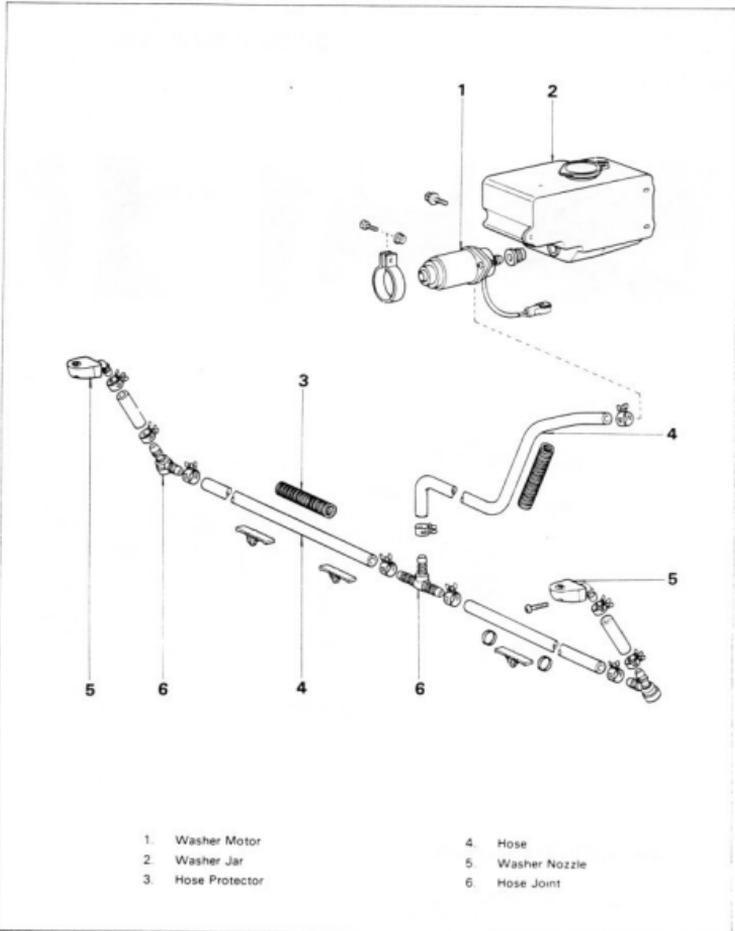
Fig. 13-121



Push up one lock clip a screwdriver when remove the nozzle.

HEADLIGHT CLEANER COMPONENTS

Fig. 13-122



CIRCUIT DIAGRAM

Fig. 13-123

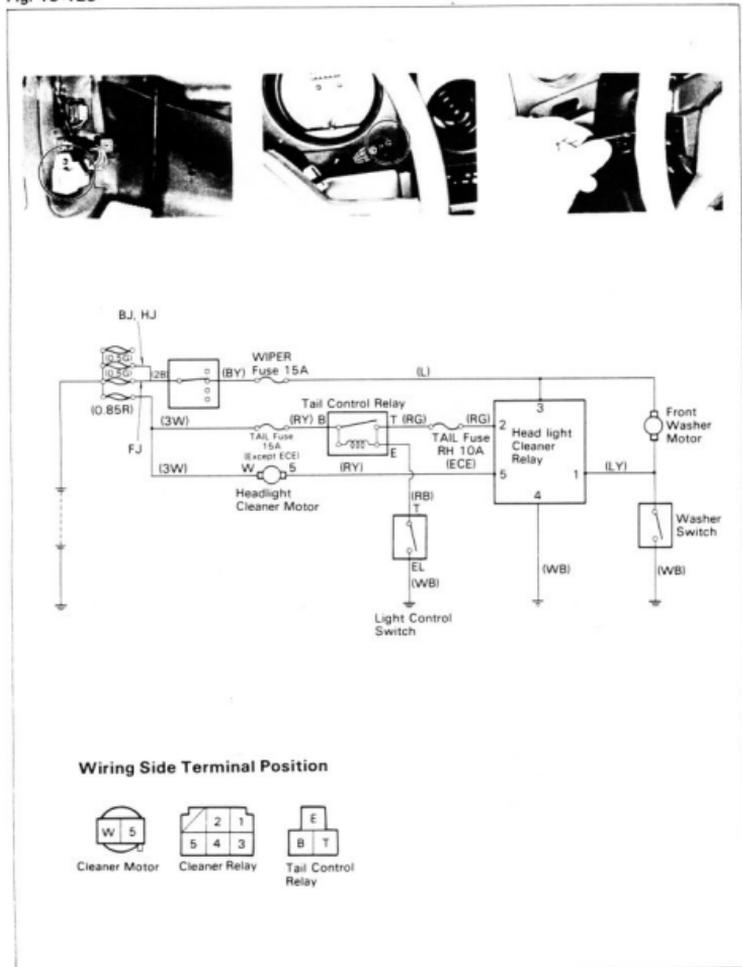
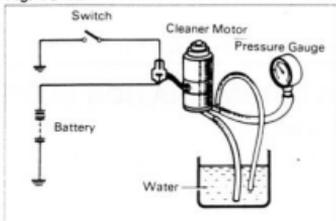


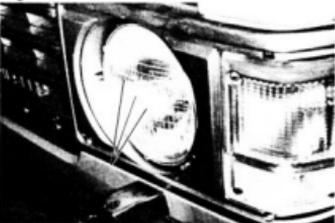
Fig. 13-124

**INSPECTION**

 Mount a pressure gauge to the outlet union, and check the motor discharge pressure.

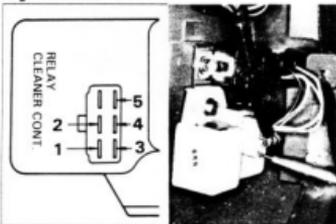
Discharge pressure:
1.8 kg/cm² Over
(26 psi)

Fig. 13-125



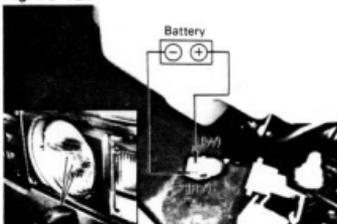
 - Note -
If one nozzle starts spraying extremely faster than the other, replace the nozzle assembly.

Fig. 13-126



 Battery voltage should be on terminals 3, 2 and 5.

Fig. 13-127

**CLEANER MOTOR**

 When connecting the battery voltage to the connector, the water is injected from the nozzle.

SPEEDOMETER & COMBINATION METER

REMOVAL

Remove the parts in the numerical order shown in the figure.

Fig. 13-128

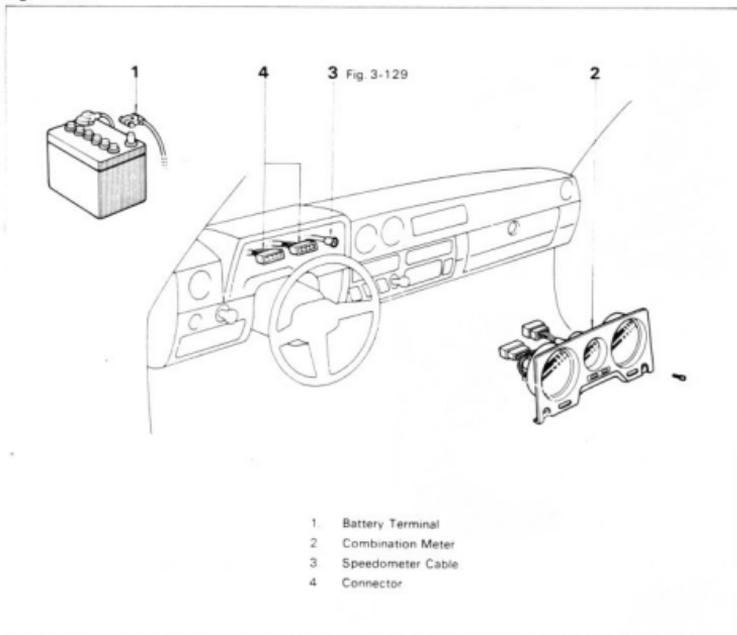
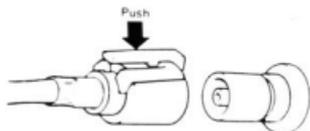


Fig. 13-129

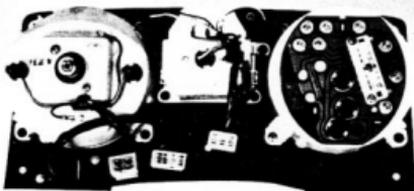


Before removing the combination meter, pull out the cable while pushing the lock lever.

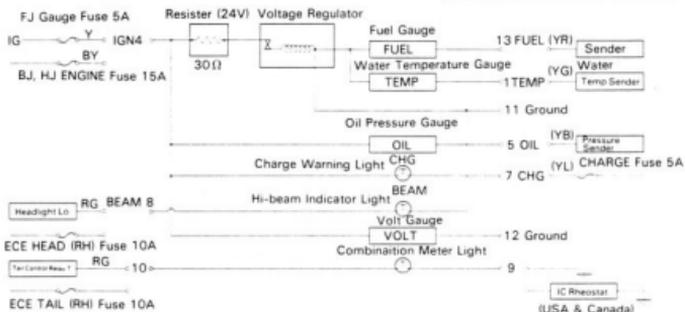
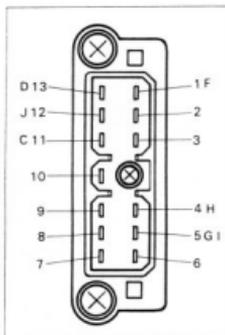
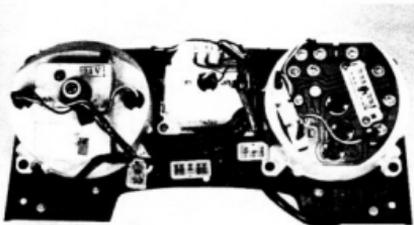
INSPECTION

Fig. 13-130

12V



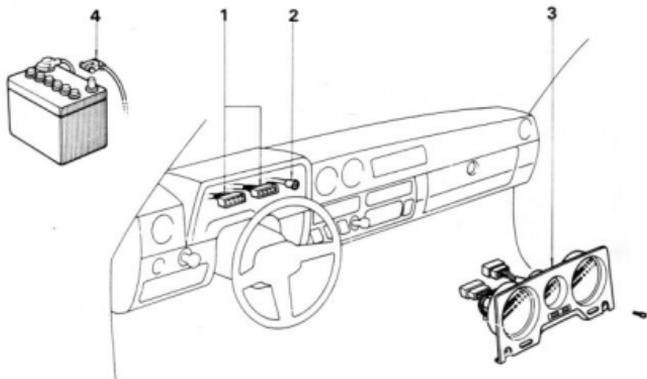
24V



INSTALLATION

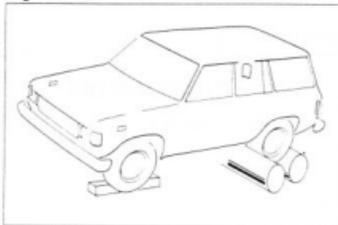
Install the parts in the numerical order shown in the figure.

Fig. 12-131



1. Connector
2. Speedometer Cable
3. Combination Meter
4. Battery Terminal

Fig. 13-132

**SPEEDOMETER****ON-VEHICLE INSPECTION**

Using a speedometer tester, inspect the meter for indicating error, pointer vibration, abnormal noise and the operation of the odometer.

- Note -

It must be noted that tire wear and tire over-and under-inflation will contribute toward indication error, and that pointer vibration is often caused by a loose cable.

Fig. 13-133



Speedometer allowable error

Std. indication (km/h)	Allowable error (km/h)
20	18 - 23
40	40 - 44
60	60 - 64.5
80	80 - 85
100	100 - 105
120	121 - 126.5
140	140 - 146

ENGINE TACHOMETER CIRCUIT DIAGRAM

Fig. 13-134

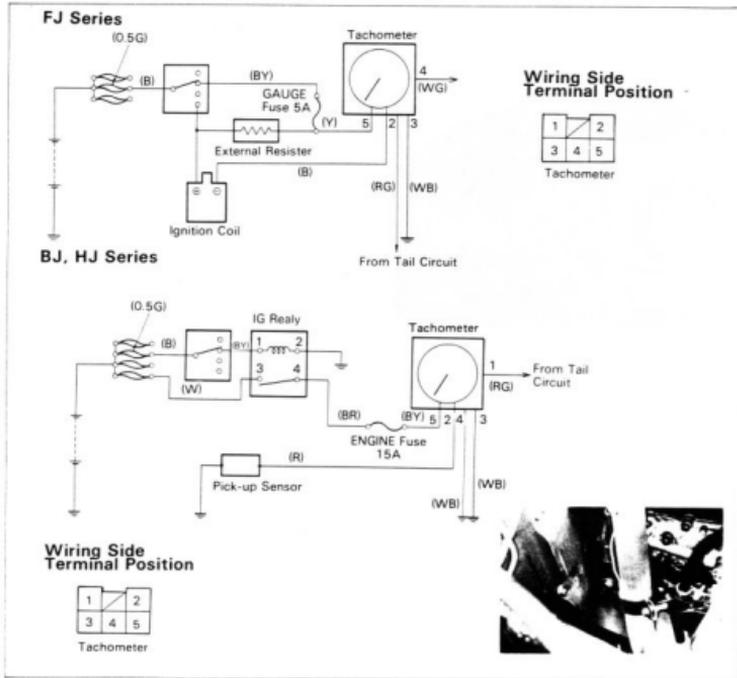


Fig. 13-135



INSPECTION

Pick-up Sensor (for 3B & 2H)

Check the resistance between the terminals

Resistance: About 500Ω

Fig. 13-136



1. Connect a tune-up test tachometer, and start the engine.
2. Compare the tester and tachometer indications, and if the error is too great, replace the tachometer.

— Caution —

1. Do not reverse battery connections as this tachometer is intended only for use in (-) ground vehicles. A reversed connection could damage the transistors and diodes contained inside.
2. In removing or installing the tachometer, be careful not to drop it or subject it to heavy shocks.

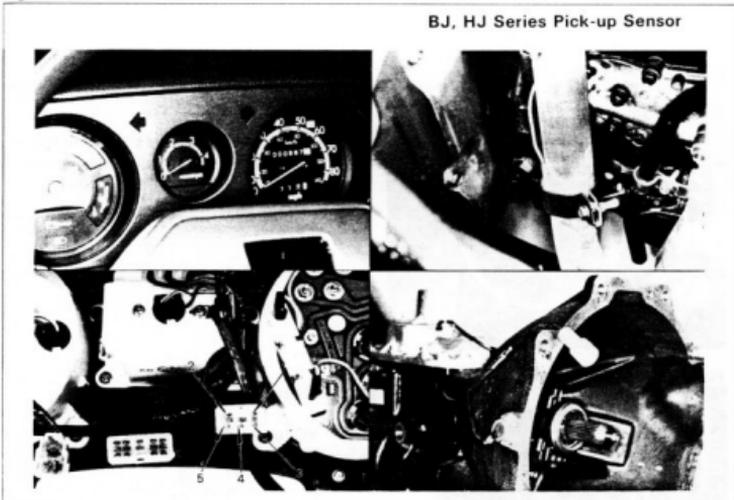
Tachometer allowable range

rpm	1,000	2,000	3,000
20°C 13V	± 100	± 125	± 150

Fig. 13-137

COMPONENTS

BJ, HJ Series Pick-up Sensor



VOLTAGE METER CIRCUIT DIAGRAM

Fig. 13-138

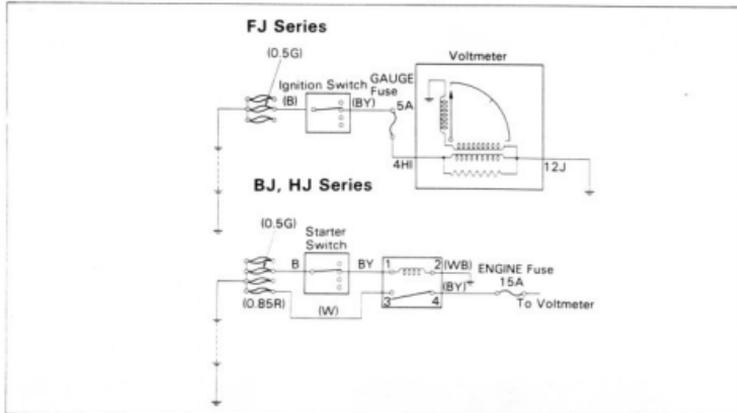
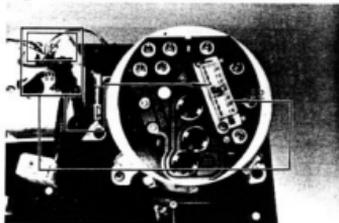


Fig. 13-139



INSPECTION

Measure the resistance between terminals. If each resistance value as shown in the table below, the relay is in good condition.

Between terminals	Resistance (Ω)
J - I	approx. 650

Fig. 13-140



Check the indicator value

Volt gauge allowable error

W/12V Battery

V	10	12	14
Error	+ 0.4 - 0.6	\pm 0.3	+ 0.6 - 0.4

W/24V Battery

V	20	24	28
Error	+ 0.8 - 1.2	\pm 0.6	+ 1.2 - 0.8

FUEL GAUGE CIRCUIT DIAGRAM

Fig. 13-141

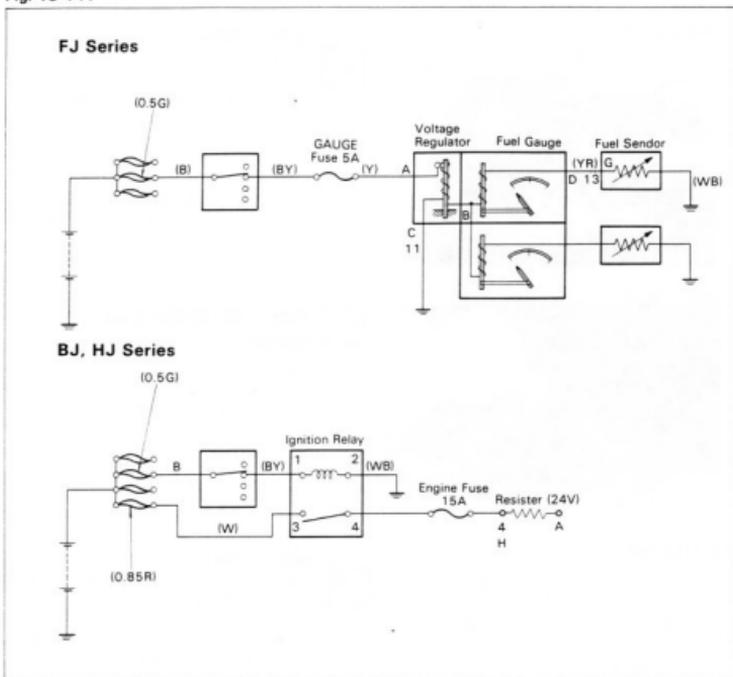
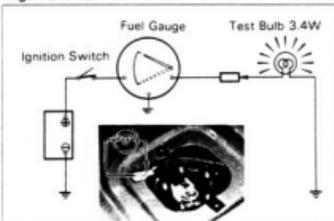


Fig. 13-142



ON-VEHICLE INSPECTION

1. Pull the connector out of the fuel sender gauge and ground it through a 3.4W bulb.
2. After the ignition switch is turned ON, the bulb should start flashing within in several seconds, and the gauge needle should vibrate.

Fig. 13-143

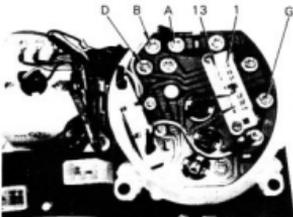
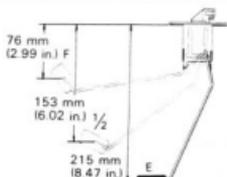


Fig. 13-144



Fig. 13-145



Sedan, Coupe & Liftback



INSPECTION



1. Measure the resistance between terminals B and D.

Resistance: STD 25 Ω

2. When the ignition switch is turned ON with a connector connected to the control panel, voltage should be applied to the terminal A.
3. Under the above condition, 2-7V of current should be applied to terminals B and D.

(A regulator is built into the fuel receiver gauge.)



FUEL SENDER GAUGE

REMOVAL

Remove the following parts.

1. Rear floor carpet
2. Rear floor wire harness protector
3. Connector
4. Fuel sender gauge



INSPECTION

Measure the resistance between the terminal and gauge body.

If the resistance values correspond to the residual amounts of fuel as shown in the table below, the gauge is in good condition.

Float position	Resistance (Ω)
F	17 \pm 2.1
1/2	40 \pm 4.5
E	120 \pm 6.5

WATER TEMPERATURE GAUGE CIRCUIT DIAGRAM

Fig. 13-146

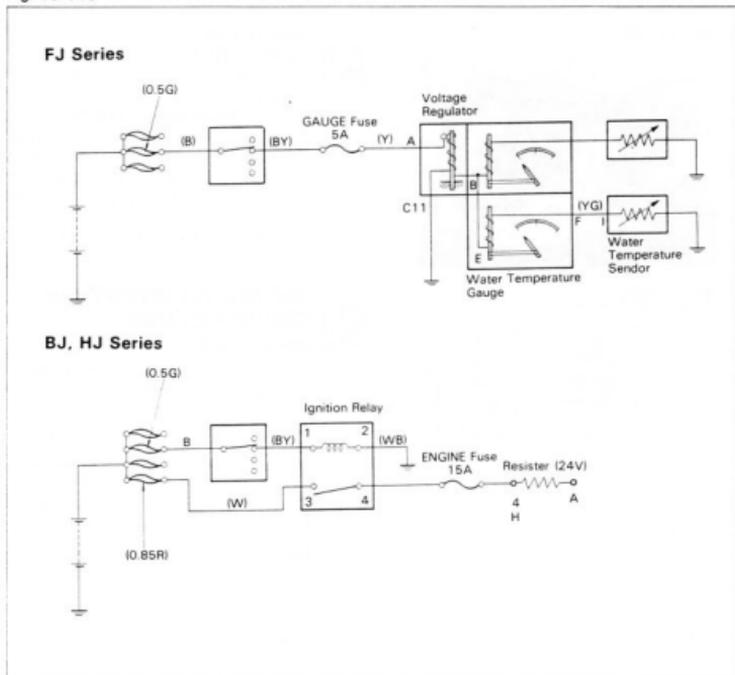
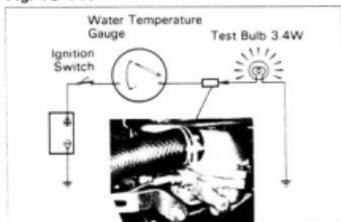


Fig. 13-147



WATER TEMPERATURE RECEIVER GAUGE

ON-VEHICLE INSPECTION

1. Pull the connector out of the water temperature sender gauge and ground through a 3.4W bulb.
2. When the ignition switch is turned ON, the bulb should start flashing with in several seconds, and the gauge needle should vibrate.

Fig. 13-148

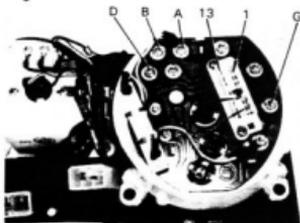
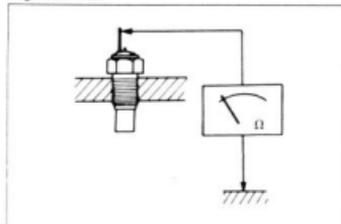


Fig. 13-149



INSPECTION (Bimetal Type)

1. Measure the resistance between terminals E and F.

Resistance: STD 25 Ω

2. When the ignition switch is turned ON with a connector connected to the control panel under the above condition, 2 – 7 V current should be applied to the terminal A.
(A regulator is built into the fuel receiver gauge.)



WATER TEMPERATURE SENDER GAUGE

INSPECTION

When resistance between the terminal and ground is measured with a circuit tester, the resistance values should correspond to the water temperatures shown in the table below.

Water temperature °C (°F)	Resistance (Ω)
50 (122)	226
115 (239)	26

OIL PRESSURE GAUGE CIRCUIT DIAGRAM

Fig. 13-150

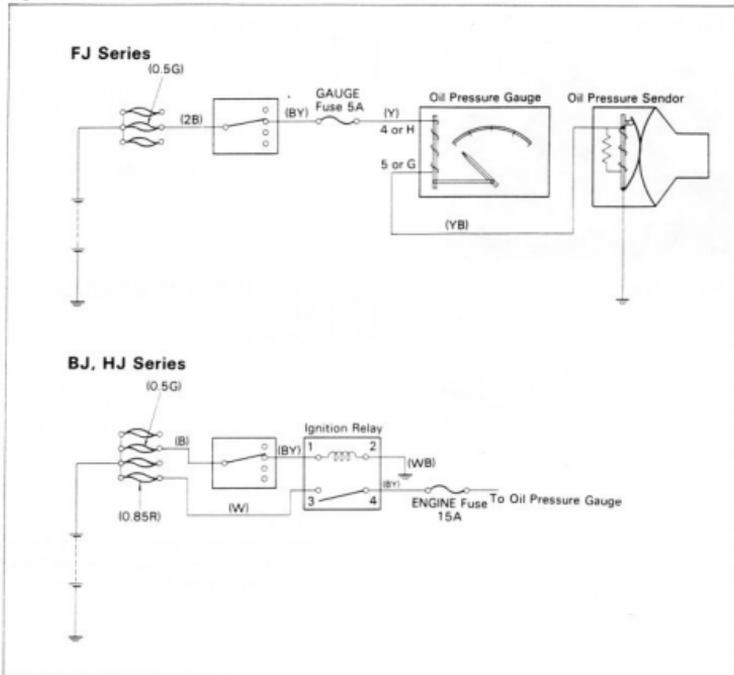
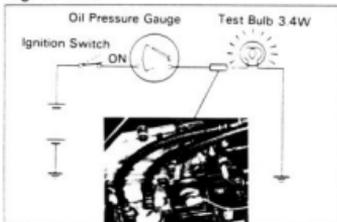


Fig. 13-151



OIL PRESSURE RECEIVER GAUGE

ON-VEHICLE INSPECTION

1. Pull the connector out of the oil pressure sender gauge and ground it through a 3.4W bulb.
2. After the ignition switch is turned ON, the bulb should light up and the gauge needle should deflect.

Fig. 13-152

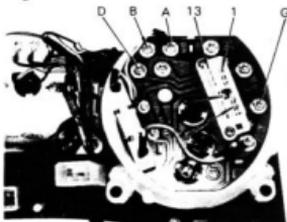
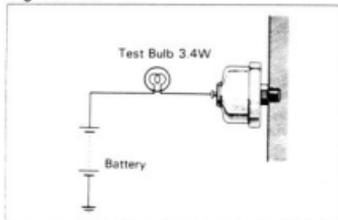


Fig. 13-153

**INSPECTION**

1. Measure the resistance between terminals 4 and 5.
2. When the ignition switch is turned ON with a connector connected to the control panel, voltage should be applied to terminal G.

Resistance: 65 Ω

OIL PRESSURE SENDER GAUGE**INSPECTION**

Pull out the connector from the sender, and apply battery voltage to the sender terminal through a 3.4W bulb. The bulb should not light when the engine is stopped, and should flash when the engine is running. The number of flashes should also vary with the engine speed.

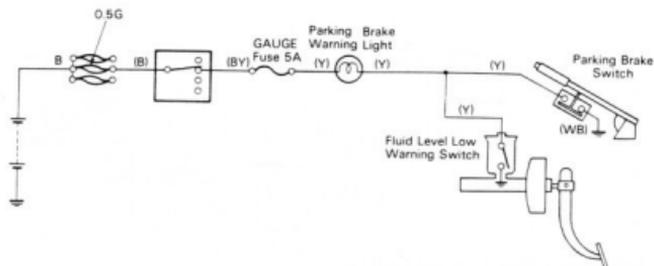
— Note —

Even when the engine is stopped, the bulb may light for an instant when the battery voltage is applied, but this is normal.

BRAKE WARNING SYSTEM CIRCUIT DIAGRAM

Fig. 13-154

FJ Series



BJ, HJ Series

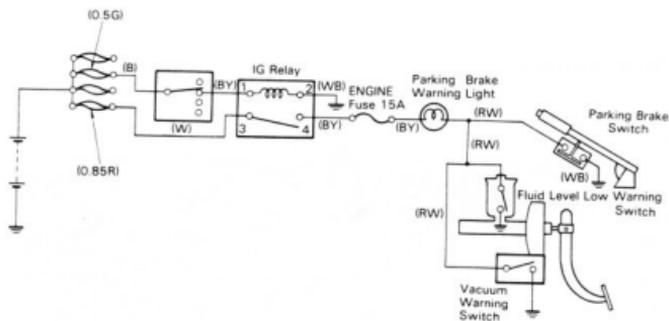
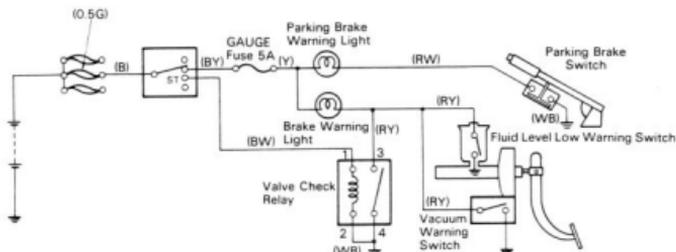


Fig. 13-155

FJ Series (ARL)

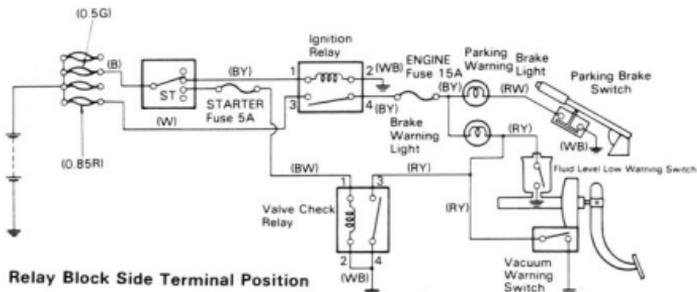


Relay Block Side Terminal Position



Valve Check Relay

HJ Series (ARL)

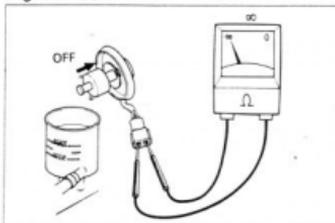


Relay Block Side Terminal Position



Valve Check Relay

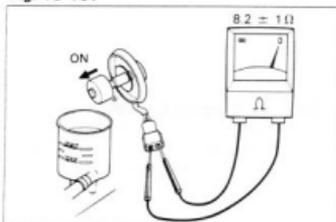
Fig. 13-156



BRAKE FLUID LOW LEVEL WARNING SWITCH ON-VEHICLE INSPECTION

When the float is up, the lead switch should be OFF (∞).

Fig. 13-157



When the float is down, the lead switch should be ON ($8.2 \pm 1 \Omega$).

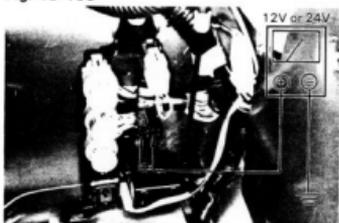
Fig. 13-158



BULB CHECK RELAY INSPECTION

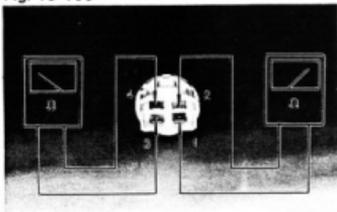
1. Remove the cowl side trim RH.
2. Remove the rear fog light relay from the relay block No.1.

Fig. 13-159



Turn on the ignition or starter switch at the ST position, check to see that there is battery voltage at terminal 1 and 3.

Fig. 13-160



3. Measure resistance between terminals.

Between terminals	Resistance (Ω)	
1 — 3	12V	24
	approx.65	245
2 — 4	∞	∞

Fig. 13-161



Vacuum Warning Switch

Check the continuity between terminals.

With engine running ON
 With engine stopping OFF

Fig. 13-162



Parking Brake Switch

Check the continuity between terminals.

When pulling the lever ON
 When release the lever OFF

REAR WINDOW DEFOGGER CIRCUIT DIAGRAM

Fig. 13-163

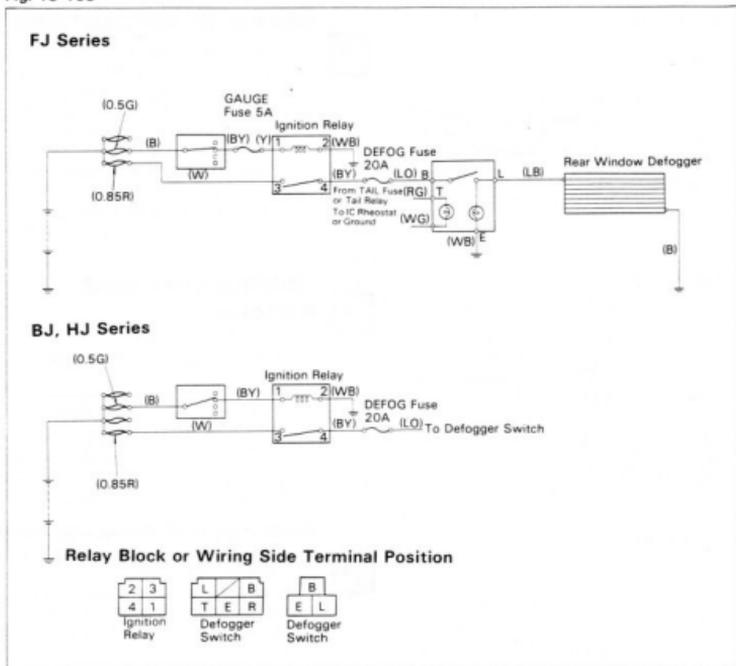
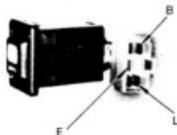


Fig. 13-164



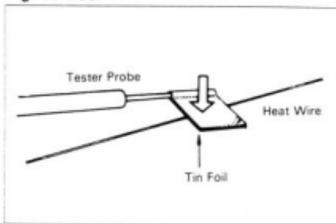
INSPECTION



- Check the continuity between terminals. If there is a continuity between terminals as shown in the table below, the switch is in good condition.

Terminal Switch position	B	L	E
OFF		○	○
ON	○	○	○

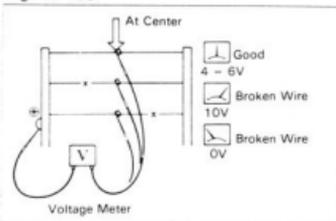
Fig. 13-165



HEAT WIRE PRECAUTIONS

1. Clean the glass with a soft, dry cloth, wiping in the direction of the wires and using care not to damage the wires.
2. Do not use detergents or glass cleaners containing abrasive ingredients.
3. To prevent the tip of tester probe from damaging the heat wire when measuring the voltage, wind a strip of tin foil around the tip and check by pressing the other end of foil against the heat wire with your finger.

Fig. 13-166



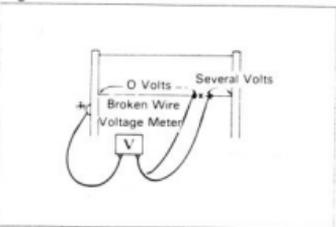
PRINTED HEAT WIRE

INSPECTION

1. Turn ON the defogger.
2. Check the voltage at the center of each heat wire.

Voltage	Criteria
approx. 5V	Good (No Break in wire)
approx. 10V or 0V	Broken wire

Fig. 13-167



CHECK FOR WIRE BREAKAGE POINT

1. Place the voltmeter (+) lead against the defogger (+) terminal.
2. Place the voltmeter (-) lead with the foil strip against the heat wire at the (+) terminal end, and shift it toward the (-) terminal end.
3. The point where the voltmeter deflects from zero volts to several volts is the place where the heat wire is broken.

REPAIR

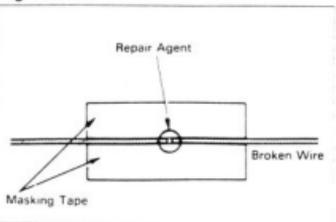
1. Preparatory materials

- (1) Fine pointed brush, size 0 or similar
- (2) White gasoline
- (3) Masking tape
- (4) Repair agent: Dupont Paste No. 4814

2. Repair method

- (1) Clean where the wire is broken.
- (2) As illustrated stick masking tape under the place that is to be repaired.
- (3) Thoroughly mix the repair agent, dip a small amount on a fine brush, and paint it on the part to be repaired.
- (4) After one or two minutes, peel off the masking tape.
- (5) Allow to stand at least 24 hours after repairing before turning the defogger on.

Fig. 13-168



SEAT BELT WARNING CIRCUIT DIAGRAM

Fig. 13-169

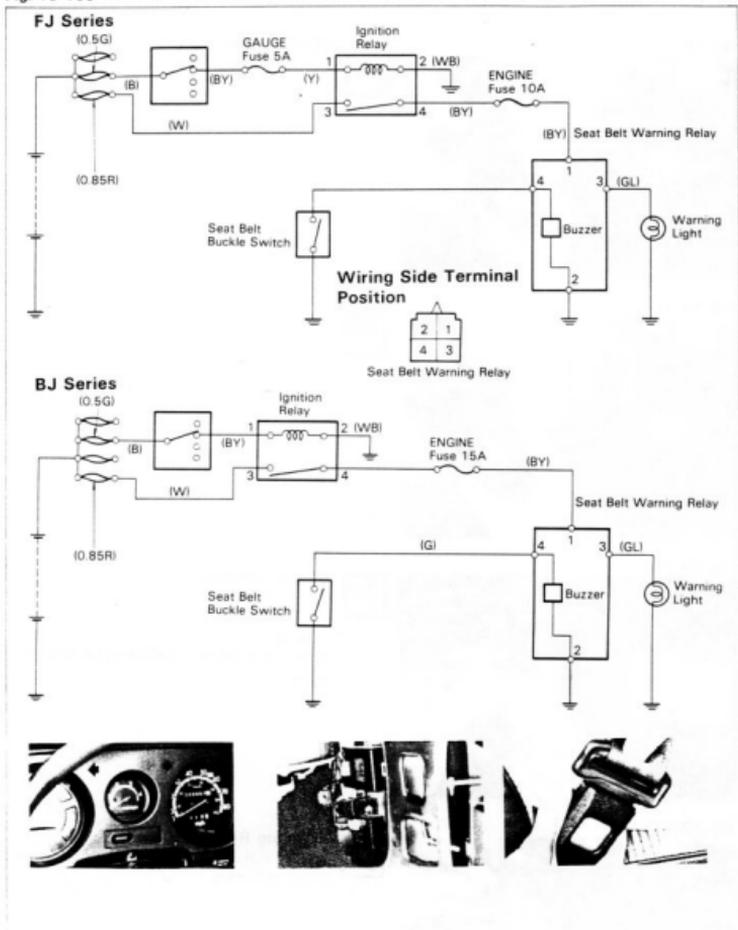


Fig. 13-170

**INSPECTION**

1. Inspect the buzzer.

Fig. 13-171



2. Inspect the buzzer

Fig. 13-172

**Buckle Switch**

Inspect the switch.

— Note —

Buckle switch is installed under the center console.

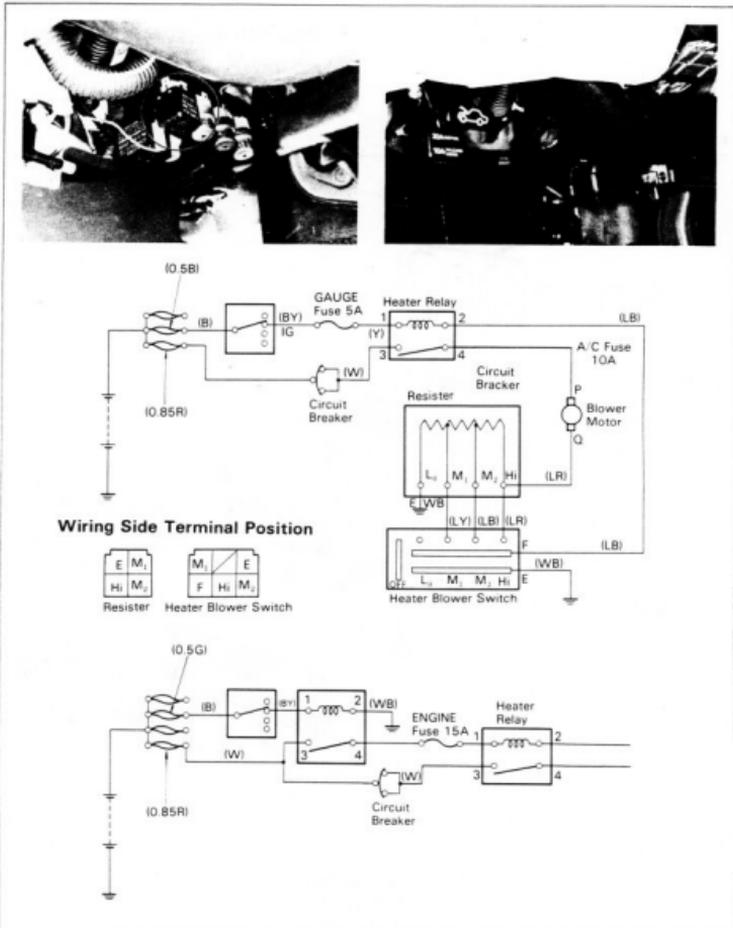
Fig. 13-173

**Warning Relay**

Battery voltage should be applied between 1 and 2 terminals.

HEATER CIRCUIT DIAGRAM

Fig. 13-174



HEATER BLOWER SWITCH**REMOVAL**

Remove the parts in the numerical order shown in the figure.

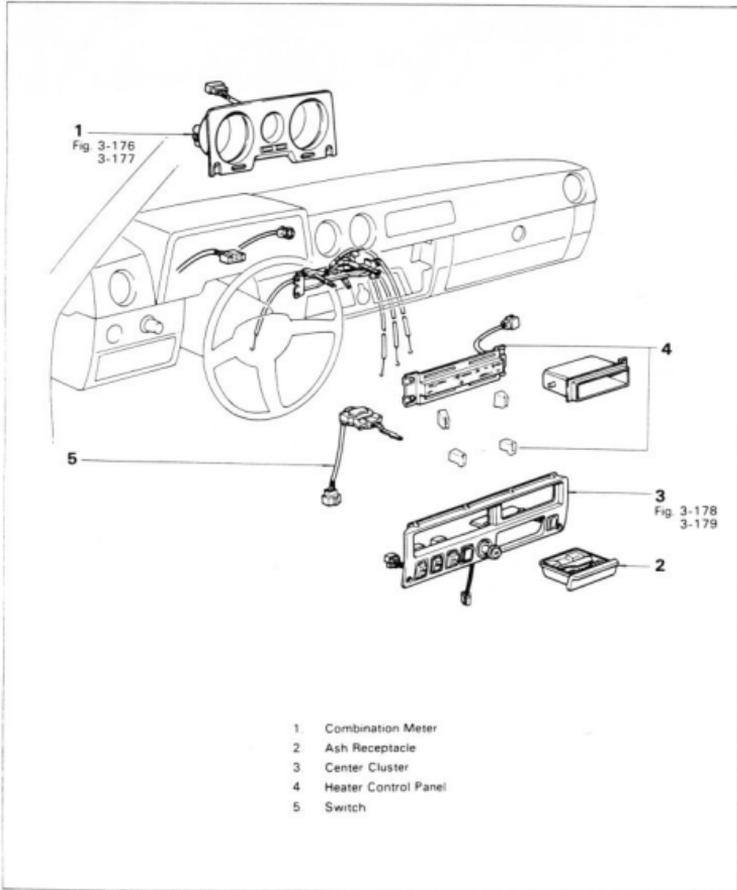
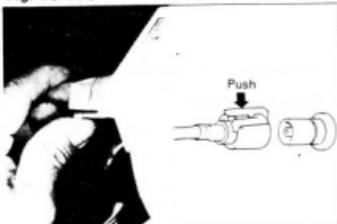
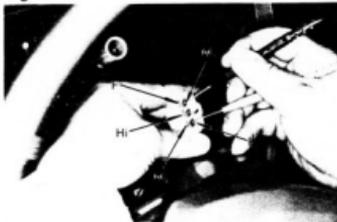
Fig. 13-175

Fig. 13-176



Before removing the combination meter, pull out the cable while pushing the lock lever.

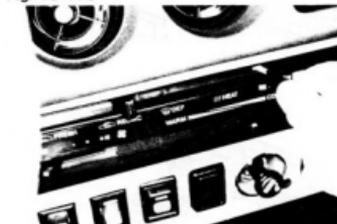
Fig. 13-177



Before removing the switch, check continuity between terminals.

Terminal Position \ Terminal	E	F	Hi	M ₂	M ₁	Lo
OFF						
Low	○—○					
M ₁	○—○	○—○			○	
M ₂	○—○	○—○	○—○			
Hi	○—○	○—○	○—○			

Fig. 13-178



Remove the knobs by pulling its.

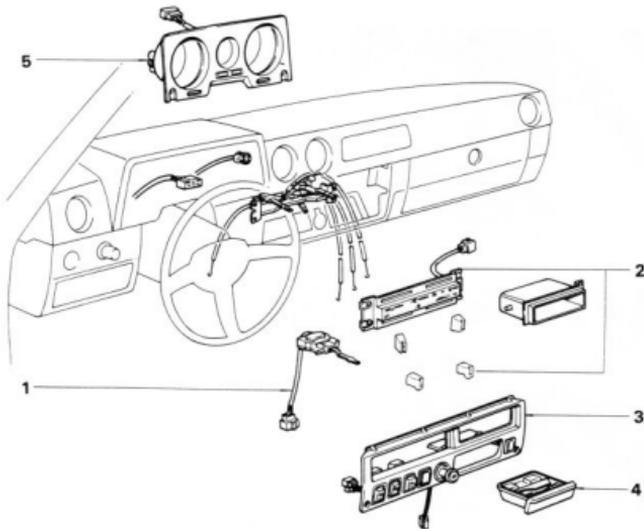
Fig. 13-179



Before removing the center panel, disconnect the connectors.

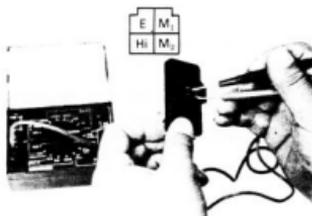
INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 13-180

- 1 Switch
- 2 Heater Control Panel
- 3 Center Cluster
- 4 Ash Receptacle
- 5 Combination Meter

Fig. 13-181

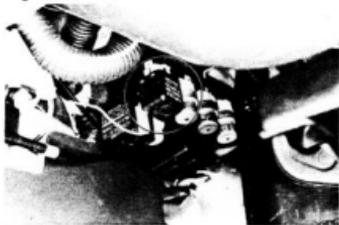


BLOWER RESISTOR

INSPECTION

Measure continuity between terminals.

Fig. 13-182

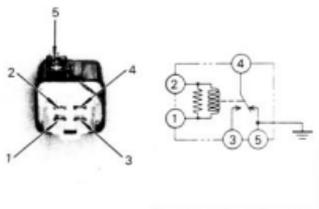


HEATER RELAY

INSPECTION

1. Check to see that there is an operational noise from the relay when turn on the switch.

Fig. 13-183



2. Measure continuity between terminals.

Between terminals	Resistance Ω	
	12V	24V
1 — 2	75 Ω	226 Ω
3 — 4	0	

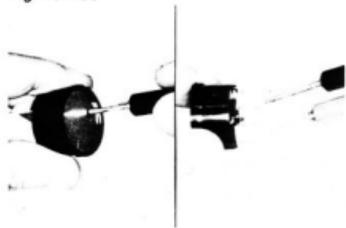
Fig. 13-184



CIRCUIT BREAKER

Remove the circuit breaker near the fuse block.

Fig. 13-185



Reset the breaker by inserting the needle into the hole and push it.
Check continuity between terminals.

HEATER BLOWER MOTOR**REMOVAL**

Remove the parts in the numerical order shown in the figure.

Fig. 13-186

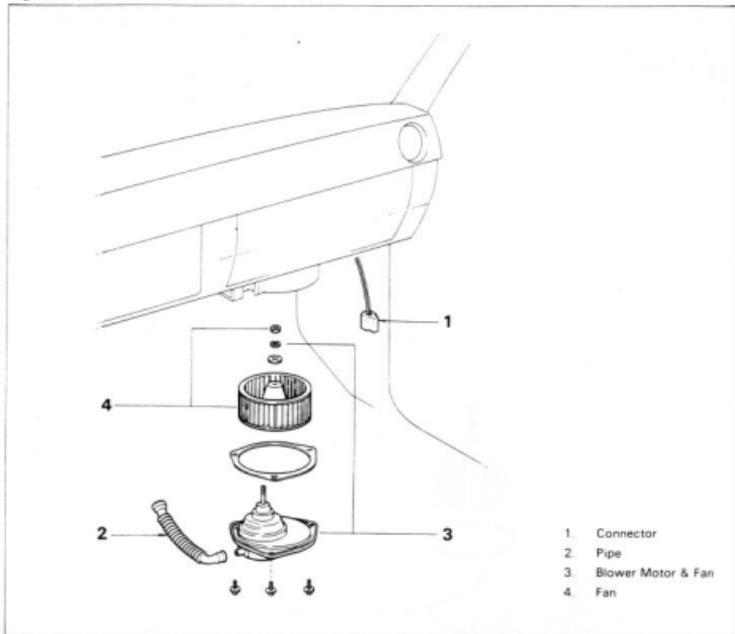
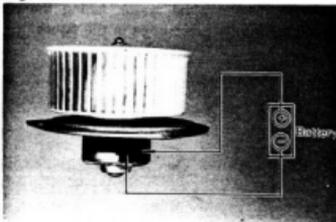


Fig. 13-187

**INSPECTION**

Apply the battery voltage to the connector check to see that the motor rotates smoothly.

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 13-188

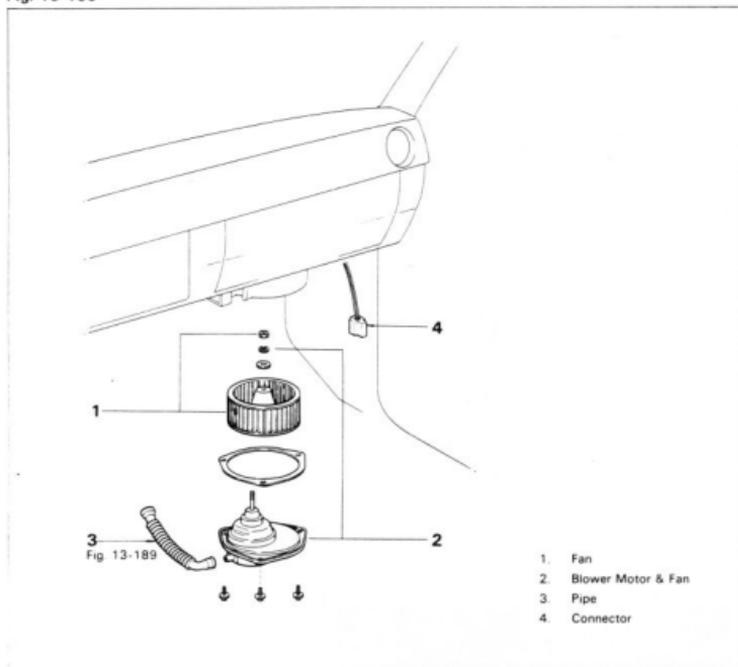
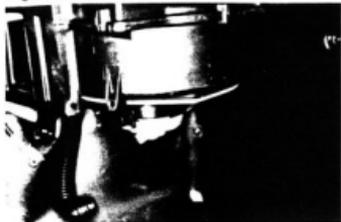


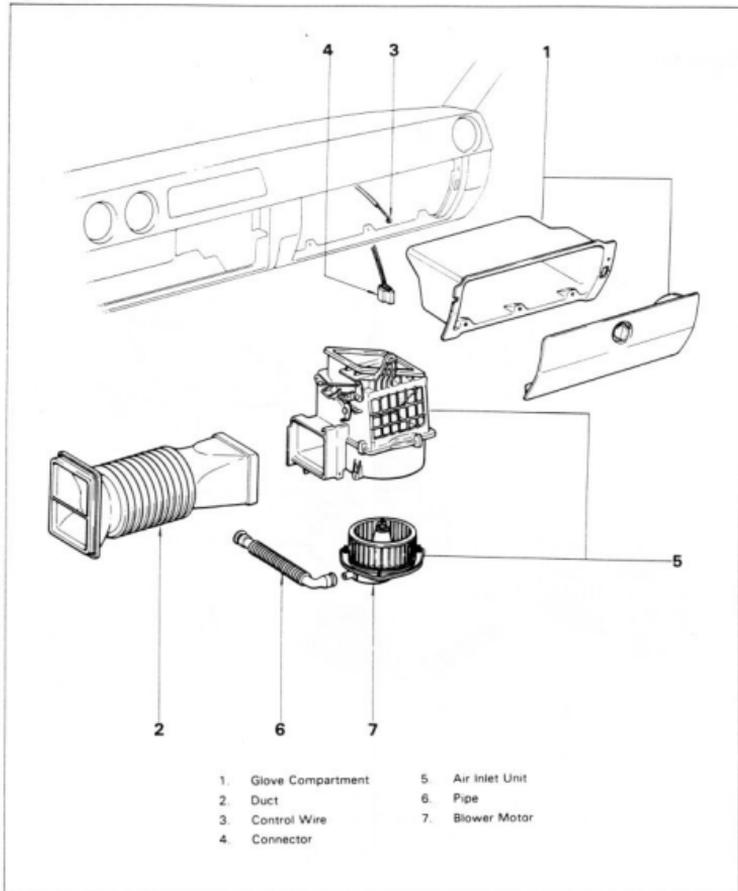
Fig. 13-189



When installing the motor, facing the pipe connecting part as shown in the figure.

AIR INLET UNIT**REMOVAL**

Remove the parts in the numerical order shown in the figure.

Fig. 13-190

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 13-191

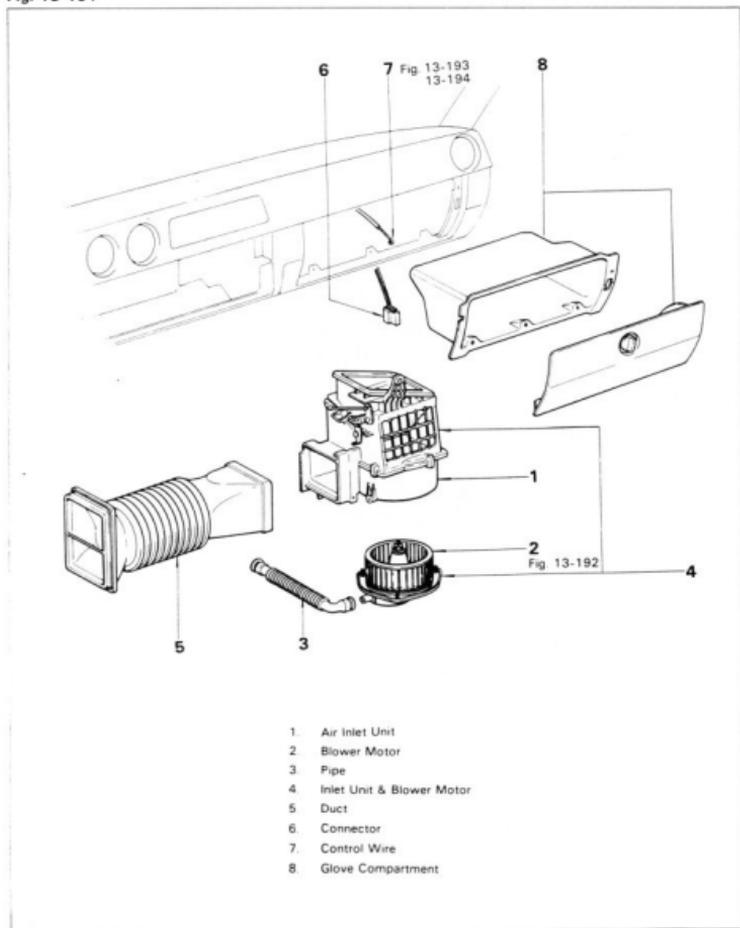
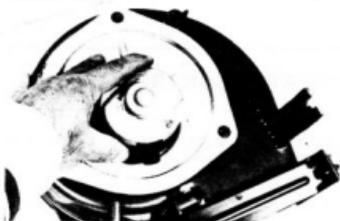
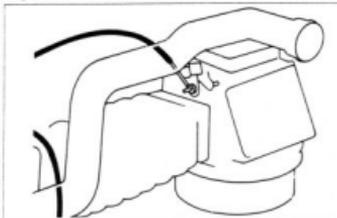


Fig. 13-192



When installing the motor, install the pipe facing as shown in the figure.

Fig. 13-193



Connect the control wire to the dumper lever.

Fig. 13-194



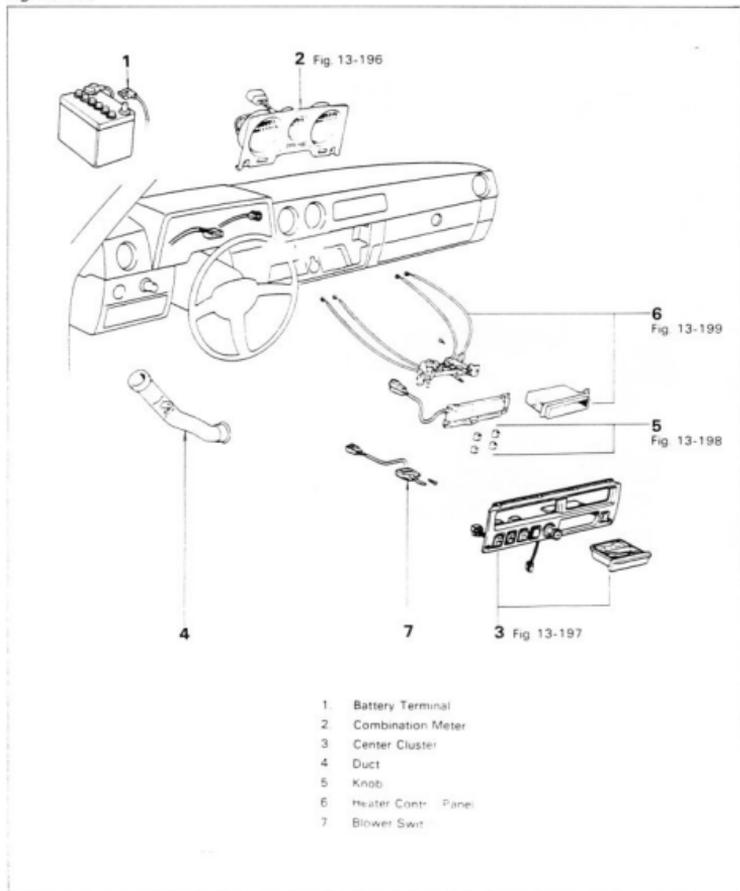
After connecting the control wire, check the lever stiffness and stroke.

HEATER CONTROL

REMOVAL

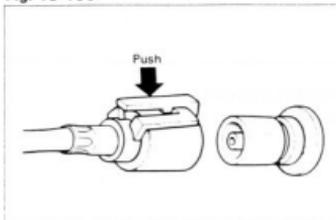
Remove the parts in the numerical order shown in the figure.

Fig. 13-195



1. Battery Terminal
2. Combination Meter
3. Center Cluster
4. Duct
5. Knob
6. Heater Control Panel
7. Blower Switch

Fig. 13-196



Before removing the combination meter, pull out the cable while pushing the lock lever.

Fig. 13-197



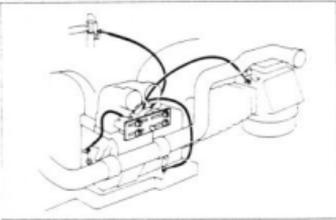
Before removing the center panel, disconnect the connectors.

Fig. 13-198



Before removing the panel, pull out the control knobs.

Fig. 13-199



Disconnect the fore cables from their clamps.

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 13-200

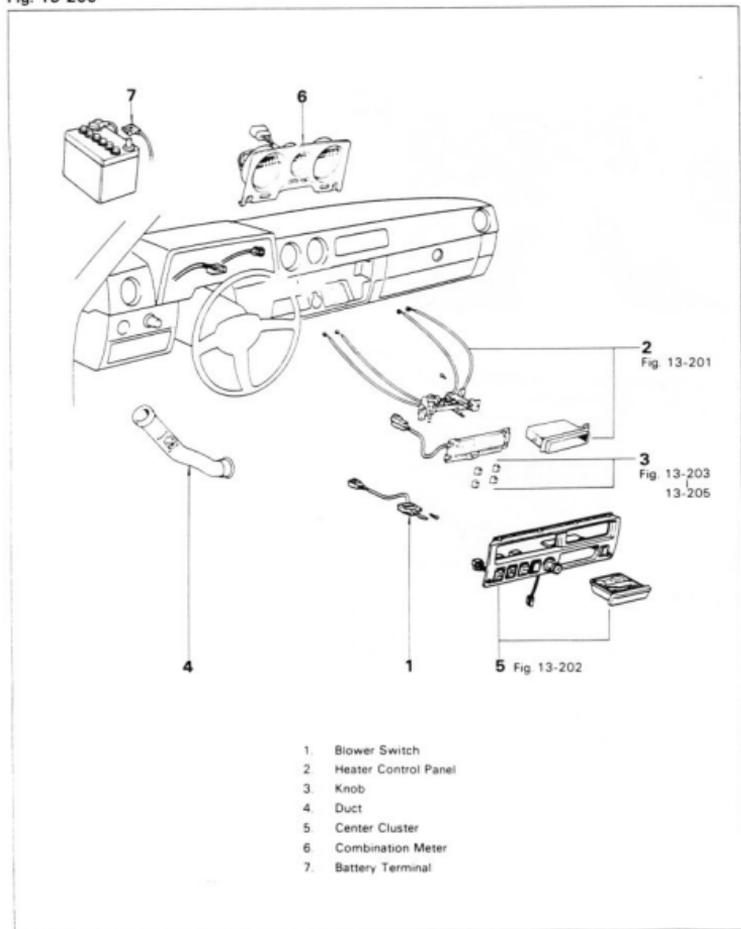
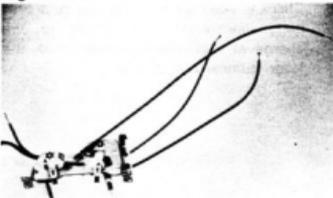


Fig. 13-201



Connect the cables as shown in the figure.

Fig. 13-202



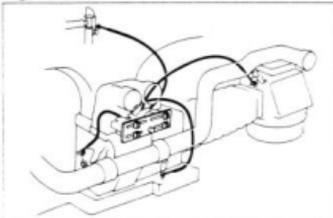
Before installing the center panel, connect the connectors.

Fig. 13-203



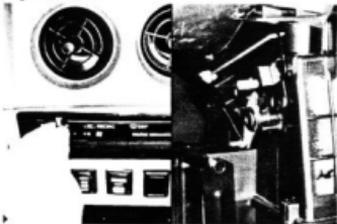
Install the knobs and retainer and make sure that the knobs are tight.

Fig. 13-204



Connect each cable to each control lever and clamp the cables.

Fig. 13-205



6. Check to see that the control lever is properly aligned by checking the air discharge at each position, and check the lever stiffness and stroke.

HEATER UNIT**REMOVAL**

1. Remove the combination meter and heater control.
2. Remove the parts in the numerical order shown in the figure.

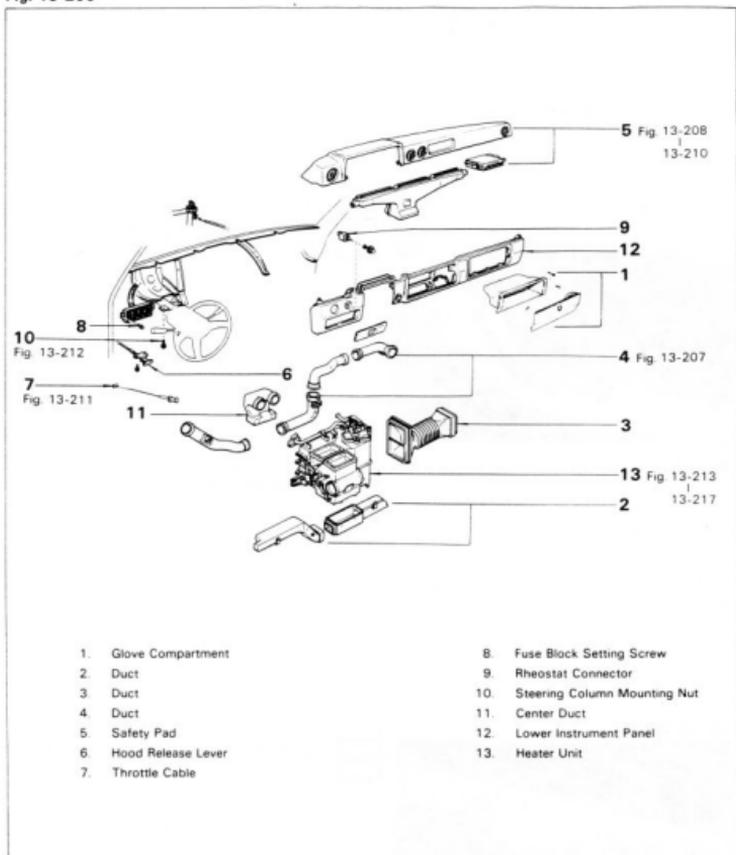
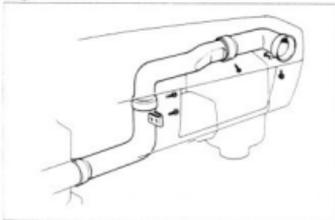
Fig. 13-206

Fig. 13-207



Remove the ducts.

Fig. 13-208



Before removing the instrument panel, disconnect the connector wire.

Fig. 13-209



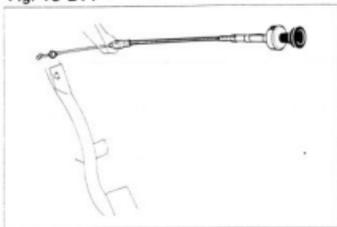
Remove the nuts.

Fig. 13-210



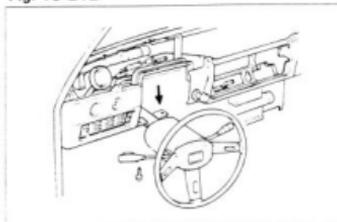
Remove the safety pad.

Fig. 13-211



Disconnect the throttle cable.

Fig. 13-212



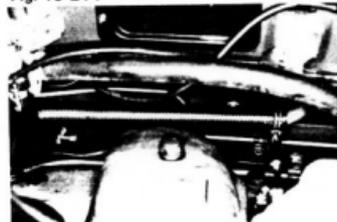
Remove the both side mounting nuts.

Fig. 13-213



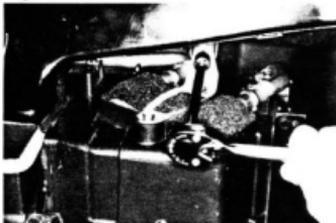
Before removing the unit, disconnect the connector.

Fig. 13-214



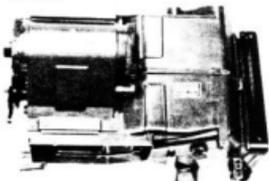
Before removing the unit, disconnect the hoses.

Fig. 13-215



Remove the unit upper side mounting bolt.

Fig. 13-216



Remove the unit lower side mounting bolts.

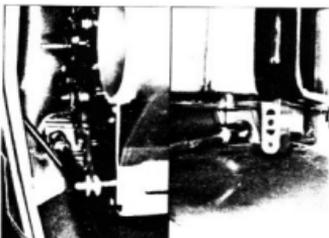
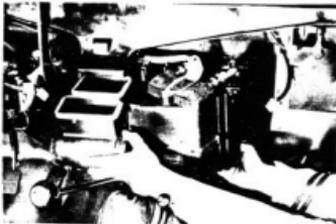


Fig. 13-217



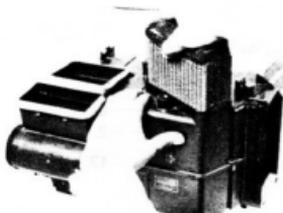
Remove the unit.

Fig. 13-218

**Replace The Radiator**

1. Remove the pipes and radiator clamps.

Fig. 13-219



2. Replace the radiator



Fig. 13-220

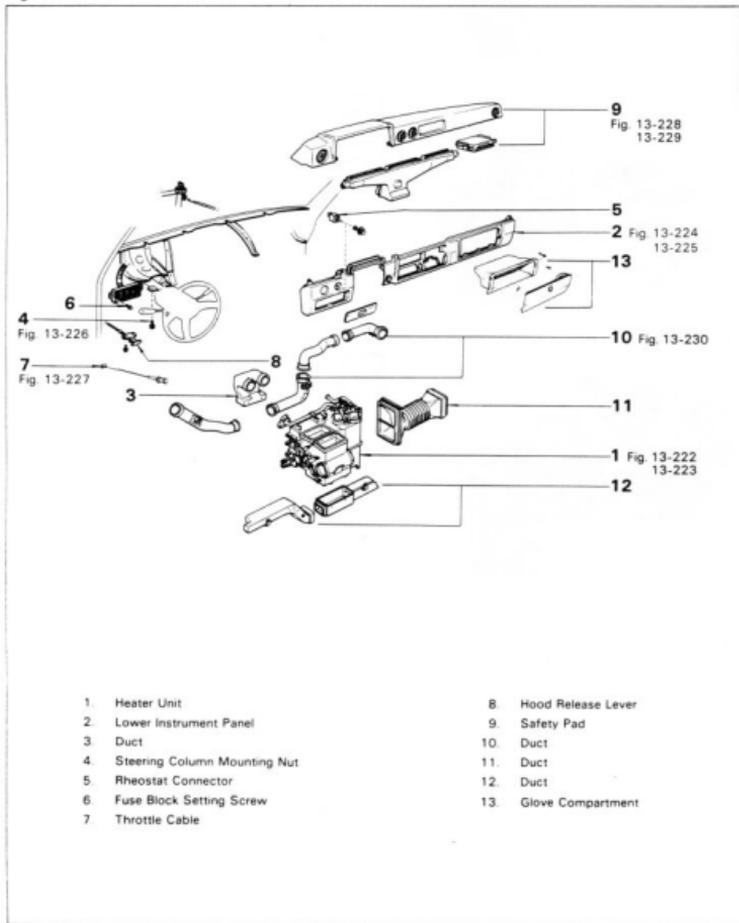


3. Install the radiator and pipe clamps.

INSTALLATION

1. Install the parts in the numerical order shown in the figure.

Fig. 13-221



1. Heater Unit

2. Lower Instrument Panel

3. Duct

4. Steering Column Mounting Nut

5. Rheostat Connector

6. Fuse Block Setting Screw

7. Throttle Cable

8. Hood Release Lever

9. Safety Pad

10. Duct

11. Duct

12. Duct

13. Glove Compartment

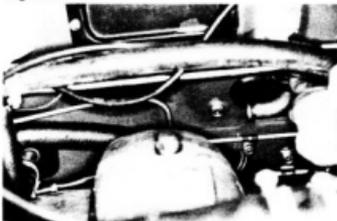
Fig. 13-222



Install the mounting nut and bolts.

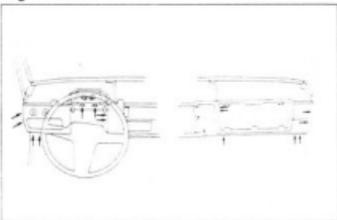


Fig. 13-223



Install the gromet from the engine compartment.

Fig. 13-224



Install the instrument panel as shown in the figure.

Fig. 13-225



Connect the inspection light wire.

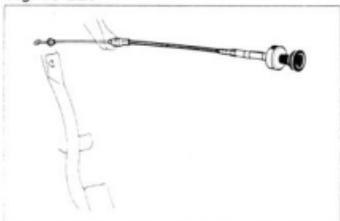
Fig. 13-226



Tighten the column upper bracket.

Tightening torque: 1.9 – 3.1 kg-m
(14 – 15 ft-lb)

Fig. 13-227



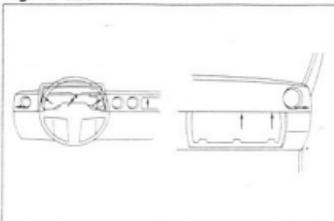
Connect the throttle cable.

Fig. 13-228



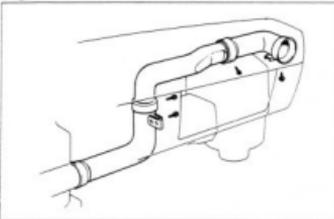
Install the safety pad

Fig. 13-229



Install the safety pad mounting bolts.

Fig. 13-230



Install the duct.

2. Install the parts in the numerical order shown in the figure.

Fig. 13-231

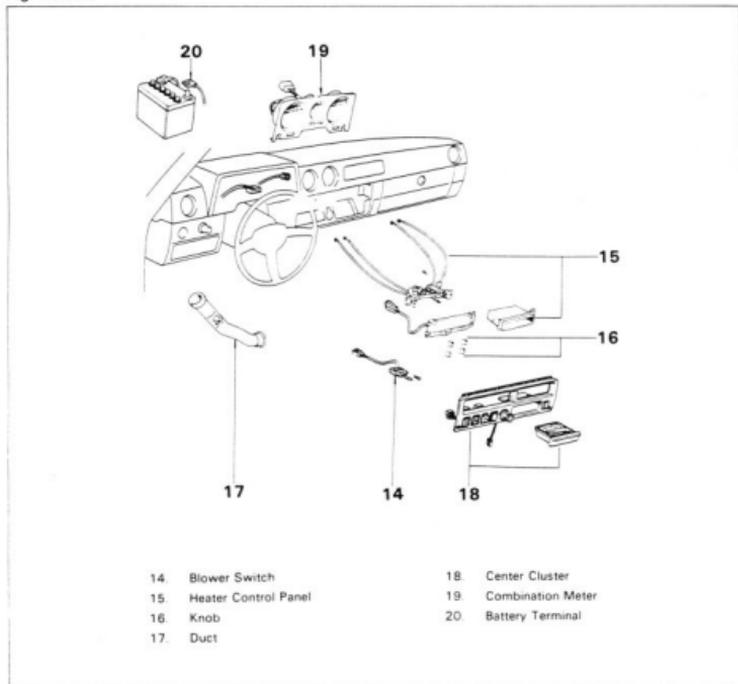


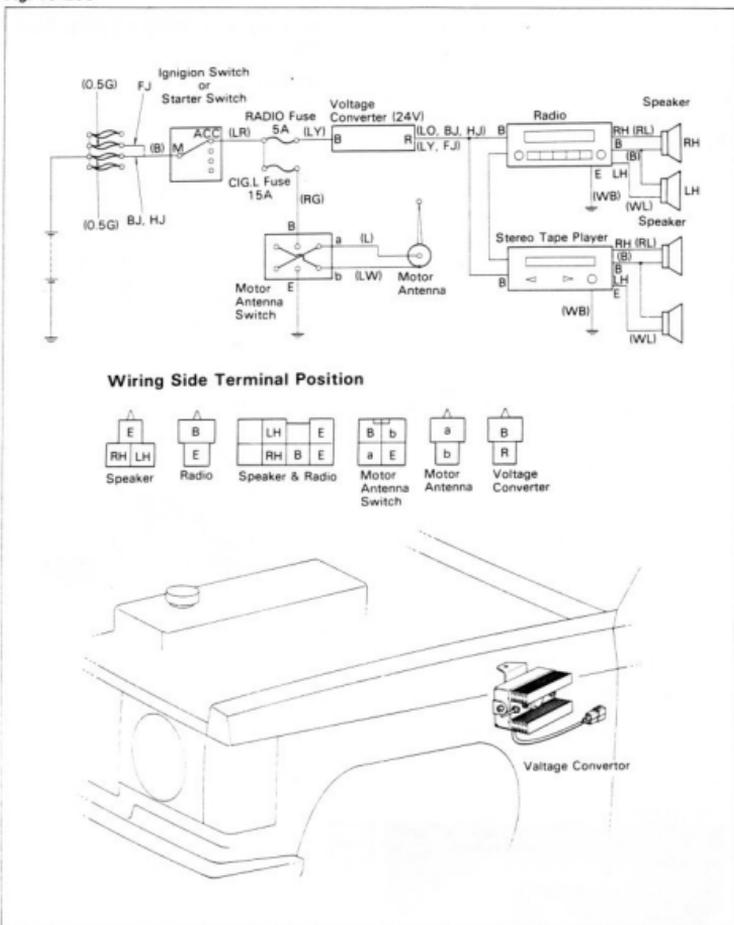
Fig. 13-232

Install the heater control.

SEE
HEATER CONTROL
INSTALLATION SECTION
Fig. 13-200 to 13-205

RADIO & STEREO TAPE PLAYER CIRCUIT DIAGRAM

Fig. 13-233



RADIO & STEREO TAPE PLAYER

REMOVAL

Remove the parts in the numerical order shown in the figure.

Fig. 13-234

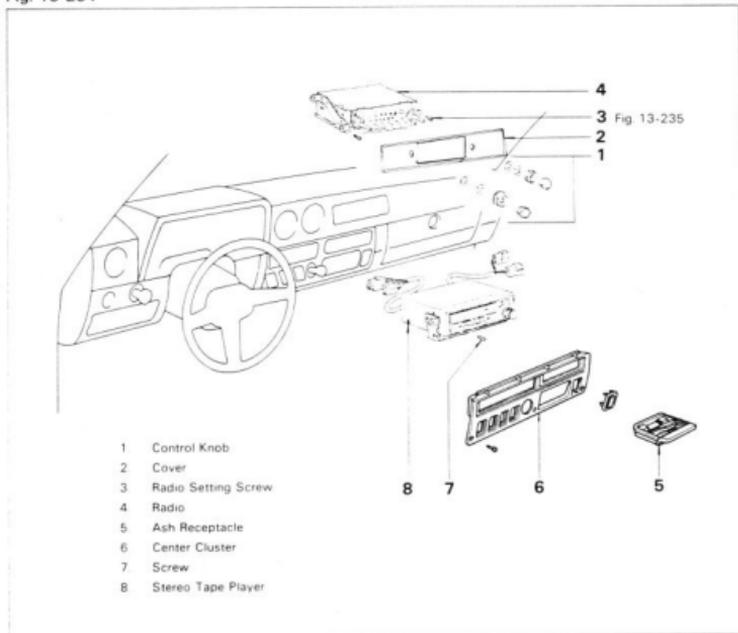
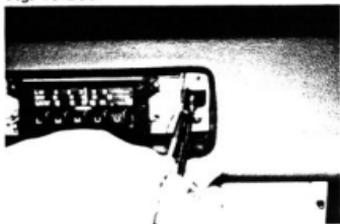


Fig. 13-235



Hold the screw with the magnet

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 13-236

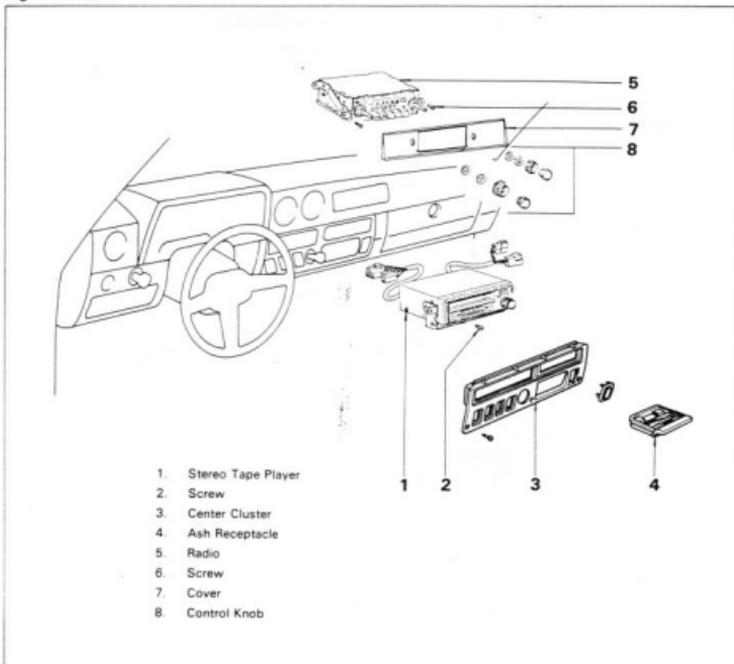


Fig. 13-237



Screw in the screw while holding the it with magnet.

ANTENNA**REMOVAL**

Remove the parts in the numerical order shown in the figure.

Fig. 13-238

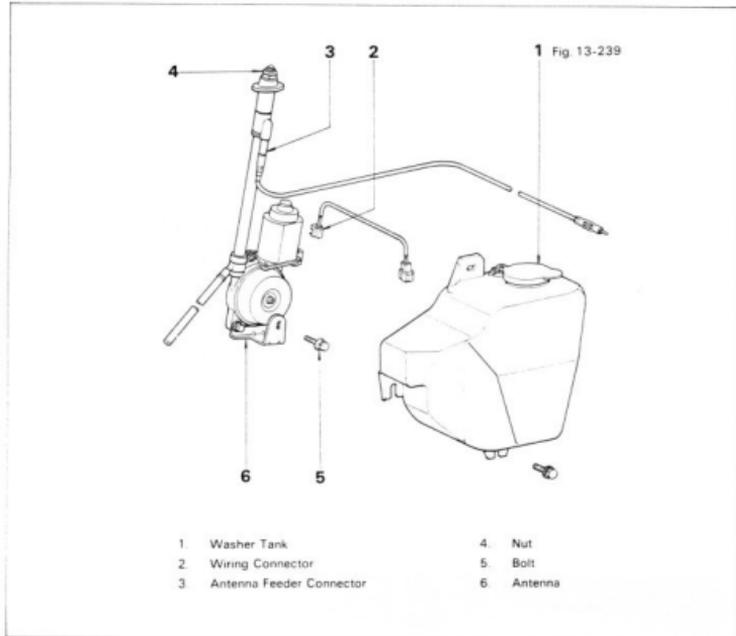


Fig. 13-239



After removing the washer tank, lower bracket bolt

Fig. 13-240



Fig. 13-241



Fig. 13-242

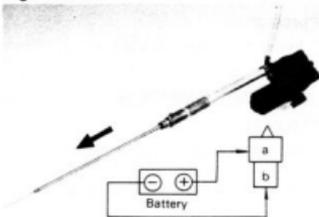
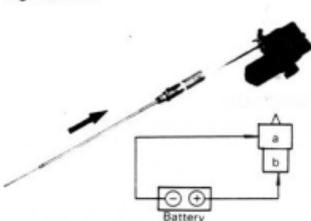


Fig. 13-243

**INSPECTION**

- 1 Check the continuity between antenna plug and pole tip.
If there is a continuity between both ends, the cord is good condition.



- 2 Check the continuity between connector core and body.
If there is not a continuity between both ends, the condition is good condition.



3. The antenna pole should be extended when apply the battery voltage to the terminals.



4. The antenna pole should be shortened when apply the battery voltage to the terminals.

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 13-244

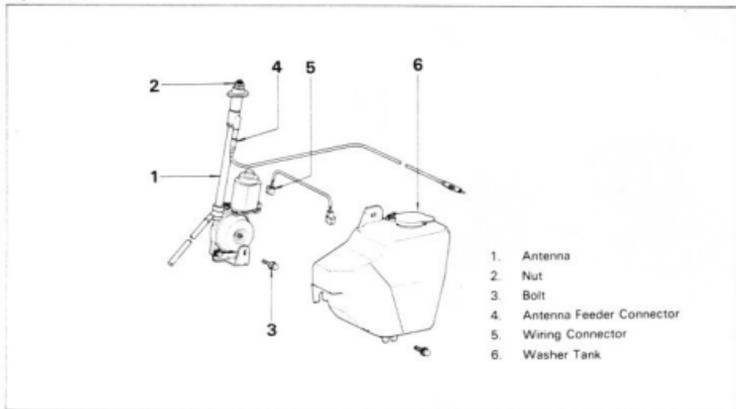
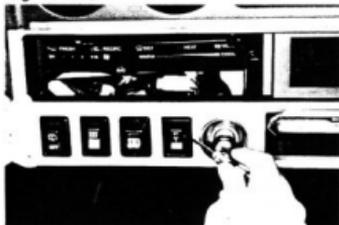
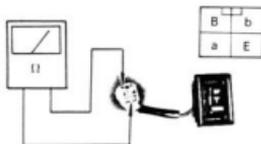


Fig. 13-245

**ANTENNA SWITCH****REMOVAL**

1. Remove the center panel.
2. Disconnect the connector.
3. Remove the switch by prying its.

Fig. 13-246

**INSPECTION**

Check the each terminals continuity.

Terminal Position	B	E	a	b
UP	○	○	○	○
DOWN	○	○	○	○

Fig. 13-247

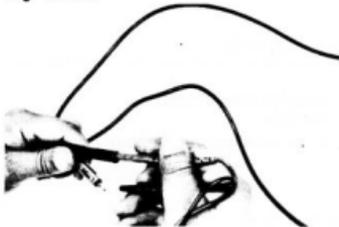
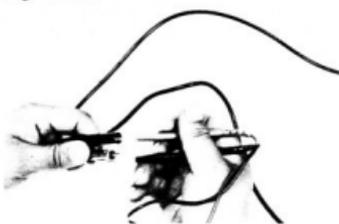


Fig. 13-248

**ANTENNA FEEDER****INSPECTION**

1. Check the continuity between core cord.
If there is a continuity between both ends,
the core cord is good condition.



2. Check the continuity between sealed
cord.
If there is a continuity between both ends,
the sealed cord is good condition.

TROUBLESHOOTING (RADIO)

1. Description of symbols

	... Inspection item	Example: [WH] For the connector, refer to the wiring diagram and check for short circuit or open circuit. Also check the connector for separation or improper contact.
	... Check or replace part	
	... Pass if not necessary	
 Adjust	
 Test by operating radio	
[WH] Wire harness	

2. Dead radio

(1) No noise whatever

Cause:

1. Blown radio fuse
2. Disconnected power source connector
3. Blown main fuse
4. Broken speaker wire or disconnected connector
5. Defective radio

Fig. 13-249

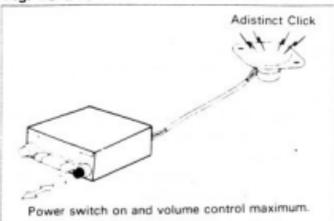


Fig. 13-250



Fig. 13-251

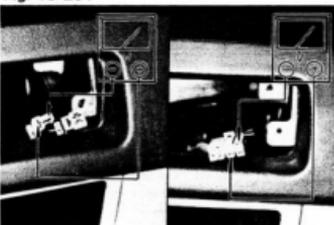
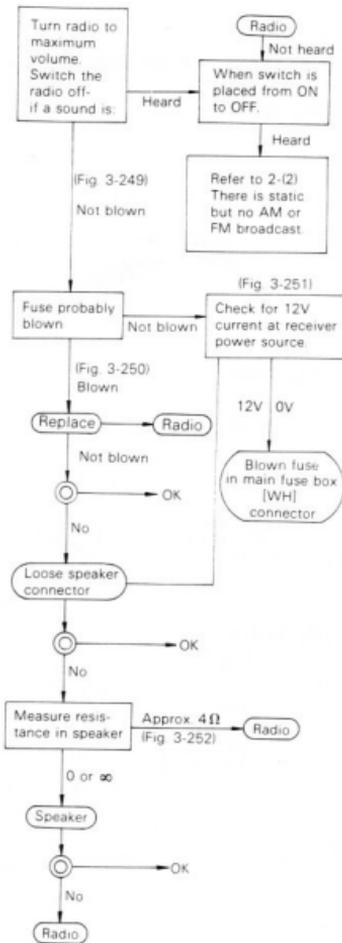
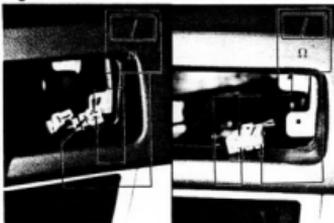


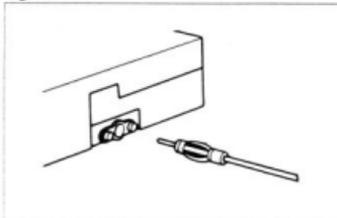
Fig. 13-252



— Reference —

A steady hum may come from the transistor, resistor, condenser and coils of a radio.

Fig. 13-253



(2) Only static — No AM or FM reception.

Cause:

1. Disconnection or improper contact of antenna plug
2. Broken antenna wire
3. Defective antenna

Fig. 13-254

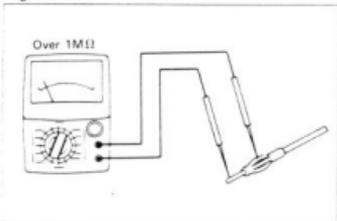
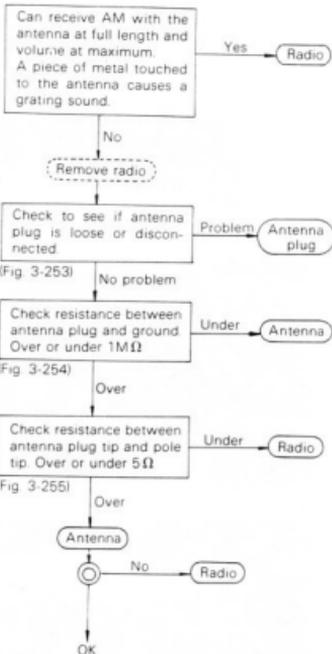
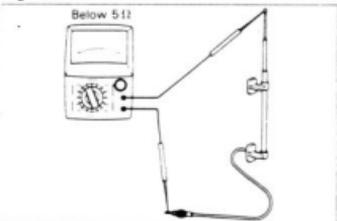
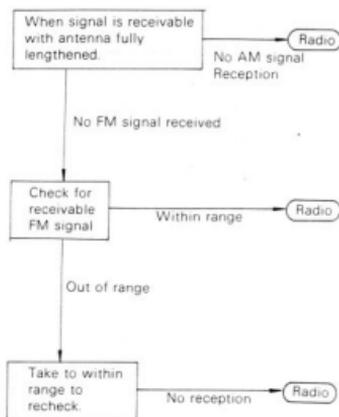


Fig. 13-255





3. No Reception of either AM and FM (If antenna is for both AM and FM)

Cause:

1. If there is no AM reception, radio receiver is defective.
2. If there is no FM reception, radio receiver is defective or there is no receivable FM signal in the area.

— Reference —

The range is the maximum radius wherein of a radio signal can be received. FM range is limited, the signal rapidly decreasing at its maximum range. FM signal is also line of sight so there are valleys behind tall buildings, mountains. In this respect, FM is similar to television.

4. Faint reception

Cause:

1. Improper adjustment of antenna trimmer.
2. Defective antenna
3. Defective speaker
4. Defective radio receiver

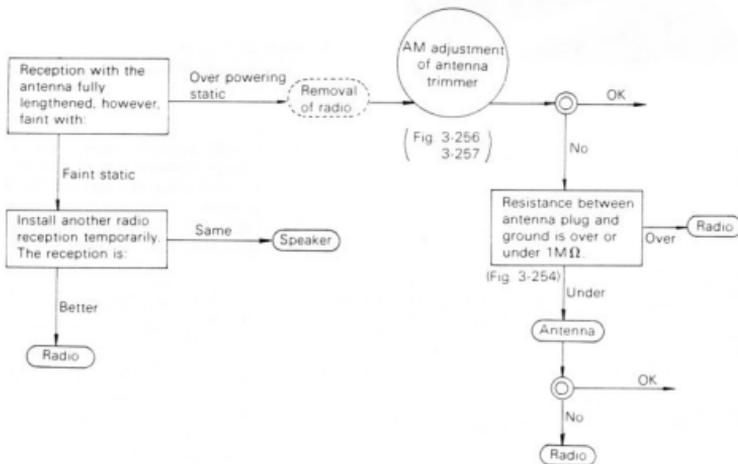
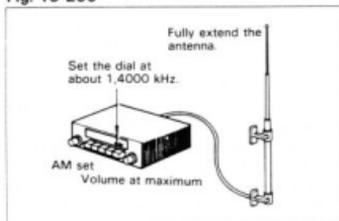


Fig. 13-256



1. Fully extend the antenna.
2. Set the dial at about 1,400 kHz, volume at maximum.

Fig. 13-257



3. Adjust the antenna trimmer so that the radio hum is loudest.

5. Hum is irregular

(1) Hum is irregular on AM or on AM/FM

Cause:

1. Broken speaker cone paper or foreign matter is lodged next to it
2. Speaker voice coil and magnet in contact
3. Excessive antenna power input
4. Defective radio receiver

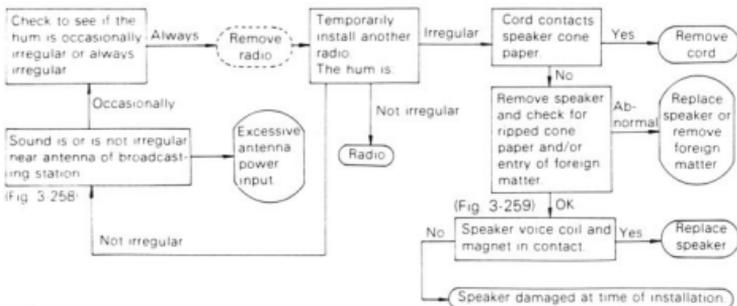
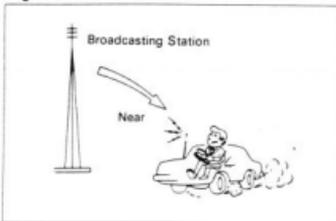


Fig. 13-258



— Reference —

Near a broadcasting station the sound on any radio becomes irregular because of excessive signal power. This cannot be avoided in most cases.

Fig. 13-259



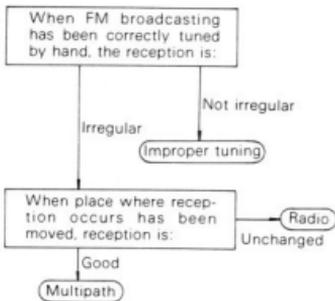
(2) Sound is irregular on FM only

Cause:

1. Improper tuning
2. Defective radio receiver

— Reference —

1. Multipath is a multiple reflection. Signals from the broadcasting station antenna reach the receiving antenna after having been reflected by buildings or mountains as well as by direct contact. They interfere with each other. However multipath changes over time or by moving the place or reception. With multipath reception, voice endings are unnatural.
2. With FM, improper tuning results in irregular sound. Pay special attention to tuning.



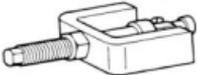
SST & SERVICE SPECIFICATIONS

	Page
SST (SPECIAL SERVICE TOOLS)	14-2
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TIGHTENING TORQUE FOR MAIN PARTS	14-25
SERVICE SPECIFICATIONS	14-30
LUBRICANT	14-43

SST (SPECIAL SERVICE TOOLS)**CLUTCH****Clutch Master Cylinder**

Illustration	Tool No.	Tool Name
	09751-36011	Brake Tube Union Nut 10 x 12 Wrench

Clutch Unit & Release Bearing

Illustration	Tool No.	Tool Name
	09301-00012	Diaphragm Aligner Tool Set
	09301-20020	Clutch Guide Tool
	09301-55022	Clutch Guide Tool
	09303-35011	Input Shaft Front Bearing Puller
	09303-55010	Input Shaft Front Bearing Puller
	09304-30012	Input Shaft Front Bearing Replacer

Clutch Unit & Release Bearing (Cont'd)

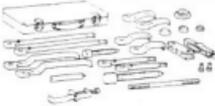
Illustration	Tool No.	Tool Name
	09304-47010	Input Shaft Front Bearing Replace
	09315-00021	Clutch Release Bearing Remover & Replacer

TRANSMISSION

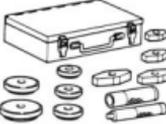
4-Speed Transmission (H41 & H42)

Illustration	Tool No.	Tool Name
	09305-55010	Transmission Gear Shift Lever Remover
	09309-36032	Transmission Bearing Replacer
	09316-60010	Transmission & Transfer Bearing Replacer
	09515-21010	Rear Axle Shaft Bearing Replacer
	09602-10010	Front Axle Inner Bearing Puller
	09905-00012	Snap Ring No.1 Expander
	09910-00014	Puller Set
	09950-20014	Universal Puller

3-Speed Transmission (J30)

Illustration	Tool No.	Tool Name
	09311-60010	Counter Gear Needle Roller Guide Shaft
	09316-60020	Transmission & Transfer Bearing Replacer
	09323-60010	Transfer Guide Shaft
	09330-00020	Companion Flange Holding Tool
	09905-00012	Snap Ring No.1 Expander
	09910-00014	Puller Set
	09950-20014	Universal Puller

TRANSFER**Transfer (H41 & H42)**

Illustration	Tool No.	Tool Name
	09308-00010	Oil Seal Puller
	09308-10010	Oil Seal Puller
	09309-36032	Transmission Bearing Replacer
	09316-60010	Transmission & Transfer Bearing Replacer
	09319-60020	Transfer Output Shaft Needle Roller Bearing Remover
	09330-00020	Companion Flange Holding Tool
	09608-20011	Front Hub & Drive Pinion Bearing Tool Set
	09905-00012	Snap Ring No.1 Expander

Transfer (H41 & H42) (Cont'd)

Illustration	Tool No.	Tool Name
	09950-20014	Universal Puller

Transfer (J30)

Illustration	Tool No.	Tool Name
	09316-60010	Transmission & Transfer Bearing Replacer
	09318-60011	Transfer Low Speed Gear Holding Tool
	09319-60010	Transfer Idle Gear Shaft Remover
	09330-00020	Companion Flange Holding Tool

PROPELLER SHAFT**Rear Propeller Shaft**

Illustration	Tool No.	Tool Name
	09332-25010	Universal Joint Bearing Remover & Replacer

FRONT AXLE & SUSPENSION**Steering Knuckle & Axle Shaft**

Illustration	Tool No.	Tool Name
	09308-00010	Oil Seal Puller
	09605-60010	Steering Knuckle Bearing Cup Replacer
	09606-60020	Steering knuckle Bearing Cup Remover
	09607-60020	Front Wheel Adjusting Nut Wrench
	09608-35013	Axle Hub & Drive Pinion Bearing Tool Set
	09611-22012	Tie Rod End Puller

Steering Knuckle & Axle Shaft (Cont'd)

Illustration	Tool No.	Tool Name
	09612-65013	Steering Worm Bearing Puller
	09618-60010	Front Axle & Drive Shaft Bearing Replacer
	09634-60013	Steering Knuckle Centering Gauge
	09751-36011	Brake Tube Union Nut 10 x 12 Wrench
	09905-00012	Snap Ring No.1 Expander

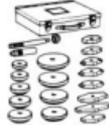
Free Wheel Hub

Illustration	Tool No.	Tool Name
	09905-00012	Snap Ring No.1 Expander

REAR AXLE & SUSPENSION**Rear Axle Shaft (Semi-floating Type)**

Illustration	Tool No.	Tool Name
	09514-35011	Rear Wheel Bearing Puller
	09515-35010	Rear Wheel Bearing Replacer

Rear Axle Shaft (Full Floating Type)

Illustration	Tool No.	Tool Name
	09308-00010	Oil Seal Puller
	09509-25011	Rear Axle Bearing Nut Wrench
	09517-36010	Rear Axle Shaft Oil Seal Replacer
	09608-35013	Axle Hub & Drive Pinion Bearing Tool Set

Differential

Illustration	Tool No.	Tool Name
	09330-00020	Companion Flange Holding Tool
	09504-00010	Differential Side Bearing Adjusting Nut Wrench
	09505-20010	Differential Side Bearing Replacer
	09506-35010	Differential Drive Pinion Rear Bearing Replacer
	09608-35013	Axle Hub & Drive Pinion Bearing Tool Set
	09950-20014	Universal Puller

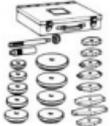
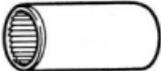
STEERING**Tilt Type Steering Column & Main Shaft**

Illustration	Tool No.	Tool Name
	09236-00100	Water Pump Overhaul Tool Set
	09527-20011	Rear Axle Shaft Bearing Remover
	09609-20010	Steering Wheel Puller
	09612-22010	Tilt Handle Bearing Replacer
	09620-30010	Steering Gear Box Replacer Set
	09905-00012	Snap Ring No.1 Expander

Steering Column & Main Shaft

Illustration	Tool No.	Tool Name
	09609-20010	Steering Wheel Puller
	09905-00012	Snap Ring No.1 Expander

Steering Gear Housing

Illustration	Tool No.	Tool Name
	09307-12010	Extension Housing Bushing Replacer
	09608-35013	Axle Hub & Drive Pinion Bearing Tool Set
	09610-55012	Pitman Arm Puller
	09612-30012	Steering Worm Bearing Puller
	09612-65013	Steering Worm Bearing Puller
	09615-37010	Sector Shaft Bushing Remover & Replacer
	09616-00010	Steering Worm Bearing Adjusting Socket
	09616-22010	Steering Worm Bearing Adjusting Screw Wrench
	09617-22010	Worm Bearing Adjusting Screw Lock Nut Wrench

Steering Gear Housing (Cont'd)

Illustration	Tool No.	Tool Name
	09620-30010	Steering Gear Box Replacer Set
	09628-62011	Ball Joint Puller

Steering Linkage

Illustration	Tool No.	Tool Name
	09611-20015	Tie Rod End Puller
	09611-22012	
	09628-62011	Ball Joint Puller

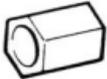
Power Steering

Illustration	Tool No.	Tool Name
	09610-55012	Pitman Arm Puller
	09611-20015	Tie Rod End Puller

Power Steering (Cont'd)

Illustration	Tool No.	Tool Name
	09616-00010	Steering Worm Bearing Adjusting Socket
	09630-00010	Power Steering Gear Housing Overhaul Tool Set
	(09631-00020)	(Overhaul Stand)
	(09631-00030)	(Vane Pump Bracket)
	(09631-00040)	(Lock Nut Wrench)
	(09631-00050)	(Adjuster Plug Wrench)
	(09631-00060)	(Teflon Ring Former)
	(09631-00070)	(Remover & Replacer Bearing)
	(09631-00080)	(B Replacer)

Power Steering (Cont'd)

Illustration	Tool No.	Tool Name
	(09632-00030)	(Wrench)
	(09632-00040)	(Handle)
	09631-22020	Power Steering Hose Nut 14 x 17 Wrench
	09631-60010	Power Steering Gear Housing Bearing Replacer

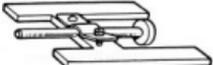
**BRAKE
Adjusting**

Illustration	Tool No.	Tool Name
	09704-10010	Brake Adjusting Tool

Brake Hose & Tube

Illustration	Tool No.	Tool Name
	09751-36011	Brake Tube Union Nut 10 x 12 Wrench

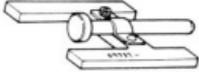
Master Cylinder

Illustration	Tool No.	Tool Name
	09737-00010	Brake Booster Push Rod Gauge
	09751-36011	Brake Tube Union Nut 10 x 12 Wrench

Brake Booster

Illustration	Tool No.	Tool Name
	09608-20011	Front Hub & Drive Pinion Bearing Tool Set

Brake Booster (Cont'd)

Illustration	Tool No.	Tool Name
	09726-35010	Front Lower Arm Bushing Remover & Replacer
	09736-30020	Booster Diaphragm Retainer Remover & Replacer
	09737-00010	Brake Booster Push Rod Gauge
	09751-36011	Brake Tube Union Nut 10 x 12 Wrench
	09738-00020	Brake Booster Overhaul Tool
	(09753-00010)	(Brake Booster Overhaul Tool)
	09753-30011	Reaction Disc Hub Holding Tool
	09753-30020	Oil Seal Replacer

Front Brake (Drum Type)

Illustration	Tool No.	Tool Name
	09703-30010	Brake Shoe Return Spring Tool

Front Brake (Drum Type) (Cont'd)

Illustration	Tool No.	Tool Name
	09704-10010	Brake Adjusting Tool
	09718-00010	Shoe Hold Down Spring Driver
	09751-36011	Brake Tube Union Nut 10 x 12 Wrench

Front Brake (Disc Type)

Illustration	Tool No.	Tool Name
	09751-36011	Brake Tube Union Nut 10 x 12 Wrench

Rear Brake

Illustration	Tool No.	Tool Name
	09703-30010	Brake Shoe Return Spring Tool
	09704-10010	Brake Adjusting Tool
	09718-00010	Shoe Hold Down Spring Driver

Rear Brake (Cont'd)

Illustration	Tool No.	Tool Name
	09751-36011	Brake Tube Union Nut 10 x 12 Wrench

P & B Valve (Proportioning & Bypass Valve)

Illustration	Tool No.	Tool Name
	09751-36011	Brake Tube Union Nut 10 x 12 Wrench

LSPV (Load Sensing Proportioning Valve)

Illustration	Tool No.	Tool Name
	09709-29017	LSPV Gauge Set
	09751-36011	Brake Tube Union Nut 10 x 12 Wrench

FRONT WINCH
Power Take Off

Illustration	Tool No.	Tool Name
	09325-12010	Transmission Oil Plug
	09330-00020	Companion Flange Holding Tool

Electric Winch

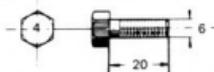
Illustration	Tool No.	Tool Name
	09550-55010	Differential Replacer Set
	09608-30021	Front Hub Bearing Replacer Set
	09611-12010	Tie Rod End Puller

BODY**Front Door**

Illustration	Tool No.	Tool Name
	09812-22010	Door Hinge Set Bolt Wrench

STANDARD BOLT TIGHTENING TORQUE

9 1 1 1 1 - 4 0 6 2 0 — Part number
 — Length of bolt: 20 mm
 — Basic major diameter of thread:
 6 mm
 — Bolt head mark*



* Explanation of bolt head marks are as indicated in the following table.

SPECIFIED TORQUE FOR STANDARD BOLTS

Class	Basic diameter mm	Pitch mm	Torque limit	kg-m (ft-lb)
4T	6	1	0.4 – 0.7	(3 – 5)
	8	1.25	1.0 – 1.6	(8 – 11)
	10	1.25	1.9 – 3.1	(14 – 22)
	10	1.5	1.8 – 3.0	(14 – 21)
	12	1.25 (ISO)	3.5 – 5.5	(26 – 39)
	12	1.5	3.5 – 5.5	(26 – 39)
	12	1.75	3.0 – 5.0	(22 – 36)
	13	1.5	4.5 – 7.0	(33 – 50)
	14	1.5	5.0 – 8.0	(37 – 57)
	14	2	4.7 – 7.7	(34 – 55)
	16	1.5	7.5 – 11.0	(55 – 79)
	16	2	7.1 – 10.6	(52 – 76)
	5T	6	1	0.6 – 0.9
8		1.25	1.5 – 2.2	(11 – 15)
10		1.25	3.0 – 4.5	(22 – 32)
10		1.5	2.7 – 4.2	(20 – 30)
12		1.25 (ISO)	5.0 – 8.0	(37 – 57)
12		1.5	5.0 – 7.0	(37 – 50)
12		1.75	4.8 – 6.8	(35 – 49)
13		1.5	6.5 – 9.0	(48 – 65)
14		1.5	7.5 – 11.0	(55 – 79)
14		2	7.0 – 10.5	(51 – 75)
16		1.5	12.0 – 17.0	(87 – 122)
16		2	11.5 – 16.5	(84 – 119)
6T		6	1	0.6 – 0.9
	8	1.25	1.5 – 2.2	(11 – 15)
	10	1.25	3.0 – 4.5	(22 – 32)
	10	1.5	2.7 – 4.2	(20 – 30)
	12	1.25 (ISO)	5.0 – 8.0	(37 – 57)
	12	1.5	5.0 – 7.0	(37 – 50)
	12	1.75	4.8 – 6.8	(35 – 49)

SPECIFIED TORQUE FOR STANDARD BOLTS (Cont'd)

Class	Basic diameter mm	Pitch mm	Torque limit	kg-m (ft-lb)
7T	6	1	0.8 – 1.2	(6 – 8)
	8	1.25	2.0 – 3.0	(15 – 21)
	10	1.25	4.0 – 5.5	(29 – 39)
	10	1.5	3.7 – 5.2	(27 – 37)
	12	1.25 (ISO)	7.5 – 10.5	(55 – 75)
	12	1.5	7.0 – 9.0	(51 – 65)
	12	1.75	6.0 – 8.5	(44 – 61)
	13	1.5	8.0 – 12.0	(58 – 86)
	14	1.5	10.0 – 15.0	(73 – 108)
	14	2	9.5 – 14.0	(69 – 101)
	16	1.5	15.0 – 23.0	(109 – 166)
	16	2	14.0 – 22.0	(102 – 159)

– Note –

These torque specifications are applicable only for steel (female) threads.

They do not apply to other types of material or if the tightening surface is subjected to heat or vibration.

TIGHTENING TORQUE FOR MAIN PARTS**CLUTCH**

Tightening part	kg-m	ft-lb
Pedal shaft	3.0 - 4.5	22 - 32
Reservoir tank	2.0 - 3.0	15 - 21
Master cylinder mounting nut	1.0 - 1.6	8 - 11
Clutch tube x Union nut	1.3 - 1.8	10 - 13
Clutch pressure plate x Strap	2.0 - 3.0	15 - 21
Clutch cover x Flywheel	1.5 - 2.2	11 - 15

TRANSMISSION

Tightening part	kg-m	ft-lb
Case cover	3.0 - 4.5	22 - 32
Transmission x Transfer	5.0 - 8.0	37 - 57
Output shaft	11.0 - 14.0	80 - 101
Front bearing retainer x Transmission case	1.0 - 1.6	8 - 11
Clutch housing x Transmission case	5.0 - 8.0	37 - 57

TRANSFER

Tightening part	kg-m	ft-lb
Intermediate plate x Transmission case	5.0 - 8.0	37 - 57
Transmission case x Transfer case		
10 mm ϕ bolt	3.5 - 4.5	26 - 32
12 mm ϕ bolt	5.8 - 8.0	37 - 57
Transmission case x Extension housing	3.0 - 4.5	22 - 32
Transfer companion flange nut	14.0 - 17.0	102 - 122
Parking brake backing plate	2.0 - 3.0	15 - 21
Parking brake drum nut	14.0 - 17.0	102 - 122

PROPELLER SHAFT

Tightening part	kg-m	ft-lb
Universal joint flange yoke x Center brake drum	6.0 - 7.5	44 - 54
Universal joint flange yoke x Transfer companion flange	6.0 - 7.5	44 - 54
Universal joint flange yoke x Differential companion flange	6.0 - 7.5	44 - 54

FRONT AXLE & SUSPENSION

Tightening part	kg-m	ft-lb
Steering knuckle arm x Steering knuckle	8.5 - 11.0	62 - 79
Steering knuckle x Knuckle bearing cup	8.5 - 11.0	62 - 79
Steering knuckle arm x Tie rod end	7.5 - 11.0	55 - 79
Backing plate x Steering knuckle	4.0 - 5.5	29 - 39
Wheel bearing lock nut	8.0 - 10.0	58 - 72
Axle hub x Flange	2.8 - 3.5	21 - 25
Disc brake cylinder x Steering knuckle	7.5 - 10.5	55 - 75
Brake tube union nut	1.3 - 1.8	10 - 13
Free wheel hub body x Axle hub	2.8 - 3.5	21 - 25
Free wheel hub cover x Free wheel hub body	0.8 - 1.2	70 - 104 in.-lb
Hanger pin flange	1.0 - 1.6	8 - 11
U bolt	10.0 - 15.0	73 - 108 in.-lb
Shock absorber x Axle housing	5.0 - 5.8	37 - 41
Hanger pin nut x Frame	7.5 - 11.0	55 - 79
Shackle pin nut x Frame	7.5 - 11.0	55 - 79
Stabilizer bar x Frame	1.0 - 1.6	8 - 11
Shock absorber x Spring seat	3.5 - 5.5	26 - 39
Shock absorber x Bracket	1.9 - 3.1	14 - 22

REAR AXLE & SUSPENSION

Tightening part	kg-m	ft-lb
Rear axle shaft flange	2.8 - 3.5	21 - 25
Bearing adjusting nut locking screw	0.4 - 0.7	35 - 60 in.-lb
Ring gear x Differential case	10.5 - 12.0	76 - 86
Drive pinion x Companion flange	20.0 - 24.0	144 - 173
Side bearing cup differential carrier	9.0 - 11.0	66 - 79
Differential case RH x LH (LS only)	3.9 - 5.7	29 - 41

STEERING**Steering Column & Main Shaft**

Tightening part	kg-m	ft-lb
Tilt steering pawl set bolt x Brakaway bracket	1.5 – 2.2	11 – 15
Tilt lever retainer x Tilt steering support x Brakaway bracket x Tilt lever	1.5 – 2.2	11 – 15
Tilt steering support x Breakaway bracket	1.5 – 3.0	11 – 21
Tilt steering support bolt x Tilt steering support	0.8 – 1.2	70 – 104 in.-lb
Column upper bracket x Tilt steering support	0.6 – 0.9	53 – 78 in.-lb
Column tube x Breakaway bracket	1.4 – 2.2	11 – 15
Column tube support x Column hole cover	1.5 – 2.2	11 – 15
Main shaft x No.2 Intermediate shaft	2.0 – 3.0	15 – 21
Breakaway bracket x Instrument panel	1.9 – 3.1	14 – 15
Column upper bracket	0.6 – 0.9	53 – 78 in.-lb
Column hole cover x Cowl panel	1.0 – 1.6	8 – 11
Intermediate shaft x No.2 Intermediate shaft	3.0 – 4.5	22 – 32
Intermediate shaft x Worm shaft	3.0 – 4.5	22 – 32
Steering wheel x Main shaft	3.0 – 4.0	22 – 28

Steering Gear Housing (FJ,BJ,HJ6_Series)

Tightening part	kg-m	ft-lb
Worm bearing adjusting nut lock nut	23.0 – 26.0	167 – 188
Sector shaft end cover	4.5 – 5.5	33 – 39
Sector shaft adjusting screw lock nut	3.0 – 4.0	22 – 28
Steering gear housing x Frame	5.5 – 8.8	40 – 63
Flexible coupling x Worm shaft	3.0 – 4.5	22 – 32
Pitman arm x Sector shaft	16.5 – 19.5	120 – 141
Pitman arm x Relay rod	7.5 – 11.0	55 – 79

Steering Gear Housing (FJ,BJ,HJ4_Series)

Tightening part	kg-m	ft-lb
Worm gear end cover	3.0 – 4.5	22 – 32
Sector shaft end cover	3.0 – 4.5	22 – 32
Gear housing x Bracket	4.0 – 4.5	29 – 32
Pitman arm x Sector shaft	16.5 – 19.5	120 – 141

Steering Linkage

Tightening part	kg-m	ft-lb
Linkage castel nut	7.5 - 11.0	55 - 79
Linkage adjusting tube clamp bolt	2.0 - 3.0	15 - 21

Power Steering

Tightening part	kg-m	ft-lb
Pump pully x Rotor shaft	3.5 - 5.4	26 - 39
Front housing x Rear housing	3.3 - 4.2	24 - 30
Reservoir tank x Rear housing	0.4 - 0.7	35 - 60 in.-lb
Worm bearing adjusting screw lock nut	4.5 - 5.5	33 - 39
Gear housing x Valve housing	4.0 - 5.5	29 - 39
End cover x Gear housing	4.0 - 5.5	29 - 39
Cross shaft adjusting screw lock nut	4.0 - 5.5	29 - 39
Pressure house union nut	4.0 - 5.0	29 - 36
Return pipe	3.2 - 4.2	24 - 30
Gear housing x Frame	5.5 - 8.8	40 - 63
Cross shaft x Pitman arm	16.5 - 19.5	120 - 141
Intermediate shaft x Worm shaft	3.0 - 4.5	22 - 32

BRAKE

Tightening part	kg-m	ft-lb
Pedal shaft bolt	3.0 - 4.5	22 - 32
Brake booster clevis lock nut	1.9 - 3.1	14 - 22
Brake booster x Pedal bracket	1.0 - 1.6	8 - 11
Master cylinder x Brake booster	1.0 - 1.6	8 - 11
Reservoir set bolt x Master cylinder	2.0 - 3.0	15 - 21
Outlet check valve x Master cylinder	3.5 - 5.5	26 - 39
Piston stopper bolt x Master cylinder	0.8 - 1.5	70 - 130 in.-lb
P & B valve x P & B valve bracket	0.4 - 1.0	35 - 86 in.-lb
Brake tube union nut	1.3 - 1.8	10 - 13
Union bolt x Vacuum pump (BJ, HJ)	1.2 - 1.6	9 - 11
Parking brake backing plate x Transmission	2.0 - 3.9	15 - 28
Disc brake caliper x Knuckle	10.0 - 15.0	73 - 108
Flexible hose	2.0 - 2.7	15 - 19
Bleeder plug	0.9 - 1.3	79 - 112 in.-lb
Disc brake dust cover x Knuckle	4.0 - 5.5	29 - 39

BRAKE (Cont'd)

Tightening part	kg-m	ft-lb
Front disc x Front axle hub	4.0 - 5.5	29 - 39
2-Way bracket x Dust cover	1.0 - 1.6	8 - 11
Front drum brake backing Plate x Knuckle	4.0 - 5.5	29 - 39
Front brake wheel cylinder x Backing plate	1.5 - 2.2	11 - 15
Front drum x Front axle hub	9.0 - 12.0	66 - 86
Parking brake nut	14 - 17	102 - 122
3-Way bracket x Front brake backing plate	0.4 - 0.7	35 - 60 in.-lb
Drum brake backing plate x Rear axle housing	10.0 - 15.0	73 - 108
Rear brake wheel cylinder x Backing plate	0.8 - 1.2	70 - 104 in.-lb
Bell crank bracket x Backing plate	1.0 - 1.6	8 - 11
Bell crank adjusting bolt lock nut	0.4 - 0.7	35 - 60 in.-lb
Bell crank equalizer	1.0 - 1.6	8 - 11
Load sensing spring x No.1 shackle	1.5 - 2.2	11 - 15
Load sensing spring x LSPV bracket	1.0 - 1.6	8 - 11
LSPV bracket x Frame	1.5 - 2.2	11 - 15
LSPV x Bracket	1.0 - 1.6	8 - 11

FRONT WINCH

Tightening part	kg-m	ft-lb
Power take off output shaft x Universal joint flange	3.5 - 5.5	26 - 39
Front winch worm bearing retainer x Winch gear case	1.9 - 3.1	14 - 22
Shift lever support x Winch case	1.5 - 2.2	11 - 15
Case cover x Case	1.5 - 2.2	11 - 15
Winch set plate x Winch case	5.0 - 8.0	37 - 57
Winch set plate x Winch housing	3.0 - 4.5	22 - 32
Rear base member mounting bolt	5.0 - 8.0	37 - 57
Winch front mounting bolt	3.0 - 4.5	22 - 32
Winch rear mounting bolt	3.0 - 4.5	22 - 32
Motor mounting bolt	1.5 - 2.0	11 - 14
Cable lock plate	1.5 - 2.0	11 - 14

SERVICE SPECIFICATIONS

CLUTCH

Pedal height (from floor panel)			
	FJ,BJ,HJ4_series	215 mm	8.46 in.
	FJ,BJ,HJ6_series	195 mm	7.68 in.
w/o brake booster	FJ 4_series	215 mm	8.46 in.
Push rod play	at Pedal top	1.0 – 5.0 mm	0.039 – 0.197 in.
Pedal freeplay		30 – 50 mm	1.18 – 1.97 in.
Release fork end play	FJ series	4.0 – 5.0 mm	0.157 – 0.197 in.
	BJ series	3.0 – 4.0 mm	0.118 – 0.157 in.
	HJ series	4.0 – 5.0 mm	0.157 – 0.197 in.
Disc rivet head depth	Limit	0.3 mm	0.012 in.
Disc runout	Limit	1.0 mm	0.039 in.
Diaphragm spring out of alignment	Limit	0.5 mm	0.020 in.

TRANSMISSION

4-Speed Transmission (H41 & H42)

Gear thrust clearance			
	2nd	STD	0.175 – 0.325 mm
		Limit	0.35 mm
	3rd	STD	0.125 – 0.275 mm
		Limit	0.35 mm
Gear oil clearance			
	3rd	STD	0.065 – 0.115 mm
		Limit	0.115 mm
	Reverse idle	Limit	0.16 mm
Shift fork to hub sleeve clearance	Limit		0.8 mm
Synchronizer ring to gear clearance			
		Limit	0.8 mm
Synchronizer ring dimension			
	1st	Limit	2.8 mm
	2nd	Limit	1.8 mm
Reverse idle gear shift arm shoe thickness	Limit		8.1 mm
Reverse idle gear to gear shift arm shoe clearance	Limit		0.7 mm
Snap ring or washer thickness			
Input shaft bearing	Part No.		
	90520-36015		3.31 – 3.42 mm
	90520-36016		3.20 – 3.31 mm
			0.1303 – 0.1346 in.
			0.1260 – 0.1303 in.

4-Speed Transmission (H41 & H42) (Cont'd)

Output shaft front	Part No.	Mark		
	90520-36250	0	2.40 - 2.45 mm	0.0945 - 0.0965 in.
	90520-36251	1	2.45 - 2.50 mm	0.0965 - 0.0984 in.
	90520-36252	2	2.50 - 2.55 mm	0.0984 - 0.1004 in.
	90520-26253	3	2.55 - 2.60 mm	0.1004 - 0.1024 in.
	90520-36254	4	2.60 - 2.65 mm	0.1024 - 0.1043 in.
	90520-36255	5	2.65 - 2.70 mm	0.1043 - 0.1063 in.
Countershaft front	Part No.	Mark		
	90520-30214	0	2.05 - 2.10 mm	0.0807 - 0.0827 in.
	90520-30216	2	2.15 - 2.20 mm	0.0846 - 0.0866 in.
	90520-20218	4	2.25 - 2.30 mm	0.0886 - 0.0906 in.

3-Speed Transmission (J30)

Gear thrust clearance				
2nd	STD	0.10 - 0.40 mm	0.0039 - 0.0157 in.	
	Limit	0.4 mm	0.016 in.	
2nd gear bushing oil clearance	Limit	0.09 mm	0.0035 in.	
Synchronizer ring to gear clearance				
	Limit	0.8 mm	0.031 in.	
Fork to sleeve clearance	Limit	0.8 mm	0.031 in.	
Snap ring or washer thickness				
Input shaft bearing	Part No.			
	09520-33010	2.43 - 2.57 mm	0.0957 - 0.1012 in.	
	09520-33011	2.30 - 2.42 mm	0.0906 - 0.0953 in.	
Countershaft	Part No.			
	33441-61010	1.45 - 1.50 mm	0.0571 - 0.0591 in.	
	33442-61010	1.50 - 1.55 mm	0.0591 - 0.0610 in.	
	33443-61010	1.55 - 1.60 mm	0.0610 - 0.0630 in.	

TRANSFER**Transfer (H41 & H42)**

Gear oil clearance			
High & Low gear	STD	0.035 - 0.081 mm	0.0014 - 0.0032 in.
	Limit	0.081 mm	0.0032 in.
Gear thrust clearance			
High & Low gear	STD	0.10 - 0.25 mm	0.0039 - 0.0098 in.
	Limit	0.25 mm	0.0098 in.
Idle gear	STD	0.275 - 0.625 mm	0.0108 - 0.0246 in.
	Limit	0.625 mm	0.0246 in.

Transfer (H41 & H42) (Cont'd)

Hub sleeve to shift fork clearance		0.1 - 0.4 mm	0.004 - 0.016 in.
Output shaft bearing preload (starting)			
New bearing		15 - 24.7 kg-cm	13.0 - 21.4 in.-lb
Reused bearing		7 - 12 kg-cm	6.1 - 10.4 in.-lb
Output shaft bearing preload adjusting shim thickness	Part No. Mark		
	90564-70001 0	0.15	0.0059
	90564-70002 4	0.4	0.016
	90564-70003 5	0.5	0.020
	90564-70004 6	0.6	0.024
	90564-70005 7	0.7	0.028
	90564-70006 8	0.8	0.031
	90564-70007 9	0.9	0.035
	90564-70008 10	1.0	0.039
	90564-70009 11	1.1	0.043
	90564-70010 12	1.2	0.047
	90564-70011 13	1.3	0.051
	90564-70012 14	1.4	0.055
	90564-70013 15	1.5	0.059

Transfer (J30)

Gear oil clearance			
High & Low gear	STD	0.035 - 0.081 mm	0.0014 - 0.0032 in.
Limit		0.081 mm	0.0032 in.
Gear thrust clearance	Idle gear		
	STD	0.275 - 0.625 mm	0.0108 - 0.0246 in.
	Limit	0.625 mm	0.0246 in.
Hub sleeve to shift fork clearance		0.1 - 0.4 mm	0.004 - 0.016 in.
Output shaft bearing preload			
New bearing		1.2 - 4.1 kg	2.6 - 9.9 lb
Reused bearing		More than 0.47 kg (1.0 lb)	
Spap ring thickness			
Output shaft front	Part No.		
	90520-33107	2.30 - 2.35 mm	0.0906 - 0.0925 in.
	90520-33110	2.60 - 2.65 mm	0.1024 - 0.1043 in.
Output shaft bearing preload adjusting shim thickness	Part No.		
	90564-64017	0.10 mm	0.0039 in.

Transfer (J30) (Cont'd)

90564-64023	0.15 mm	0.0059 in.
90564-64024	0.20 mm	0.0079 in.
90564-64025	0.25 mm	0.0098 in.

PROPELLER SHAFT

Spider axial play		Less than 0.05 mm (0.0020 in.)
Snap ring thickness	Part No. Color	
	90520-29286 None	1.475 – 1.525 mm 0.0581 – 0.0600 in.
	90520-29287 Brown	1.525 – 1.575 mm 0.0600 – 0.0620 in.
	90520-29288 Blue	1.575 – 1.625 mm 0.0620 – 0.0640 in.
Runout	Limit	0.8 mm 0.031 in.

FRONT AXLE & SUSPENSION

Toe-in	Bias tire	4 ± 2 mm	0.16 ± 0.08 in.
	Radial tire	1 ± 2 mm	0.04 ± 0.08 in.
Camber		1° ± 45'	
Caster	FJ,BJ,HJ4_series	1° ± 45'	
	FJ,BJ,HJ6_series	1°05' ± 45'	
King pin inclination		9°30'	
Wheel angle	Inside	29 – 32°	
	Outside	30°	
Wheel bearing preload (starting load at hub bolt)		2.8 – 5.7 kg	6.2 – 12.6 lb
Steering knuckle bearing preload (rotating) at Knuckle arm end		1.8 – 3.8 kg	4.0 – 8.4 lb
Steering knuckle preload adjusting shim thickness	Part No.		
	43236-60010	0.1 mm	0.004 in.
	43233-60011	0.2 mm	0.008 in.
	43234-60011	0.5 mm	0.020 in.
	43235-60010	1.0 mm	0.039 in.

Cold Tire Inflation Pressure**USA**kg/cm² (psi)

Model	Tire size	Front			Rear		
		Below 80 km/h (50 mph)	Above 80 km/h (50 mph)	Sand Driving	Below 80 km/h (50 mph)	Above 80 km/h (50 mph)	Sand Driving
FJ40, BJ42 series	H78-15(B)	1.6 (22)	1.8 (26)	1.6 (22)	2.0 (28)	2.1 (30)	2.0 (28)
FJ60 series	H78-15(B)	1.7 (24)	2.0 (28)	1.7 (24)	2.3 (32)	2.3 (32)	2.3 (32)

- Note -**Do not drive over 105 kg/h (65 mph) with snow tire.**

Cold Tire Inflation Pressure (Cont'd)

Australia

kg/cm² (psi)

Model	Tire size	Front			Rear		
		Below 80 km/h (50 mph)	Above 80 km/h (50 mph)	Sand Driving	Below 80 km/h (50 mph)	Above 80 km/h (50 mph)	Sand Driving
FJ40, BJ42 series	7.50-16-6PR LT	1.8 (180)	1.8 (180)	1.8 (180)	2.0 (195)	2.4 (235)	2.0 (195)
FJ45, HJ47 series	7.50-16-8PR LT	2.4 (235)	2.4 (235)	2.4 (235)	3.5 (345)	4.0 (395)	3.5 (340)
FJ60, BJ60 series	7.50-16-6PR LT	1.8 (180)	1.8 (180)	1.8 (180)	2.6 (255)	3.0 (295)	2.6 (255)

Europe

kg/cm² (psi)

Model	Tire size	Front			Rear		
		Below 80 km/h (50 mph)	Above 80 km/h (50 mph)	Sand Driving	Below 80 km/h (50 mph)	Above 80 km/h (50 mph)	Sand Driving
FJ40, BJ42 series	7.00-16-6PR LT 7.50-16-6PR LT 205SR16 R	1.8 (26) 1.8 (26) 1.7 (24)	1.8 (26) 1.8 (26) 2.0 (28)	1.8 (26) 1.8 (26) 1.7 (24)	2.4 (34) 2.0 (28) 2.2 (31)	2.8 (40) 2.4 (34) 2.5 (35)	2.4 (34) 2.0 (28) 2.2 (31)
BJ46 series	7.00-16-6PR LT 7.50-16-6PR LT 205SR16 R	1.8 (26) 1.8 (26) 1.7 (24)	1.8 (26) 1.8 (26) 2.0 (28)	1.8 (26) 1.8 (26) 1.7 (24)	2.6 (37) 2.2 (31) 2.4 (34)	3.0 (43) 2.6 (37) 2.7 (38)	2.6 (37) 2.2 (31) 2.4 (34)
FJ45, BJ45 series	7.00-16-8PR LT 7.50-16-6PR LT 7.50-16-8PR LT	2.4 (34) 1.8 (26) 2.4 (34)	2.4 (34) 2.0 (28) 2.4 (34)	4.25 (60) 1.8 (26) 2.4 (34)	4.25 (60) — 3.5 (50)	4.25 (60) — 4.0 (57)	4.25 (60) — 3.5 (50)
FJ60, HJ60 series	205SR16 R	1.7 (24)	2.0 (28)	1.7 (24)	2.5 (35)	2.8 (40)	2.5 (35)

General Countries

kg/cm² (psi)

Model	Tire size	Front			Rear		
		Below 80 km/h (50 mph)	Above 80 km/h (50 mph)	Sand Driving	Below 80 km/h (50 mph)	Above 80 km/h (50 mph)	Sand Driving
FJ40, BJ40, BJ42 series	7.00-15-6PR LT 7.00-16-6PR LT 7.50-16-6PR LT 9.00-15-6PR	1.8 (26) 1.8 (26) 1.8 (26) 1.2 (17)	2.0 (28) 1.8 (26) 1.8 (26) —	1.8 (26) 1.8 (26) 1.8 (26) 0.7 (10)	2.6 (37) 2.4 (34) 2.0 (28) 1.8 (26)	3.0 (43) 2.8 (40) 2.4 (34) —	2.6 (37) 2.4 (34) 2.0 (28) 1.8 (26)
FJ43, BJ43, BJ46 series	7.00-15-16PR LT 7.00-16-16PR LT 7.50-16-6PR LT 9.00-15-6PR	1.8 (26) 1.8 (26) 1.8 (26) 1.2 (17)	2.0 (28) 1.8 (26) 1.8 (26) —	1.8 (26) 1.8 (26) 1.8 (26) 0.7 (10)	2.8 (40) 2.6 (37) 2.2 (31) 2.0 (28)	3.25 (46) 3.0 (43) 2.6 (37) —	2.8 (40) 2.6 (37) 2.2 (31) 2.0 (28)
FJ45, BJ45, HJ47 series	7.00-16-8PR LT 7.50-16-6PR LT 7.50-16-8PR LT 9.00-15-6PR LT	2.4 (34) 1.8 (26) 2.4 (34) 1.3 (13)	2.4 (34) 2.0 (28) 2.4 (34) —	2.4 (34) 1.8 (26) 2.4 (34) 0.9 (13)	4.25 (60) — 3.5 (50) 2.3 (33)	4.25 (60) — 4.0 (57) —	4.25 (60) — 3.5 (50) 2.3 (33)
FJ60, BJ60, HJ60 series	7.00-15-6PR LT 7.00-16-6PR LT 7.50-16-6PR LT 9.00-15-6PR	1.8 (26) 1.8 (26) 1.8 (26) 1.4 (20)	2.2 (31) 2.2 (31) 1.8 (26) —	1.8 (26) 1.8 (26) 1.8 (26) 1.2 (17)	3.25 (46) 3.25 (46) 2.6 (37) 2.3 (33)	3.25 (46) 3.25 (46) 3.0 (43) —	3.25 (46) 3.25 (46) 2.6 (37) 2.1 (30)

REAR AXLE & SUSPENSION**Differential**

Drive pinion bearing preload	at Starting		
	New bearing	19 - 26 kg-cm	16.5 - 22.6 in.-lb
	Reused bearing	9-13 kg-cm	7.8-11.3 in.-lb
Total preload	at Starting	Add drive pinion bearing preload	
		4 - 6 kg-cm	3.5 - 5.2 in.-lb
Drive pinion to ring gear backlash		0.15 - 0.20 mm	0.0059 - 0.0079 in.
Pinion gear to side gear backlash		0.02 - 0.20 mm	0.0008 - 0.0079 in.
Rear axle shaft end clearance		0.060 - 0.465 mm	0.0024 - 0.0183 in.
Ring gear runout	Limit	0.10 mm	0.0039 in.
Companion flange runout			
	Limit	Radial	0.10 mm
		Lateral	0.10 mm
Ring gear installing temperature		90 - 110°C	194 - 230°F
Side gear thrust washer thickness			
	Part No.		
	41361-60010	1.55 - 1.65 mm	0.0610 - 0.0650 in.
	41361-60020	1.70 - 1.80 mm	0.0669 - 0.0709 in.
	41361-60030	1.85 - 1.95 mm	0.0728 - 0.0768 in.
	41361-60040	2.00 - 2.10 mm	0.0787 - 0.0827 in.
Drive pinion bearing preload adjusting shim thickness	Part No.		
	90564-30035	0.25 mm	0.0098 in.
Drive pinion bearing preload adjusting spacer thickness	Part No.		
	90560-30184	2.74 - 2.76 mm	0.1079 - 0.1087 in.
	90560-30185	2.77 - 2.79 mm	0.1091 - 0.1098 in.
	90560-30186	2.80 - 2.82 mm	0.1102 - 0.1110 in.
	90560-30187	2.83 - 2.85 mm	0.1114 - 0.1122 in.
	90560-30188	2.86 - 2.88 mm	0.1126 - 0.1134 in.
	90560-30190	2.89 - 2.91 mm	0.1138 - 0.1146 in.
	90560-30191	2.92 - 2.94 mm	0.1150 - 0.1157 in.
	90560-30192	2.95 - 2.97 mm	0.1161 - 0.1169 in.
	90560-30199	2.98 - 3.00 mm	0.1173 - 0.1181 in.

Differential (Cont'd)

Drive pinion protrusion adjusting shim thickness	Part No.		
	90564-68001	0.25 mm	0.0098 in.
	90564-68002	0.30 mm	0.0118 in.
	90564-68003	0.35 mm	0.0138 in.
	90564-68004	0.40 mm	0.0157 in.
	90564-68005	0.45 mm	0.0177 in.
Pinion shaft spacer thickness	Part No.		
	41344-35010	29.8 mm	1.173 in.
	41345-35010	30.2 mm	1.189 in.
	41346-35010	30.6 mm	1.205 in.
	41347-35010	29.0 mm	1.142 in.
	41348-35010	29.4 mm	1.157 in.

Limited Slip Differential (LSD)

Drive pinion bearing preload	at Starting		
	New bearing	19 - 26 kg-cm	16.5 - 22.6 in.-lb
	Reused bearing	9 - 13 kg-cm	7.8 - 11.3 in.-lb
Total preload	at Starting	Add drive pinion bearing preload	
		4 - 6 kg-cm	3.5 - 5.2 in.-lb
Drive pinion to ring gear backlash		0.15 - 0.20 mm	0.0059 - 0.0079 in.
Pinion gear to side gear backlash		0.02 - 0.24 mm	0.0008 - 0.0095 in.
Ring gear runout	Limit	0.10 mm	0.0039 in.
Companion flange runout			
	Limit	Radial	0.10 mm
		Lateral	0.10 mm
Ring gear installing temperature		90 - 110°C	194 - 230°F
Side gear thrust washer thickness	Part No.		
	41361-60050	1.965 - 2.015 mm	0.0774 - 0.0793 in.
Drive pinion adjusting plate washer thickness	Part No.		
	90564-68001	0.25 mm	0.0098 in.
	90564-68002	0.30 mm	0.0118 in.
	90564-68003	0.35 mm	0.0138 in.
	90564-68004	0.40 mm	0.0157 in.
	90564-68005	0.45 mm	0.0177 in.

Limited Slip Differential (LSD) (Cont'd)

Drive pinion bearing preload adjusting			
Shim thickness	Part No. 90564-30035	0.25 mm	0.0098 in.
Drive pinion bearing preload adjusting			
spacer thickness	Part No.		
	90560-30184	2.74 – 2.76 mm	0.1079 – 0.1087 in.
	90560-30185	2.77 – 2.79 mm	0.1091 – 0.1098 in.
	90560-30186	2.80 – 2.82 mm	0.1102 – 0.1110 in.
	90560-30187	2.83 – 2.85 mm	0.1114 – 0.1122 in.
	90560-30188	2.86 – 2.88 mm	0.1126 – 0.1134 in.
	90560-30190	2.89 – 2.91 mm	0.1138 – 0.1146 in.
	90560-30191	2.92 – 2.94 mm	0.1150 – 0.1157 in.
	90560-30192	2.95 – 2.97 mm	0.1161 – 0.1169 in.
	90560-30199	2.98 – 3.00 mm	0.1173 – 0.1181 in.
Compression spring			
	Free length	38.6 mm	1.520 in.
Clutch plate thickness &			
Thrust washer thickness			
	Limit	1.93 mm	0.0760 in.
Dimension from differential case center (spider center) to front surface of side gear) (with side gear pushed with 10 kg or 22 lb of pressure)			
		19.03 – 19.13 mm	0.7492 – 0.7531 in.
Adjusting shim thickness			
	Part No.		
	90564-54001	0.20 mm	0.0079 in.
	90564-54002	0.25 mm	0.0098 in.
	90564-54003	0.30 mm	0.0118 in.
	90564-54004	0.35 mm	0.0138 in.

Rear Axle Shaft

Wheel bearing preload (starting load at hub bolt)	2.6 – 5.7 kg	5.7 – 12.6 lb
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STEERING**Steering Column & Main Shaft**

Collar No.1 outer diameter	Part No.		
	45813-22010	17.996 – 18.003 mm	0.7085 – 0.7088 in.
	45813-22020	18.003 – 18.010 mm	0.7088 – 0.7091 in.
	45813-22030	18.010 – 18.017 mm	0.7091 – 0.7093 in.
	45813-22040	18.017 – 18.024 mm	0.7093 – 0.7096 in.
Collar No.2 outer diameter	Part No.		
	45814-22010	17.982 – 18.000 mm	0.7080 – 0.7087 in.
	45814-22020	18.000 – 18.018 mm	0.7087 – 0.7094 in.
Tilt steering support shim thickness	Part No.		
	45815-22010	0.2 mm	0.01 in.
	45815-22020	0.5 mm	0.02 in.
	45815-22030	0.8 mm	0.03 in.
	45815-22040	1.4 mm	0.06 in.
Intermediate shaft spider bearing to snap ring clearance	Part No.		
	45815-22050	1.8 mm	0.07 in.
Intermediate shaft spider bearing to snap ring clearance		Less than 0.05 mm (0.0020 in.)	
Snap ring thickness	Part No.	Mark	
	80521-22011	None	1.175 – 1.225 mm 0.0463 – 0.0482 in.
	80521-22012	Brown	1.225 – 1.275 mm 0.0482 – 0.0502 in.
	80521-22013	Blue	1.275 – 1.325 mm 0.0502 – 0.0522 in.
Intermediate shaft snap ring thickness	Part No.		
	90521-22011	1.20 mm	0.0472 in.
	90521-22012	1.25 mm	0.0492 in.
	90521-22013	1.30 mm	0.0512 in.

Steering Gear Housing

Steering wheel freeplay	STD	Less than 30 mm (1.18 in.)	
Sector shaft oil clearance	STD	0.009 – 0.060 mm	0.0004 – 0.0024 in.
	Limit	0.10 mm	0.0039 in.
Sector shaft thrust clearance	Limit	0.05 mm	0.0020 in.
Worm bearing preload	w/o Sector shaft	35 – 65 kg-cm	30 – 56 in.-lb
	w/ Sector shaft	8 – 11 kg-cm	69 – 95 in.-lb

Steering Gear Housing (Cont'd)

Sector shaft thrust washer thickness			
	Mark		
	1	2.00 mm	0.0787 in.
	2	2.05 mm	0.0807 in.
	3	2.10 mm	0.0827 in.
	4	2.15 mm	0.0846 in.
	5	2.20 mm	0.0866 in.
End cover shim thickness (for worm bearing preload)			
	Mark		
	1	0.05 mm	0.0020 in.
	2	0.07 mm	0.0028 in.
	3	0.08 mm	0.0031 in.
	4	0.10 mm	0.0039 in.
	5	0.20 mm	0.0079 in.
	6	0.50 mm	0.0197 in.
	7	0.06 mm	0.0024 in.
	8	0.09 mm	0.0035 in.

Steering Linkage

Steering relay rod			
	FJ,BJ,HJ4_ series	842 mm	33.15 in.
	FJ,BJ,HJ6_ series	836 mm	32.91 in.
Tie rod		1,267 mm	49.88 in.
Steering drag link length			
	FJ,BJ,HJ4_ series	855 mm	33.66 in.

Power Steering

Maximum rise of oil level		Below 5 mm (0.20 in.)	
Oil pressure	at Idle speed	More than 72 kg/cm ² (1,022 psi)	
Variation in vane pump discharge pressure (at 1,000 rpm and 3,000 rpm)		Less than 5 kg/cm ² (71 psi)	
V belt tension	at 10 kg (22lb)		
P/S pump x Alternator		11 — 14 mm	0.43 — 0.55 in.
Steering effort	at Steering wheel	Less than 6 kg (13.2 lb)	
Overall length of rotor and			
fixed ring	STD	0.03 mm	0.0012 in.
	Limit	0.06 mm	0.0024 in.
Slipper thickness			
	STD	1.55 mm	0.0610 in.
	Limit	1.4 mm	0.055 in.

Power Steering (Cont'd)

Slipper length	STD	w/Mark	39.940 mm	1.5724 in.
		w/o Mark	39.945 mm	1.5726 in.
	Limit		39.920 mm	1.5717 in.
Slipper compression spring length	STD		14 mm	0.55 in.
		Limit	13 mm	0.51 in.
Shaft to bushing clearance	STD		0.010 - 0.015 mm	0.0004 - 0.0006 in.
		Limit	0.03 mm	0.0012 in.
Flow control valve spring length	STD		50 mm	1.97 in.
		Limit	47 mm	1.85 in.
Pump preload (at pump pulley) rotating			2.8 kg	6.2 lb
Cross shaft adjusting screw thrust clearance			0.03 - 0.05 mm	0.0012 - 0.0020 in.
Ball clearance	STD		0.02 - 0.06 mm	0.0008 - 0.0024 in.
		Limit	0.15 mm	0.0059 in.
Worm shaft preload	at Starting	w/o Cross shaft	4.0 - 6.5 kg-cm	3.5 - 5.6 in.-lb
		w/ Cross shaft	In addition to without cross shaft preload	
			2 - 3 kg-cm	1.7 - 2.6 in.-lb

BRAKE**Brake Pedal**

Pedal height (from floor panel)	FJ,BJ,HJ4_series	215 mm	8.46 in.
	FJ,BJ,HJ6_series	192 mm	7.56 in.
Pedal freeplay		3 - 6 mm	0.12 - 0.24 in.
Pedal reserve distance	at 50 kg (110 lb)		
Disc brake	FJ,BJ40 42 43 series	More than 115 mm (4.53 in.)	
	FJ,BJ,HJ60 series	More than 105 mm (4.13 in.)	
Drum brake	FJ,BJ40 42 43 series	More than 110 mm (4.33 in.)	
	FJ,BJ,HJ45 46 47 60 series	More than 100 mm (3.94 in.)	

Brake Booster

Booster push rod to piston clearance	0.1 - 0.5 mm	0.004 - 0.020 in.
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Front & Rear Brake (Drum)

Drum inner diameter	STD	295 mm	11.61 in.
	Limit	297 mm	11.69 in.
Lining thickness	Limit	1.5 mm	0.059 in.

Front Brake (Disc)

Disc thickness	STD	20 mm	0.79 in.
	Limit	19 mm	0.75 in.
Disc runout	Limit	0.12 mm	0.0047 in.
Pad thickness	Limit	1.0 mm	0.039 in.

Parking Brake

Lever distance	at 20 kg(44 lb)		
	FJ,BJ,HJ60 series	7 - 9 clicks	
	FJ,BJ40-42-43 series	8 - 10 clicks	
	with center brake		
	at 25 kg (55 lb)	3 - 6 clicks	
Drum inner diameter	Limit	161 mm	6.34 in.
Lining thickness	Limit	1.5 mm	0.059 in.

Vacuum Pump

Bushing bore diameter	Limit	16.14 mm	0.6354 in.
Rotor to spline play	Limit	2.4 mm	0.094 in.
Blade			
Height	Limit	11.6 mm	0.457 in.
Width	Limit	6.9 mm	0.272 in.
Length	Limit	34.9 mm	1.374 in.

FRONT WINCH**Mechanical Winch**

Worm bearing preload adjusting shim thickness	Part No.		
	38123-60010	0.228 mm	0.0090 in.
	38124-60010	0.5 mm	0.020 in.

Electric Winch

Armature shaft			
Thrust clearance		0.05 - 0.50 mm	0.0020 - 0.0197 in.
Thrust washer thickness		1.6 mm	0.063 in.
Commutator			
Mica depth	STD	0.7 mm	0.028 in.
	Limit	0.3 mm	0.012 in.

Electric Winch (Cont'd)

Runout	STD	0.05 mm	0.0020 in.
	Limit	0.20 mm	0.0079 in.
Outer diameter	STD	43 mm	1.69 in.
	Limit	41 mm	1.61 in.
Brush Length	STD	22 mm	0.87 in.
	Limit	15 mm	0.59 in.
Spring tension		3.2 - 4.0 kg	7.1 - 8.8 lb

LUBRICANT

Item		Capacity			Classification	
		Liter	US qt	Imp. qt		
Transmission oil	H41 & H42	3.1	3.3	2.7	API GL-4 or GL-5 SAE 90	
	J30	1.7	1.8	1.5		
Transfer oil	H41 & H42	w/o P.T.O	2.5	2.6	2.2	API GL-4 or GL-5 SAE 90
		w/ P.T.O	3.1	3.3	2.7	
	J30	w/o P.T.O	1.7	1.8	1.5	
		w/ P.T.O	2.1	2.2	1.8	
Differential oil		2.5	2.6	2.2	API GL-5 hypoid gear oil Above -18°C (0°F) SAE 90 Below -18°C (0°F) SAE 80 - 90 or 80 W	
LSD		2.5	2.6	2.2	API GL-5 for LSD oil Above -18°C (0°F) SAE 90 Below -18°C (0°F) SAE 80W-90 or 80W	
Steering gear box oil					API GL-4, SAE 90	
FJ,BJ,HJ6_series		500 cc	30.5 cu in.			
FJ,BJ,HJ4_series		610 cc	37.2 cu in.			
Power steering fluid					ATF type Dexron	
Pump		300 cc	18.3 cu in.			
Total						
FJ, HJ4_series		630 cc	38.4 cu in.			
FJ, HJ6_series		800 cc	48.8 cu in.			
Chassis grease					Lithium base, NLGI No.2 Molybdenum disulphide lithium base, NLGI No.2	
Propeller shaft Steering link ends						
Wheel bearing grease					Lithium base multipurpose, NLGI No.2	
Steering knuckle and front axle shaft grease					Molybdenum disulphide lithium base, NLGI No.2	
Brake fluid					SAE J1703, DOT-3	
Anti freeze					Anti-rust type Iene glycol base coolant	

**LAND CRUISER
ELECTRICAL WIRING DIAGRAM**

LAND CRUISER ELECTRICAL WIRING DIAGRAM

BJ40, BJ43 & HJ47 Series

Note

When reading the wiring diagram, following should be noted.

1. Wiring color code is shown with alphabetical letter's.
The first letter indicates the basic color for the wire, and the second letter indicates the spiral line color.
B = Black O = Orange W = White
G = Green R = Red Y = Yellow
L = Light Blue Lg = Light Green
Example: RG, is for Red and Green line.
2. Legend in the bracket [] of the wiring diagram shows the grid location of mating connection.
3. Broken lines in the wiring diagram are for varied models or optional equipment.
4. The following abbreviations are used in this wiring diagram.
RHD = Right Hand Drive Vehicles S.W = Switch
LHD = Left Hand Drive Vehicles A.T = Automatic Transmission
VSV = Vacuum Switching Valve

LAND CRUISER (BJ40, BJ43 & HJ47 Series) ELECTRICAL WIRING DIAGRAM INDEX - 1981 PRODUCTION VEHICLE

GRID LOCATION	COMPONENTS	GRID LOCATION	COMPONENTS
D-1 B-3 B-8	ALTERNATOR AMMETER ANTENNA (OPT)	D-2 B-5 C-5 B-1 B-4 B-7 B-7	EDIC (OPT) HEATER BLOWER HEATER BLOWER, REAR STARTER WINCH (OPT) WINDSHIELD WASHER WINDSHIELD WIPER
B-2	BATTERY 12V or 24V	B-3 B-3 B-1	OIL PRESSURE GAUGE OIL PRESSURE SENDER OVER INJECTION MAGNET (Ex. EDIC)
B-8 C-1 D-2	CIGARETTE LIGHTER (OPT) CONDENSER COOLER CONTROL BOX (OPT)	B-8	RADIO (OPT)
B-4	DIODE (OPT)	C-1 B-8 C-3	REGULATOR RESISTOR (For 24V OPT) RESISTOR (OPT)
C-3 C-3 A-2 B-2 A-2 B-3 B-2	FUEL GAUGE FUEL LEVEL SENDER FUSE 5A X 2 FUSE BOX FUSE COOLER 15A FUSIBLE LINK		RELAYS: D-4 BULB CHECK C-2 EDIC (OPT) B-6 FLASHER B-2 GLOW PLUG C-3 MAIN (OPT) B-6 QUICK FLASHER (For ECE) B-1 STARTER
B-2 C-2 B-2	GLOW PLUG GLOW PLUG CONTROLLER	B-8	SPEAKER (OPT)
B-6 B-5	HORN Hi HORN Lo		SWITCHES: C-4 BACK-UP LIGHT C-4 BRAKE FLUID LEVEL (Ex. Australia) D-3 BRAKE FLUID LEVEL (For Australia) B-8 DIMMER C-7 FOG LIGHT (OPT) B-6 HAZARD B-5 HEATER BLOWER (OPT) B-5 HORN C-7 INTERIOR LIGHT B-7 LIGHT CONTROL D-2 LOW PRESSURE (OPT) B-4 MAGNET (OPT) C-2 OIL PRESSURE C-4 PARKING BRAKE (Ex. Australia) C-3 PARKING BRAKE (For Australia) B-4 SEDIMENTER (OPT) A-1 STARTER B-5 STOP LIGHT C-6 TRAILER SOCKET CHANGE OVER (OPT) C-5 TURN SIGNAL C-4 VACUUM (Ex. Australia) D-3 VACUUM (For Australia) B-4 WINCH CONTROL (OPT) B-7 WINDSHIELD WASHER B-7 WINDSHIELD WIPER
D-7	INSPECTION SOCKET		
	LIGHTS: D-4 BACK-UP, LH D-4 BACK-UP, RH D-3 BRAKE WARNING B-4 BRAKE SYSTEM WARNING (Ex. Australia) D-7 CLEARANCE, LH D-7 CLEARANCE, RH D-8 COMBINATION METER X 2 D-7 FOG, LH (OPT) D-7 FOG, RH (OPT) C-7 HEAD, LH C-8 HEAD, RH C-8 HIGH BEAM INDICATOR C-7 INTERIOR D-8 LICENSE X 2 C-3 P. K. B. D-6 RED INDICATOR (OPT For ECE) B-4 SEDIMENTER (OPT) D-5 STOP, LH D-5 STOP, RH D-8 TAIL, LH D-8 TAIL, RH D-5 TURN SIGNAL, FRONT LH D-6 TURN SIGNAL, FRONT RH D-5 TURN SIGNAL, INDICATOR LH D-6 TURN SIGNAL, INDICATOR RH D-6 TURN SIGNAL, REAR LH D-6 TURN SIGNAL, REAR RH D-5 TURN SIGNAL, SIDE LH D-6 TURN SIGNAL, SIDE RH		
D-2	MAGNET CLUTCH	D-3 C-6	THERMISTOR (OPT) TRAILER SOCKET (OPT)
C-3	MOTORS: BLOWER (OPT)	C-3 C-3	WATER TEMP GAUGE WATER TEMP SENDER

FJ40 & FJ43 Series

LAND CRUISER (FJ40 & FJ43 Series) ELECTRICAL WIRING DIAGRAM INDEX – 1981 PRODUCTION VEHICLE

GRID LOCATION	COMPONENTS	GRID LOCATION	COMPONENTS
D-1 B-3 B-8	ALTERNATOR AMMETER ANTENNA (OPT)	D-6 D-6 D-6	TURN SIGNAL, INDICATOR RH TURN SIGNAL, REAR LH TURN SIGNAL, REAR RH
B-2	BATTERY 12V	D-2	MAGNET CLUTCH (OPT)
B-8 B-1 C-1 D-2	CIGARETTE LIGHTER (OPT) CONDENSER CONDENSER COOLER CONTROL BOX (OPT)	C-3 B-5 C-5	MOTORS: BLOWER (OPT) HEATER BLOWER (OPT) HEATER BLOWER, REAR (OPT)
B-1	DISTRIBUTOR	B-1 B-4 B-7 B-7	STARTER WINCH (OPT) WINDSHIELD WASHER WINDSHIELD WIPER
C-2 D-2 C-2 C-2 C-2	EMISSION CONTROL SYSTEM: (For Australia, NSW, ECE & Hong Kong) COMPUTER SPEED SENSOR TOP SWITCH (For ECE, NSW & Hong Kong) VSV (TCS) (For ECE, NSW & Hong Kong) VSV (TP)	B-3 B-3	OIL PRESSURE GAUGE OIL PRESSURE SENDER
B-2 C-3 C-3 B-2 A-2 B-3 B-2	FUEL CUT SOLENOID FUEL GAUGE FUEL LEVEL SENDER FUZE 5A X 2 FUZE BOX FUZE COOLER 15A FUSIBLE LINK	B-8 C-1 C-3	RADIO (OPT) REGULATOR RESISTOR (OPT)
B-6 B-5	HORN Hi HORN Lo	D-4 B-6 C-3	RELAYS: BULB CHECK (For Australia) FLASHER MAIN (OPT)
B-1 D-7	IGNITION COIL INSPECTION SOCKET	B-8	SPEAKER (OPT)
D-4 D-4 D-3 B-4 D-7 D-7 D-8 D-7 D-7 C-7 C-8 C-7 D-7 D-8 C-3 D-6 D-5 D-5 D-8 D-8 D-5 D-6 D-5	LIGHTS: BACK-UP, LH BACK-UP, RH BRAKE WARNING (For Australia) BRAKE SYSTEM WARNING (Ex. Australia) CLEARANCE, LH CLEARANCE, RH COMBINATION METER X 2 FOG, LH (OPT) FOG, RH (OPT) HEAD, LH HEAD, RH HIGH BEAM INDICATOR INTERIOR LICENSE X 2 P.K.B. (For Australia) RED INDICATOR (For ECE OPT) STOP, LH STOP, RH TAIL, LH TAIL, RH TURN SIGNAL, FRONT LH TURN SIGNAL, FRONT RH TURN SIGNAL, INDICATOR LH	C-4 C-4 D-3 B-7 C-7 A-6 A-5 B-5 A-1 C-7 B-7 D-2 B-4 C-4 C-3 B-5 C-6 C-5 A-4 A-7 A-7 D-3 C-7 B-3 B-3	SWITCHES: BACK-UP LIGHT BRAKE FLUID LEVEL (Ex. Australia) BRAKE FLUID LEVEL (For Australia) DIMMER FOG LIGHT (OPT) HAZARD HEATER BLOWER (OPT) HORN IGNITION INTERIOR LIGHT LIGHT CONTROL LOW PRESSURE MAGNET (OPT) PARKING BRAKE (Ex. Australia) PARKING BRAKE (For Australia) STOP LIGHT TRAILER SOCKET CHANG OVER (OPT) TURN SIGNAL WINCH CONTROL (OPT) WINDSHIELD WASHER WINDSHIELD WIPER THERMISTOR (OPT) TRAILER SOCKET (OPT) WATER TEMP GAUGE WATER TEMP SENDER

BJ60 & HJ60 Series

LAND CRUISER (BJ60 & HJ60 Series) ELECTRICAL WIRING DIAGRAM INDEX – 1981 PRODUCTION VEHICLE

GRID LOCATION	COMPONENTS	GRID LOCATION	COMPONENTS
D-1	ALTERNATOR	D-5	WINCH (OPT)
C-1	BATTERY 12V or 24V	B-5	WINDSHIELD WASHER
B-8	CIGARETTE LIGHTER	C-5	WINDSHIELD WIPER
A-2	CIRCUIT BREAKER HEATER	D-6	WIPER, REAR (OPT)
C-8	CLOCK (Digital) (OPT For General)	B-3	OIL PRESSURE GAUGE
D-1	CONDENSER	B-3	OIL PRESSURE SENDER
A-3	COOLER ASSEMBLY	B-3	PICK-UP SENSOR (OPT)
B-2	DIODE	B-8	RADIO (OPT)
D-2	DIODE	C-2	REAR WINDOW DEFOGGER (OPT)
B-3	FUEL GAUGE	D-1	REGULATOR
B-3	FUEL LEVEL SENDER	A-8	RESISTOR (For 24V)
A-1	FUSE BOX	D-6	RESISTOR (For 24V)
B-1	FUSIBLE LINK		RELAYS:
B-1	GLOW PLUG	D-3	BULB CHECK (For Australia)
B-2	GLOW PLUG TIMER	B-7	DIMMER (For Europe)
C-2	HEATER BLOWER RESISTOR (OPT)	D-1	EDIC (OPT)
B-4	HORN Hi	B-4	FLASHER
B-4	HORN Lo	B-2	GLOW PLUG INDICATOR
C-8	INSPECTION SOCKET	B-6	HEADLIGHT
	LIGHTS:	A-7	HEADLIGHT (For Europe)
D-4	BACK-UP, LH	B-5	HEADLIGHT CLEANER (OPT)
D-4	BACK-UP, RH	B-2	HEATER (OPT)
C-3	BRAKE WARNING	B-2	IGNITION
C-3	BRAKE WARNING (For Australia)	D-4	RED INDICATOR (OPT For ECE)
B-3	CHARGE WARNING	B-1	STARTER
D-5	CIGARETTE LIGHTER	B-6	TAIL LIGHT
D-7	CIGARETTE LIGHTER (For Europe)	B-7	TAIL LIGHT (For Europe)
B-5	CLEARANCE, LH	C-4	TURN & HAZARD (For 24V)
B-7	CLEARANCE, LH (For Europe)	B-4	WINDSHIELD WIPER (For 24V)
B-5	CLEARANCE, RH	B-5	WINDSHIELD WIPER Intermittent
C-7	CLEARANCE, RH (For Europe)	B-8	SPEAKER (OPT)
C-5	COMBINATION METER	C-8	SPEAKER, LH (OPT)
D-7	COMBINATION METER (For Europe)	C-8	SPEAKER, RH (OPT)
C-6	GLOW BOX (OPT)	B-8	STEREO (OPT)
B-7	GLOVE BOX (For Europe)		SWITCHES:
B-2	GLOVE PLUG INDICATOR	B-8	ANTENNA MOTOR (OPT)
B-6	HEAD, LH	C-4	BACK-UP LIGHT
B-7	HEAD, LH (For Europe)	B-3	BRAKE FLUID LEVEL
B-6	HEAD, RH	D-3	BRAKE FLUID LEVEL (For Australia)
B-8	HEAD, RH (For Europe)	B-2	DEFOGGER (OPT)
D-5	HEATER CONTROL (OPT)	C-6	DIMMER
D-7	HEATER CONTROL (For Europe)	C-7	DIMMER (For Europe)
D-8	HIGH BEAM INDICATOR	D-7	DOOR COURTESY, FRONT LH
B-8	HIGH BEAM INDICATOR (For Europe)	D-8	DOOR COURTESY, FRONT RH
C-8	INTERIOR	D-8	DOOR COURTESY, REAR LH
C-8	INTERIOR, REAR (OPT)	D-8	DOOR COURTESY, REAR RH
C-5	LICENSE x 2	B-7	GLOVE BOX LIGHT (For Europe)
C-7	LICENSE x 2 (For Europe)	C-6	GLOVE BOX LIGHT (OPT)
C-3	P.K.B. (For Australia)	B-3	HAZARD
D-4	RED INDICATOR (OPT For ECE)	D-2	HEATER BLOWER, FRONT (OPT)
C-3	SEDIMENTER	C-4	HEATER BLOWER, REAR (OPT)
C-5	SPEEDOMETER x 2	B-4	HORN
C-7	SPEEDOMETER x 2	C-8	INTERIOR
D-4	STOP, LH	C-8	INTERIOR, REAR (OPT)
D-4	STOP, RH	D-8	LEFT GATE COURTESY (OPT)
D-5	TACHOMETER (OPT)	C-6	LIGHT CONTROL
D-7	TACHOMETER (For Europe)	C-7	LIGHT CONTROL (For Europe)
B-5	TAIL, LH	D-5	MAGNET (OPT)
B-7	TAIL, LH (For Europe)	D-2	OIL PRESSURE (For EDIC)
B-7	TAIL, RH	C-3	PARKING BRAKE
B-7	TAIL, RH (For Europe)	C-3	PARKING BRAKE (For Australia)
D-3	TURN SIGNAL, FRONT LH	C-3	SEDIMENTER (OPT)
D-4	TURN SIGNAL, FRONT RH	A-1	STARTER
D-3	TURN SIGNAL, INDICATOR LH	C-4	STOP LIGHT
D-4	TURN SIGNAL, INDICATOR RH	D-3	TURN SIGNAL
D-3	TURN SIGNAL, REAR LH	C-3	TURN SIGNAL
D-4	TURN SIGNAL, REAR RH	C-3	VACUUM
C-3	TURN SIGNAL, SIDE LH (For ECE)	D-4	VACUUM (For Australia)
C-4	TURN SIGNAL, SIDE RH (For ECE)	C-5	WASHER, REAR (OPT)
	MOTORS:	C-5	WINCH CONTROL (OPT)
C-8	ANTENNA (OPT)	B-5	WINDSHIELD WASHER
C-2	EDIC (OPT)	B-5	WINDSHIELD WIPER
B-6	HEADLIGHT CLEANER (OPT)	C-4	WIPER, REAR (OPT)
C-2	HEATER BLOWER (OPT)	B-3	TACHOMETER (OPT)
C-4	HEATER BLOWER, REAR (OPT)	B-3	VOLTMETER
B-1	STARTER	B-3	WATER TEMP GAUGE
C-5	WASHER, REAR (OPT)	B-3	WATER TEMP SENDER

FJ60 Series

LAND CRUISER (FJ60 Series) ELECTRICAL WIRING DIAGRAM INDEX – 1981 PRODUCTION VEHICLE

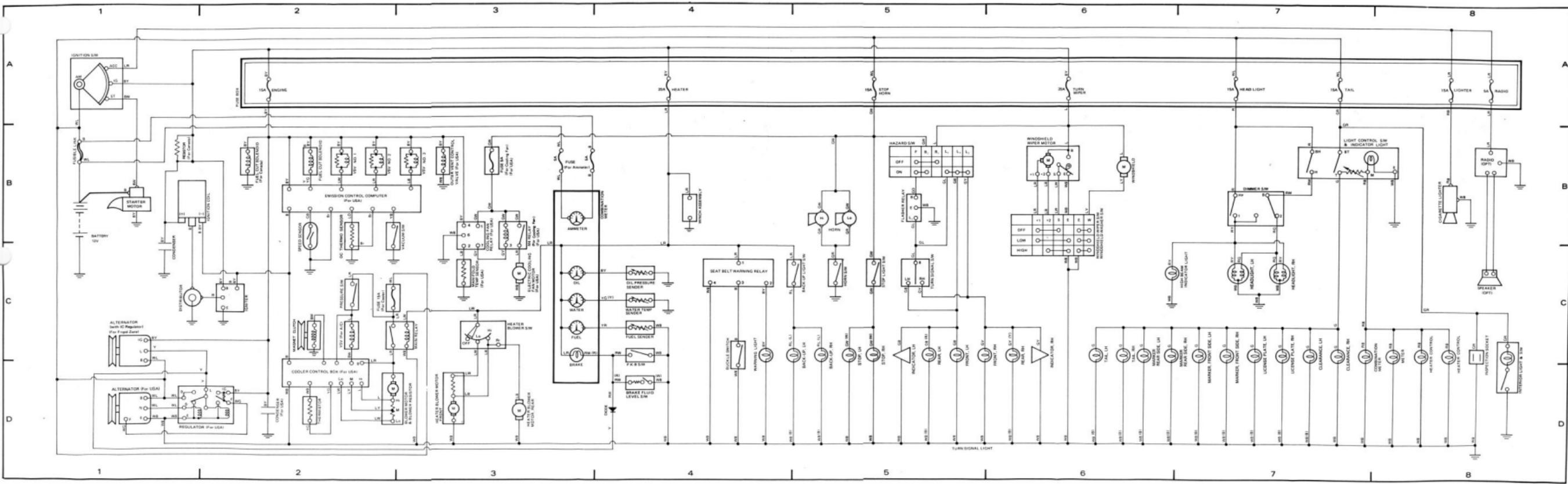
GRID LOCATION	COMPONENTS	GRID LOCATION	COMPONENTS
D-1 D-1	ALTERNATOR ALTERNATOR (With IC Regulator) (For ECE OPT)	C-8	MOTORS: ANTENNA (OPT)
B-1	BATTERY 12V	B-6	HEADLIGHT CLEANER (OPT)
B-8	CIGARETTE LIGHTER	B-2	HEATER BLOWER (OPT)
A-2	CIRCUIT BREAKER HEATER	C-5	HEATER BLOWER, REAR (OPT)
C-8	CLOCK (Digital) (OPT For General)	B-1	STARTER
C-1	CONDENSER	C-5	WASHER, REAR (OPT)
D-2	CONDENSER	C-1	WINCH (OPT)
C-3	COOLER ASSEMBLY	B-5	WINDSHIELD WASHER
		B-5	WINDSHIELD WIPER
		C-5	WIPER, REAR (OPT)
B-1	DIODE (Ex. Charge Light Relay)	B-3	OIL PRESSURE GAUGE
C-1	DISTRIBUTOR	B-3	OIL PRESSURE SENDER
		D-8	RADIO (OPT)
C-2	EMISSION CONTROL SYSTEM: COMPUTER	B-2	REAR WINDOW DEFOGGER (OPT)
C-2	VSV (FR)	D-1	REGULATOR
C-2	VSV (TCS) (Ex. Australia)		RELAYS:
D-2	SPEED SENSOR	D-3	BULB CHECK (For Australia)
C-2	TOP SWITCH (Ex. Australia)	B-2	CHARGE LIGHT (OPT For ECE)
B-2	FUEL CUT SOLENOID	B-7	DIMMER (For Europe)
B-3	FUEL GAUGE	B-4	FLASHER
B-3	FUEL LEVEL SENDER	B-6	HEADLIGHT
A-1	FUSE BOX	B-7	HEADLIGHT (For Europe)
B-1	FUSIBLE LINK	B-5	HEADLIGHT CLEANER (OPT)
C-3	HEATER RESISTOR (OPT)	B-2	HEATER (OPT)
B-4	HORN H	D-2	IGNITION
B-4	HORN L	C-4	RED INDICATOR (OPT For ECE)
B-1	IGNITION COIL	B-6	TAIL LIGHT
C-8	INSPECTION SOCKET	B-7	TAIL LIGHT (For Europe)
		B-5	WINDSHIELD WIPER (Intermittent) (OPT)
D-4	LIGHTS:	B-8	SPEAKER (OPT)
D-4	BACK-UP, LH	C-8	SPEAKER, LH (OPT)
C-3	BACK-UP, RH	C-8	SPEAKER, RH (OPT)
C-3	BRAKE WARNING	B-8	STEREO (OPT)
B-5	BRAKE WARNING (For Australia)		SWITCHES:
B-3	CHARGE WARNING	B-8	ANTENNA MOTOR (OPT)
D-5	CIGARETTE LIGHTER	C-4	BACK-UP LIGHT
C-7	CIGARETTE LIGHTER (For Europe)	C-3	BRAKE FLUID LEVEL
B-5	CLEARANCE, LH	C-3	BRAKE FLUID LEVEL (For Australia)
B-7	CLEARANCE, LH (For Europe)	B-2	DEFOGGER (OPT)
B-5	CLEARANCE, RH	C-6	DIMMER
C-7	CLEARANCE, RH (For Europe)	C-7	DIMMER (For Europe)
C-5	COMBINATION METER	D-8	DOOR COURTESY, FRONT LH
D-7	COMBINATION METER (For Europe)	D-8	DOOR COURTESY, FRONT RH
C-6	GLOVE BOX (OPT)	D-8	DOOR COURTESY, REAR LH
B-7	GLOVE BOX (For Europe)	D-8	DOOR COURTESY, REAR RH
B-6	HEAD, LH	B-7	GLOVE BOX LIGHT (For Europe)
B-8	HEAD, LH (For Europe)	C-6	GLOVE BOX LIGHT (OPT)
B-6	HEAD, RH	B-4	HAZARD
B-8	HEAD, RH (For Europe)	D-3	HEATER BLOWER, FRONT (OPT)
D-5	HEATER CONTROL (OPT)	C-5	HEATER BLOWER, REAR (OPT)
D-7	HEATER CONTROL (For Europe)	B-4	HORN
D-6	HIGH BEAM INDICATOR	A-1	IGNITION
B-8	HIGH BEAM INDICATOR (For Europe)	C-8	INTERIOR
C-8	INTERIOR	C-8	INTERIOR, REAR (OPT)
C-8	INTERIOR, REAR (OPT)	D-8	LIFT GATE COURTESY (OPT)
C-5	LICENSE x 2	C-6	LIGHT CONTROL
C-7	LICENSE x 2 (For Europe)	C-7	LIGHT CONTROL (For Europe)
C-3	P.K.B. (For Australia)	C-1	MAGNET (OPT)
C-4	RED INDICATOR (OPT For ECE)	C-3	PARKING BRAKE
C-5	SPEEDOMETER x 2	C-3	PARKING BRAKE (For Australia)
C-7	SPEEDOMETER (For Europe)	C-4	STOP LIGHT
D-4	STOP, LH	C-4	TURN SIGNAL
D-4	STOP, RH	C-5	WASHER, REAR (OPT)
C-5	TACHOMETER (OPT)	B-1	WINCH CONTROL (OPT)
D-7	TACHOMETER (For Europe)	A-5	WINDSHIELD WASHER
B-5	TAIL, LH	A-5	WINDSHIELD WIPER
B-7	TAIL, LH (For Europe)	C-5	WIPER, REAR (OPT)
B-5	TAIL, RH		
B-7	TAIL, RH (For Europe)	C-3	TACHOMETER
D-4	TURN SIGNAL, FRONT LH	B-3	VOLTMETER
D-4	TURN SIGNAL, FRONT RH		
D-4	TURN SIGNAL, INDICATOR LH	B-3	WATER TEMP GAUGE
D-4	TURN SIGNAL, INDICATOR RH	B-3	WATER TEMP SENDER
D-4	TURN SIGNAL, REAR LH		
D-4	TURN SIGNAL, REAR RH		
C-4	TURN SIGNAL, SIDE LH (For ECE)		
C-4	TURN SIGNAL, SIDE RH (For ECE)		

FJ40 Series
(For USA & CANADA)

LAND CRUISER (FJ40 Series) ELECTRICAL WIRING DIAGRAM INDEX (For USA & CANADA) - 1981 Model

GRID LOCATION	COMPONENTS	GRID LOCATION	COMPONENTS
D-1	ALTERNATOR (For USA)	B-7	LIGHT CONTROL INDICATOR
C-1	ALTERNATOR (With IC Regulator) (For Canada Frigid Zone)	C-7	MARKER, FRONT SIDE LH
C-1	ALTERNATOR (With IC Regulator) (For USA Frigid Zone)	C-6	MARKER, FRONT SIDE RH
B-3	AMMETER	C-7	MARKER, REAR SIDE LH
B-1	BATTERY 12V	C-8	MARKER, REAR SIDE RH
B-8	CIGARETTE LIGHTER	C-5	METER
B-3	COMBINATION METER	C-5	STOP LH
D-2	CONDENSER	C-5	STOP RH
D-2	CONDENSER (For USA)	C-6	TAIL LH
D-2	COOLER SYSTEM; (For USA) ASSEMBLY	C-6	TAIL RH
D-2	CONTROL BOX	C-5	TURN SIGNAL, FRONT LH
C-2	FUSE 15A	C-6	TURN SIGNAL, FRONT RH
C-2	MAGNET CLUTCH	C-5	TURN SIGNAL, INDICATOR LH
C-2	MAIN RELAY	C-6	TURN SIGNAL, INDICATOR RH
C-2	PRESSURE SWITCH	C-5	TURN SIGNAL, REAR LH
D-2	THERMISTOR	C-6	TURN SIGNAL, REAR RH
C-2	VSV	C-3	MANIFOLD TEMP SENSOR (For USA)
D-4	DIODE	C-3	MOTORS:
C-1	DISTRIBUTOR	C-3	ELECTRIC COOLING FAN (For USA)
B-2	EMISSION CONTROL SYSTEM; (For USA)	D-3	HEATER BLOWER, FRONT
B-2	EMISSION CONTROL COMPUTER	B-1	HEATER BLOWER, REAR
B-2	FUEL CUT SOLENOID	B-1	STARTER (For Canada)
B-3	OC THERMO SENSOR	B-6	STARTER (For USA)
B-2	OUTER VENT CONTROL VALVE	B-6	WINDSHIELD WASHER
B-2	SPEED SENSOR	B-6	WINDSHIELD WIPER
B-2	VACUUM SWITCH	C-3	OIL PRESSURE GAUGE
B-2	VSV NO.1 (AI)	C-4	OIL PRESSURE SENDER
B-2	VSV NO.2 (CC)	B-8	RADIO (OPT)
B-3	VSV NO.3 (EGR)	D-1	REGULATOR (For USA)
B-2	FUEL CUT SOLENOID (For Canada)	B-1	RESISTOR (For Ignition Coil) (For Canada)
C-3	FUEL GAUGE	B-3	RELAYS:
C-4	FUEL SENDER	B-5	COOLING FAN (For USA)
B-3	FUSE (For Ammeter) (5A x 2)	B-3	FLASHER
B-3	FUSE 5A (For Cooling Fan) (For USA)	B-3	M4 (For Cooling Fan) (For USA)
A-2	FUSE BOX	C-4	SEAT BELT SYSTEM:
B-1	FUSIBLE LINK	C-4	BUCKLE SWITCH
B-5	HORN, HIGH	C-4	WARNING LIGHT
B-5	HORN, LOW	C-4	WARNING RELAY (For Canada)
C-2	IGNITER	C-4	WARNING RELAY (For USA)
B-1	IGNITION COIL (For Canada)	C-8	SPEAKER (OPT)
B-1	IGNITION COIL (For USA)	C-5	SWITCHES:
C-8	INSPECTION SOCKET	D-4	BACK-UP LIGHT
C-5	LIGHTS:	D-4	BRAKE FLUID LEVEL (For Canada)
C-5	BACK-UP LH	B-5	BRAKE FLUID LEVEL (For USA)
C-5	BACK-UP RH	B-5	DIMMER
C-3	BRAKE WARNING	C-3	HAZARD
C-7	CLEARANCE LH	C-5	HEATER BLOWER
C-7	CLEARANCE RH	A-1	HORN
C-8	COMBINATION METER	D-8	IGNITION
C-7	HEAD LH	B-7	INTERIOR LIGHT
C-7	HEAD RH	B-7	LIGHT CONTROL
C-8	HEATER CONTROL	C-4	PARKING BRAKE
C-7	HIGH BEAM INDICATOR	C-5	STOP LIGHT
D-8	INTERIOR	C-5	TURN SIGNAL
C-7	LICENSE PLATE LH	B-6	WINDSHIELD WASHER
C-7	LICENSE PLATE LH (For USA)	B-6	WINDSHIELD WIPER
C-7	LICENSE PLATE RH	C-3	WATER TEMPERATURE GAUGE
C-7	LICENSE PLATE RH (For USA)	C-4	WATER TEMPERATURE SENDER
		B-4	WINCH ASSEMBLY

LAND CRUISER (FJ40 Series) ELECTRICAL WIRING DIAGRAM (For USA & CANADA) - 1981 Model

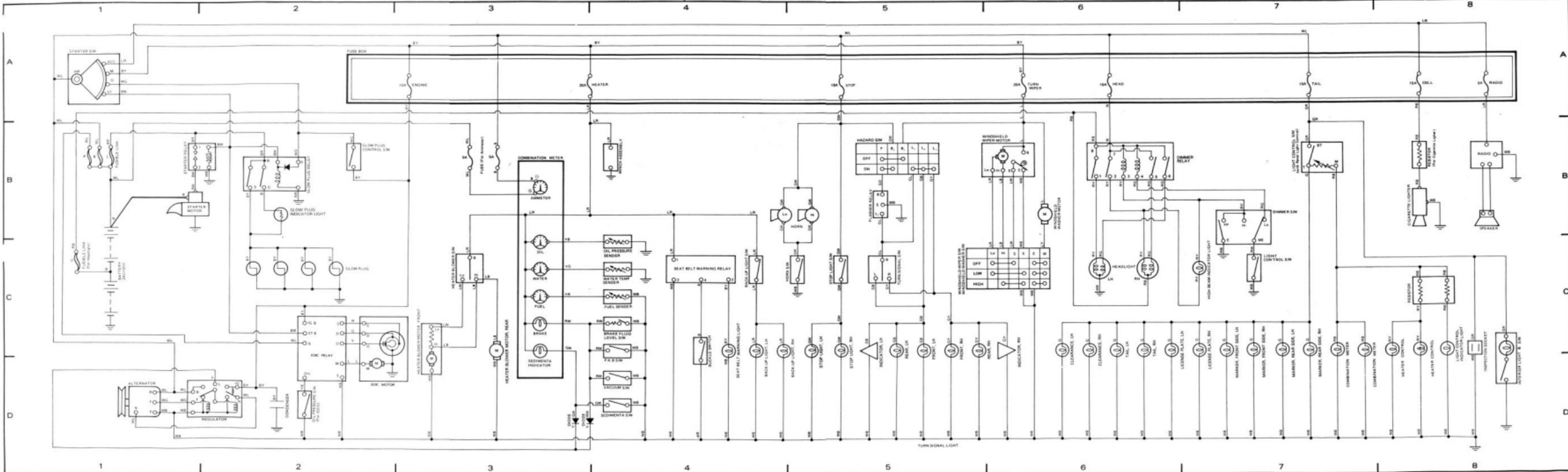


BJ40 Series
(For USA & CANADA)

LAND CRUISER (BJ40 Series) ELECTRICAL WIRING DIAGRAM INDEX (For USA & CANADA) – 1981 Model

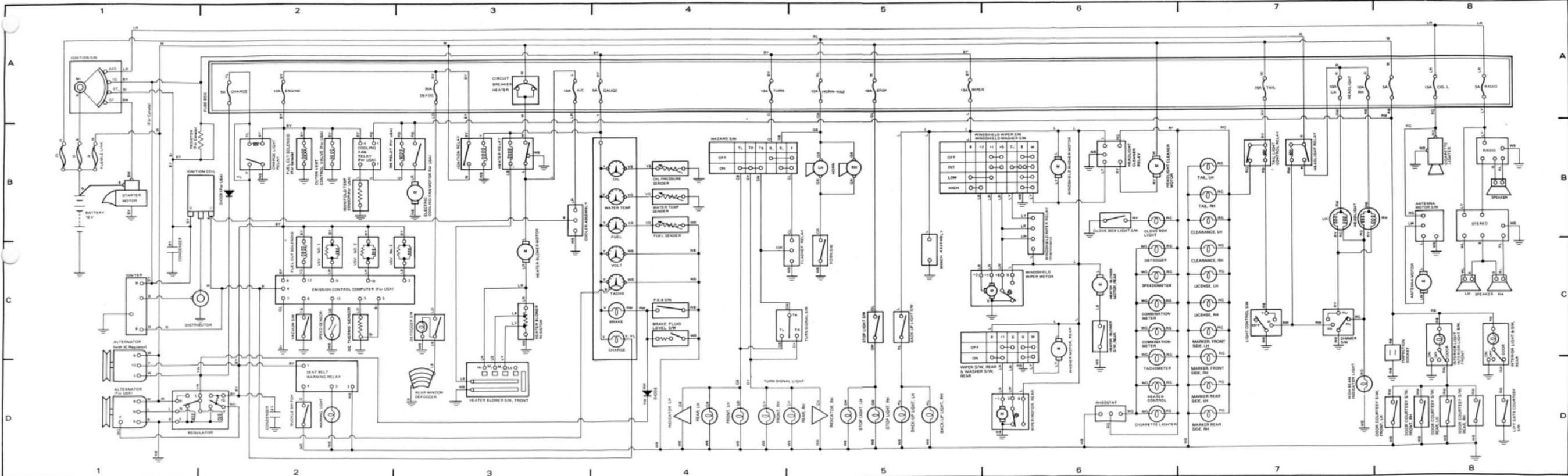
GRID LOCATION	COMPONENTS	GRID LOCATION	COMPONENTS
D-1 B-3	ALTERNATOR AMMETER	B-1 B-6 B-6	STARTER WINDSHIELD WASHER WINDSHIELD WIPER
C-1	BATTERY 24V (12V x 2)	C-3 C-4	OIL PRESSURE GAUGE OIL PRESSURE SENDER
B-8 B-3 D-2	CIGARETTE LIGHTER COMBINATION METER CONDENSER	B-8 D-1 B-8 C-8 C-8	RADIO REGULATOR RESISTOR (For Cigarette Lighter) RESISTOR (For Heater Control Light) RESISTOR (For Light Control Indicator Light)
D-3 D-3	DIODE DIODE (For Sedimental)	B-6 C-2 B-5 B-2 B-1	RELAYS; DIMMER EDIC FLASHER GLOW PLUG STARTER
C-3 C-4 B-3 A-2 B-1 C-1	FUEL GAUGE FUEL SENDER FUSE (For Ammeter) (5A x 2) FUSE BOX FUSIBLE LINK FUSIBLE LINK (For Headlight)	C-4 C-4 C-4	SEAT BELT SYSTEM; BUCKLE SWITCH WARNING LIGHT WARNING RELAY
C-2	GLOW PLUG	B-8	SPEAKER
B-5 B-5	HORN, HIGH HORN, LOW	C-4 C-4 C-4	SWITCHES; BACK-UP LIGHT BRAKE FLUID LEVEL DIMMER GLOW PLUG CONTROL HAZARD HEATER BLOWER HORN INTERIOR LIGHT LIGHT CONTROL LIGHT CONTROL (With Panel Light Control) OIL PRESSURE (For EDIC)
C-8	INSPECTION SOCKET	C-4 C-4 C-4	PARKING BRAKE SEDIMENTA STARTER STOP LIGHT TURN SIGNAL VACUUM WINDSHIELD WASHER WINDSHIELD WIPER
C-4 C-4 C-3 C-6 C-6 C-7 C-8 B-2 C-6 C-6 C-8 C-7 C-8 C-7 C-7 C-7 C-7 C-3 C-5 C-5 C-6 C-6 C-5 C-5 C-5 C-6 C-5 C-6 C-6	LIGHTS; BACK-UP LH BACK-UP RH BRAKE WARNING CLEARANCE LH CLEARANCE RH COMBINATION METER GLOW PLUG INDICATOR HEAD LH HEAD RH HEATER CONTROL HIGH BEAM INDICATOR INTERIOR LICENSE PLATE LH LICENSE PLATE RH LIGHT CONTROL INDICATOR MARKER, FRONT SIDE LH MARKER, FRONT SIDE RH MARKER, REAR SIDE LH MARKER, REAR SIDE RH SEDIMENTA INDICATOR STOP LH STOP RH TAIL LH TAIL RH TURN SIGNAL, FRONT LH TURN SIGNAL, FRONT RH TURN SIGNAL, INDICATOR LH TURN SIGNAL, INDICATOR RH TURN SIGNAL, REAR LH TURN SIGNAL, REAR RH	D-2 C-4 D-4 A-1 C-5 C-5 D-4 C-6 C-6 C-3 C-4 B-4	WATER TEMPERATURE GAUGE WATER TEMPERATURE SENDER WINCH ASSEMBLY
C-2 C-3 C-3	MOTORS; EDIC HEATER BLOWER, FRONT HEATER BLOWER, REAR		

LAND CRUISER (BJ40 Series) ELECTRICAL WIRING DIAGRAM (For USA & CANADA) - 1981 Model



FJ60 Series
(For USA & CANADA)

LAND CRUISER (FJ60 Series) ELECTRICAL WIRING DIAGRAM (For USA & CANADA) - 1981 Model



BJ60 Series
(For USA & CANADA)

LAND CRUISER (BJ60 Series) ELECTRICAL WIRING DIAGRAM INDEX (For USA & CANADA) - 1981 Model

GRID LOCATION	COMPONENTS	GRID LOCATION	COMPONENTS
C-1	ALTERNATOR (With IC Regulator)	B-3	OIL PRESSURE GAUGE
C-1	BATTERY 12V	B-4	OIL PRESSURE SENDER
B-8	CIGARETTE LIGHTER	C-4	PICK-UP SENSOR
A-3	CIRCUIT BREAKER, HEATER	B-8	RADIO
B-3	COOLER ASSEMBLY	C-3	REAR WINDOW DEFOGGER
D-4	DIODE	-	RELAY BLOCK
B-3	FUEL GAUGE	D-6	REGSTAT (With IC Regulator)
B-4	FUEL SENDER	B-3	RELAYS:
A-1	FUSE BOX	D-1	CHARGE LIGHT
B-1	FUSIBLE LINK	D-1	EDIC (OPT)
C-2	GLOW PLUG	C-4	FLASHER
C-2	GLOW PLUG TIMER	B-2	GLOW PLUG
C-3	HEATER BLOWER RESISTOR	B-7	HEADLIGHT
B-5	HORN HIGH	B-6	HEADLIGHT CLEANER
B-5	HORN LOW	B-3	HEATER
D-8	INSPECTION SOCKET	B-2	IGNITION
D-5	LIGHTS:	B-1	STARTER
D-5	BACK-UP LH	B-7	TAIL LIGHT CONTROL
D-5	BACK-UP RH	B-6	WINDSHIELD WIPER (Intermittent)
C-3	BRAKE WARNING	D-2	SEAT BELT SYSTEM:
D-6	CIGARETTE LIGHTER	D-2	BUCKLE SWITCH
B-7	CLEARANCE LH	D-2	WARNING LIGHT
C-7	CLEARANCE RH	D-2	WARNING LIGHT
C-6	COMBINATION METER	C-8	SPEAKER LH
C-6	DEFOGGER	C-8	SPEAKER RH
C-3	DISCHARGE WARNING	B-8	STEREO
B-6	GLOVE BOX	B-8	SWITCHES:
C-2	GLOW PLUG INDICATOR	C-5	ANTENNA MOTOR
B-7	HEAD LH	C-4	BACK-UP LIGHT
B-8	HEAD RH	B-3	BRAKE FLUID LEVEL
D-6	HEATER CONTROL	B-3	DEFOGGER
D-7	HIGH BEAM INDICATOR	C-7	DIMMER
C-8	INTERIOR, FRONT	D-8	DOOR COURTESY, FRONT LH
C-8	INTERIOR, REAR	D-8	DOOR COURTESY, FRONT RH
C-7	LICENSE PLATE LH	D-8	DOOR COURTESY, REAR LH
C-7	LICENSE PLATE RH	B-6	DOOR COURTESY, REAR RH
D-7	MARKER, FRONT SIDE LH	B-4	GLOVE BOX LIGHT
D-7	MARKER, FRONT SIDE RH	D-3	HAZARD
D-7	MARKER, REAR SIDE LH	D-3	HEATER BLOWER, FRONT
C-3	MARKER, REAR SIDE RH	C-5	HEATER BLOWER, REAR
C-6	SEDIMENTA INDICATOR	C-8	HORN
D-6	SPEEDOMETER	C-8	INTERIOR LIGHT, FRONT
D-6	STOP LH	C-8	INTERIOR LIGHT, REAR
D-6	STOP RH	C-8	INTERIOR LIGHT, REAR
D-6	TACHOMETER	D-8	(With Rear Wiper)
B-7	TAIL LH	C-7	LIFT GATE COURTESY
B-7	TAIL RH	D-1	LIGHT CONTROL
D-4	TURN SIGNAL, FRONT LH	D-1	OIL PRESSURE (for EDIC)
D-4	TURN SIGNAL, FRONT RH	C-4	P. K. B
D-4	TURN SIGNAL, INDICATOR LH	C-4	SEDIMENTA
D-5	TURN SIGNAL, INDICATOR RH	A-1	STARTER
D-4	TURN SIGNAL, REAR LH	C-5	STOP LIGHT
D-4	TURN SIGNAL, REAR RH	C-4	TURN SIGNAL
C-8	MOTORS:	C-4	VACUUM
D-2	ANTENNA	C-6	WASHER, REAR
B-6	EDIC (OPT)	B-6	WINDSHIELD WASHER
C-3	HEADLIGHT CLEANER	B-6	WINDSHIELD WIPER
C-5	HEATER BLOWER	C-6	WIPER, REAR
B-1	HEATER BLOWER, REAR	C-3	TACHOMETER
C-6	STARTER	C-3	VOLT METER
B-6	WASHER, REAR	B-3	WATER TEMPERATURE GAUGE
B-6	WINDSHIELD WASHER	B-4	WATER TEMPERATURE SENDER
C-6	WINDSHIELD WIPER	C-6	WINCH ASSEMBLY
D-6	WIPER, REAR		

LAND CRUISER (BJ60 Series) ELECTRICAL WIRING DIAGRAM (For USA & CANADA) - 1981 Model

