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

SECTION INDEX

INTRODUCTION

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

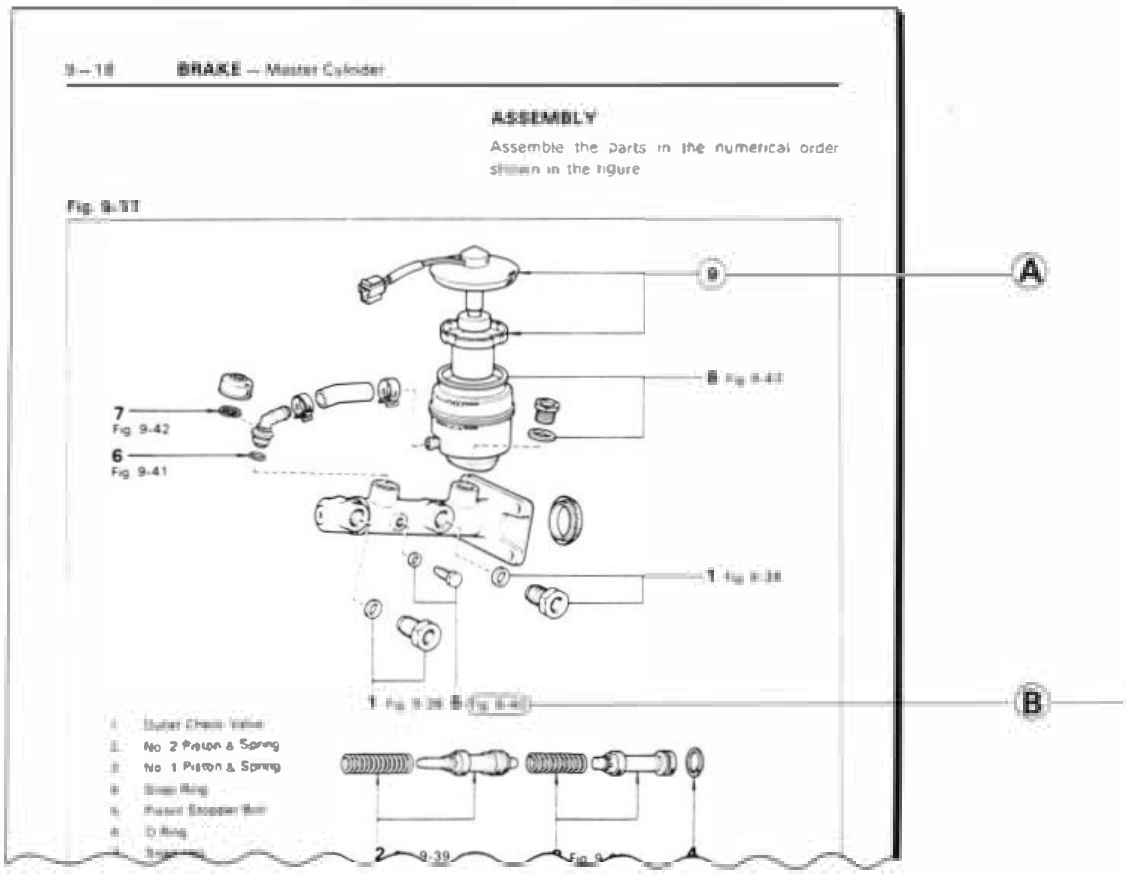
For convenience, the following abbreviations are used in Toyota repair manuals

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

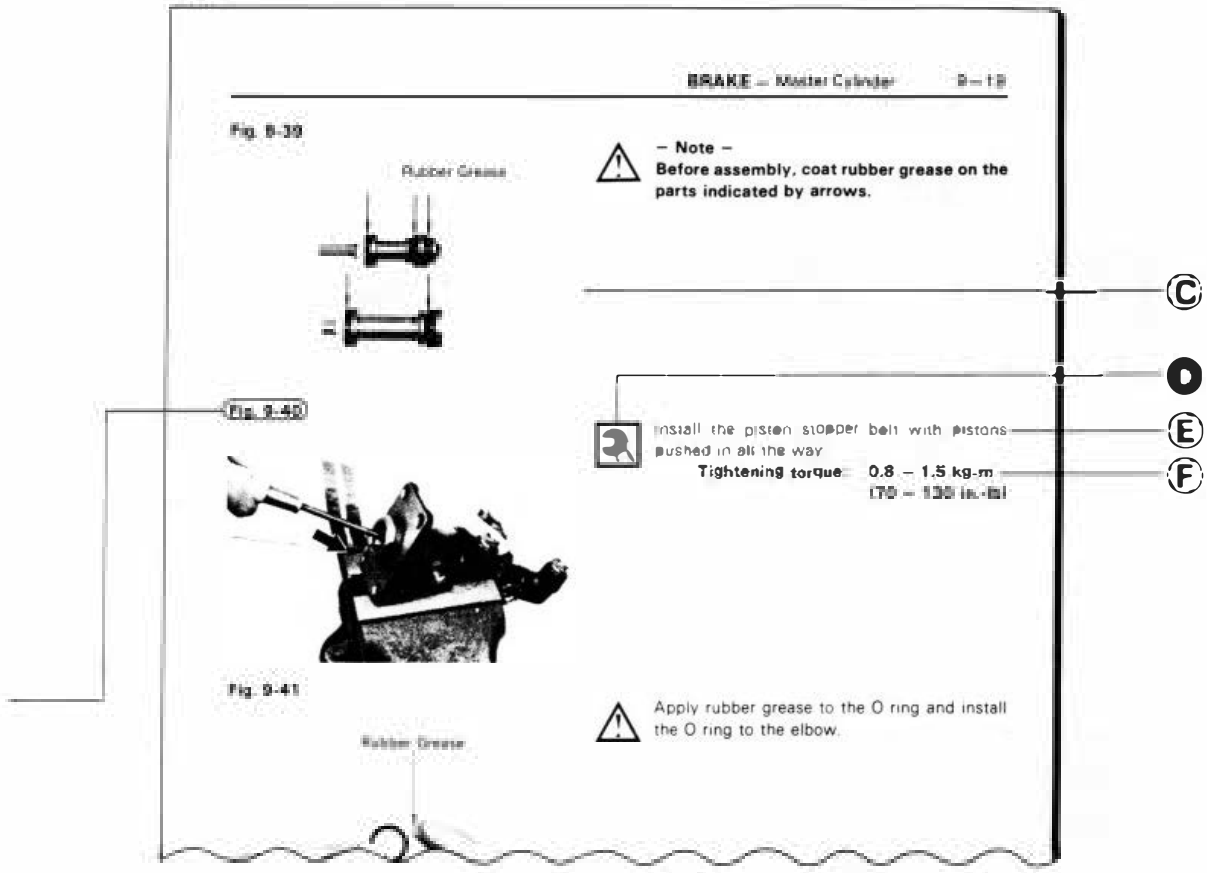


Ⓐ : The bold numbers show the order in which the work is to be done

Ⓑ : 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.



Ⓒ : The pictures give basic information on what to do in each step

Ⓓ : A symbol is often used to explain the action required

Ⓔ : The text explains how to perform the step

Ⓕ : 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

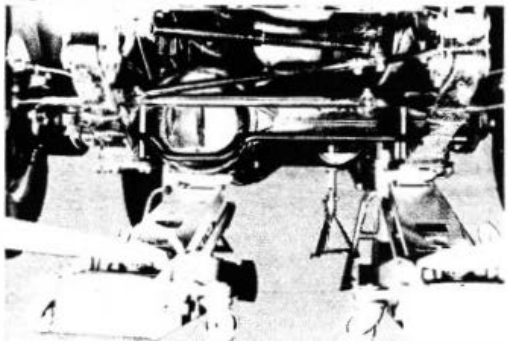
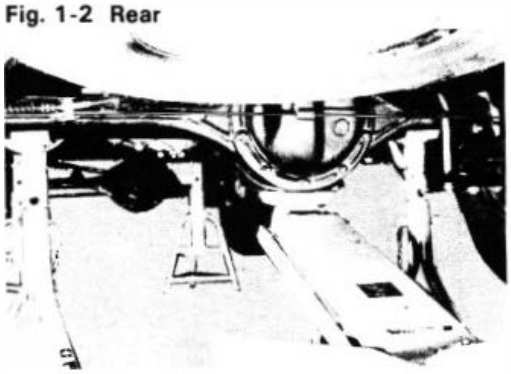
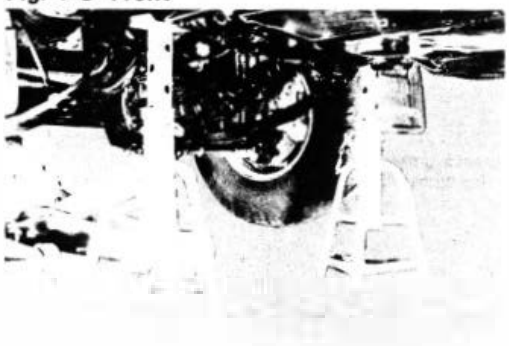


Fig. 1-2 Rear



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

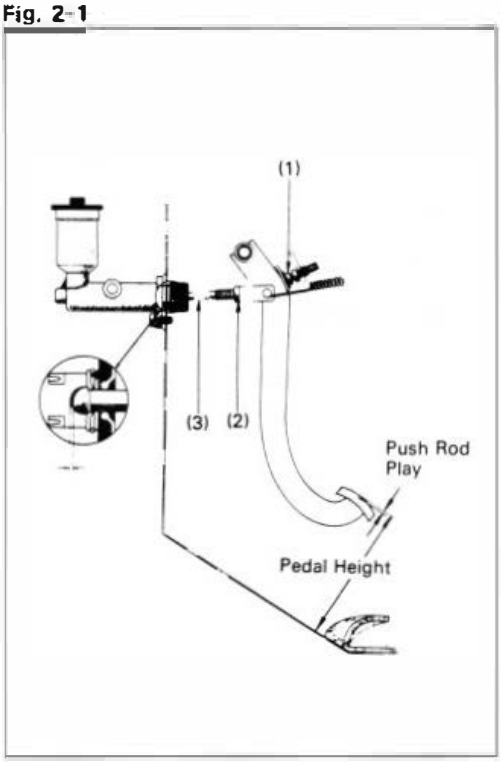
TIGHTEN

CLEAN

IMPORTANT

CLUTCH

Fig. 2-1



ADJUSTMENT

CLUTCH PEDAL

1 Loosen the lock nut (2) and the push rod (3)

2 Adjust the pedal height by turning the stop bolt (1)

Pedal height from toe-boad:

(w/brake booster)

FJ, BJ, HJ4 _ series	**215 mm (8.46 in.)**
FJ, BJ, HJ6 _ series	**195 mm (7.68 in.)**

(w/o brake booster)

FJ4 _ series	**215 mm (8.46 in.)**

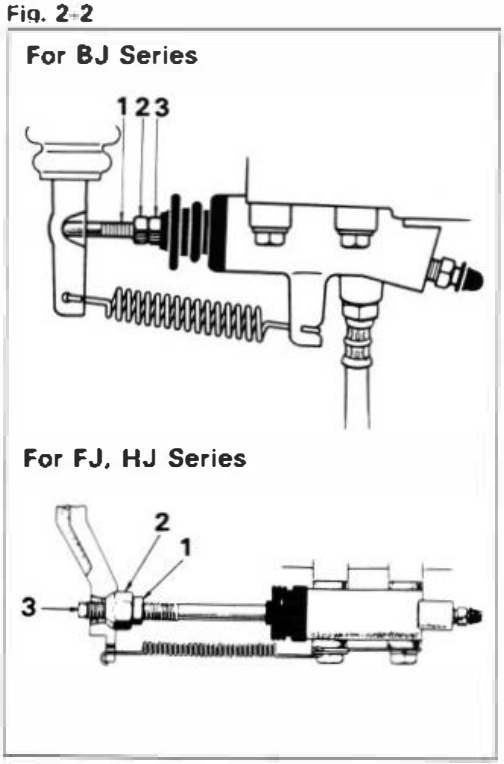
3 Loosen the lock nut (2), and adjust the push rod play by turning the push rod (3)

Push rod play at pedal top:

1.0 – 5.0 mm

(0.039 – 0.197 in.)

Fig. 2-2



RELEASE CYLINDER

1 Adjust the play at release fork tip by loosening the lock nut (2), and turning the push rod No.1 (3) with a spanner while holding the push rod No.2 (1) with a suitable tool

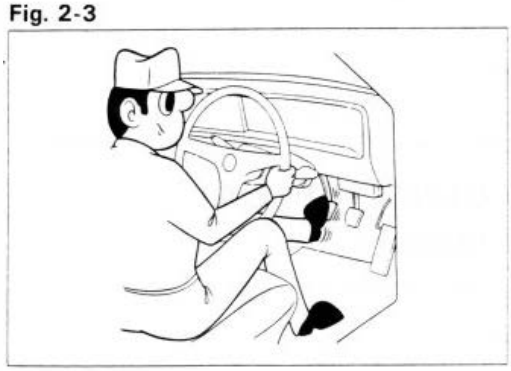
Release fork end play

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.)**

2 Check the pedal freeplay at the pedal top

Pedal freeplay: 30 – 50 mm (1.18 – 1.97 in.)

Fig. 2-3



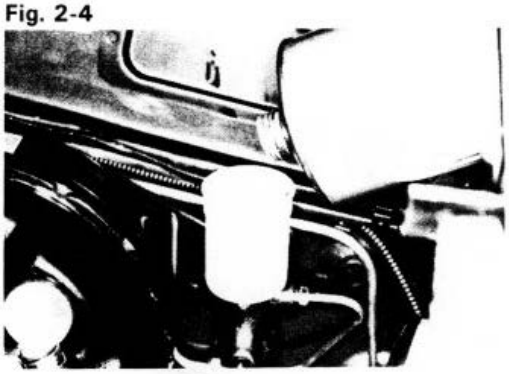
AIR BLEEDING

If any work isperformed 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

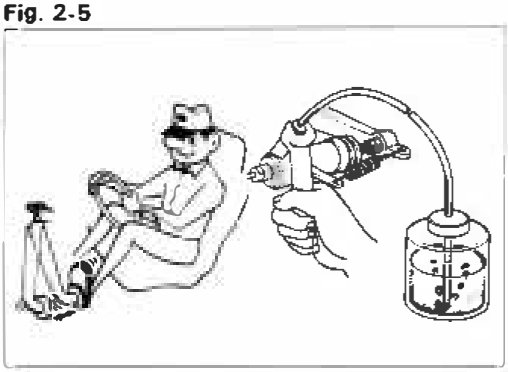


1. Fill the master cylinder reservoir with clean brake fluid

— Note —

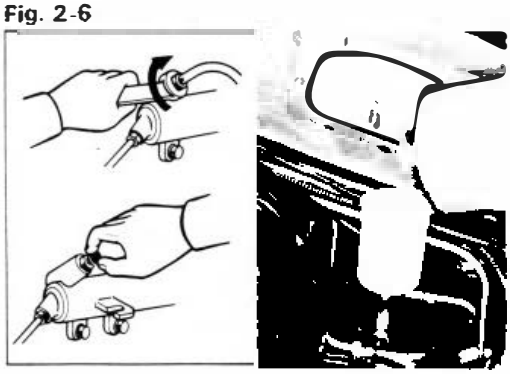
When bleeding, do not allow the fluid in the master cylinder reservoir to become depleted.

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

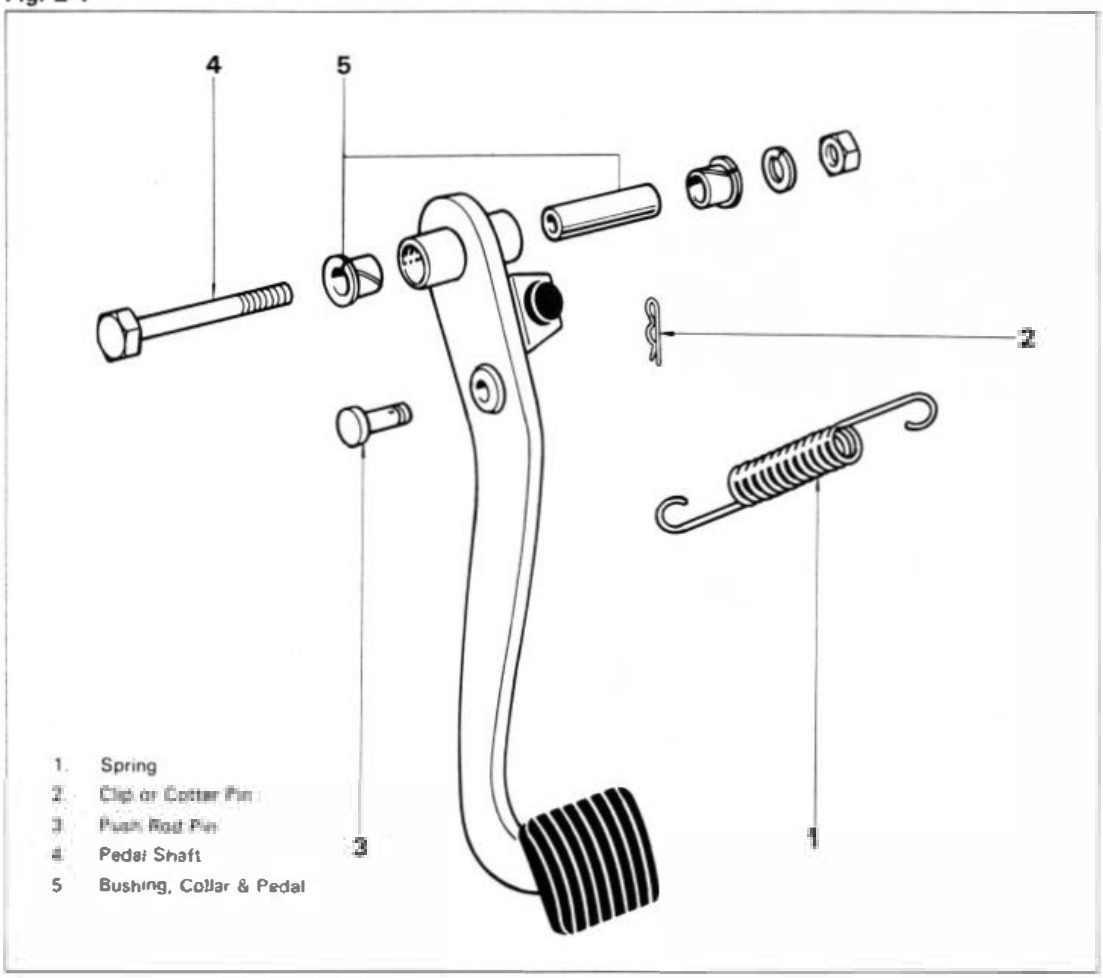
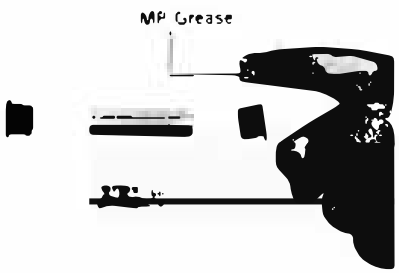


Fig. 2-8

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.

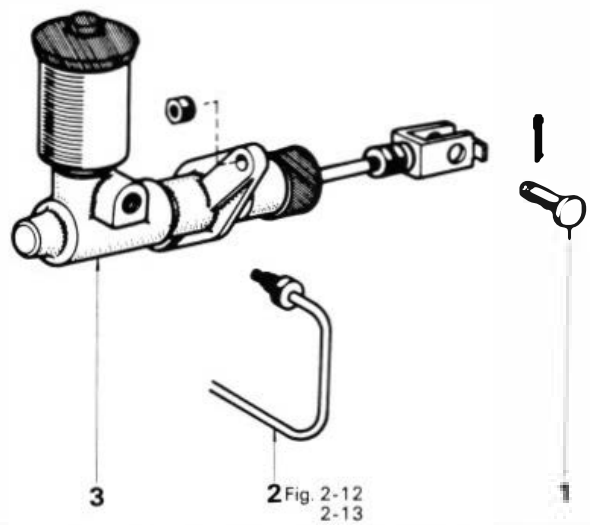
Tightening torque: 3.0 – 4.5 kg-m (22 – 32 ft-lb)

CLUTCH MASTER CYLINDER

REMOVAL

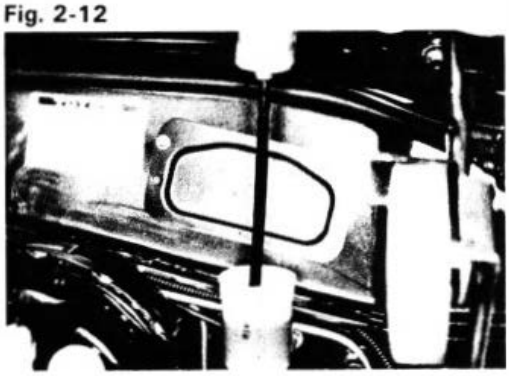
Remove the parts in the numerical order shown in the figure

Fig. 2-11



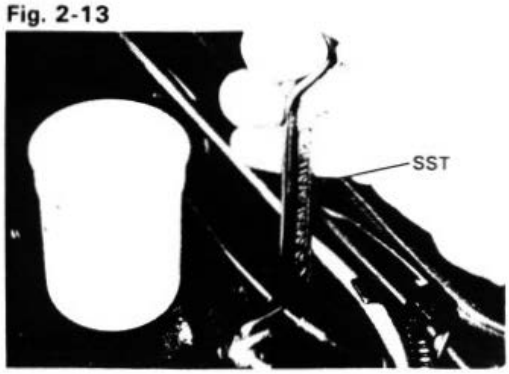
1. Push Rod Pin
2. Clutch Tube
3. Master Cylinder

Fig. 2-12



Take out fluid with a syringe or such

Fig. 2-13



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

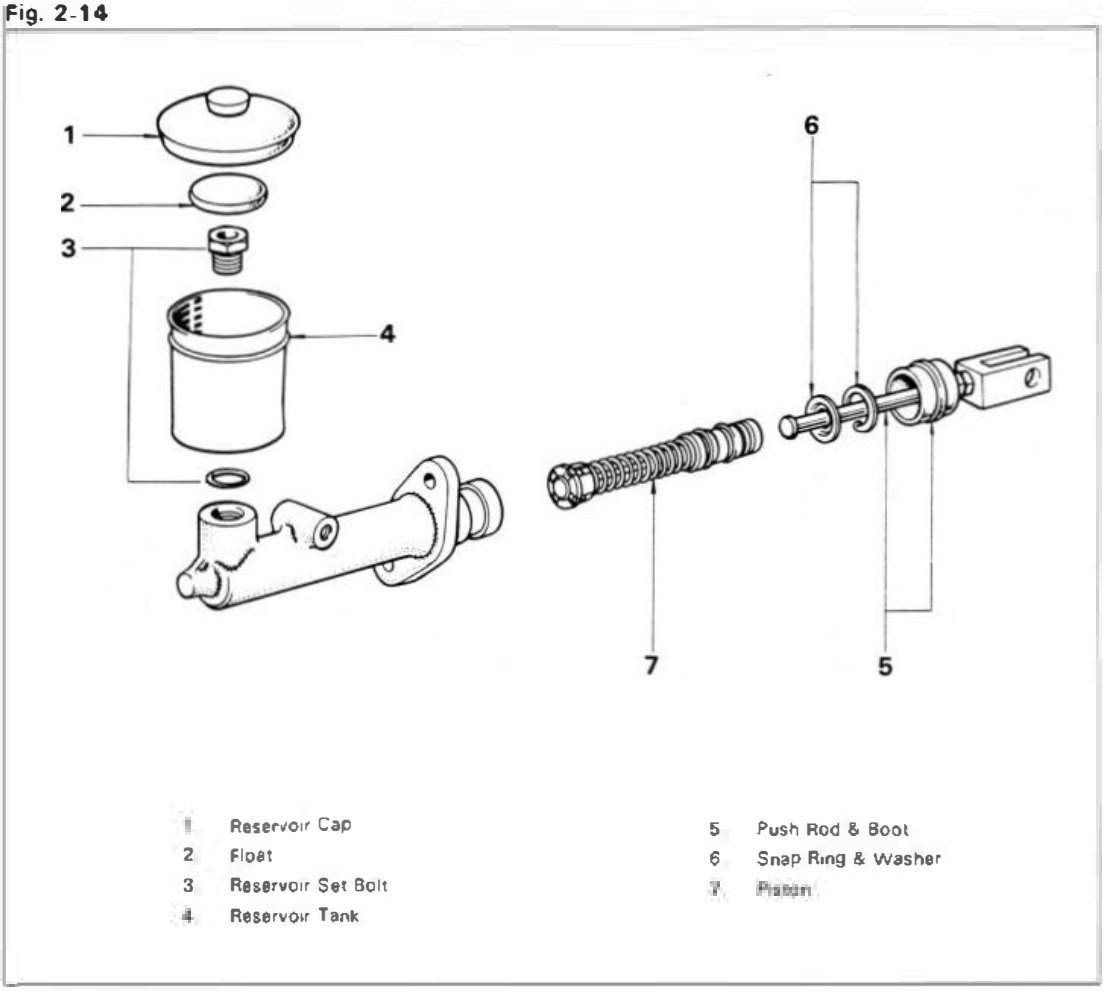
— Note —

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

DISASSEMBLY

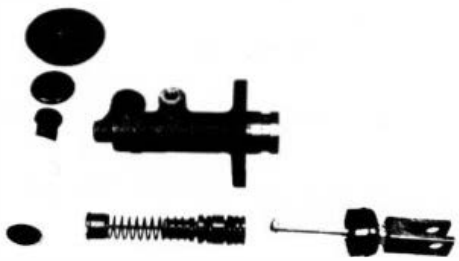
Disassemble the parts in the numerical order shown in the figure

Fig. 2-14



1 Reservoir Cap
2 Float
3 Reservoir Set Bolt
4 Reservoir Tank
5 Push Rod & Boot
6 Snap Ring & Washer
7 Piston

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.

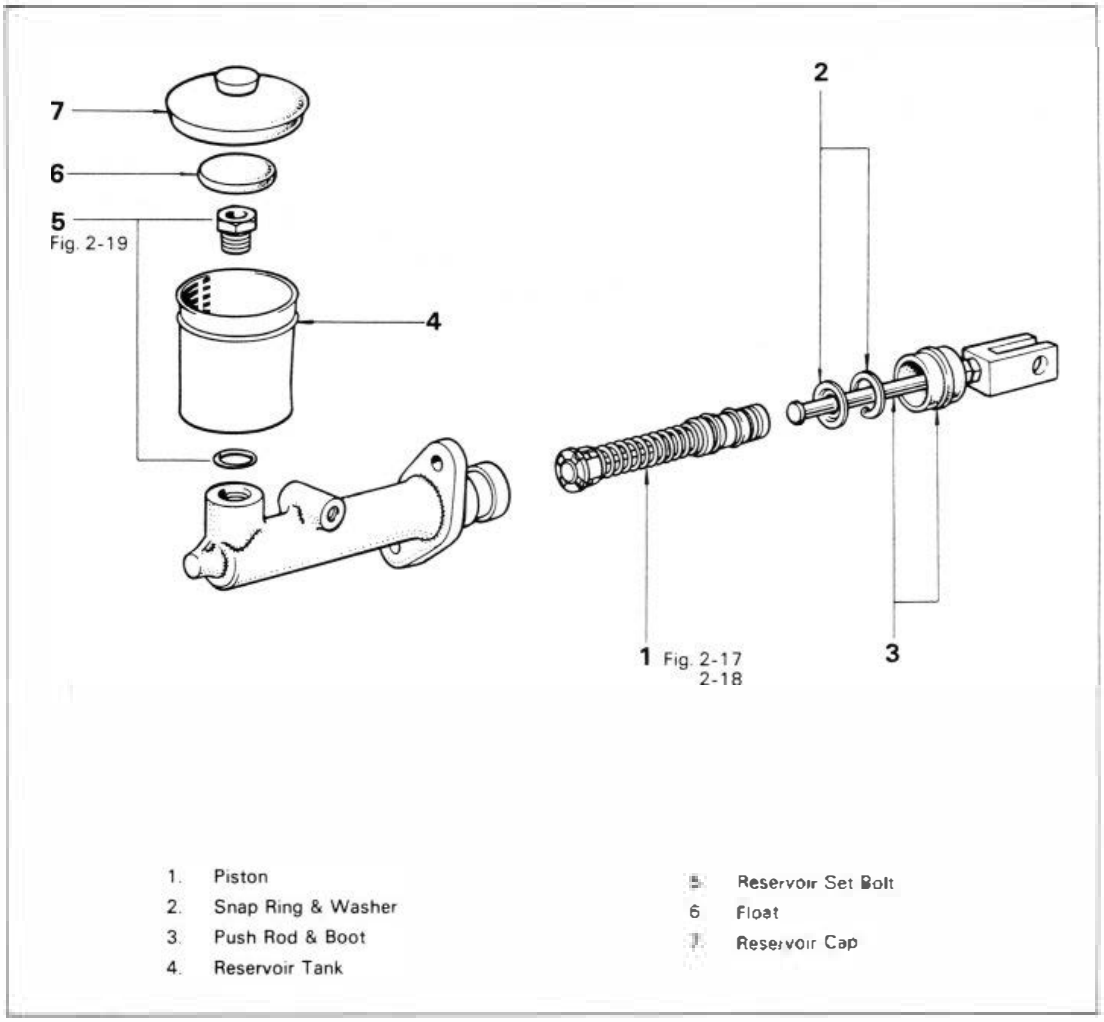
— Note —

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

ASSEMBLY

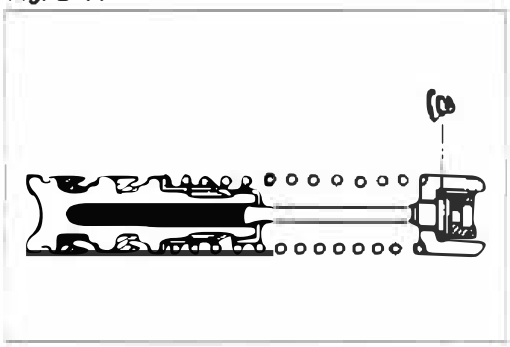
Assemble the parts in the numerical order shown in the figure.

Fig. 2-16



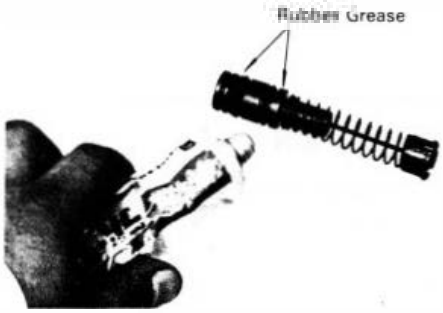
1. Piston
2. Snap Ring & Washer
3. Push Rod & Boot
4. Reservoir Tank
5. Reservoir Set Bolt
6. Float
7. Reservoir Cap

Fig. 2-17



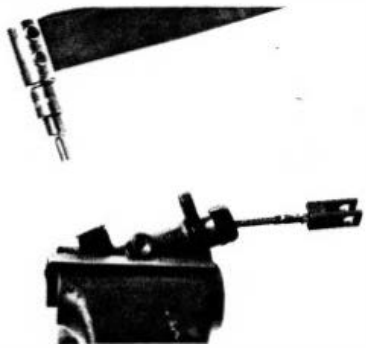
⚠ Conical spring and cylinder cups are parts with directionality.

Fig. 2-18 8



Apply rubber grease to the cylinder cups

Fig. 2-19



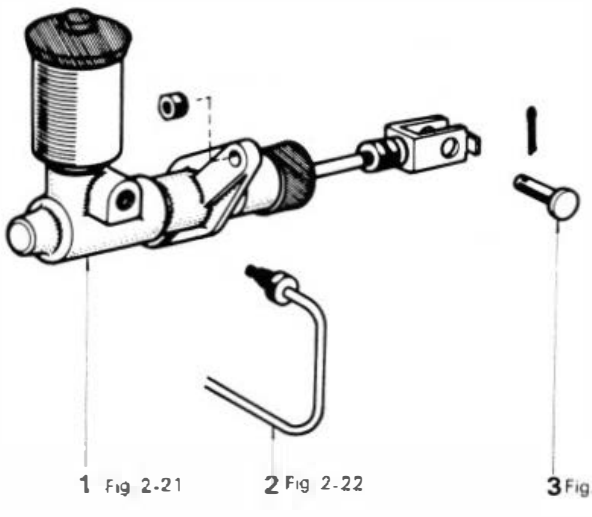
Install the reservoir tank.

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

INSTALLATION

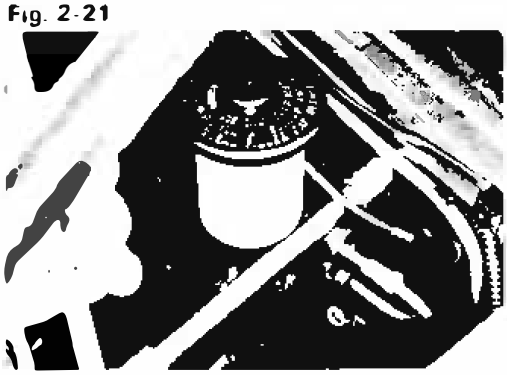
Install the parts in the numerical order shown in the figure

Fig. 2-20



1. Master Cylinder
2. Clutch Tube
3. Push Rod Pin

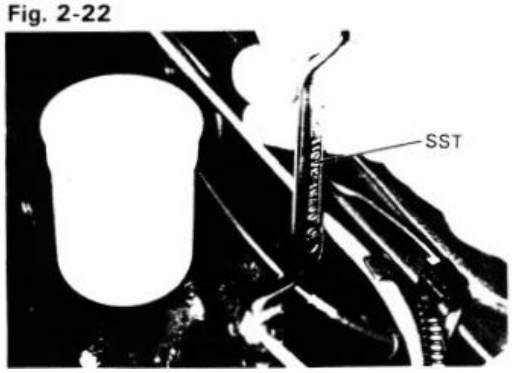
Fig. 2-21



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]

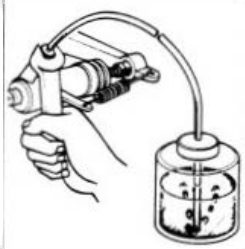
Tightening torque: 1.3 – 1.8 kg-m (10 – 13 ft-lb)

Fig. 2-23

SEE CLUTCH PEDAL ADJUSTMENT SECTION Fig. 2-1

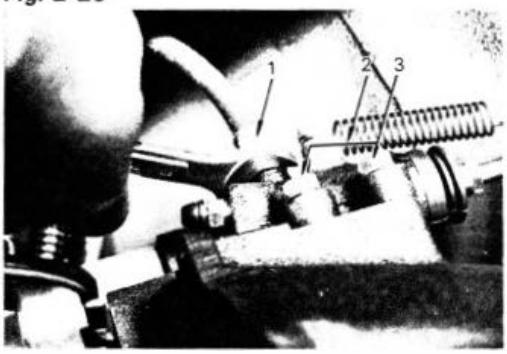
Adjust the pedal height and play

Fig. 2-24

	**SEE AIR BLEEDING SECION Fig. 2-3 to 2-6**

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

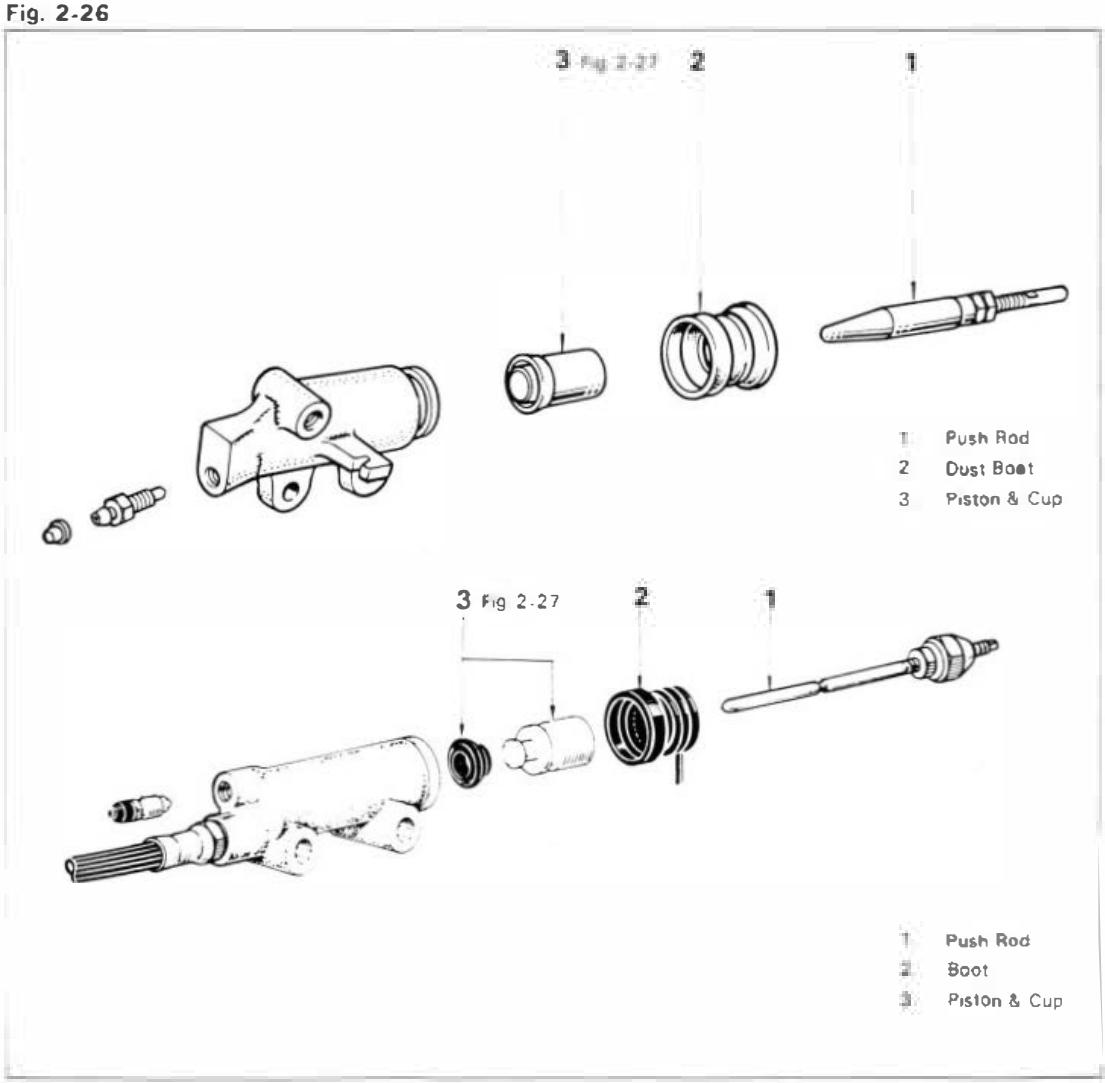
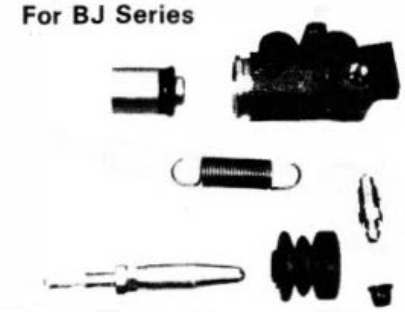


Fig. 2-27

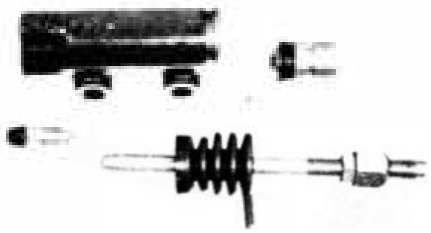
Remove the piston by blowing compressed air in the outlet hole

Fig. 2-28

For BJ Series



For FJ, HJ Series



INSPECTION

Inspect the disassembled parts for wear or damage

ASSEMBLY

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

Fig. 2-29

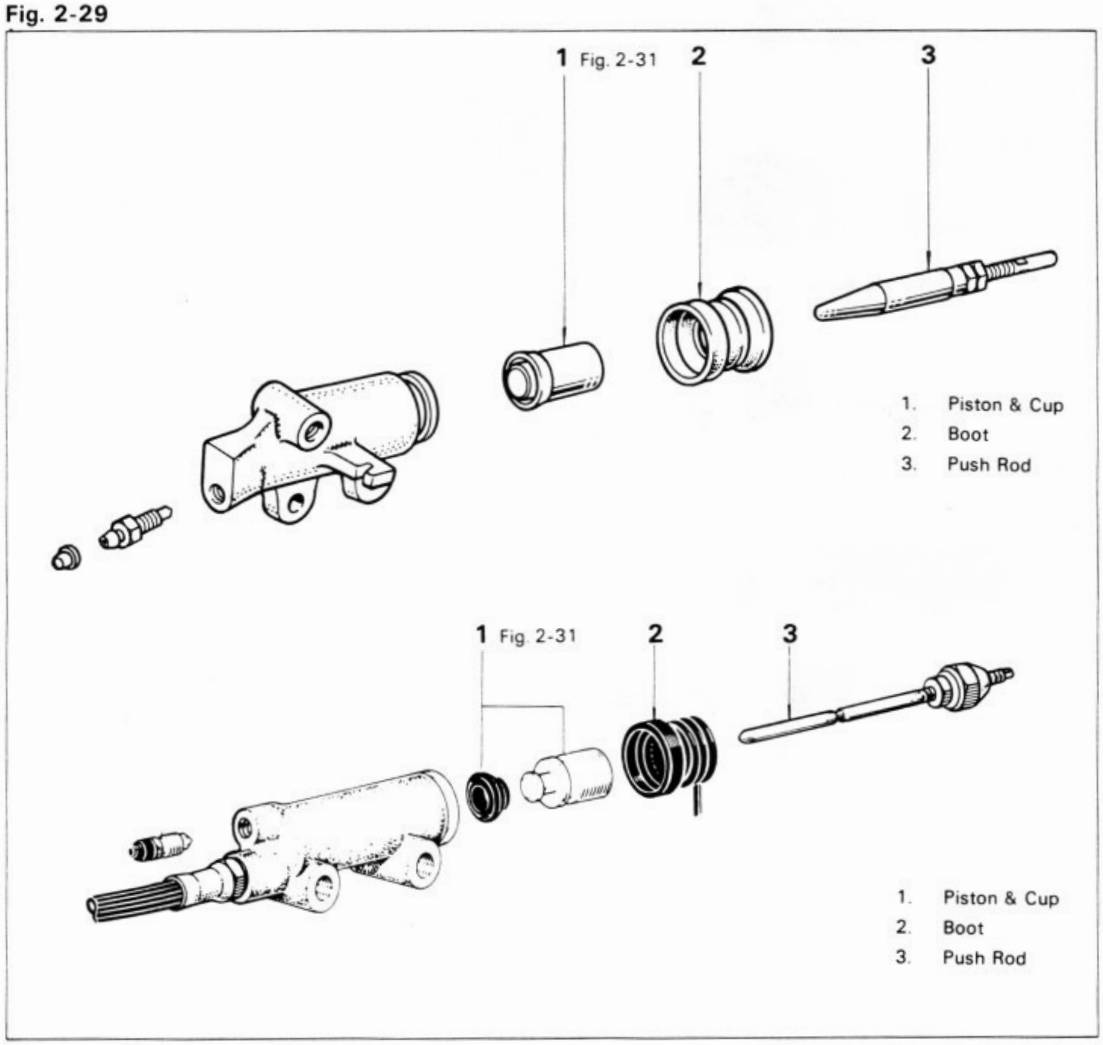


Fig. 2-30

Clean all parts in fresh brake fluid before assembling.

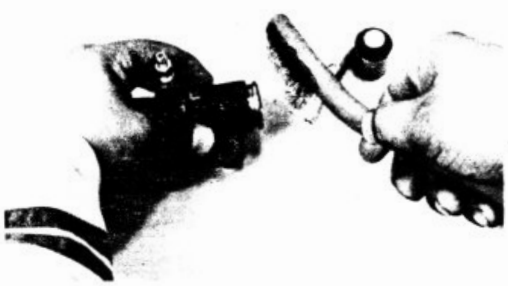
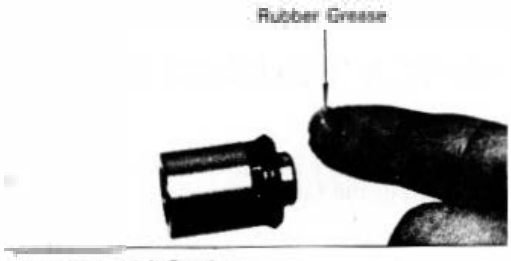
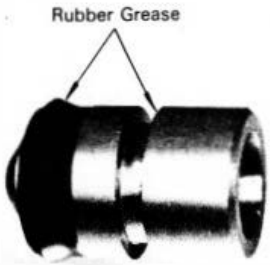


Fig. 2-31

For BJ, Series



For FJ, HJ Series



⚠ Apply rubber grease to the piston cup

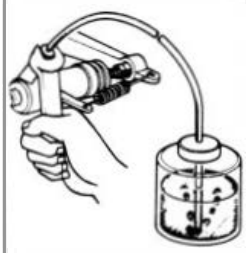
Fig. 2-32

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

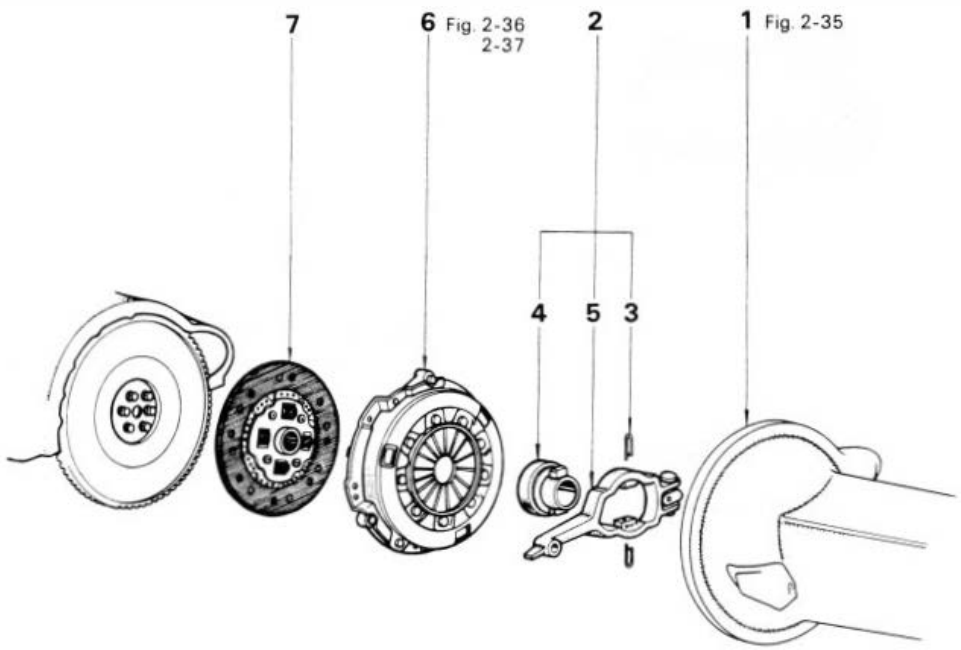
3 Remove the air from clutch line

CLUTCH UNIT & RELEASE BEARING

REMOVAL

Remove the parts in the numerical order shown in the figure

Fig. 2-34



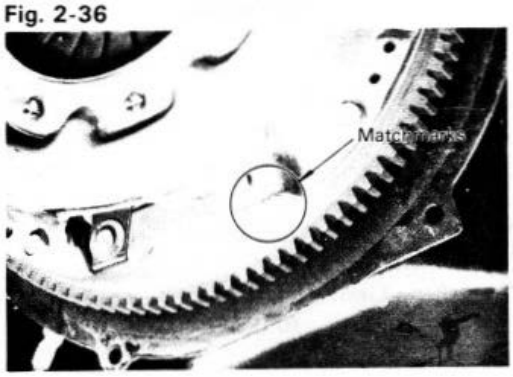
1. Transmission
2. Release Bearing, Hub & Fork
3. Clip
4. Release Bearing & Hub
5. Release Fork
6. Clutch Cover
7. Clutch Disc

Fig. 2-35

Remove the transmission

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

Fig. 2-36



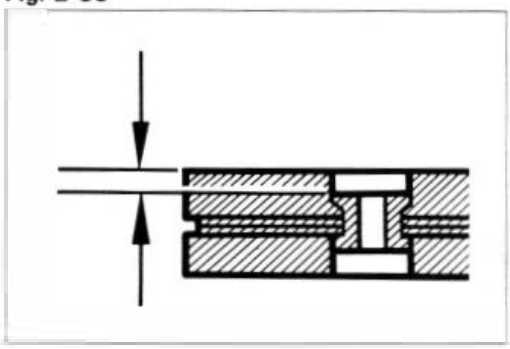
Place matchmarks on the clutch cover and the flywheel

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



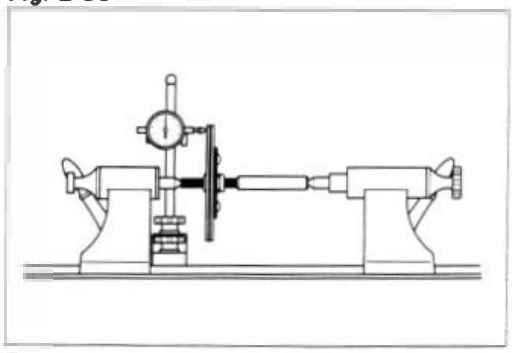
INSPECTION

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.

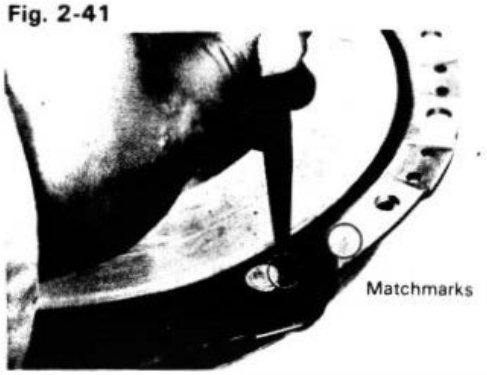
Runout:
Limit 1.0 mm (0.039 in.)

Fig. 2-40

Clutch Cover

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

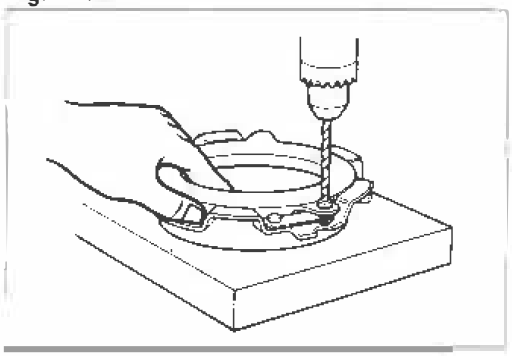
Fig. 2-41



Replace The Clutch Pressure Plate

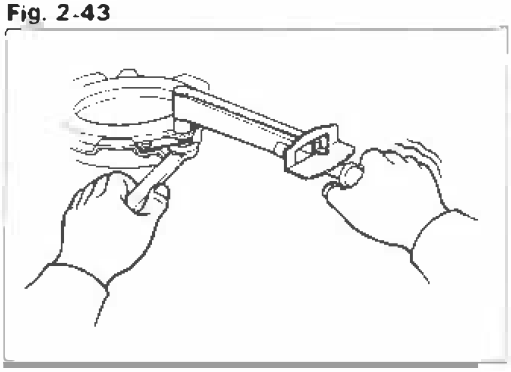
1 Place matchmarks on the clutch cover and pressure plate

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)

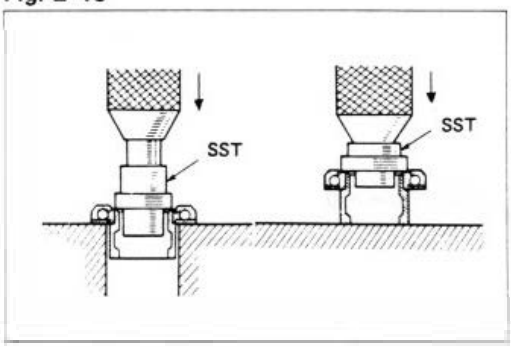
— Note —
Stake the nuts after tightening.

Fig. 2-44

Bearing, Hub & Fork
Inspect for wear or damage.

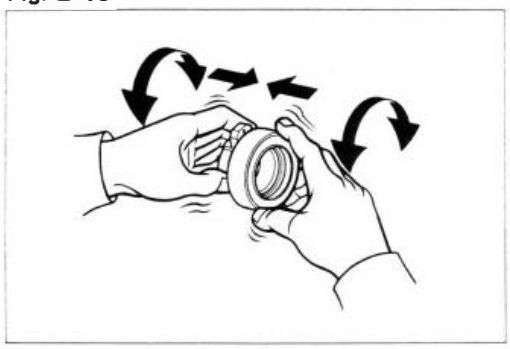
— Note —
This ball bearing is permanently lubricated and does not require repacking or cleaning.

Fig. 2-45



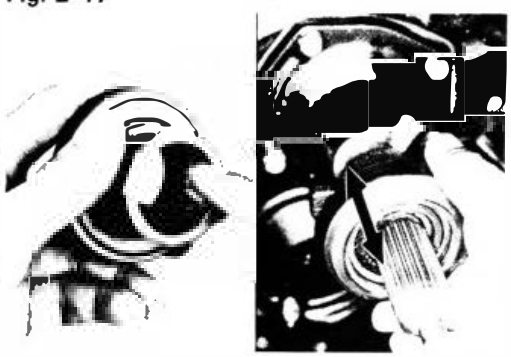
Replace The Release Bearing
1. Remove the bearing with SST. SST[09315-00021]
2. Install the bearing with SST. SST[09315-00021]

Fig. 2-46



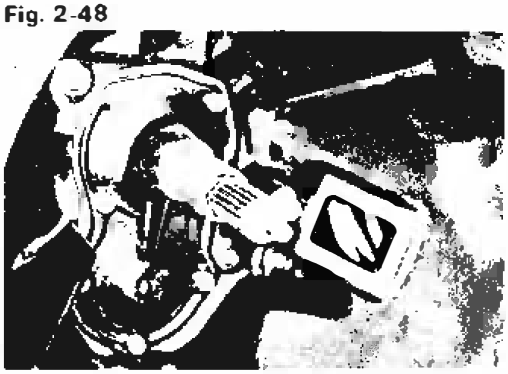
3. After assembling the bearing to the hub, insure that it rotates smoothly.

Fig. 2-47



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

Fig. 2-48



Front Bearing Retainer

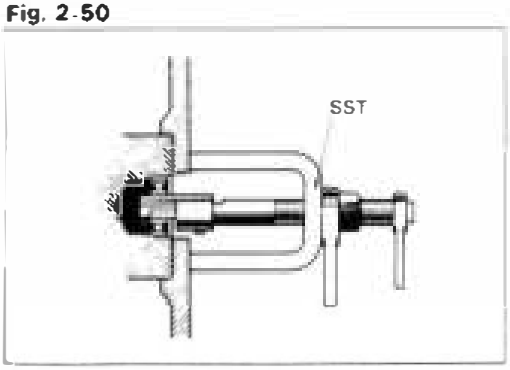
Inspect for wear on the release bearing sliding surface.

Fig. 2-49

Pilot Bearing

Inspect the bearing for damage or sticking.

Fig. 2-50



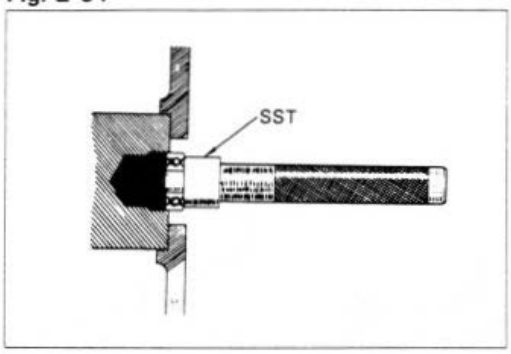
Pilot Bearing

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

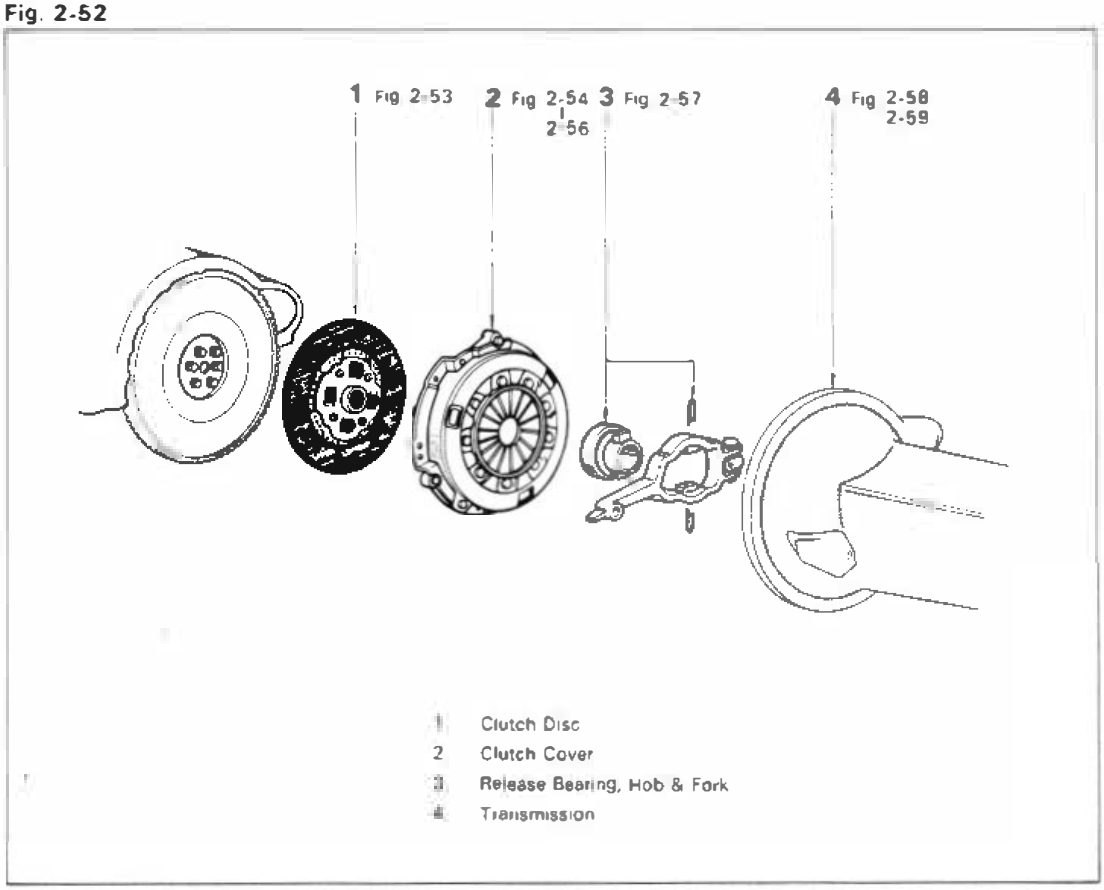
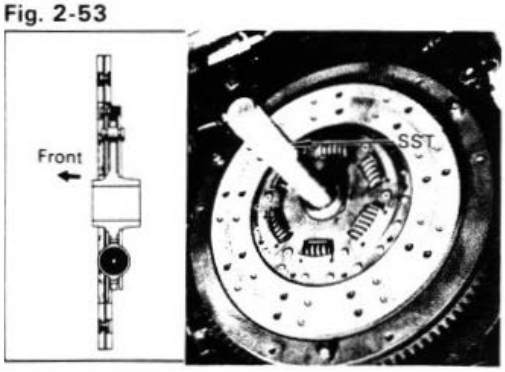


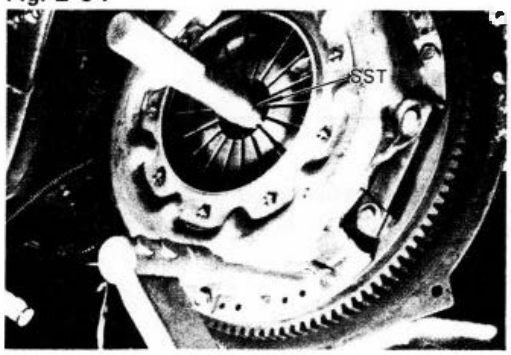
Fig. 2-53



Install the clutch disc onto the flywheel with SST.

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

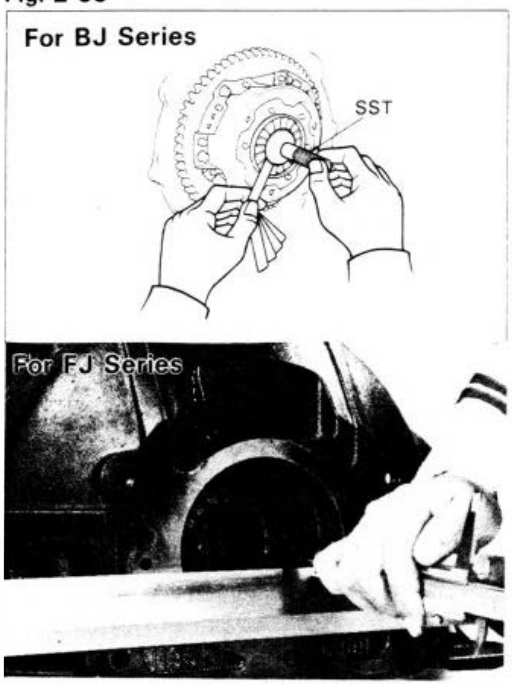
Fig. 2-54



Tighten the bolts uniformally, 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)

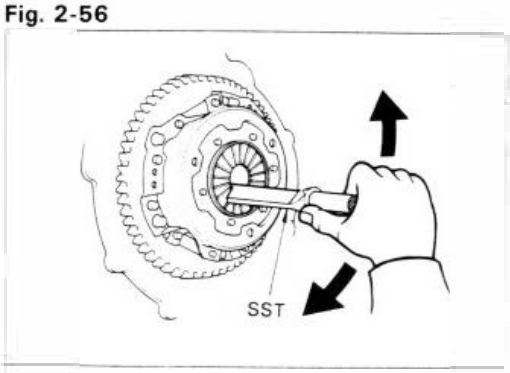
Fig. 2-55



Check the diaphragm spring tips for alignment with a thicknesss gauge and SST
SST [09301-00012]

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

Fig. 2-56

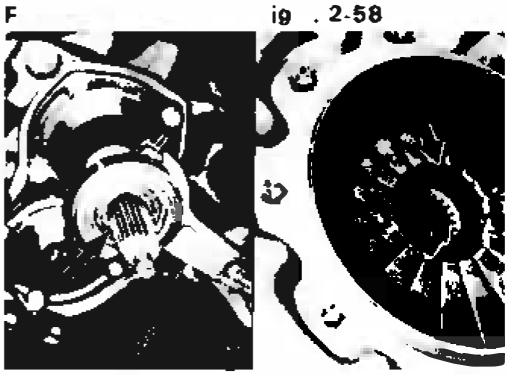


If over the limit of non-alignment, correct with SST
SST [09301-00012]

Fig. 2-57

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

F ig . 2-58



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

Fig. 2-59

Install the transmission

SEE

TRANSMISSION

INSTALLATION

SECTION

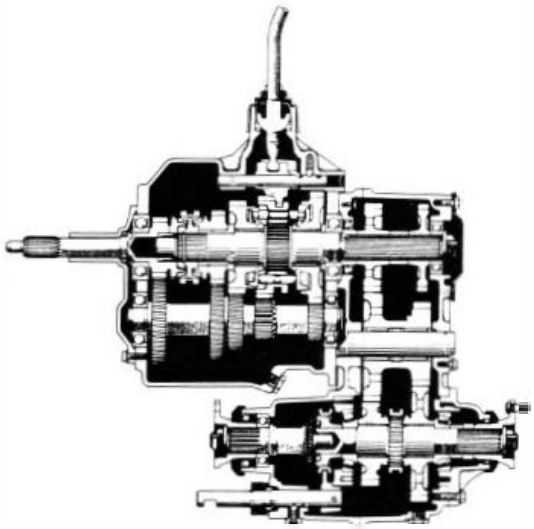
Fig. 3-102 to 3-108

TRANSMISSION

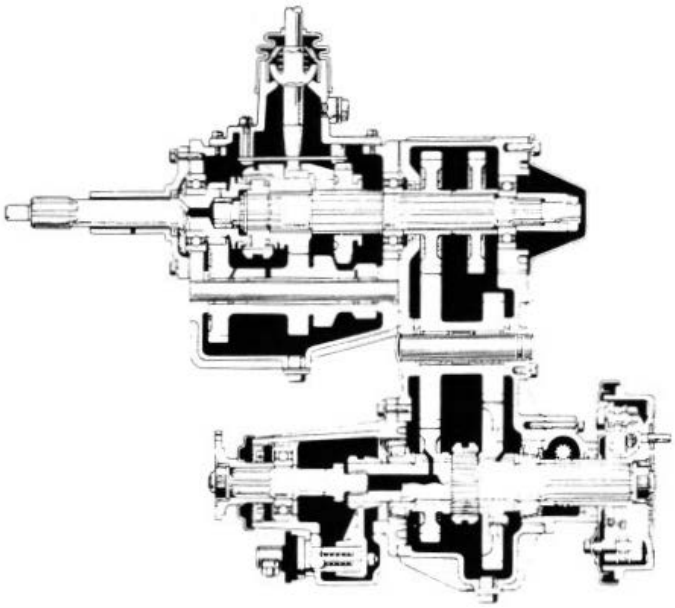
CUTAWAY VIEW

Fig. 3-1

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



3-Speed Manual Transmission (J30) & Transfer



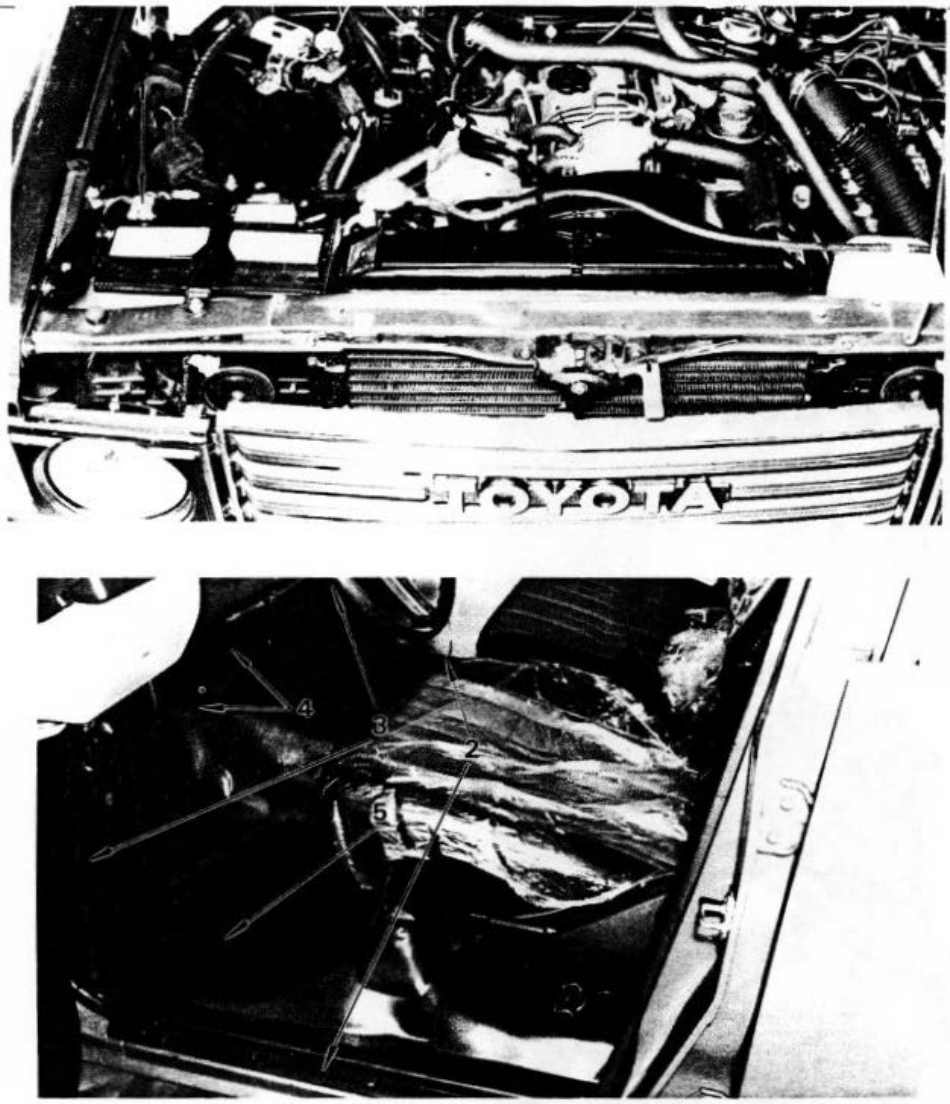
4-SPEED TRANSMISSION (H41 & H42)

REMOVAL

Remove From Vehicle

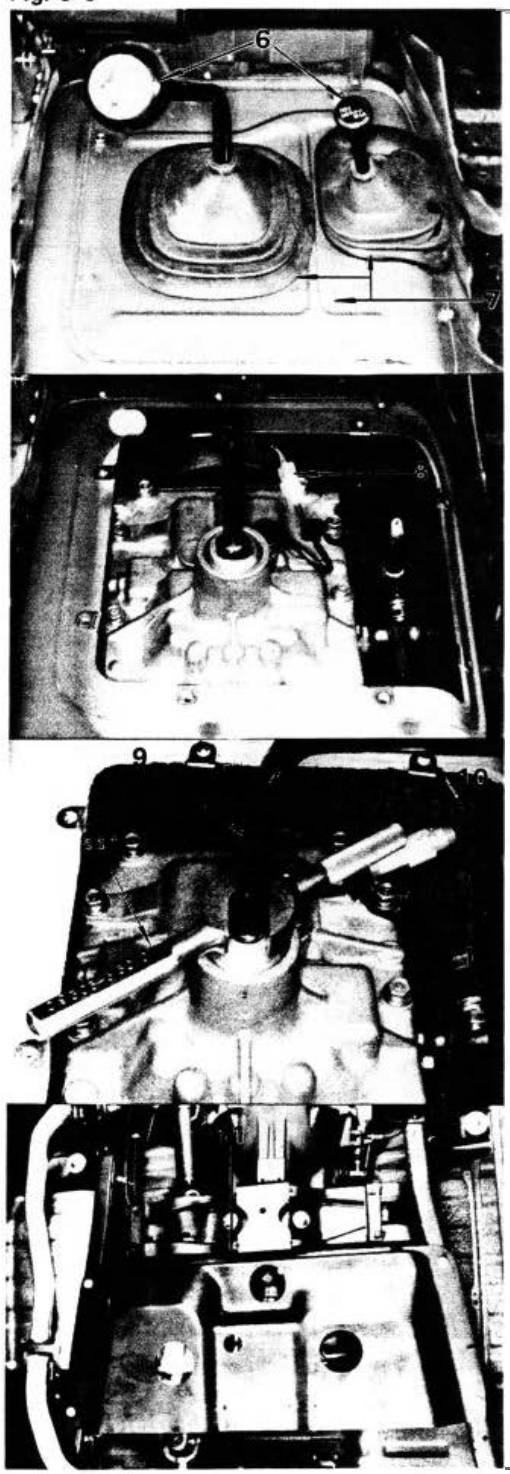
1. Drain the transmission and transfer oil.
2. Remove the parts in the numerical order shown in the figure.

Fig. 3-2



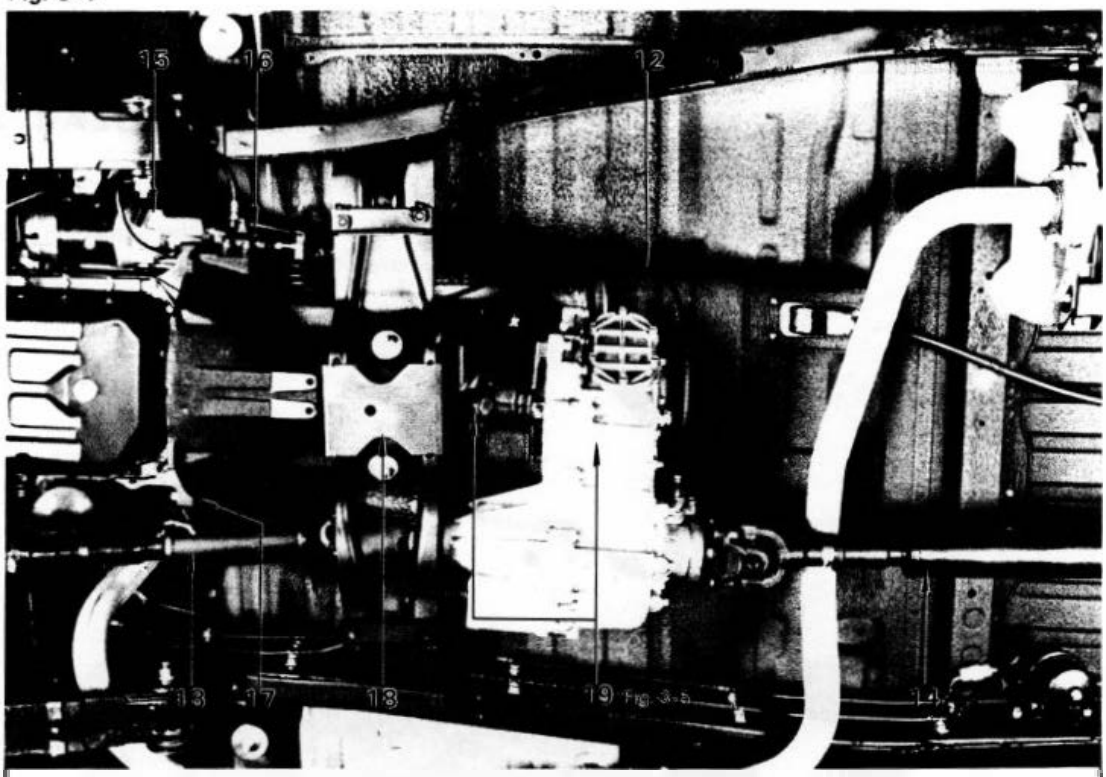
1. Battery Terminal
2. Scuff Plate
3. Cowl Side Trim
4. Heater Duct
5. Carpet or Mat

Fig. 3-3



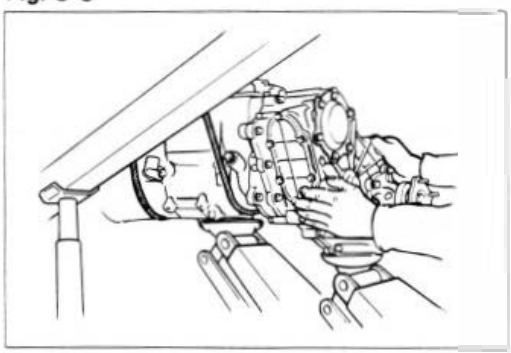
6. Shift Lever Knob & Transfer Knob
7. Service Hole Cover with boot
8. Back-up Light Switch Connector
9. Shift Lever
   SST (09305-55010)
10. Transfer Shift Lever
11. Under Guard

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



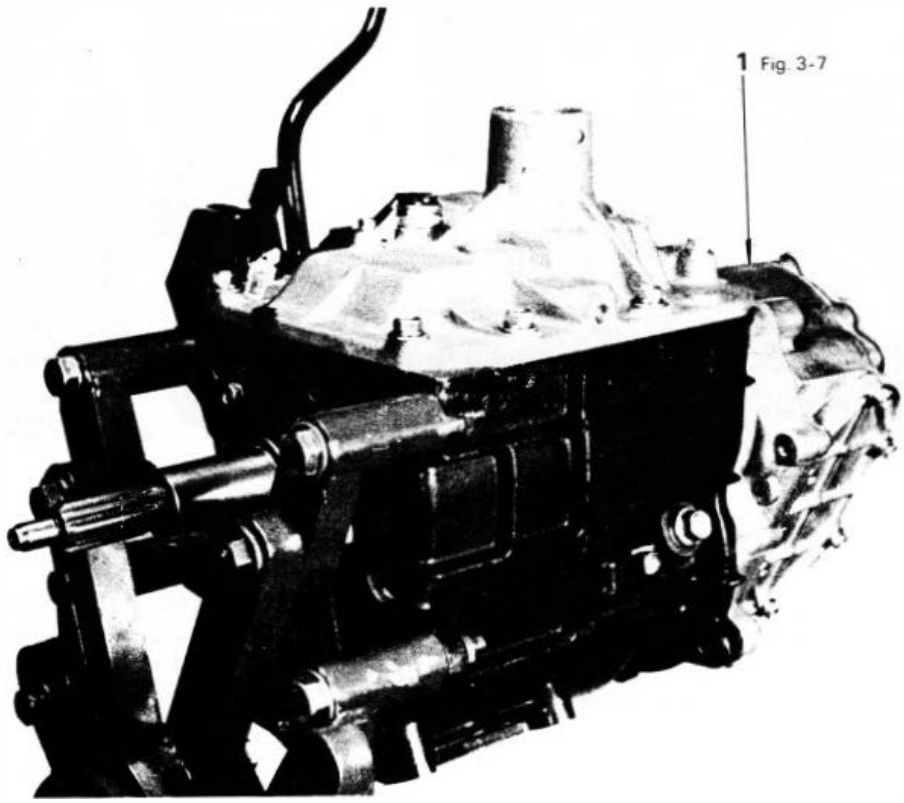
Support the transmission and transfer assembly with jacks and a rope, and remove

TRANSMISSION GEAR & CASE

REMOVAL

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

Fig. 3-6



1. Transfer

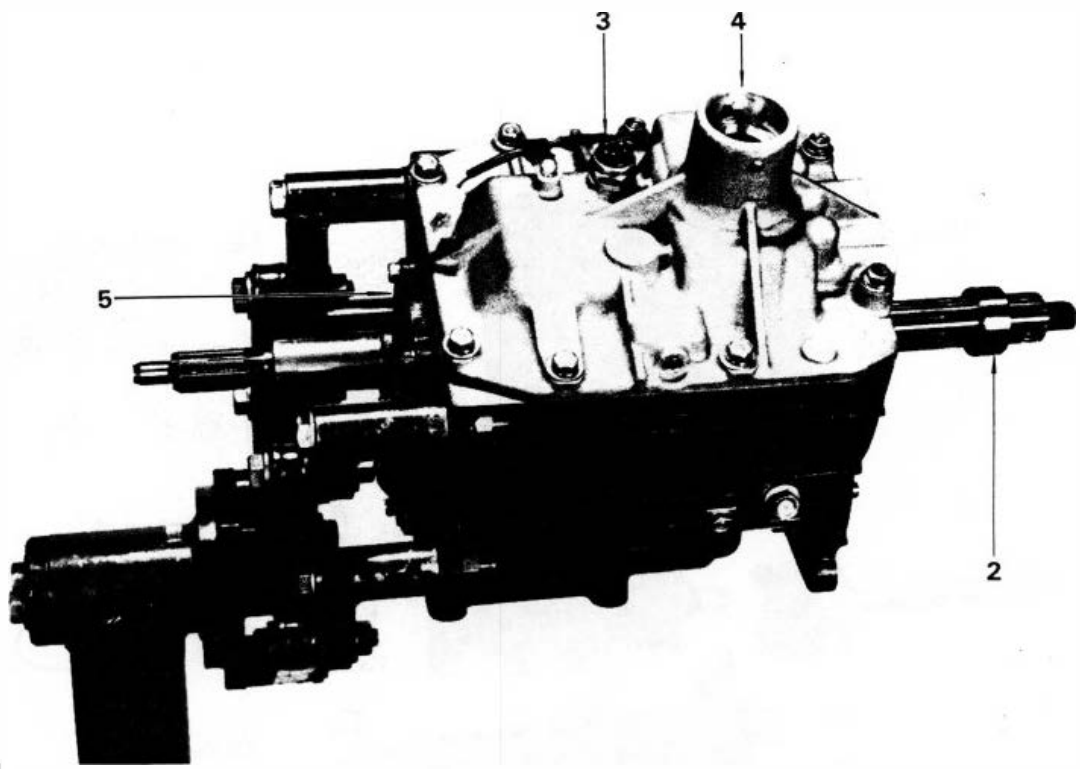
Fig. 3-7

Separate the transfer from the transmission

SEE
TRANSFER DISASSEMBLY
SECTION
Fig. 4-1 to 4-24

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

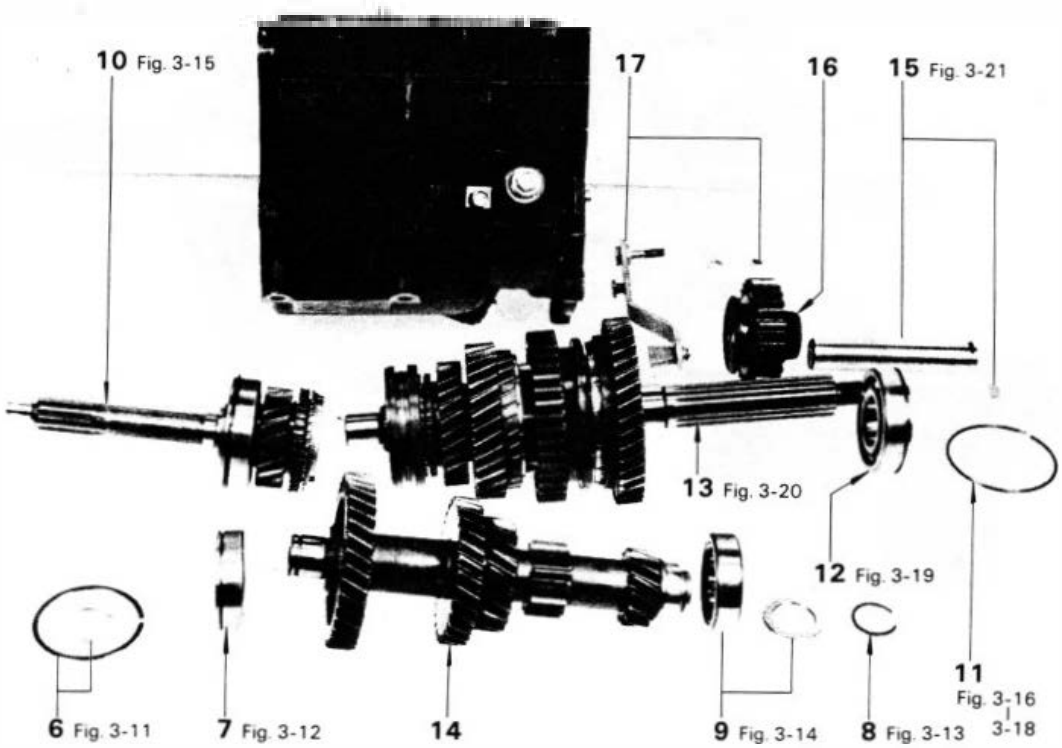
Fig. 3-8



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	12	Bearing
7	Bearing	13	Output Shaft
8	Snap Ring	14	Countershaft
9	Bearing	15	Reverse Idler Gear Shaft
10	Input Shaft	16	Reverse Idler Gear
11	Snap Ring	17	Reverse Shift Arm

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

Fig. 3-10

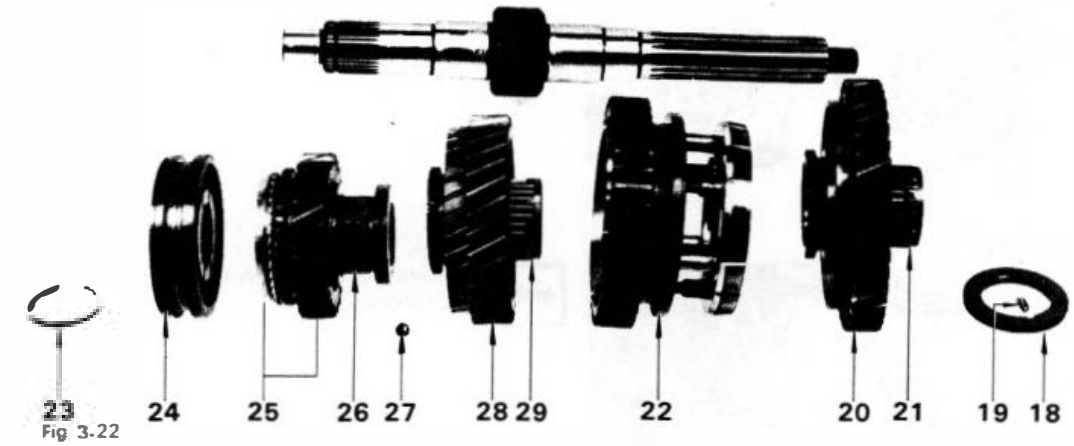
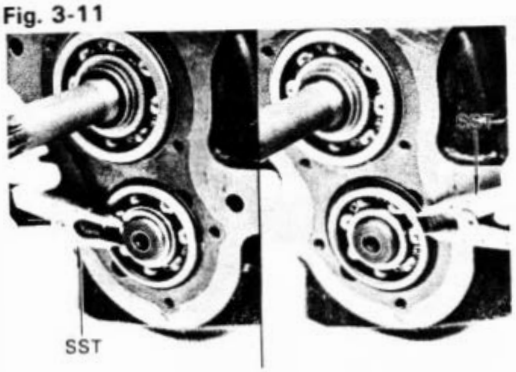


Fig 3-22

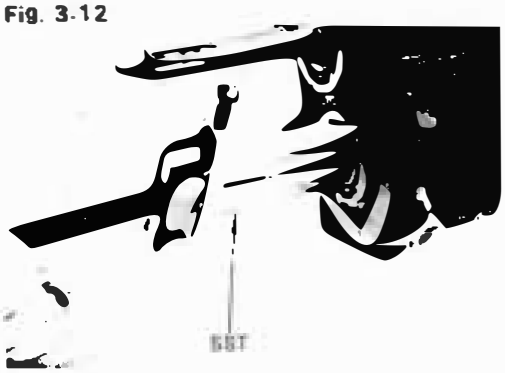
18	Thrust Washer	24	No.2 Clutch Hub, Sleeve & Synchronizer Ring
19	Pin	25	3rd Gear
20	1st Gear	26	Bushing
21	Bearing	27	Ball
22	Synchronizer Ring	28	2nd Gear
23	Snap Ring	29	Bearing

Fig. 3-11



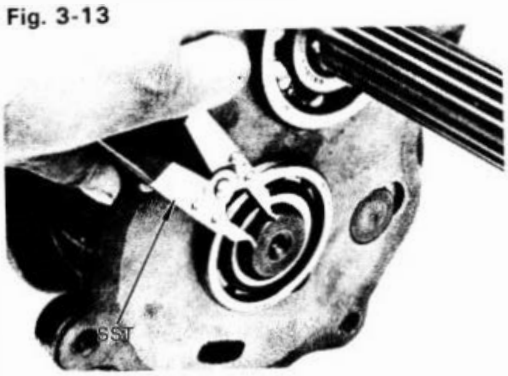
Remove the snap ring with SST.
SST [09905-00012]

Fig. 3-12



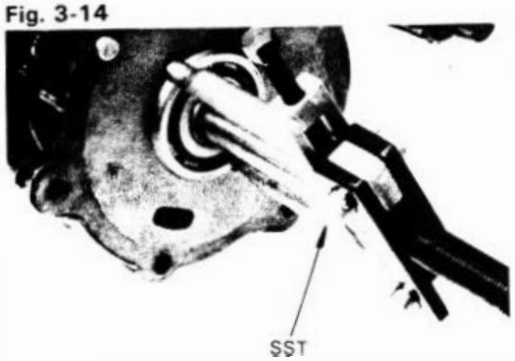
Remove the bearing with SST.
SST [09950-20014]

Fig. 3-13



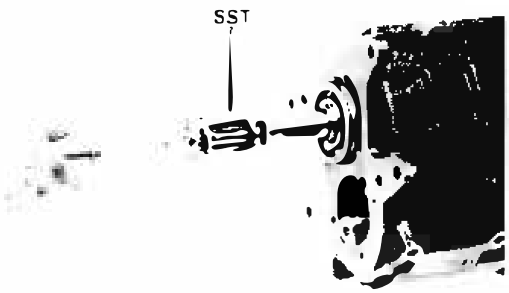
Remove the snap ring with SST.
SST [09905-00012]

Fig. 3-14



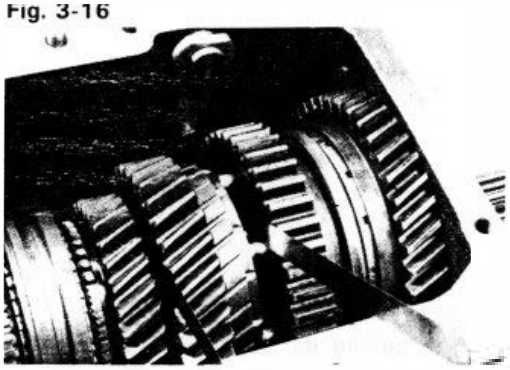
Remove the bearing with SST.
SST [09950-20014]

Fig.3-15



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

Fig. 3-16

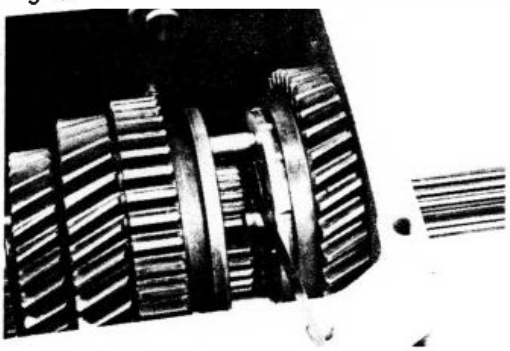


Measure the 3rd and 2nd gear thrust clearance

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

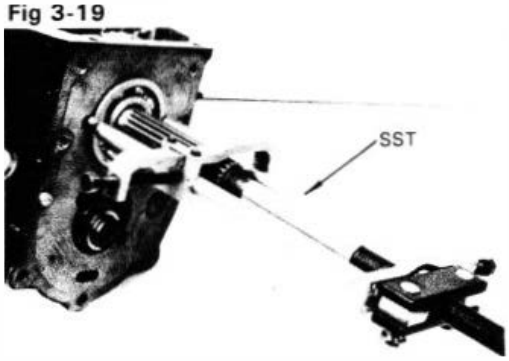
Thrust clearance:

STD	**0.175 – 0.320 mm (0.0069 – 0.0126 in.)**
Limit	**0.32 mm (0.0126)**

Fig. 3-18

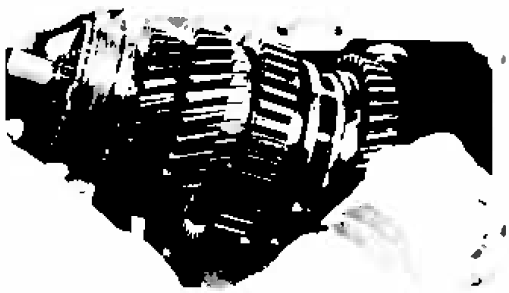
Remove the snap ring with SST
SST [09905-00012]

Fig 3-19



Remove the bearing with SST
SST [09950-20014]

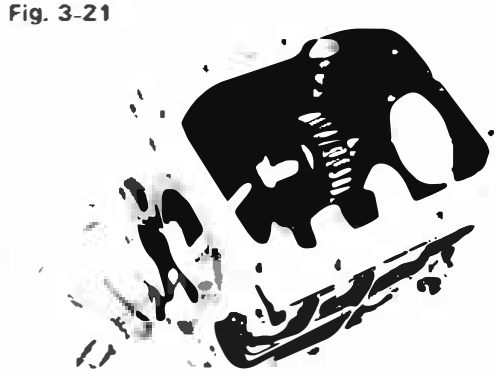
Fig. 3-20



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

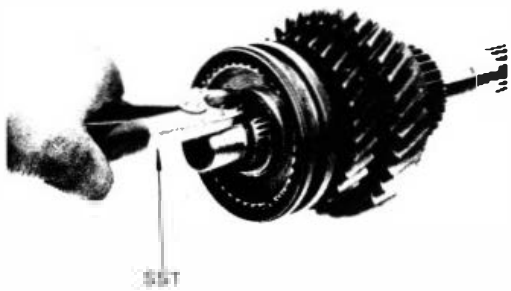
— Note —
When pulling out the assembly, hold the gears in place to keep them from sliding off the shaft.

Fig. 3-21



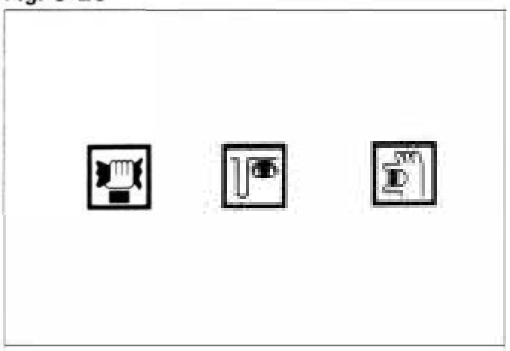
Drive out the reverse idler gear shaft toward the rear

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

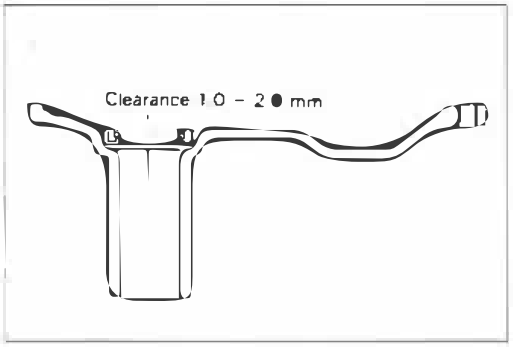
Inspect for wear or damage.

Fig. 3-25

Replace The Front Bearing Retainer Oil Seal

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

Fig. 3-26

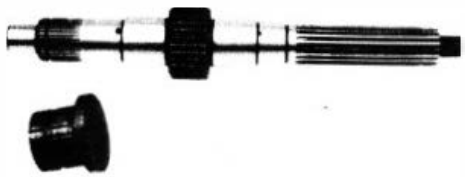


– Note –

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

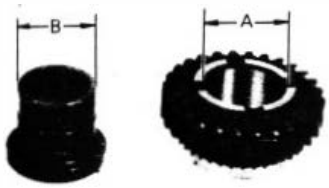
1. Inspect the shaft surfaces contacting the bearings and gears for wear or damage.
2. Inspect the bushing for wear or damage.

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.)**

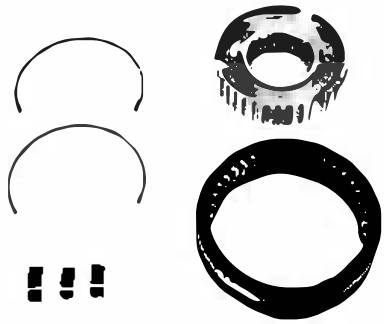
Fig. 3-31

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.)**

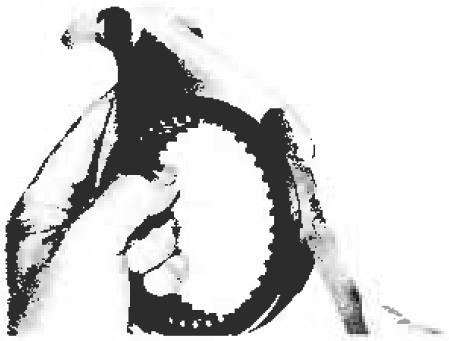
Fig. 3-32



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.

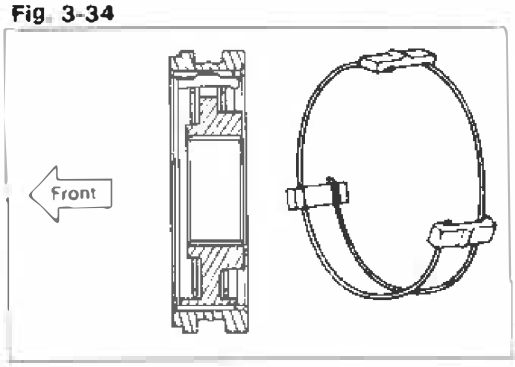
Fig. 3-33



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

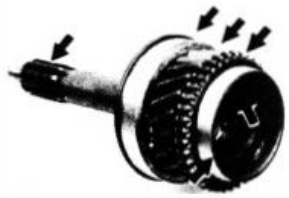
Shift fork to hub sleeve clearance:
Limit 0.8 mm (0.031 in.)

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.

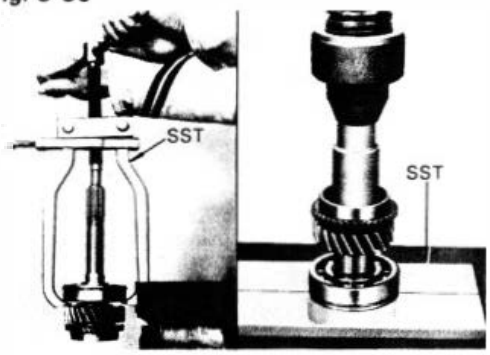
Fig. 3- 35



Input Shaft

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

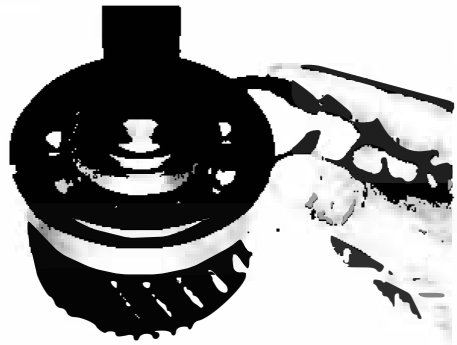
Fig. 3-36



Replace The Input Shaft Bearing

1. Remove the snap ring with SST
   SST [09905-00012]
2. Remove the bearing with SST
   SST [09950-20014]
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

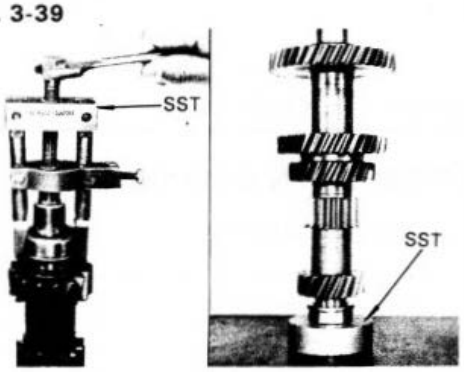
Part No	Thickness mm (in)
90520-36015	3.31 – 3.42 (.01303 – .01346)
90520-36016	3.20 – 3.31 (.0 1260 – .0 1303)

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 —

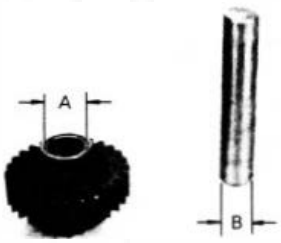
Make sure to position the inner race so that its flanged side will be directed toward the front.

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 idle gear gear bushing and shaft oil clearance

Oil clearance:

Limit 0.16 mm (0.0063 in.)

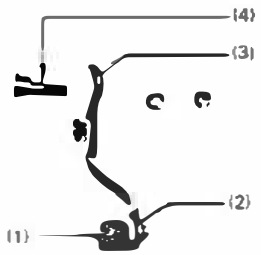
Reverse Shift Arm

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

Shoe thickness:

Limit 8.1 mm (0.319 in.)

Fig. 3-42



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:

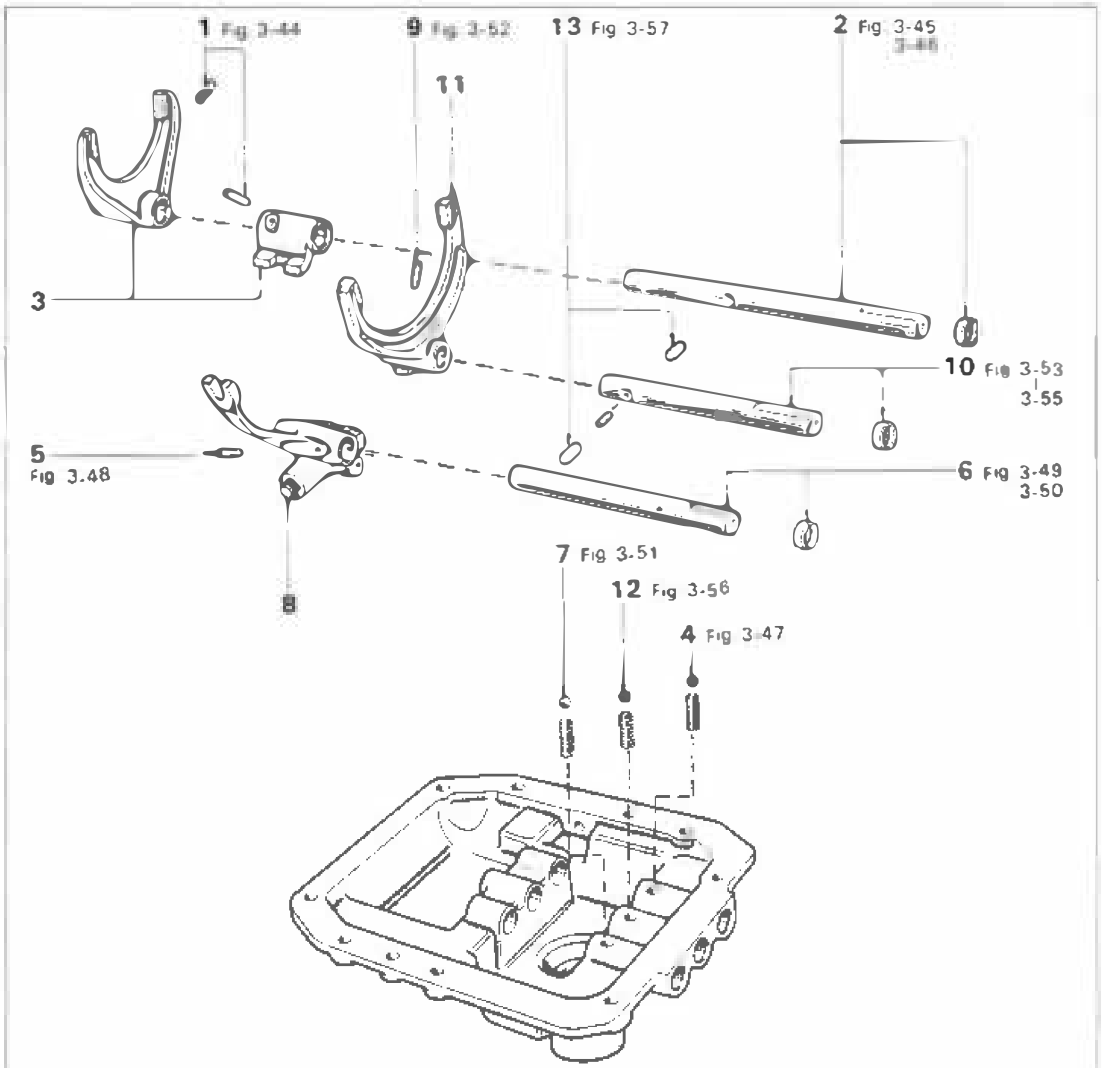
Limit 0.7 mm (0.028 in.)

TRANSMISSION CASE COVER

DISASSEMBLY

Disassemble the parts in the numerical order shown in the figure

Fig. 3-43

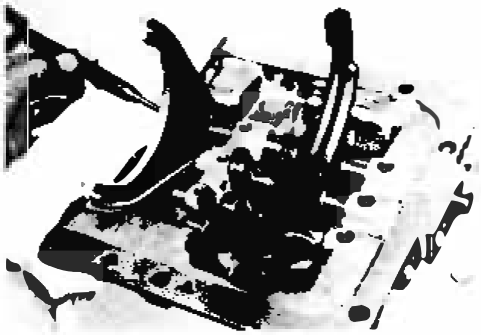


1 Slotted Spring Pin
2 3rd, 4th Shift fork Shaft & Blind Plug
3 3rd, 4th Shift Fork & 3rd, 4th Shift Head
4 Locking ball & Spring
5 Slotted Spring Pin
6 Reverse Shift Fork Shaft & Blind Plug
7 Locking Ball & Spring
8 Reverse Shift Head
9 Slotted Spring Pin
10 1st, 2nd Shift Fork Shaft & Blind Plug
11 1st & 2nd Shift Fork
12 Locking Ball & Spring
13 Interlock Pin

Fig. 3-44

Drive out the slotted spring pin

Fig. 3-45



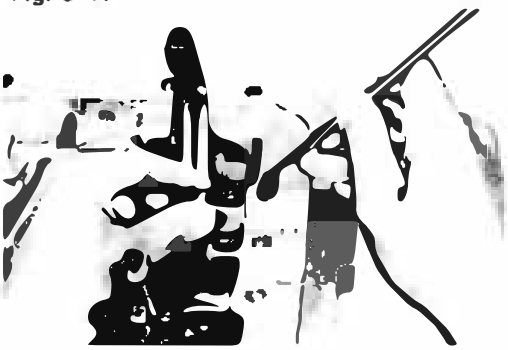
Drive out the shift fork shaft together with the blind plug

– Note –
Do not damage the case cover.

Fig. 3-46

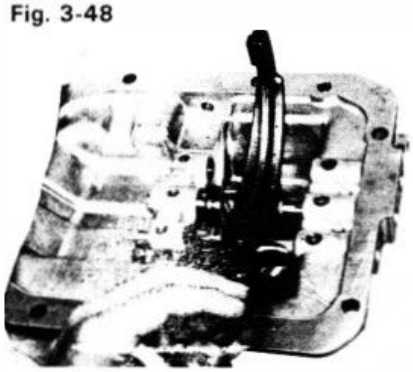
Cover the service hole with your hand to prevent locking ball from flying out

Fig. 3-47



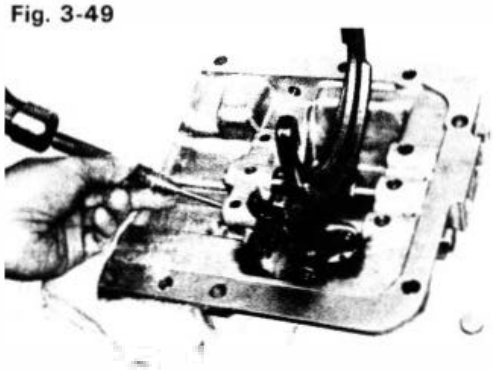
Remove the locking ball and the spring with magnet.

Fig. 3-48



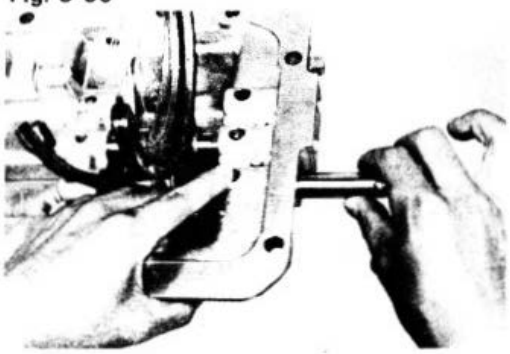
Drive out the slotted spring pin

Fig. 3-49



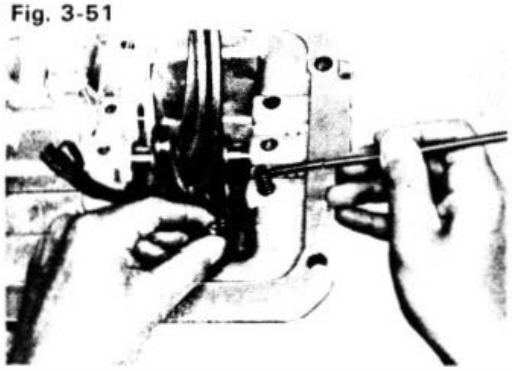
Drive out the shift fork shaft together with blined plug

Fig. 3-50



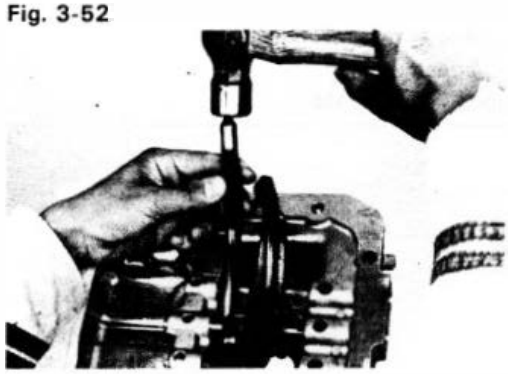
Cover the service hole with your hand to prevent the locking ball from flying out

Fig. 3-51



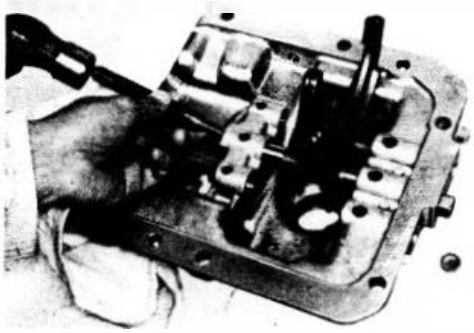
Remove the locking ball and the spring with magnet

Fig. 3-52



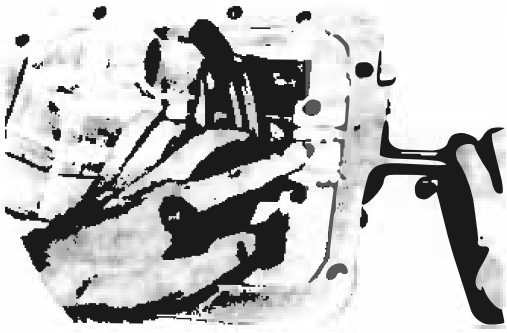
Drive out the slotted spring pin.

Fig. 3-53



Drive out the fork shaft together with the blind plug.

Fig. 3-54

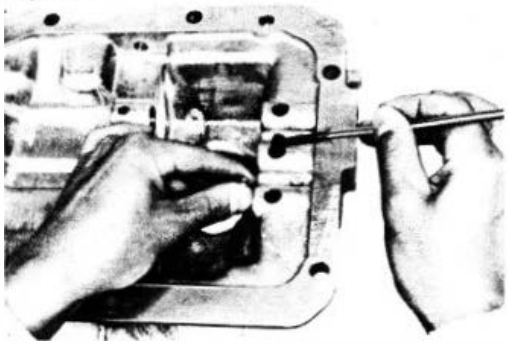


Cover the service hole with your hand to prevent locking ball from flying out.

Fig. 3-55

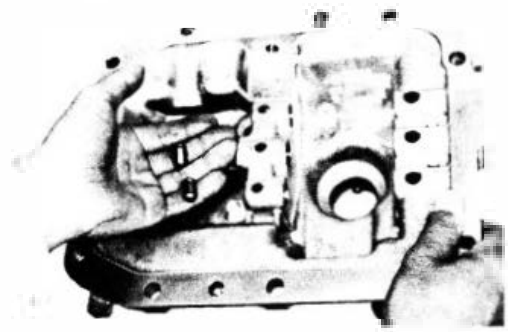
Remove the interlock pin with magnet.

Fig. 3-56



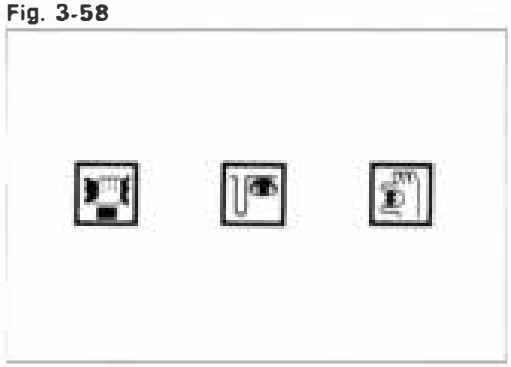
Remove the locking ball and the spring with magnet

Fig. 3-57



Remove theinterlock pins from thecase cover

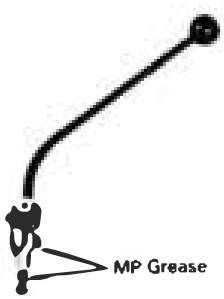
Fig. 3-58



INSPECTION & REPAIR

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

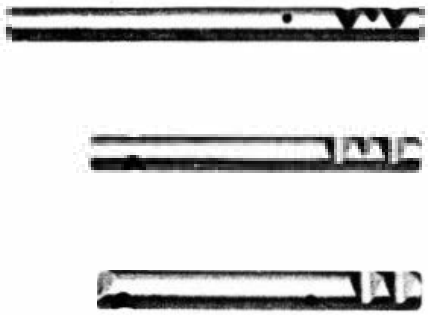
Fig. 3-59



Shift Lever

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

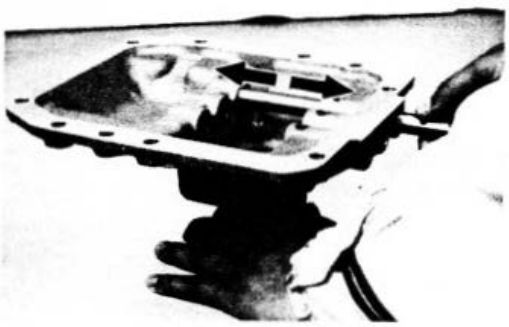
Fig. 3-60



Shift Fork Shaft

1. Check for wear or damage

Fig. 3-61



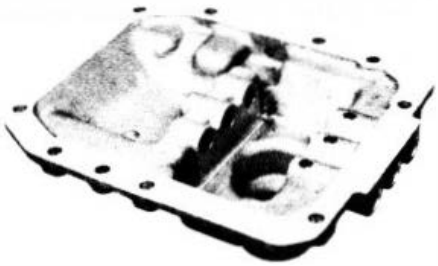
2. Check the sliding action against the case

Fig. 3-62

Shift Fork

Check for wear or damage

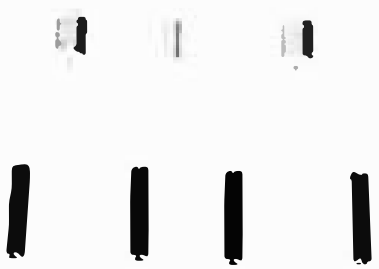
Fig. 3-63



Case

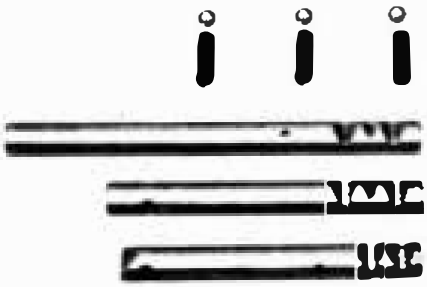
Check for cracks or damage

Fig. 3-64



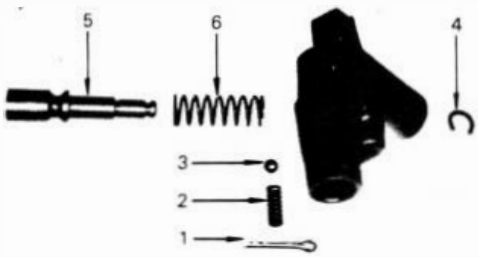
Interlock Pin & Slotted Spring Pin
Check for wear or damage

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.**

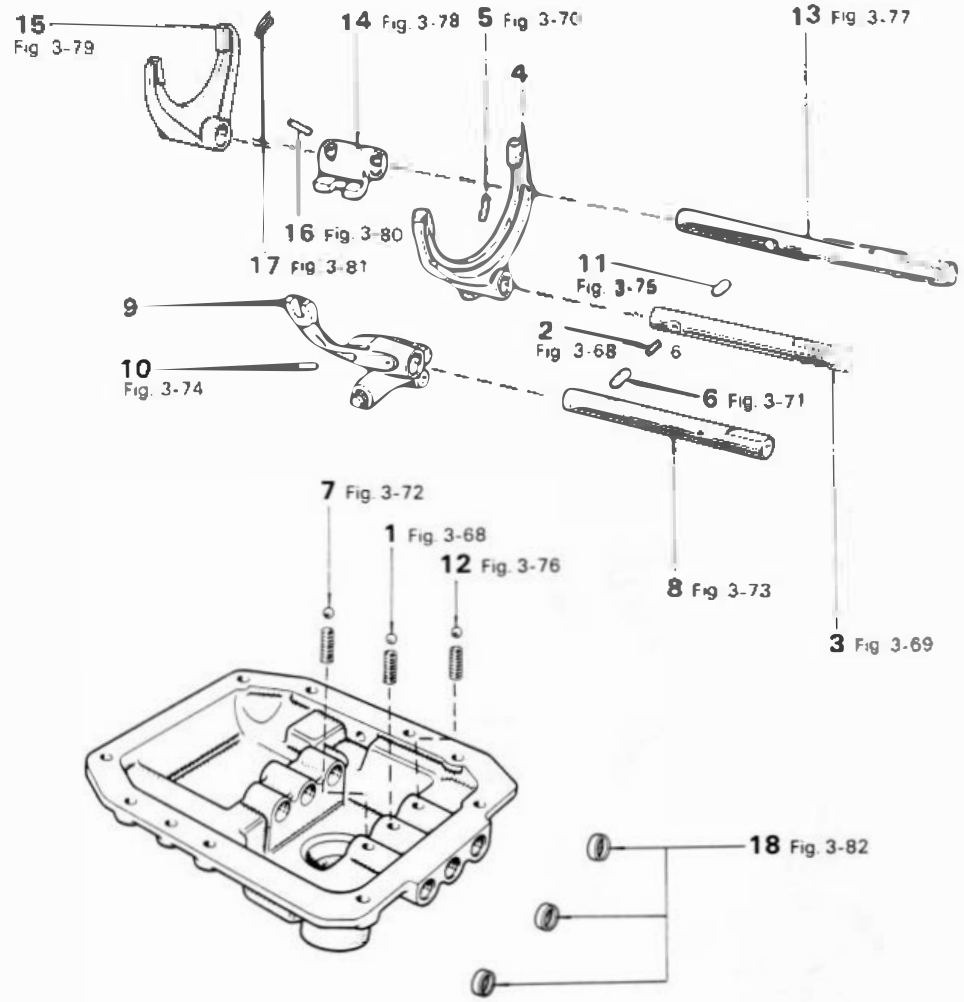
ASSEMBLY

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

Fig. 3-67

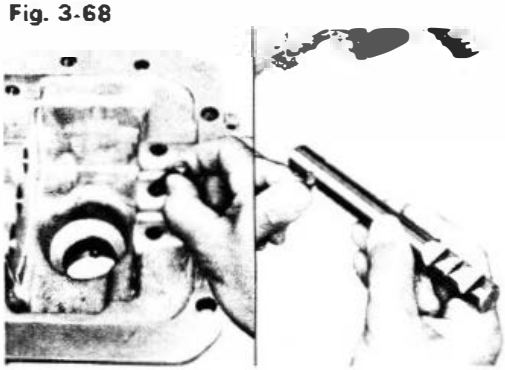
– Note –

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



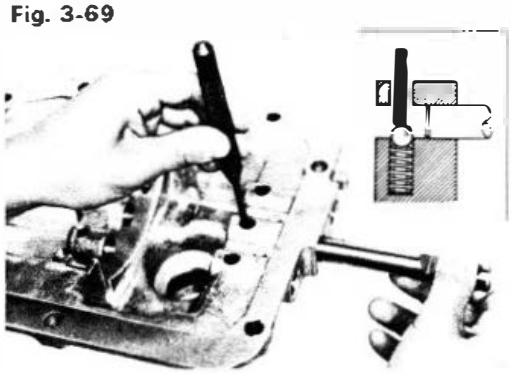
1. Locking Ball & Spring
2. Interlock Pin
3. 1st & 2nd Shift Fork Shaft
4. 1st & 2nd Shift Fork
5. Slotted Spring Pin
6. Interlock Pin
7. Locking Ball & Spring
8. Reverse Shift Fork Shaft
9. Reverse Shift Head
10. Slotted Spring Pin
11. Interlock Pin
12. Locking Ball & Spring
13. 3rd & 4th Shift Fork Shaft
14. 3rd & 4th Shift Head
15. 3rd & 4th Shift Fork
16. Slotted Spring Pin
17. Slotted Spring Pin
18. Blind Plug

Fig. 3-68



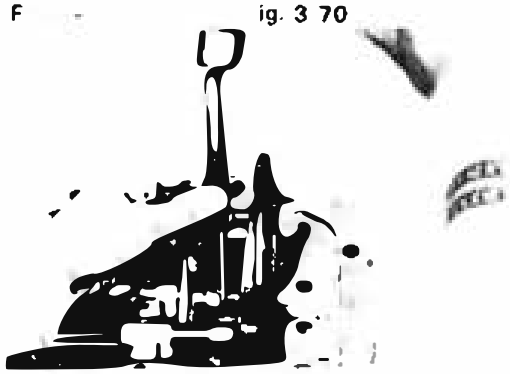
Install the spring and ball
Install the interlock pin on the shift fork shaft with MP grease

Fig. 3-69



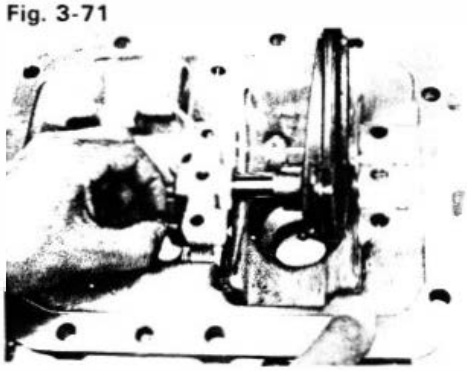
Insert the shift fork shaft over the locking ball

Fig. 3-70



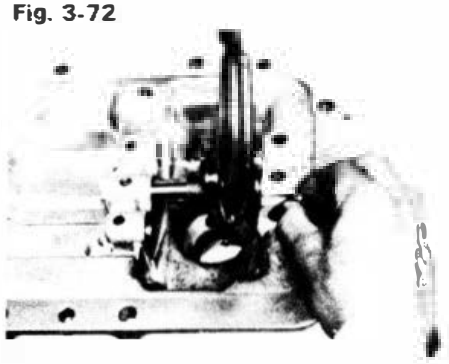
Drive in the slotted spring pin

Fig. 3-71



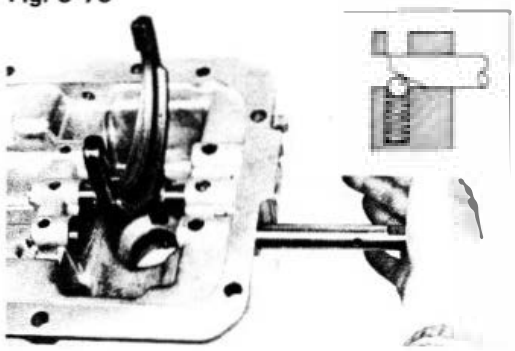
Install the interlock pin with MP grease

Fig. 3-72



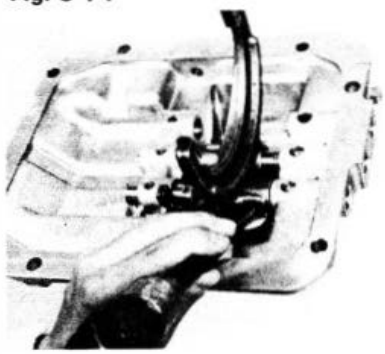
Install the spring and locking ball

Fig. 3-73



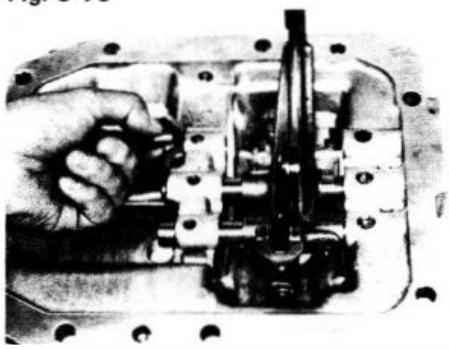
Insert the shift fork shaft over the locking ball

Fig. 3-74



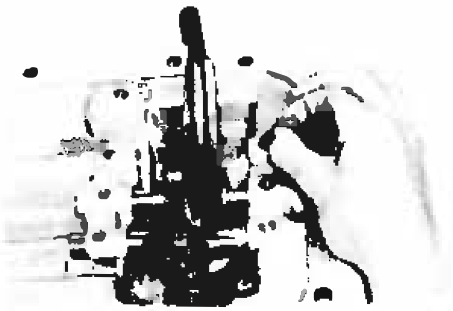
Install the slotted spring pin

Fig. 3-75



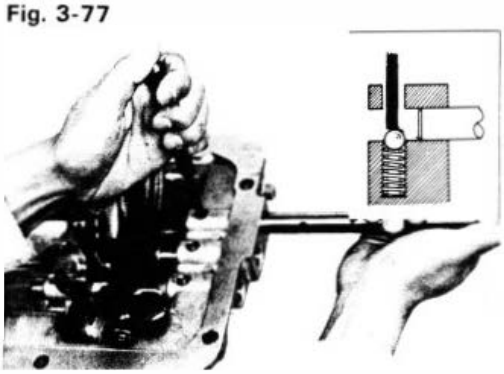
Install the interlock pin with MP grease

Fig. 3-76



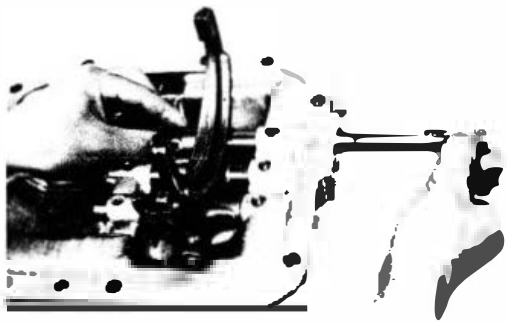
Install the spring and locking ball.

Fig. 3-77



Insert the shift fork over the locking ball.

Fig. 3-78

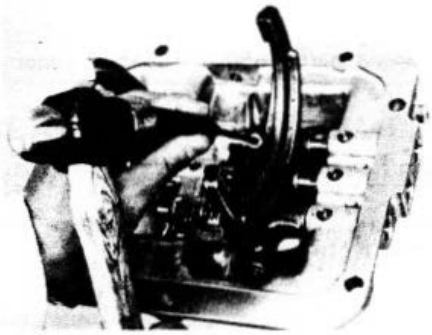


Install the shift head.

Fig. 3-79

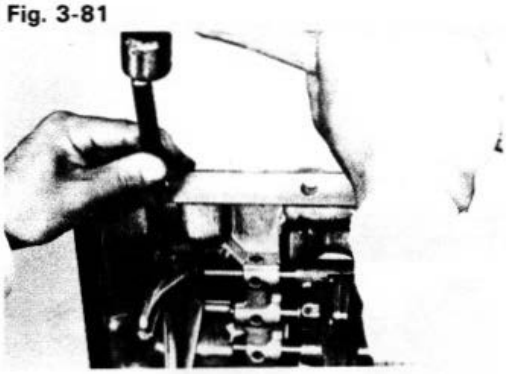
Install the shift fork.

Fig. 3-80



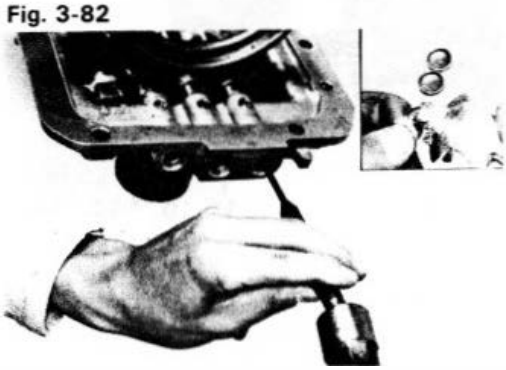
Install the slotted spring pin

Fig. 3-81



Install the slotted spring pin

Fig. 3-82



Apply liquid sealer to the blind plug before assembly

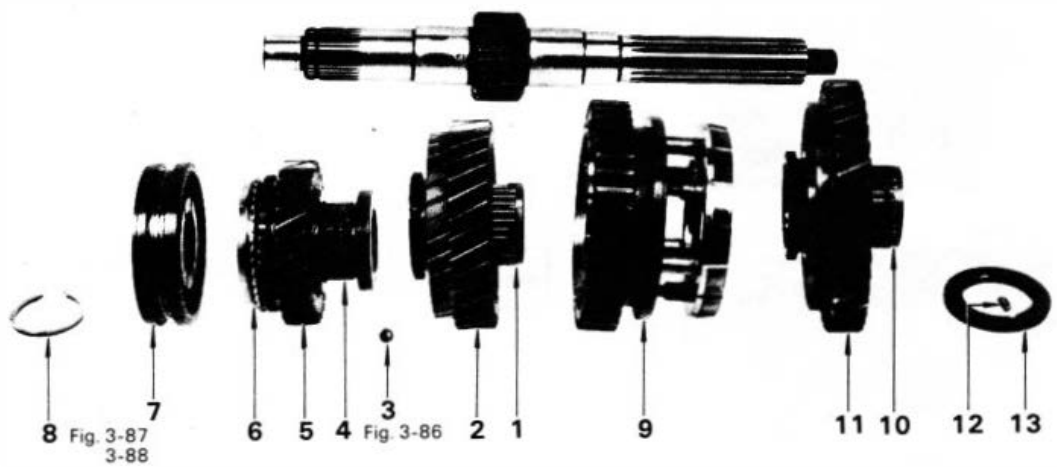
TRANSMISSION GEAR & CASE

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.

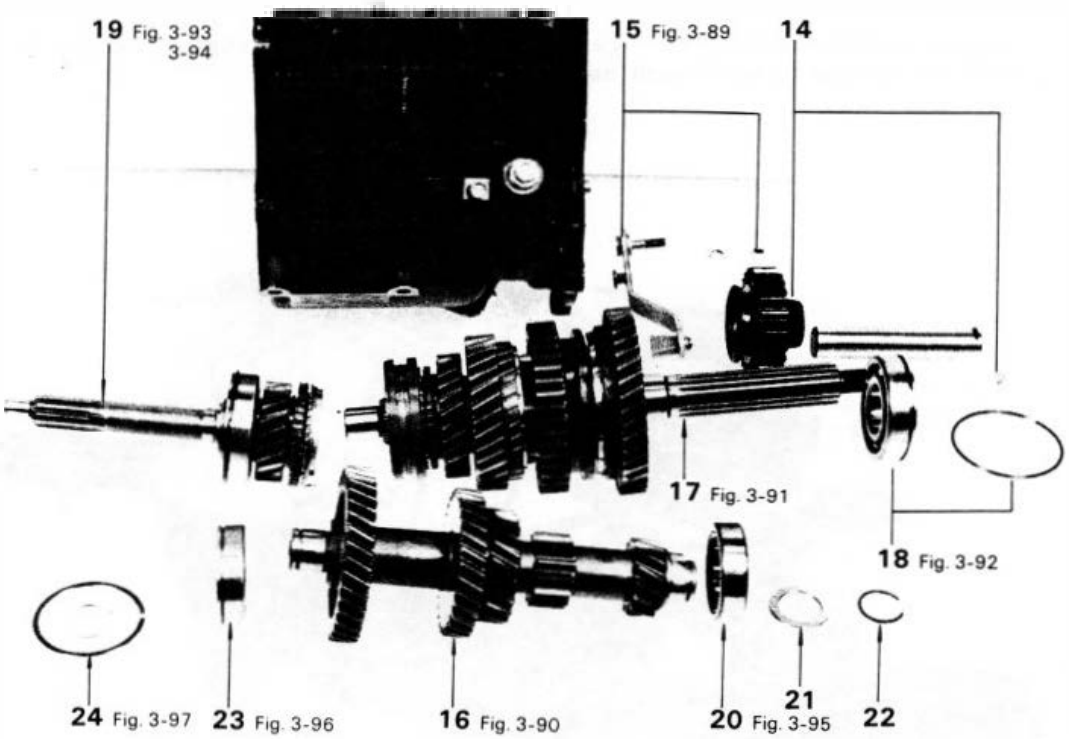


1	Bearing	8	Snap Ring
2	2nd Gear	9	No.1 Synchronizer Ring
3	Locking Ball	10	Bearing
4	Bushing	11	1st Gear
5	3rd Gear	12	Pin
6	Synchronizer Ring	13	Thrust Washer
7	No.2 Clutch Hub & Sleeve		

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.



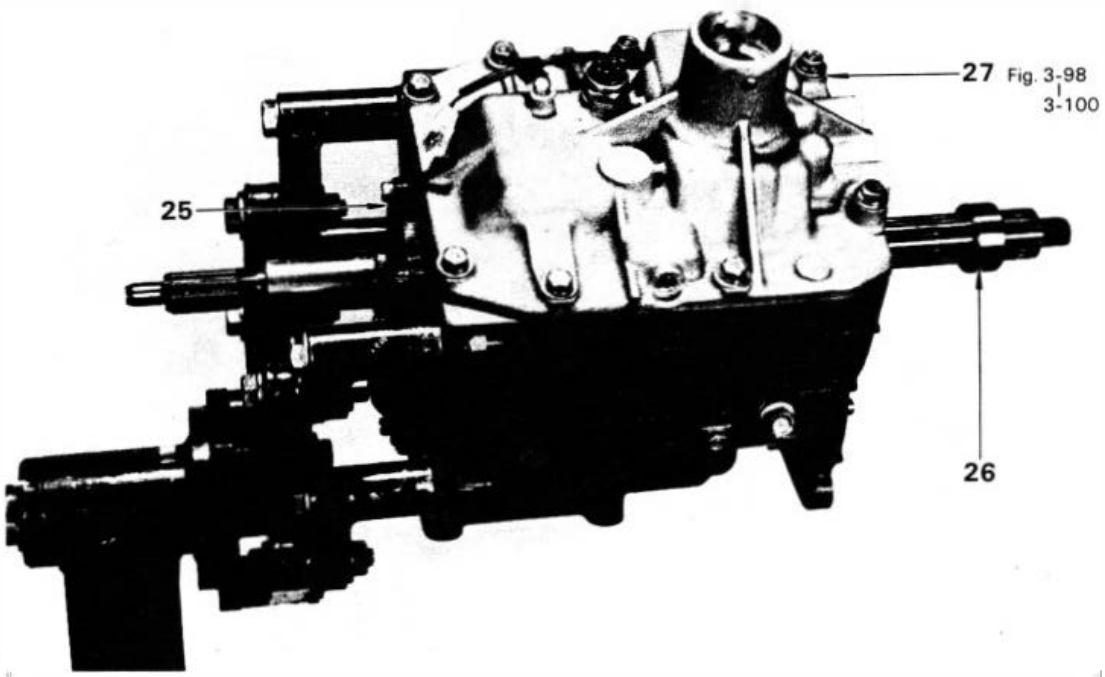
14.	Idler Gear, Shaft & Key	20	Bearing
15.	Shift Arm	21	Retainer
16.	Countershaft	22	Snap Ring
17.	Output Shaft	23	Bearing
18	Bearing	24	Snap Ring
19	Input Shaft, Bearing & Synchronizer Ring		

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

Fig. 3-85

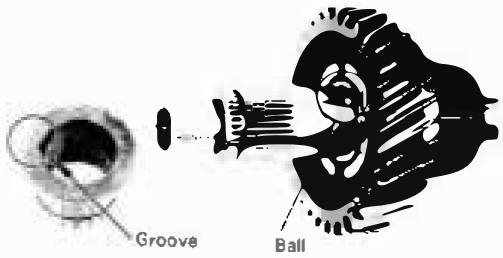
— Note —

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.



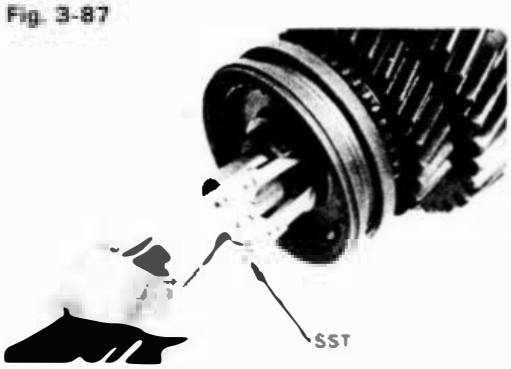
25 Front Bearing Retainer
26 Spacer
27 Case Cover

Fig. 3-86



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

Fig. 3-87

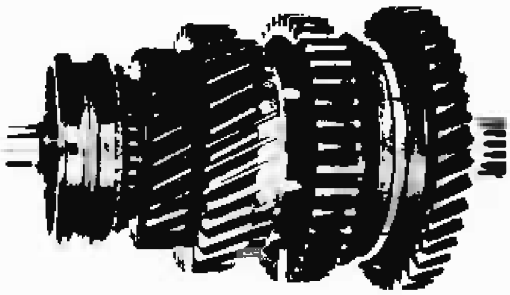


Select a snap ring of the thickness that will reduce the clearance to a minimum.

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.)**

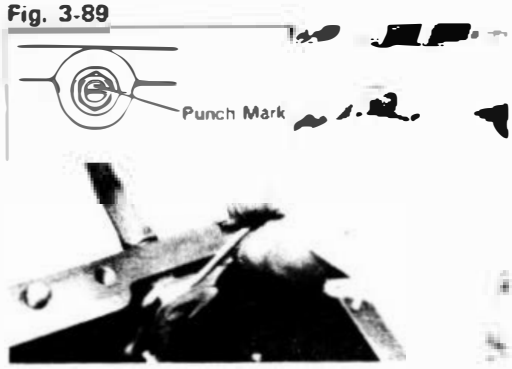
Limt **0.35 mm (0.0138 in.)**

3rd gear

STD **0.125 – 0.275 mm (0.0049 – 0.0108 in.)**

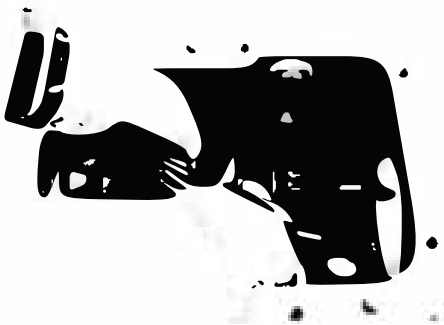
Limit **0.35 mm (0.0138 in.)**

Fig. 3-89



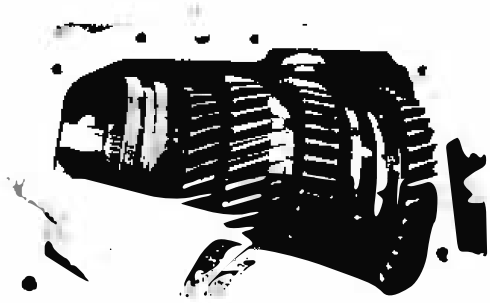
Lock the nut when the punch mark on the shift arm is repositioned straight up.

Fig. 3-90



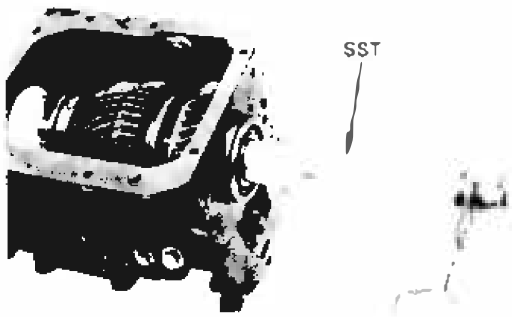
Lay the countershaft on the bottom of the transmission case

Fig. 3-91



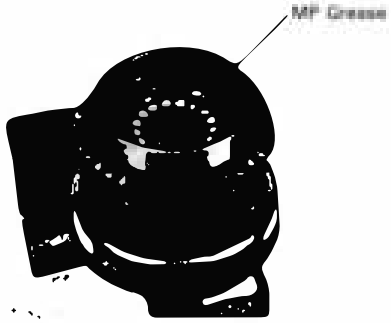
Install the output shaft assembly into the case

Fig. 3-92



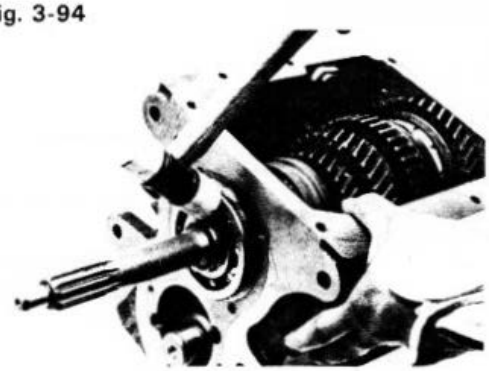
Install the bearing with SST
SST [09309-36032]

Fig. 3-93



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

Fig. 3-94

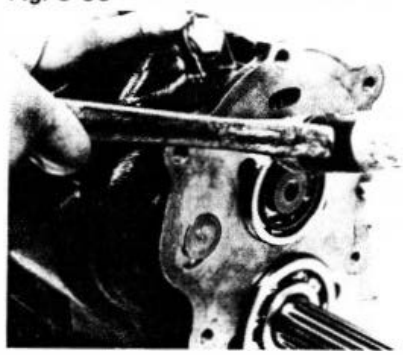


Drive in the input shaft to the case with a plastic hammer.

– Note –

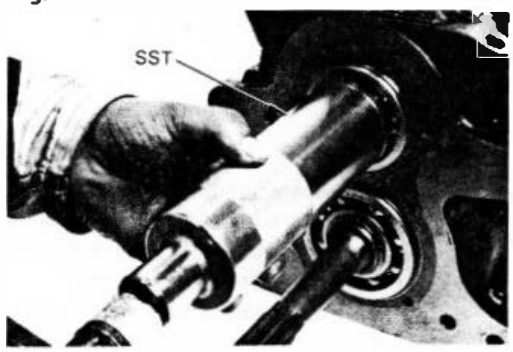
Use care not to damage the synchronizer ring.

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 [09316-60 010]

– Note –

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

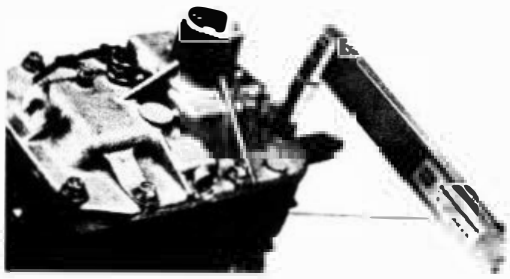
Fig. 3-97

From the table below, select the thickness snap ring that will fit properly on the shaft, and install it with SST.
SST [09905-0 0012]

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



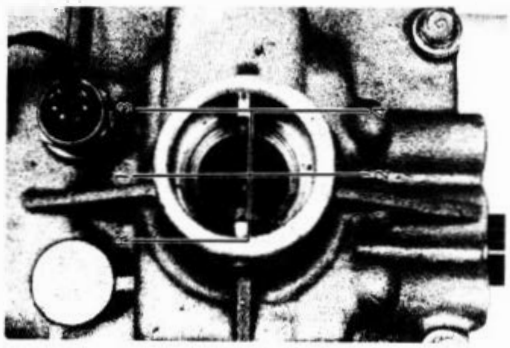
Tighten the case cover set bolts to the specified torque.

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

– Note –

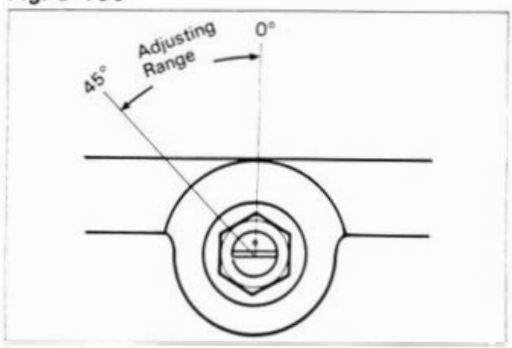
Have the case cover assembly and the gears in neutral position before installation.

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

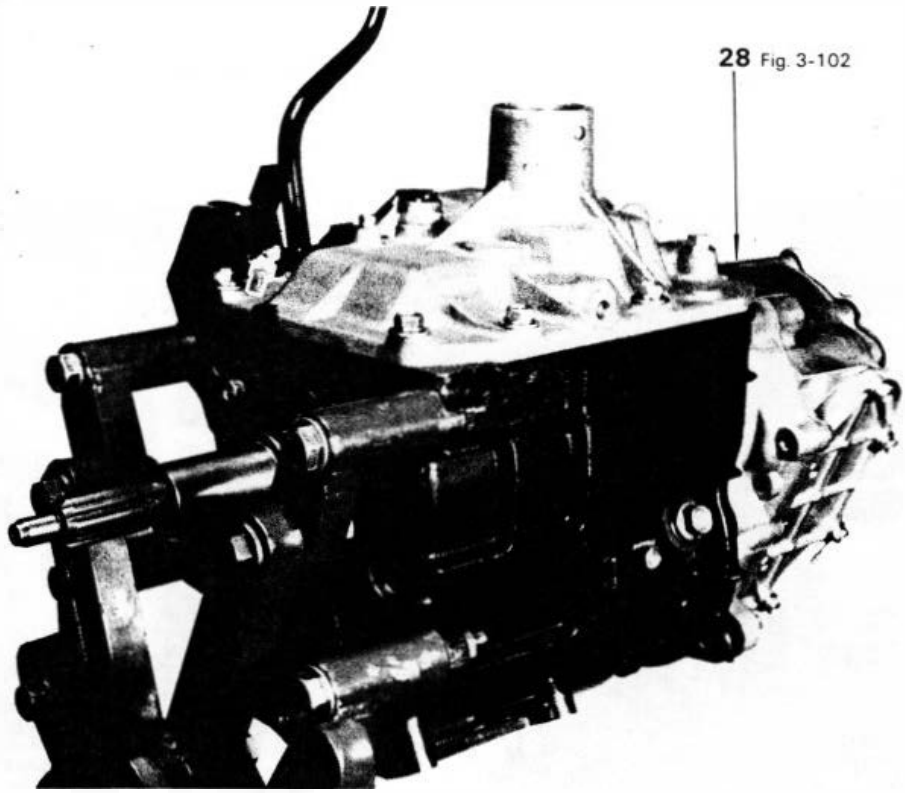


Adjust the reverse shift link.

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

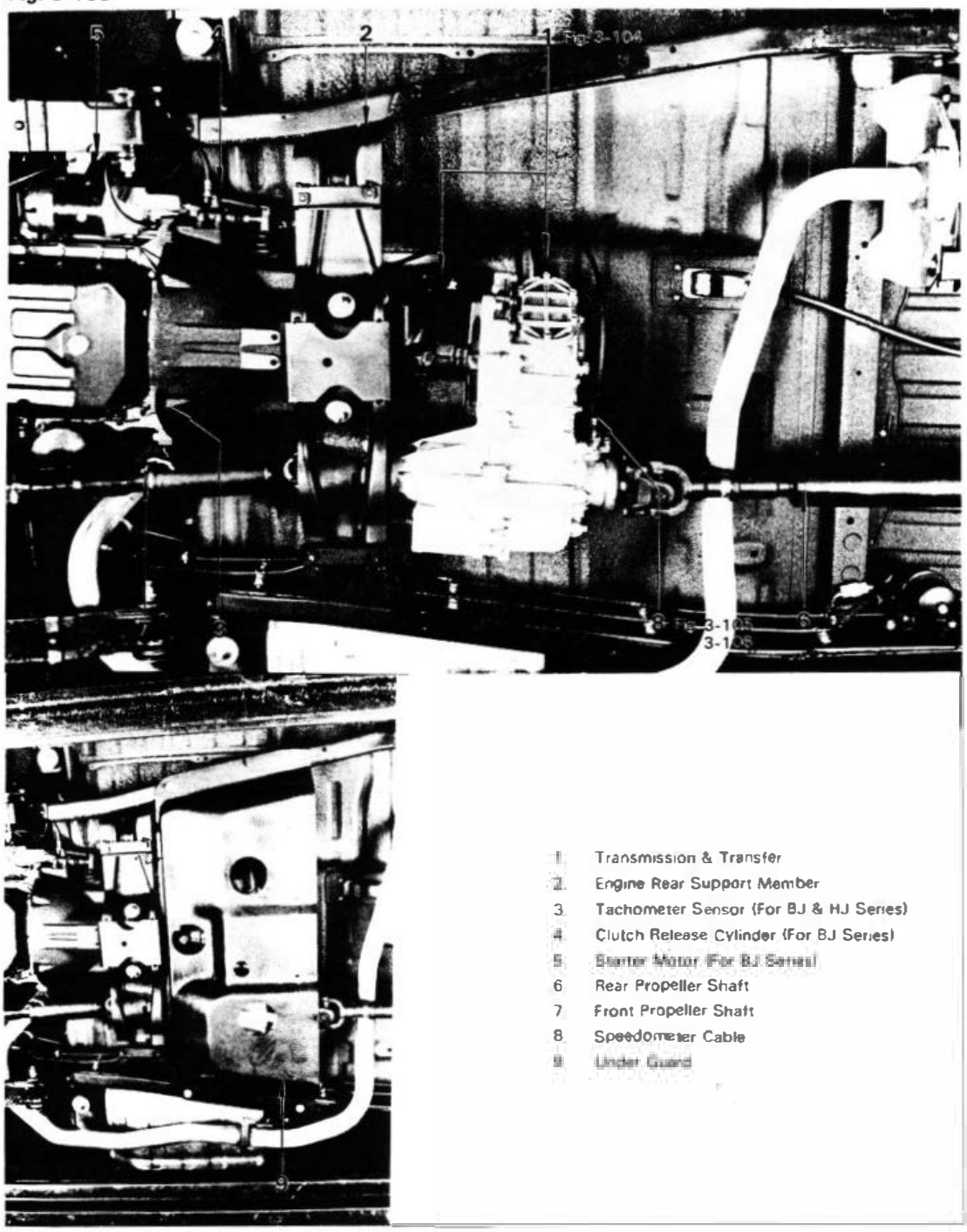
Install the transfer.

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

INSTALLATION

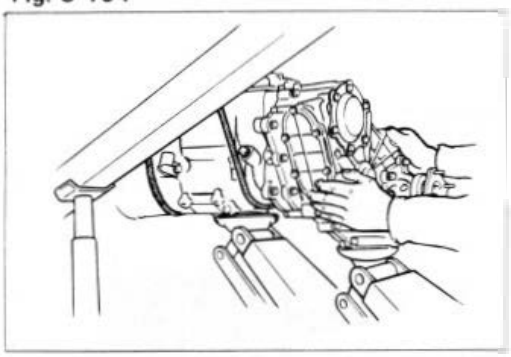
1. Install the parts in the numerical order shown in the figure.

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

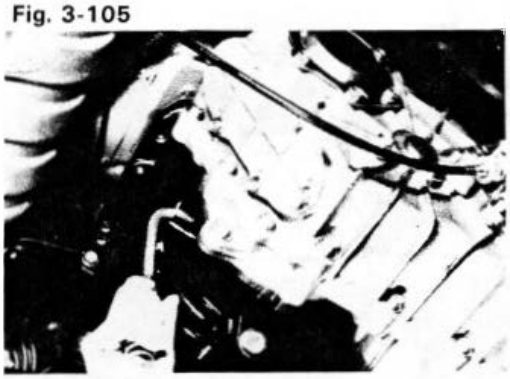
Fig. 3-104



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)

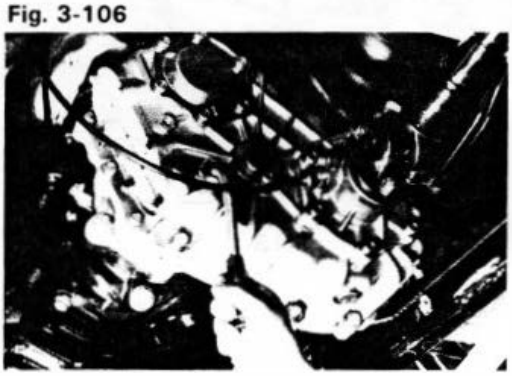
Fig. 3-105



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

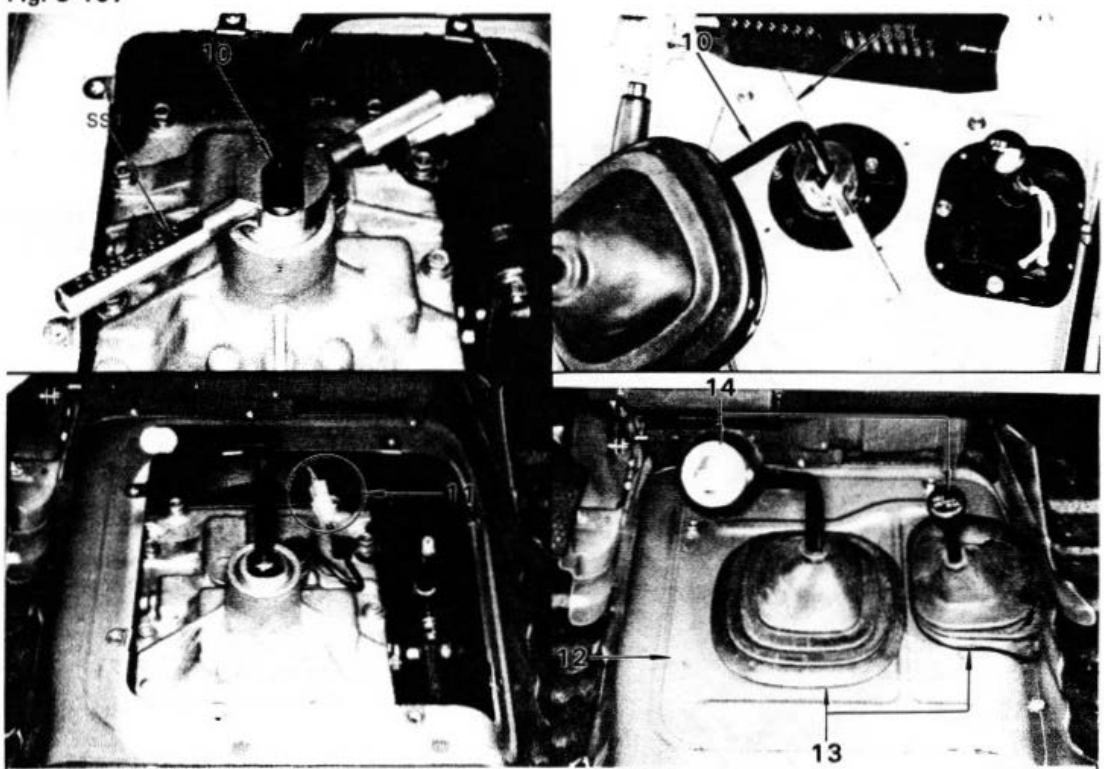
Fig. 3-106



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

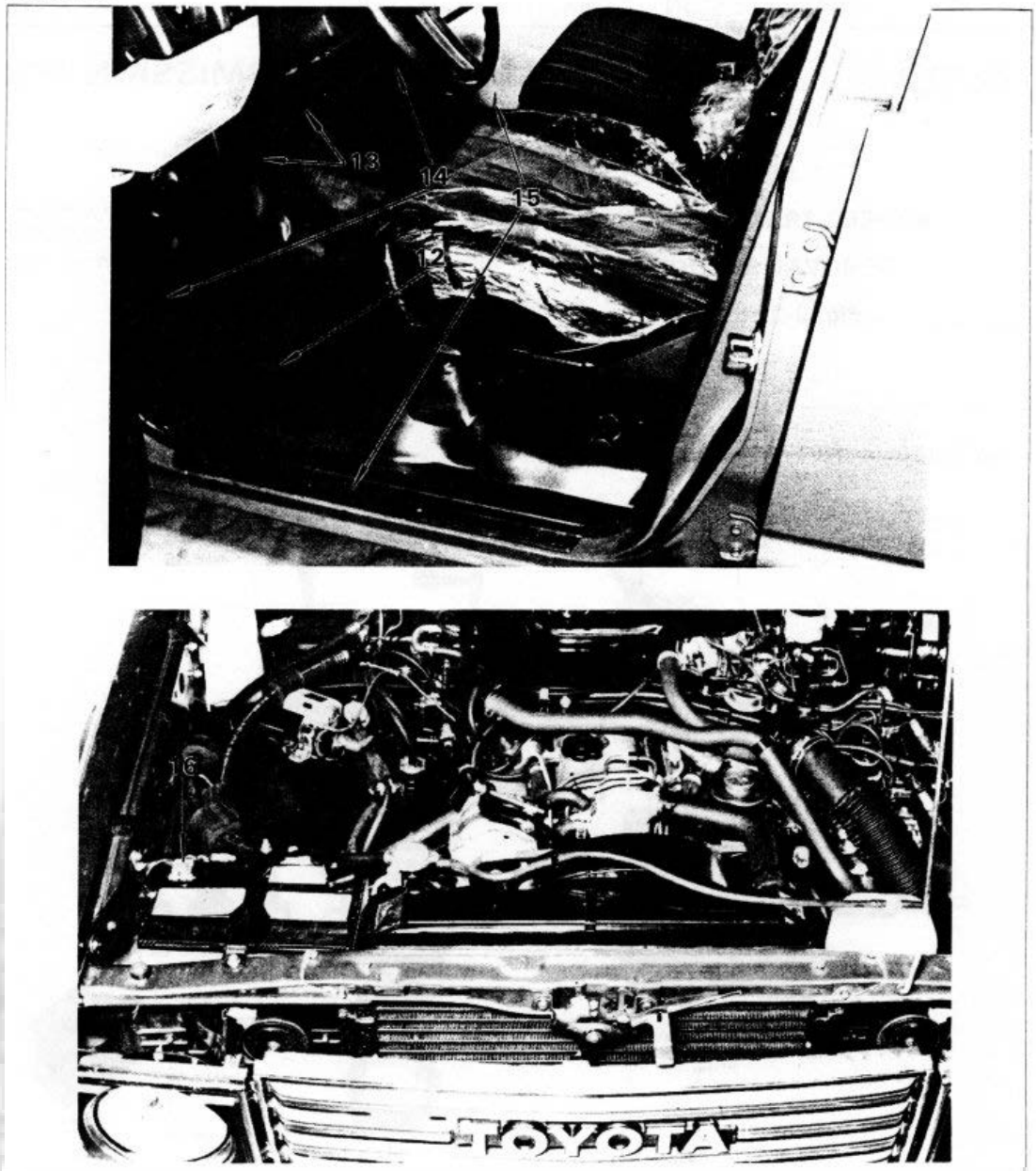
Fig. 3-107



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



12. Carpet or Mat
13. Heater Duct
14. Cowl Side Trim
15. Scuff Plate
16. Battery Terminal

Fig. 3-109

SEE

4-SPEED TRANSMISSION

REMOVAL SECTION

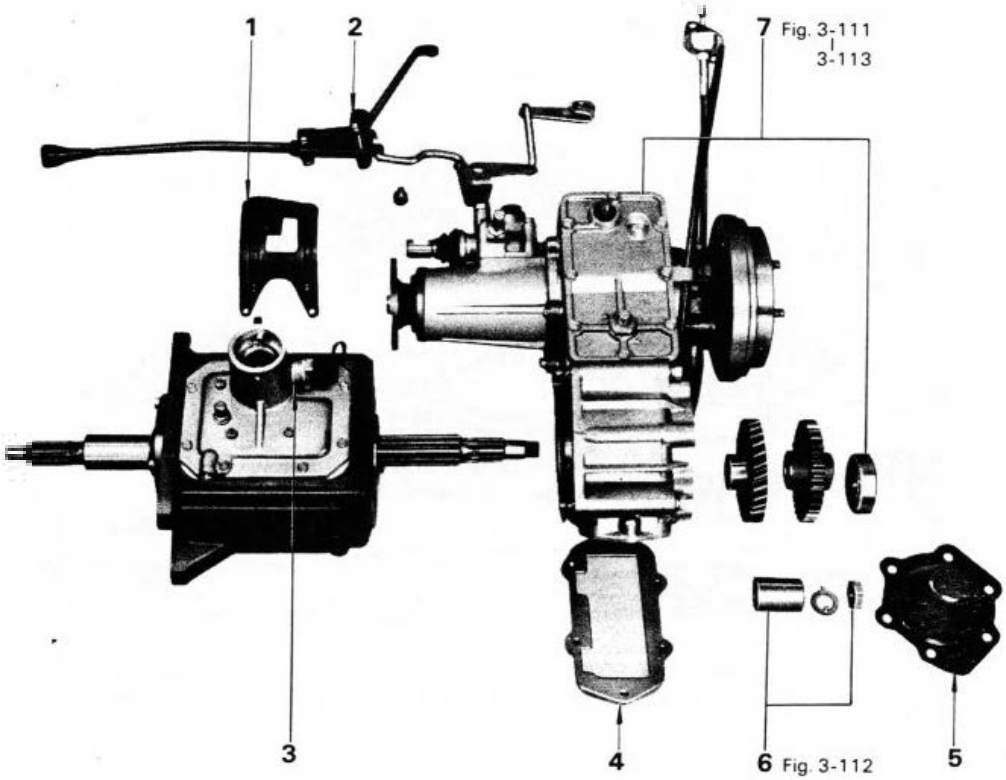
Fig. 3-2 to 3-5

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

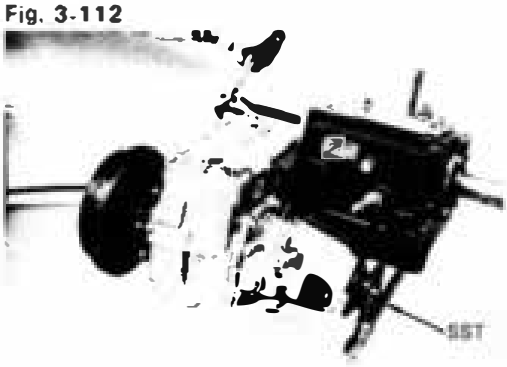


1. Shift Lever Guide
2. Lever & Rod
3. Back-up Light Switch
4. Power Take Off or Cover
5. No.2 Case Cover
6. Spacer, Washer & Nut
7. Transfer, Gear & Bearing

Fig. 3-111

Remove the five bolts

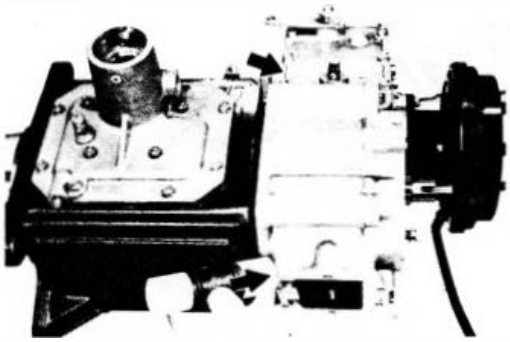
Fig. 3-112



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

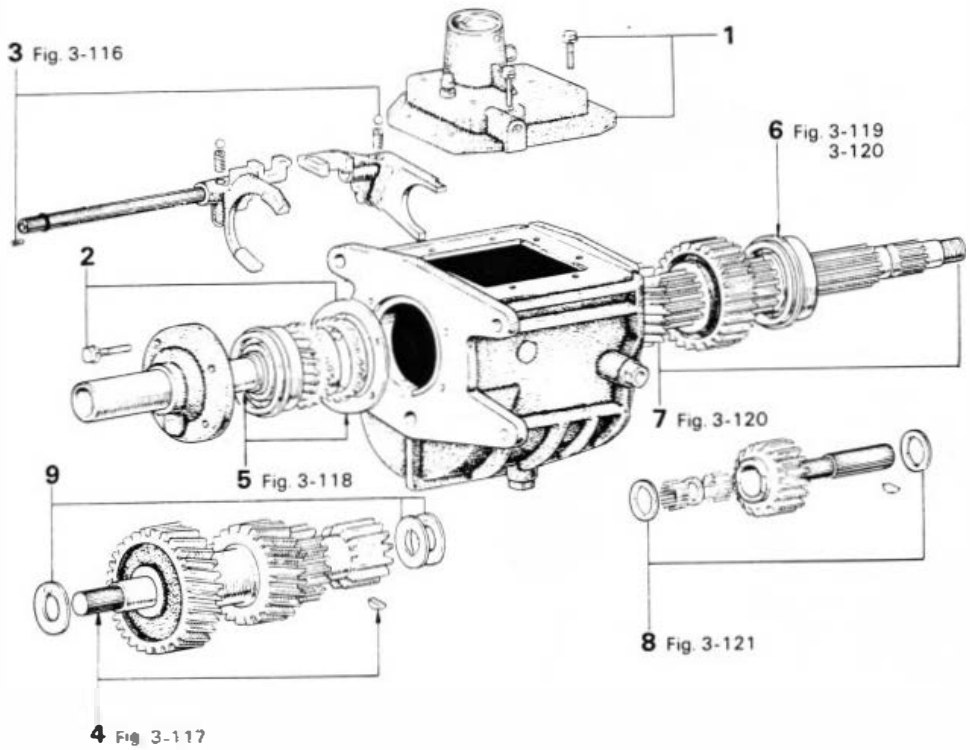


Tap out the transfer assembly

DISASSEMBLY

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

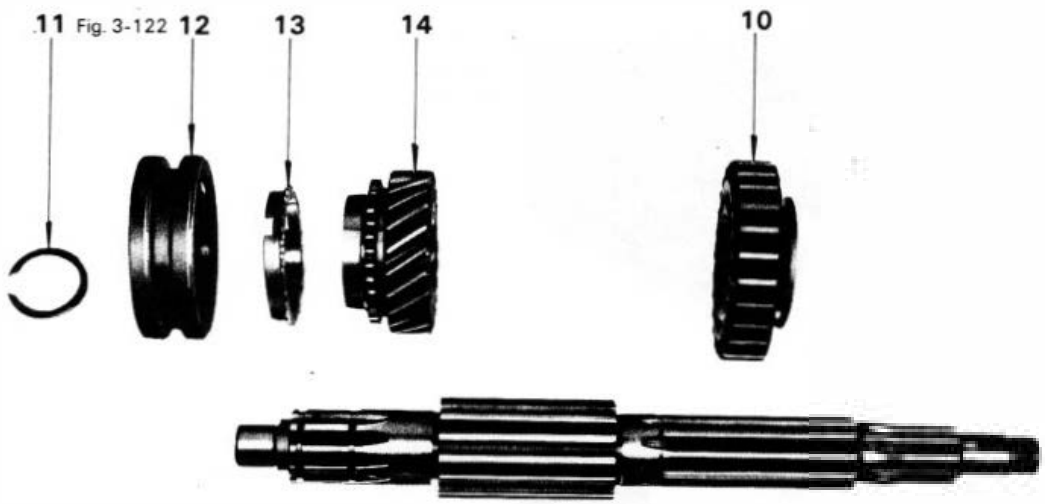
Fig. 3-114



1. Case Cover
2. Front Bearing Retainer
3. Shift Fork & Shaft
4. Countershaft & Key
5. Input Shaft & Synchronizer Ring
6. Bearing
7. Output Shaft
8. Reverse Idler Gear
9. Couter Gear

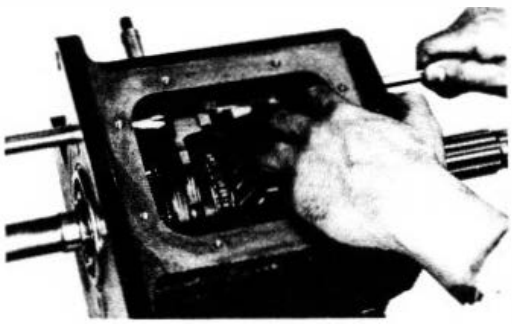
2 Disassemble the parts in the numerical order shown in the figure

Fig. 3-115



10 1st & Reverse Gear
11 Snap Ring
12 Clutch Hub & Sleeve
13 Synchronizer Ring
14 2nd Gear

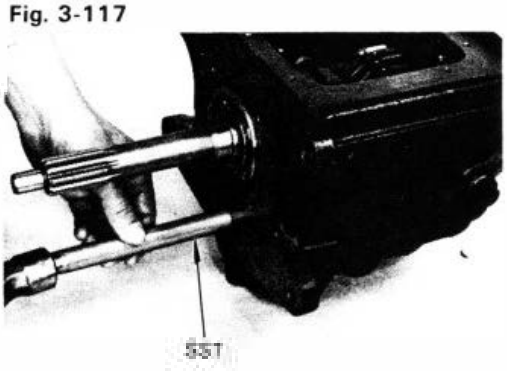
Fig. 3-116



Drive out the shaft toward the front

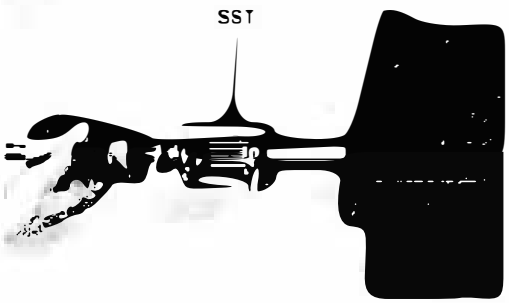
– Note –
Cover the locking ball hole with your finger so as to prevent the locking ball from jumping out.

Fig. 3-117



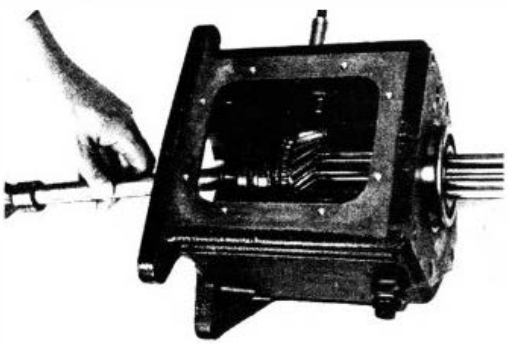
Drive out the shaft toward the rear with SST.
SST [09311-60010]

Fig. 3-118



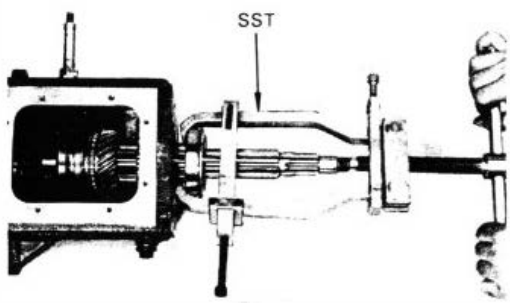
Remove the input shaft with SST.
SST [09910-00014]

Fig. 3-119



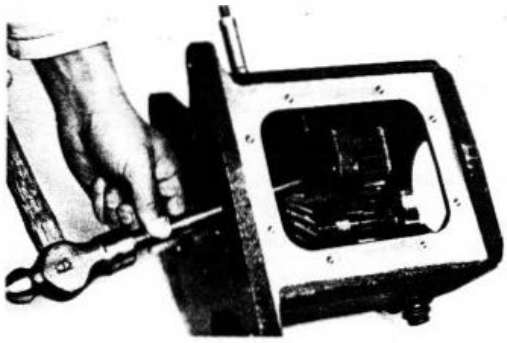
Using a brass bar, hammer the output shaft until the bearing is separated from the case.

Fig. 3-120



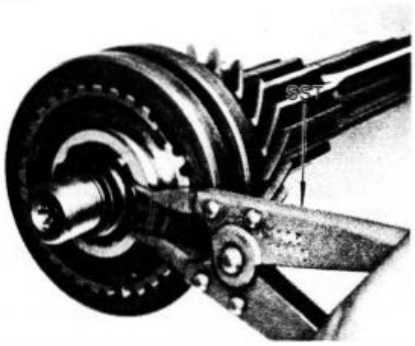
Remove the bearing with SST.
SST [09950-20014]

Fig. 3-121



Using a drift pin, drive out the shaft.

Fig. 3-122



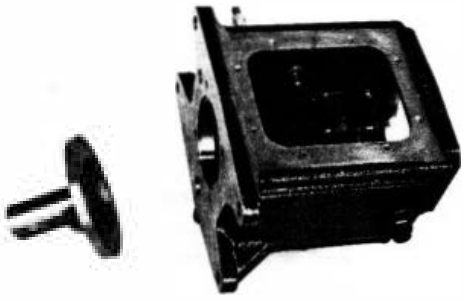
Remove the snap ring with SST.
SST [09905-00012]

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

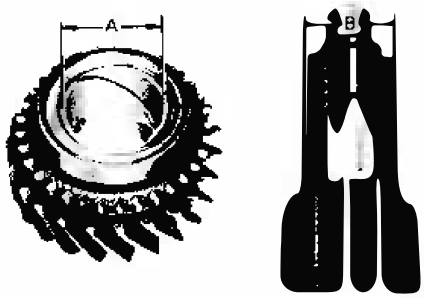
Inspect the shaft for wear or damage at the surfaces where the gears and bearing are installed.

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.

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

Limit 0.09 mm (0.0035 in.)

Fig. 3-128

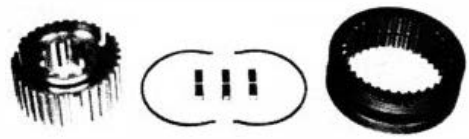
Synchronizer Ring

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

2nd & 3rd gear synchronizer ring clearance:

Limt 0.8 mm (0.031 in.)

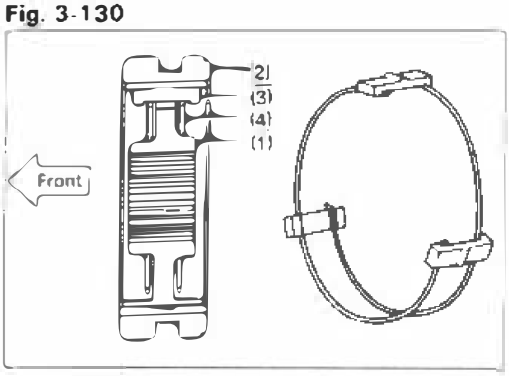
Fig. 3-129



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

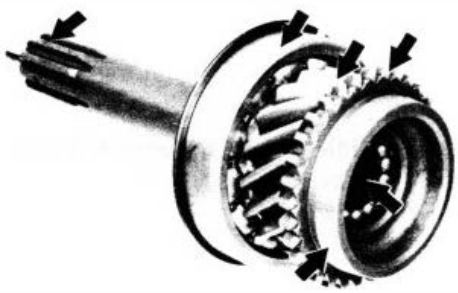
Shift Fork

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

Clearance:

Limit 0.8 mm (0.031 in.)

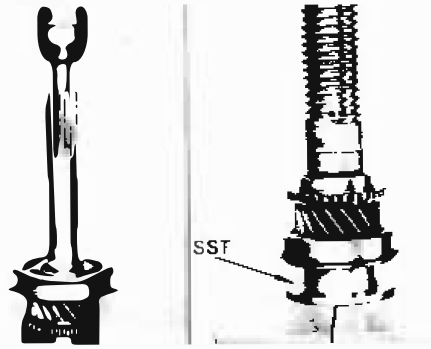
Fig. 3-132



Input Shaft

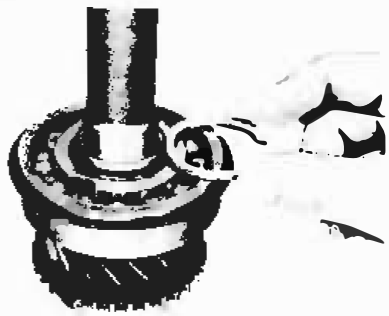
1. Inspect the gear teeth, splines, coned surfaces, and bearings for wear or damage

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

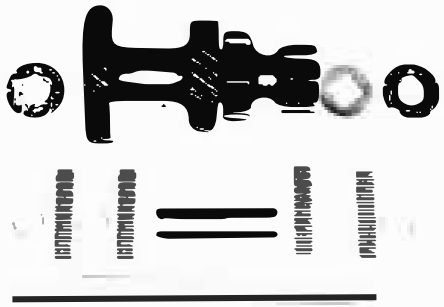


(4) Select a snap ring of the thickness that will allow minimum axial play and install it on the shaft

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)

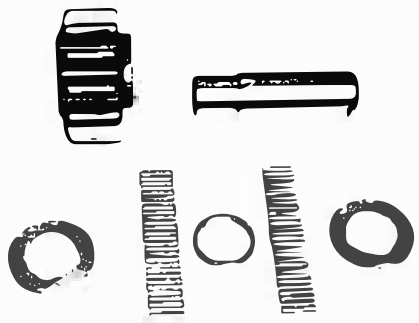
Fig. 3-135



Couter 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



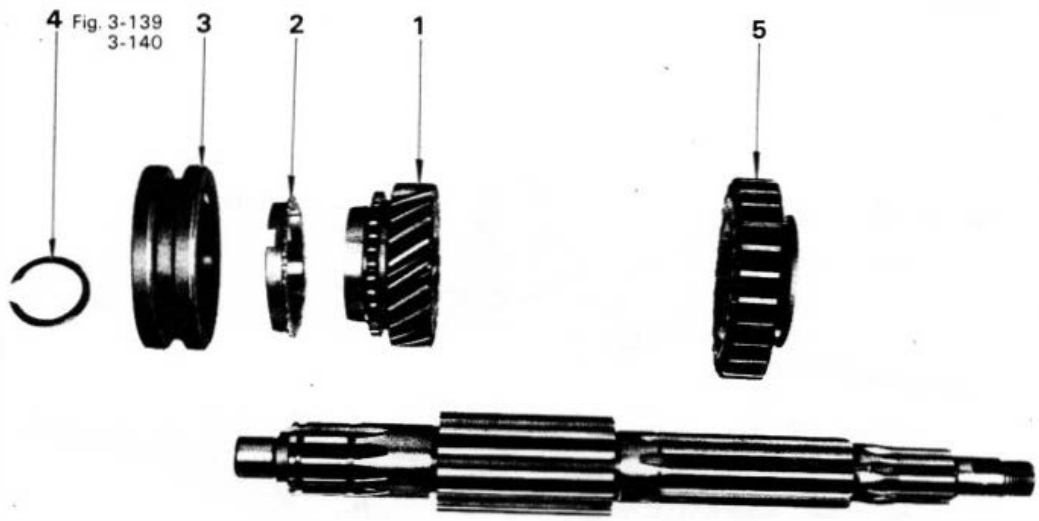
Reverse Idler Gear, Bearing & Shaft

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

ASSEMBLY

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

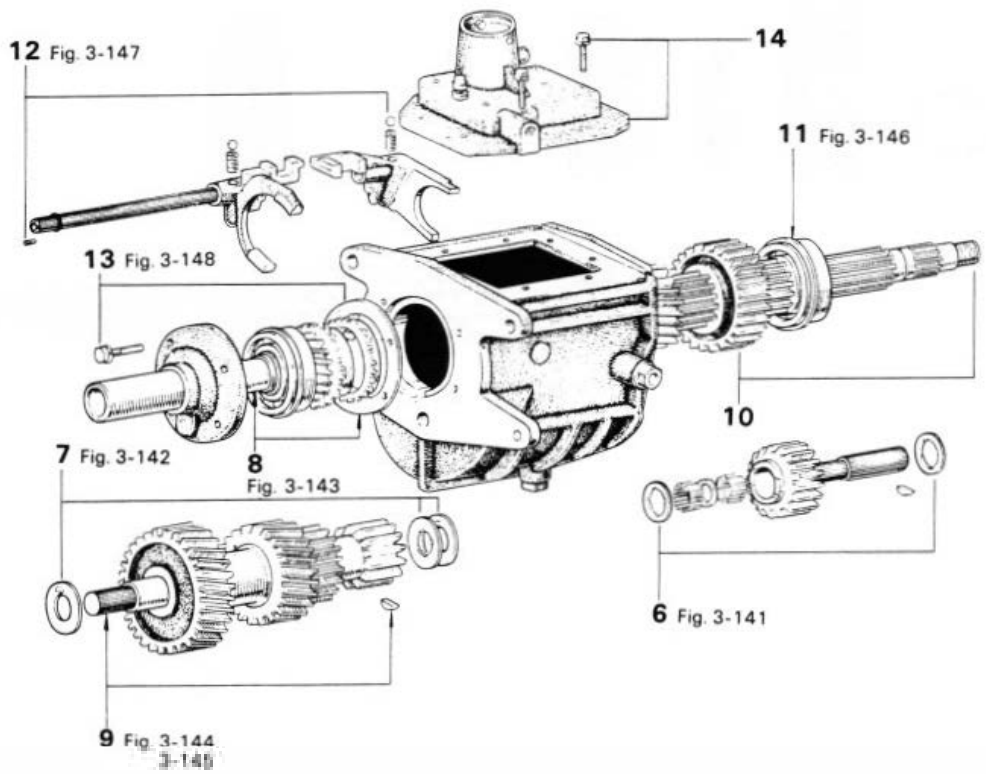
Fig. 3-137



1 2nd Gear
2 Synchronizer Ring
3 Clutch Hub & Sleeve
4 Snap Ring
5 1st & Reverse Gear

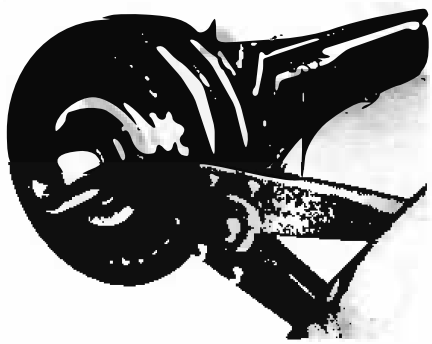
2 Assemble the parts in the numerical order shown in the figure

Fig. 3-138



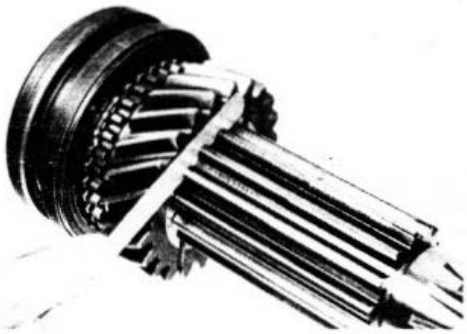
6. Reverse Idler Gear
7. Counter Gear
8. Input Shaft & Synchronizer Ring
9. Countershaft & Key
10. Output Shaft
11. Bearing
12. Shift Fork & Shaft
13. Front Bearing Retainer
14. Case Cover

Fig. 3-139



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

Fig. 3-140



Measure the 2nd gear thrust clearance.

Thrust clearance:

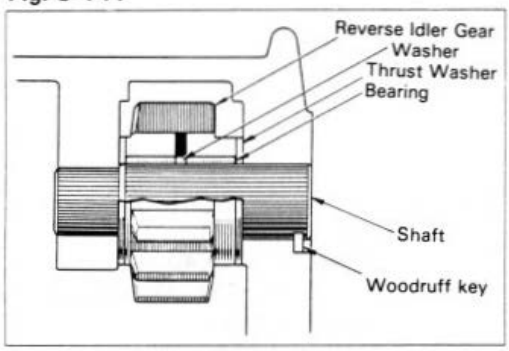
STD 0.10–0.40 mm (0.0039–0.0157 in.)

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

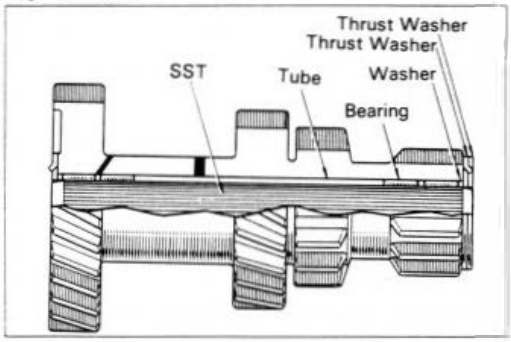


Install as illustrated at left.

– Note –

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

Fig. 3-142

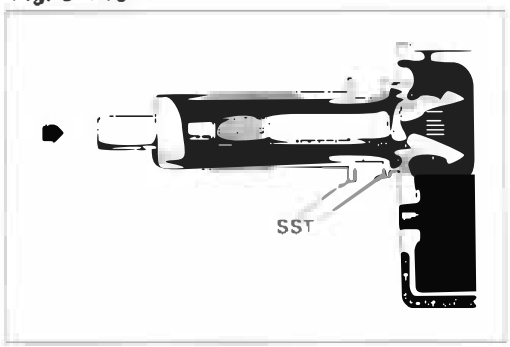


Assemble the counter gear assembly as illustrated at left, and install in the case with SST.
SST [09311-60010]

– Note –

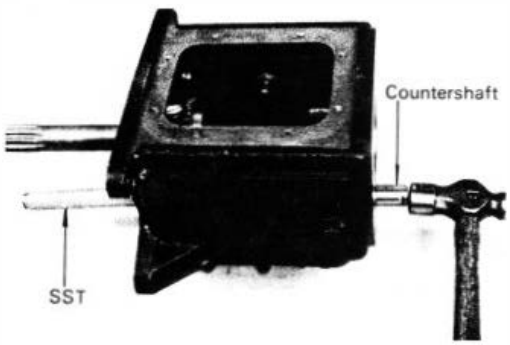
Coat MP grease on the bearing, washer, and spacer before installing.

Fig. 3-143



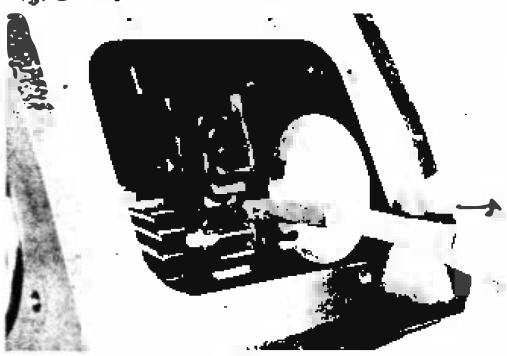
Drive in the input shaft with SST
SST [09316-60010]

Fig. 3-144



Drive in the countershaf tand key

Fig. 3-145



Measure the counter gear thrust clearance

Thrust clearance:

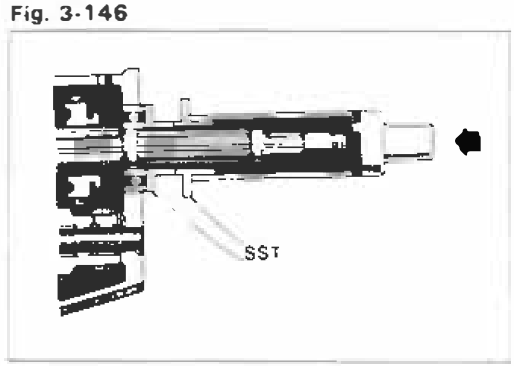
STD 0.10—0.40 mm (0.0039—0.0157 in.)

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

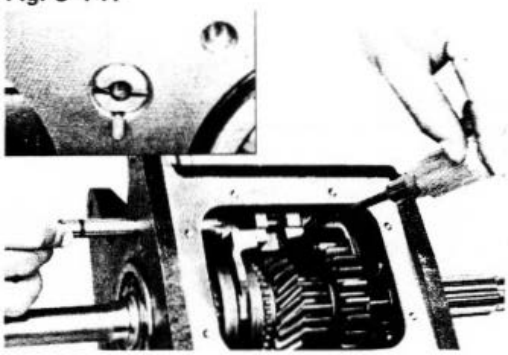


Drive in the bearin g with SST
SST [09316-60010]

— Note —

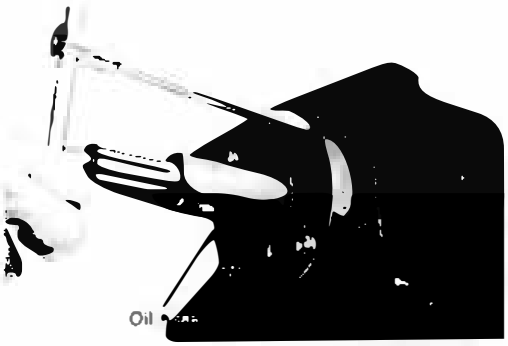
Position the hub sleeve at 3rd gear, and insert the output shaft assembly into the case.

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

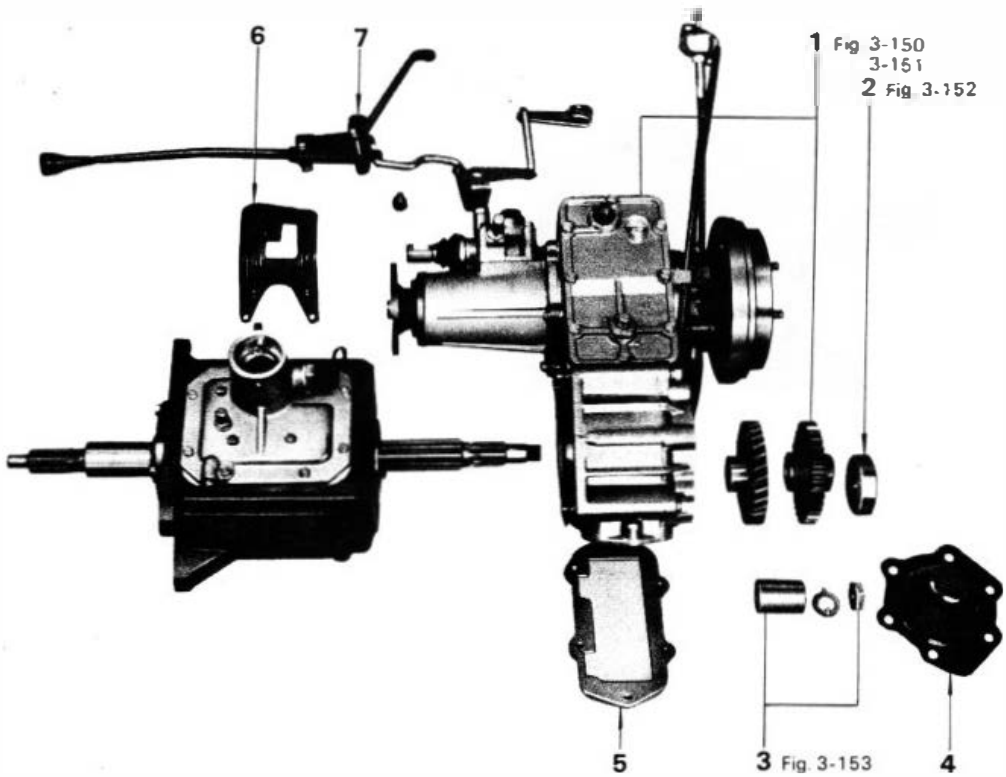


Install the retainer with its oil hole positioned downward.

INSTALLATION

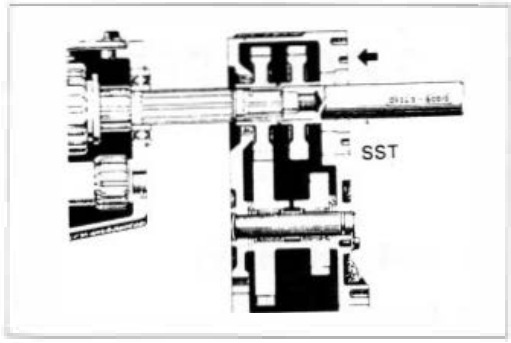
Install the parts in the numerical order shown in the figure.

Fig. 3-149



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

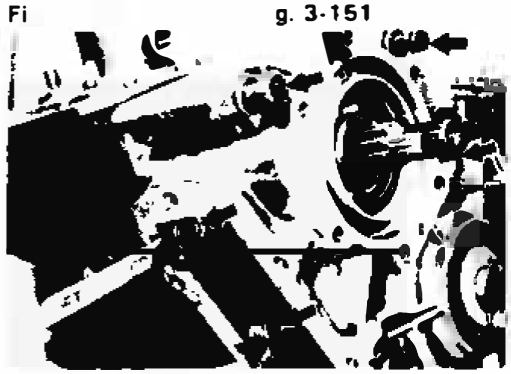
Fig. 3-150



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]

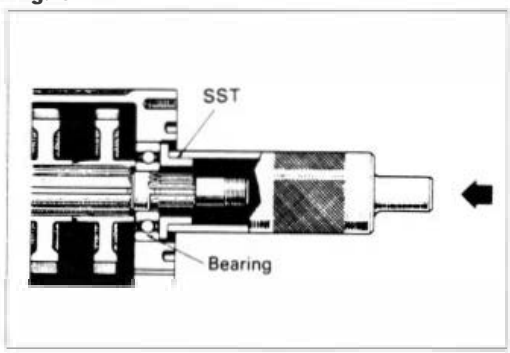
– Note –
Make sure that the gears are positioned in correct direction.
Remove the SST from the output shaft.

Fig. 3-151



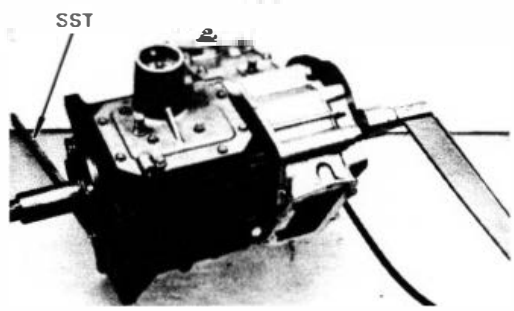
Tighten the five bolts at the specified torque.
Tightening torque:
5.0 – 8.0 kg-m
(37 – 57 ft-lb)

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

Fig. 4-1

SEE

TRANSMISSION

REMOVAL SECTION

Fig. 3-2 to 3-5

TRASFER (H41 & H42)

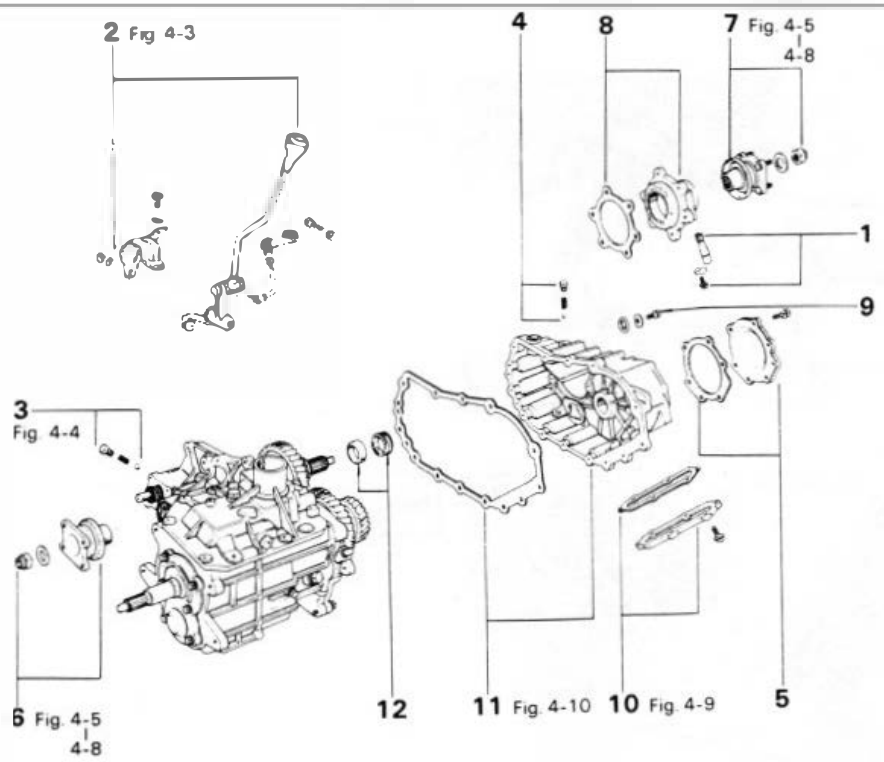
REMOVAL

Remove the transmission

DISASSEMBLY

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

Fig. 4-2



1	Speedometer Driven Gear	7	Companion Flange
2	Shift Lever	8	Bearing Retainer & Gasket
3	Locking Ball & Spring	9	Idler Gear Shaft Lock Plate
4	Locking Ball & Spring	10	PTO Cover
5	Case Cover	11	Transfer Case
6	Companion Flange	12	Speedometer Drive Gear & Spacer

Fig. 4-3

Shift the shift lever into neutral position and measure the preload

Preload (starting):

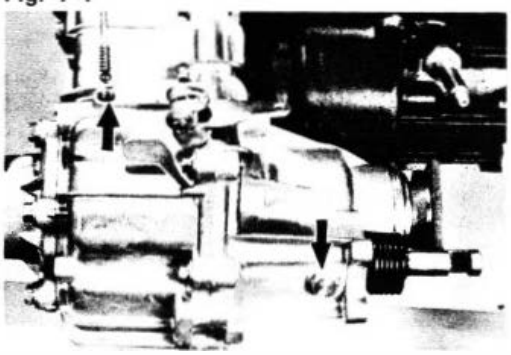
New Bearing

15 – 24.7 kg-cm
(13.0 – 21.4 in.-lb)

Reused Bearing

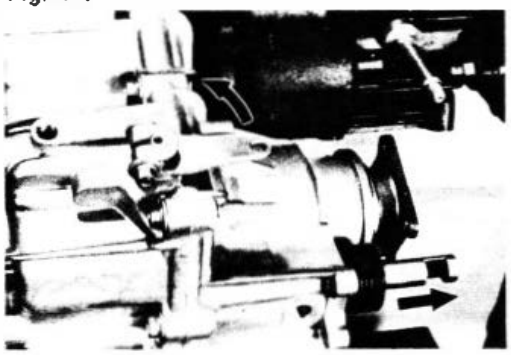
7 – 12 kg-cm
(6.1 – 10.4 in.-lb)

Fig. 4-4



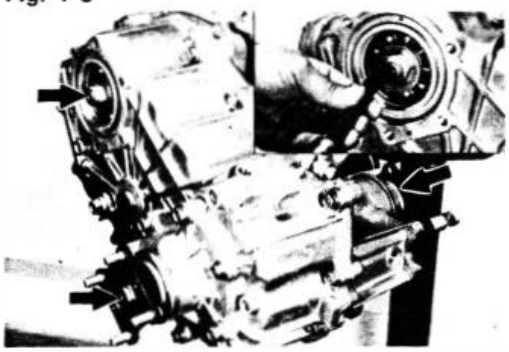
Remove the springs and the steel balls with a magnet

Fig. 4-5



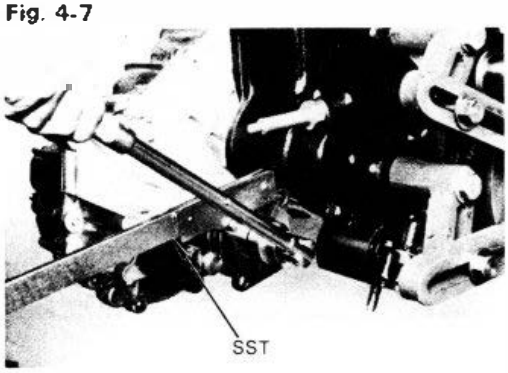
Shift the shift lever into 4L position before loosening the nuts

Fig. 4-6



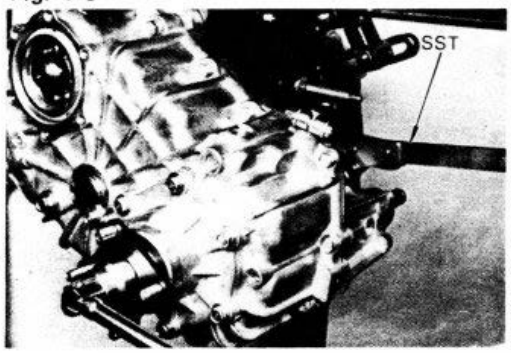
Partially loosen the nuts.

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:

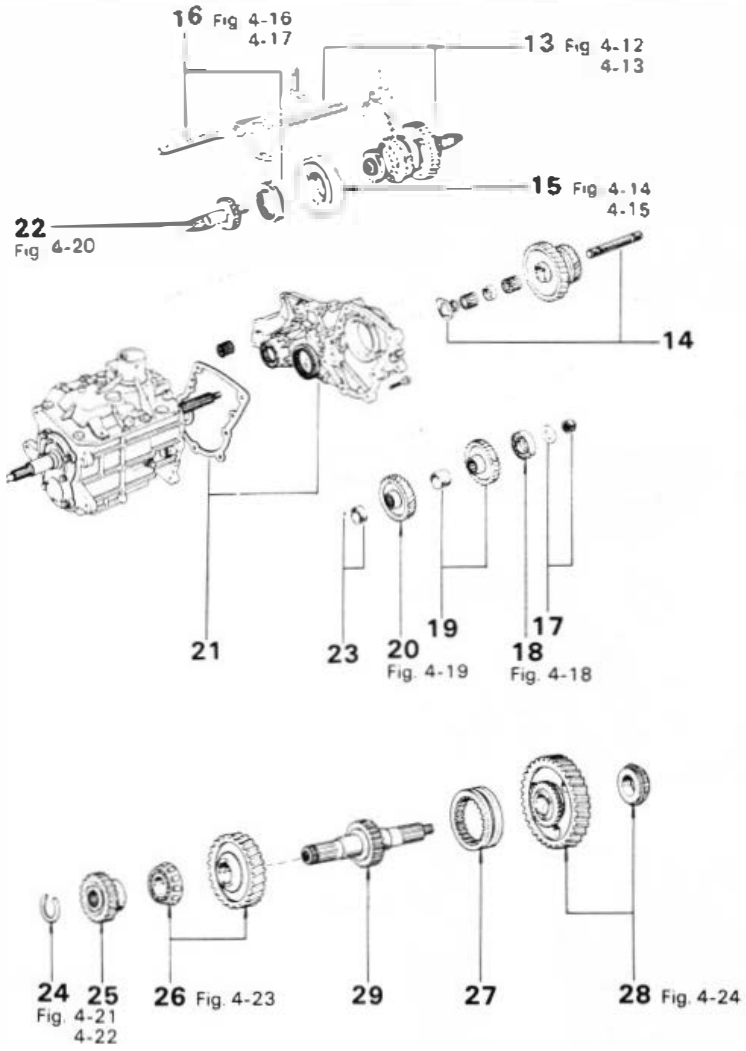
STD	**0.275 – 0.625 mm (0.0108 – 0.0246 in.)**
Limit	**0.625 mm (0.0246 in.)**

Fig. 4-10

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

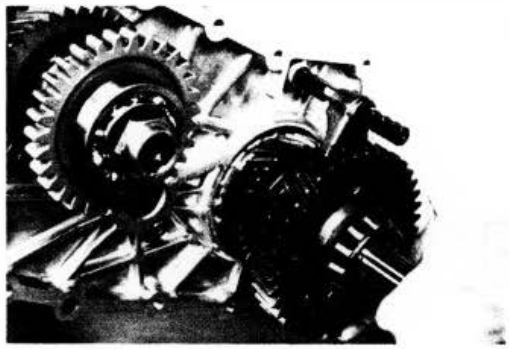
2 Disassemble the parts in the numerical order shown in the figure.

Fig. 4-11



13. Output Shaft, Shift Fork & Shaft
14. Idler Gear, Bearing & Thrust Washer
15. Bearing Retainer
16. Shift Fork, Shaft & Sleeve
17. Lock Nut
18. Bearing
19. PTO Drive Gear & Spacer
20. Transmission Output Gear
21. Intermediate Plate & Gasket
22. Front Output Shaft
23. Spacer & Ball
24. Snap Ring
25. Front Drive Clutch Hub
26. Bearing & High Speed Gear
27. Front Drive Clutch Hub Sleeve
28. Bearing & Low Speed Gear
29. Rear Output Shaft

Fig. 4-12



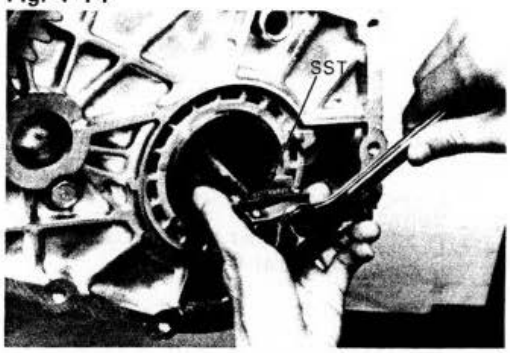
Pull out the output shaft with gears from the intermediate plate.

– Note –
Pull out the output shaf t together wi th the shift fork.

Fig. 4-13

Drive out the slotted spring pin.

Fig. 4-14



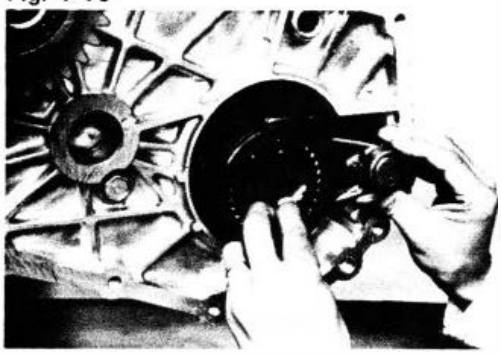
Remove the bearing retainer with SST.
SST [09308-10010]

Fig. 4-15

Remove the outer race.

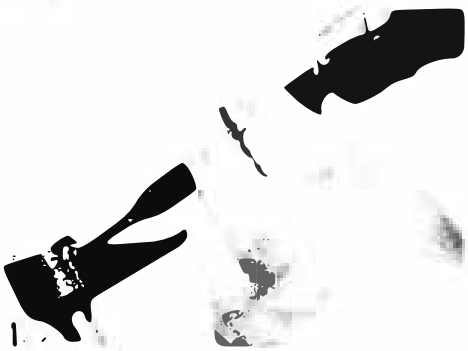
– Note –
Heat the retainer to 80°C (176°F) and tap out the outer race.

Fig. 4-16



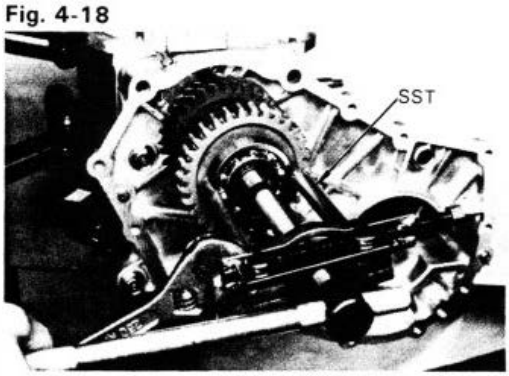
Pull out the clutch sleeve and shift fork with shaft

Fig. 4-17



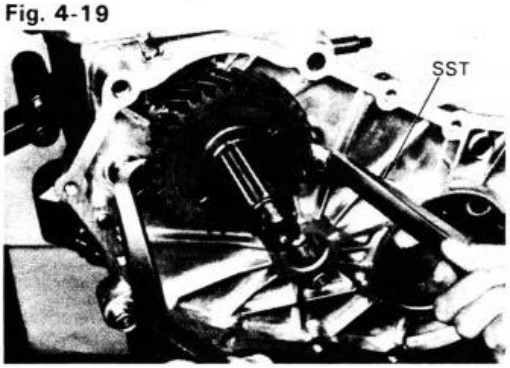
Drive out the slotted spring pin

Fig. 4-18



Remove the bearing with SST
SST [09950-20014]

Fig. 4-19

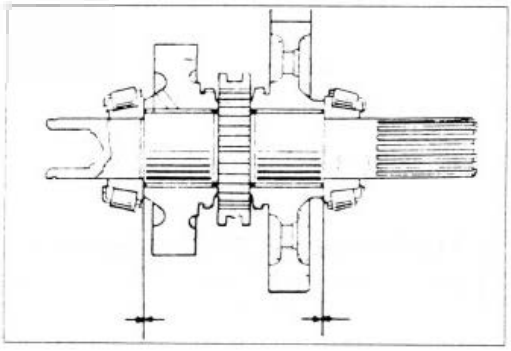


Using SST or suitable tool, pull out the gear
SST [09950-20014]

Fig. 4-20

Using a press, remove the front output shaft.

Fig. 4-21

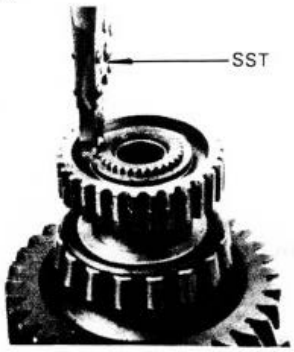


Measure the high and low gears thrust clearance.

Thrust clearance:

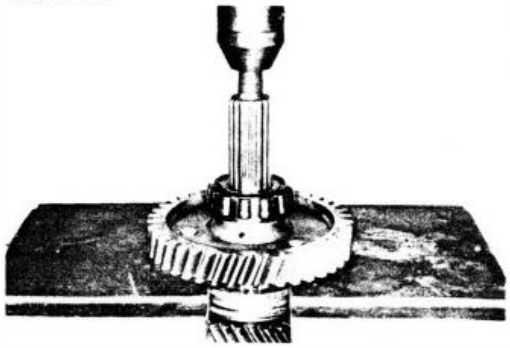
STD	**0.10—0.25 mm (0.0039—0.0098 in.)**
Limit	**0.25 mm (0.0098 in.)**

Fig. 4-22



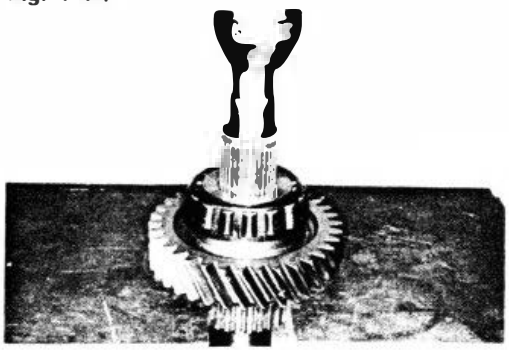
Remove the snap ring with SST.
SST [09905-00012]

Fig. 4-23



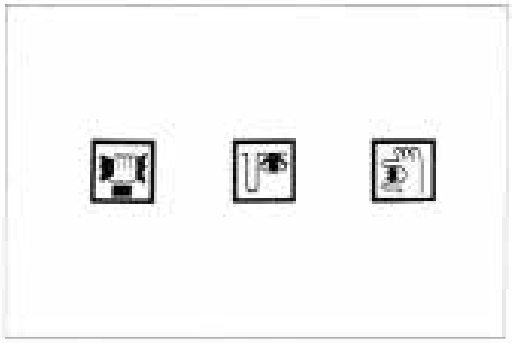
Using a press, remove the bearing.

Fig. 4-24



Using a press, remove the bearing.

Fig. 4-25



INSPECTION & REPAIR

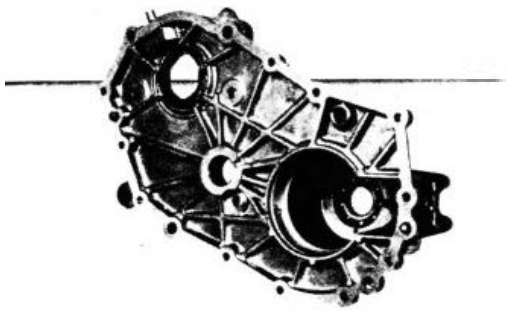
Wash the disassembled parts and inspect them as described below. Replace any part found defective.

Fig. 4-26

Transfer Case & Bearing Retainer

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

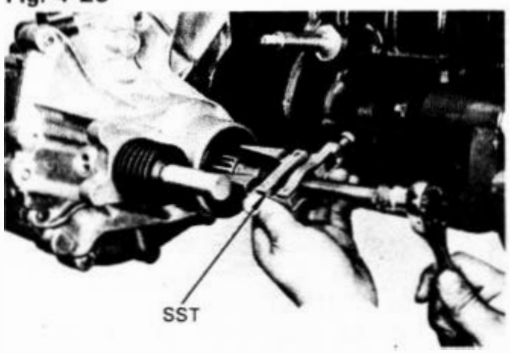
Fig. 4-27



Intermediate Plate

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

Fig. 4-28



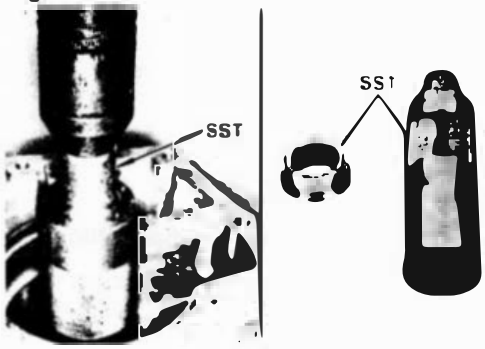
Replace The Output Shaft Front Bearing

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

Fig. 4-29

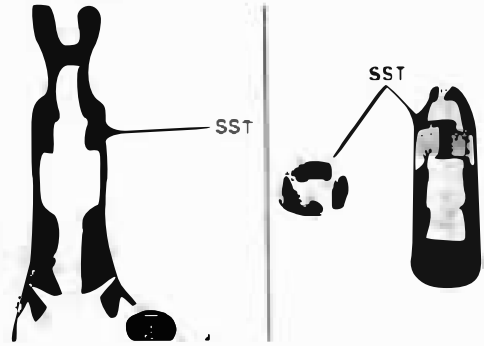
2 Remove the snap ring

Fig. 4-30



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

Fig. 4-31

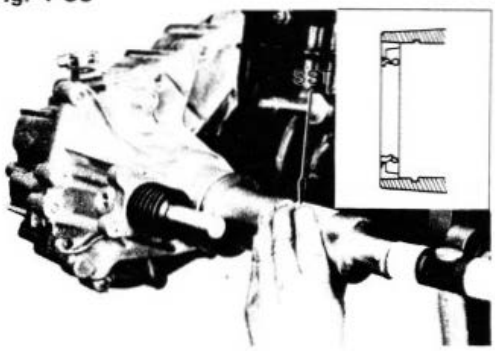


4 Install the bearing with a press and SST
SST [09316-60010]

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

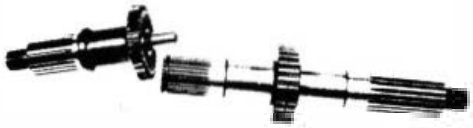
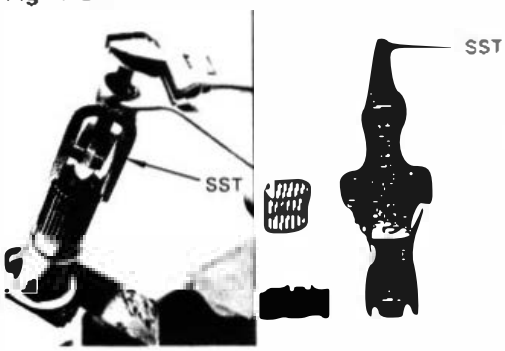


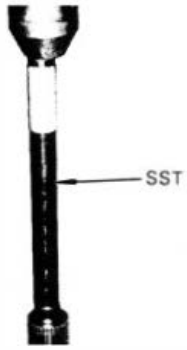
Fig. 4-35



Replace The Output Shaft Pilot Bearing
1. Remove the bearing with SST
SST [09319-60020]

– Note –
If you remove the bearing, the bearing is broken.

Fig. 4-36

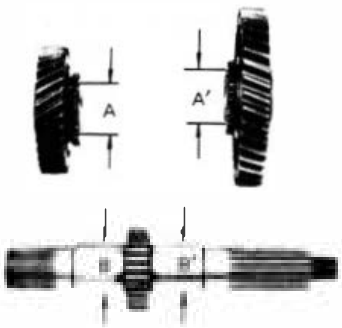


2. Press in the new bearing with SST.
SST [09608-20011] No.2

Fig. 4-37

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

Fig. 4-38

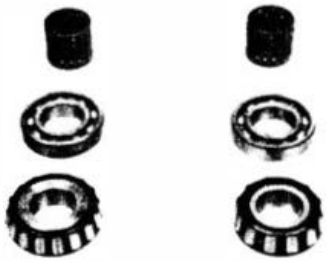


Measure the oil clearance.

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

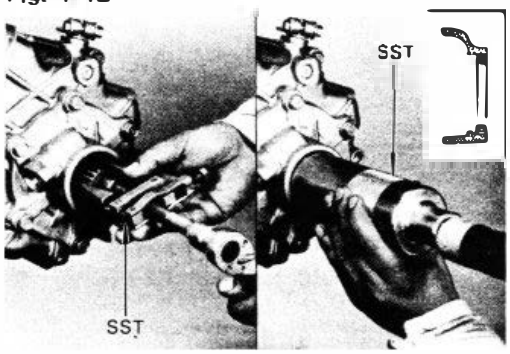
Clearance: 0.1—0.4 mm (0.004 — 0.016 in.)

Fig. 4-41

Idler Gear

Inspect for wear or damage

Fig. 4-42



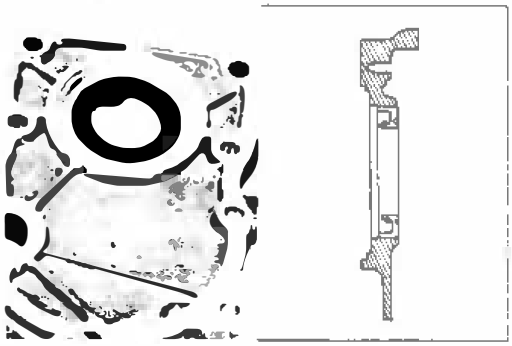
Replace The Transfer Rear Oil Seal

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

2 Install the oil seal to the correct depth with SST.
SST [09316-60010]

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 ssal with driver

2 Install the oil saal to the correct depth with SST
SST [09316-60010]

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

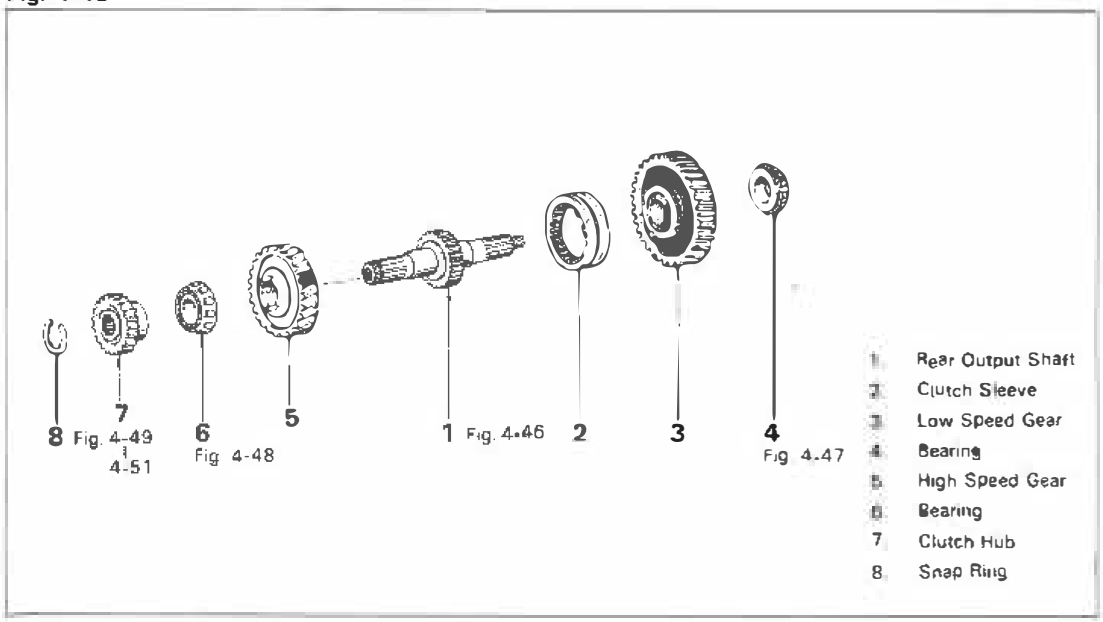
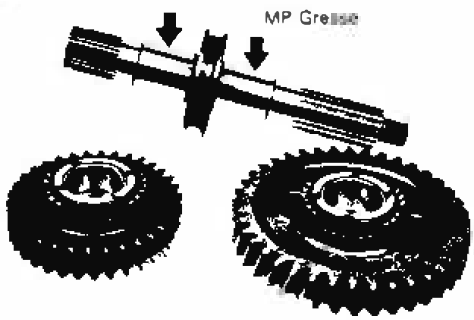
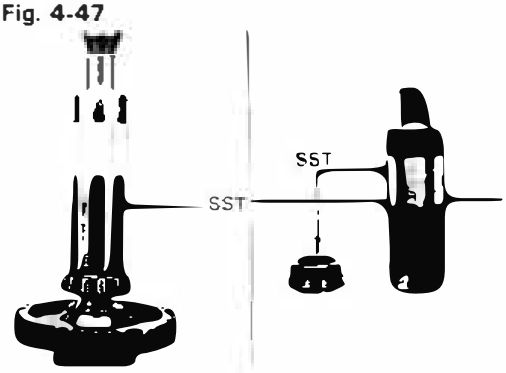


Fig. 4-46



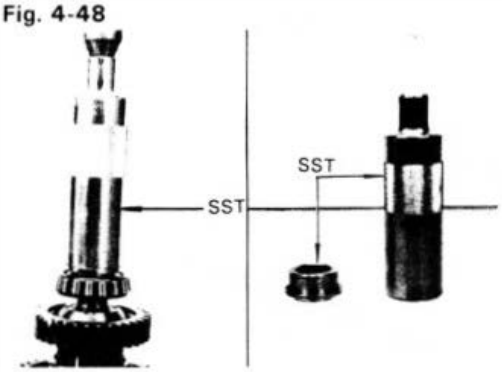
Coat MP grease on the shaft and install the high and low gears.

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.)

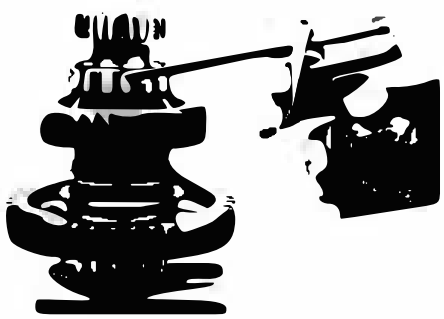
Mark	Thickness mm (in.)
90520-33107	2.30 – 2.35 (0.0906 – 0.0925)
90520-33110	2.60 – 2.65 (0.1024 – 0.1043)

Fig. 4-50

Install thesnap ring with SST
SST [09905-00012]

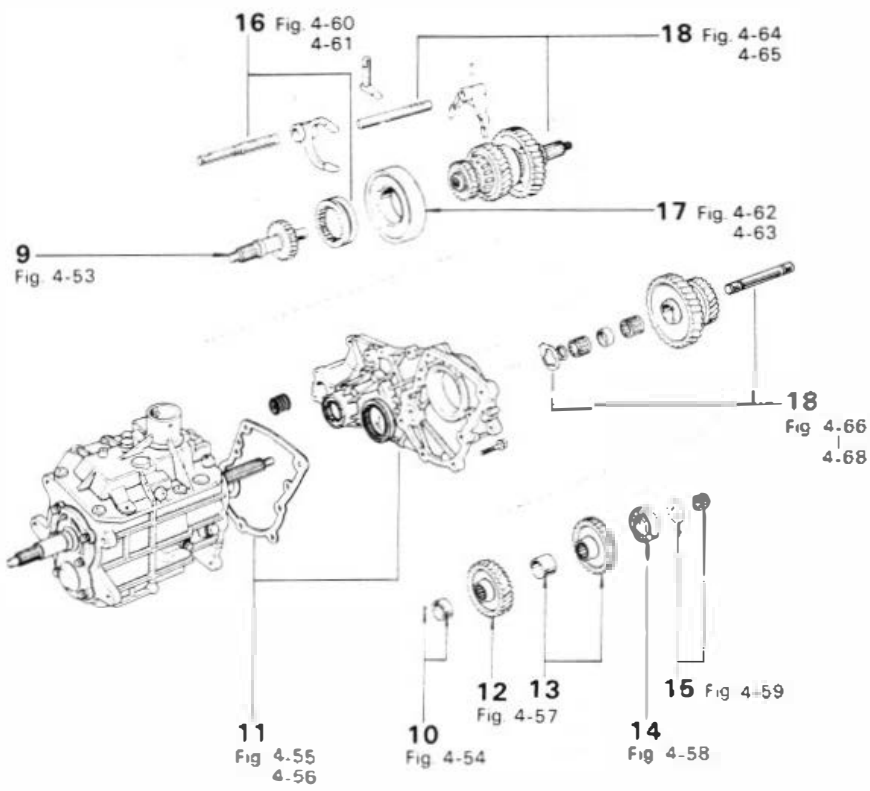
Fig. 4-51

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



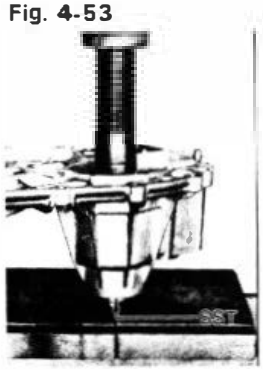
2 Assemble the parts in the numerical order shown in the figure

Fig. 4-52



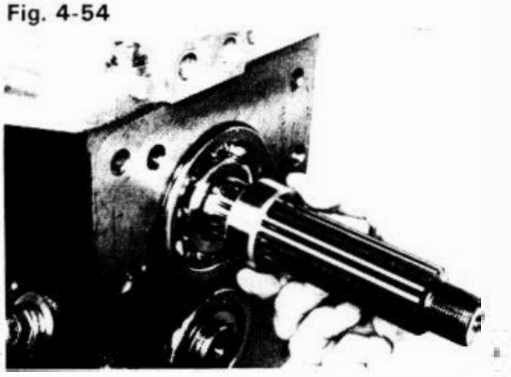
9	Front Output Shaft	13	Spacer & PTO Drive Gear	17	Bearing Retainer
10	Ball & Spacer	14	Bearing	18	Thrust Washer, Bearing, Spacer & Idler Gear
11	Gasket & Intermediate Plate	15	Washer & Lock Nut		
12	Transmission Output Gear	16	Front Drive Shift Fork, Shaft & Sleeve		

Fig. 4-53



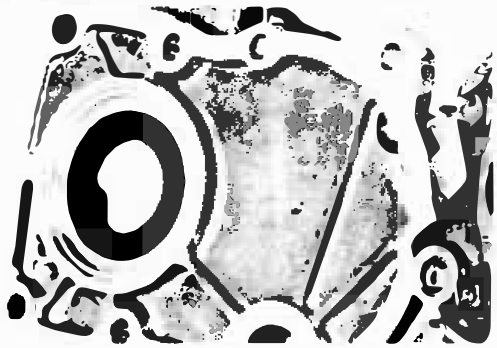
Press in the shaft with SST
SST [09316-60010]

Fig. 4-54



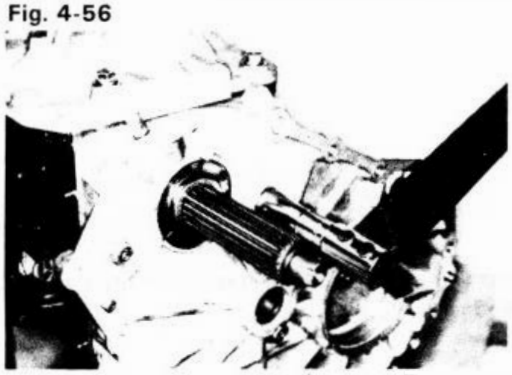
Fit the collar groove securely over the locking ball

Fig. 4-55



Coat MP grease on the oil seal

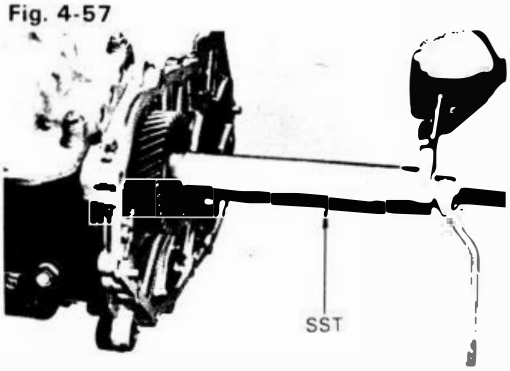
Fig. 4-56



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

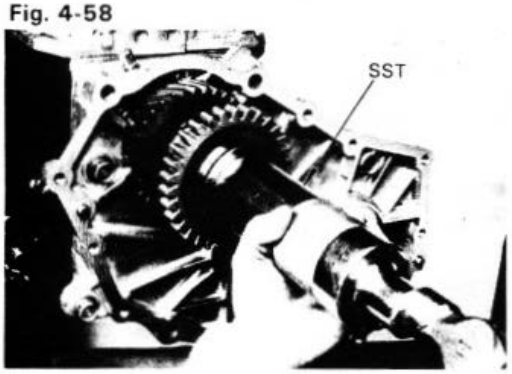
Tightening torque:
5.0—8.0 kg-m
(37—57 ft-lb)

Fig. 4-57



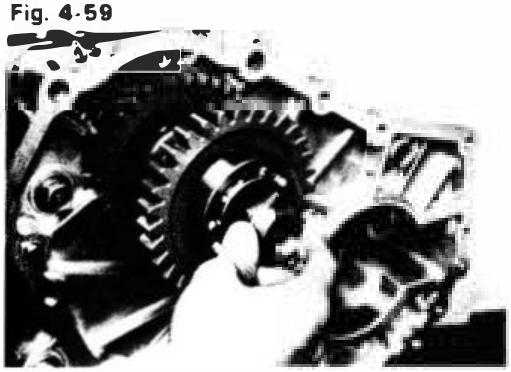
Install the gear with SST
SST [09309-36032]

Fig. 4-58



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

Fig. 4-59

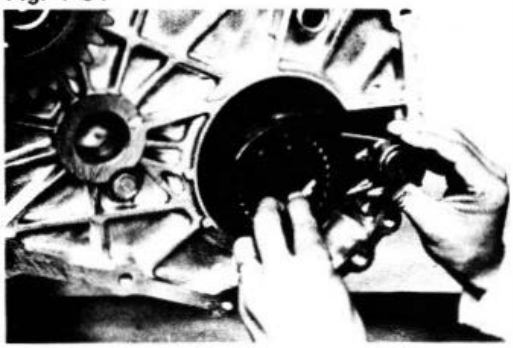


Temporarilly tighten the lock nut

Fig. 4-60

Drive in the slotted spring pin

Fig. 4-61

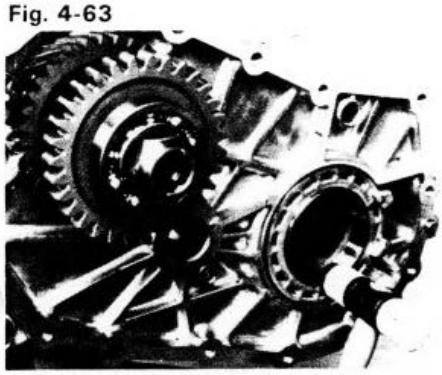


Install the shift fork, shaft and clutch hub sleeve

Fig. 4-62

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

Fig. 4-63

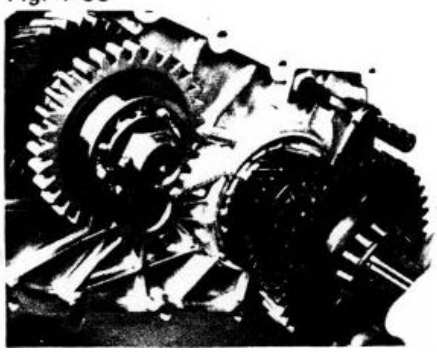


Install the bearing retainer by tapping with the plastic hammer

Fig. 4-64

Drive in the slotted spring pin

Fig. 4-65

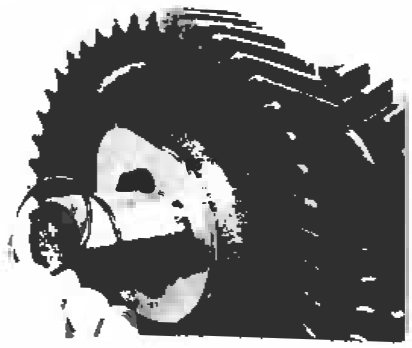


Install the shift fork, shaft and output shaft together

Fig. 4-66

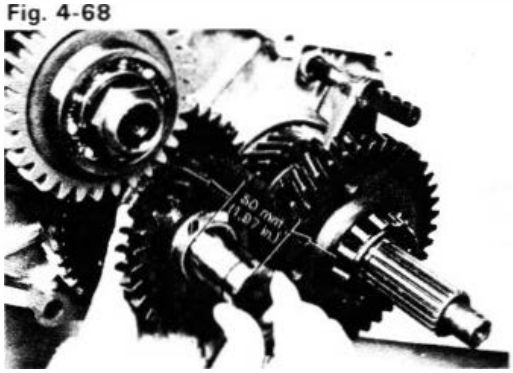
Stick the thrust washer to the plate with MP grease

Fig. 4-67



Install the O ring on the shaft

Fig. 4-68

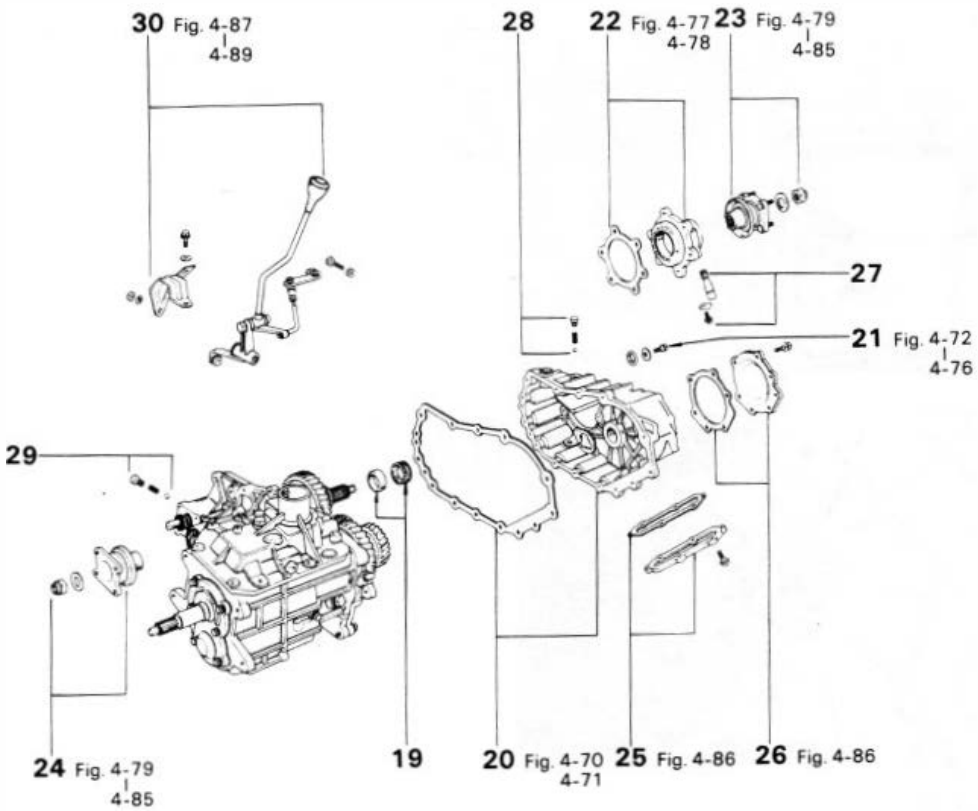


Do not completly insert the idler gear shaft

-Note-
Do not install the rear side O ring on the shaft

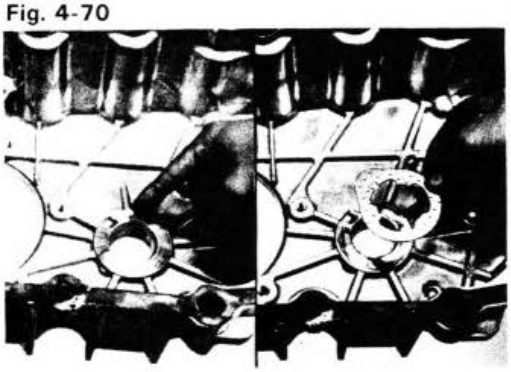
3 Assemble the parts in the numerical order shown in the figure

Fig. 4-69



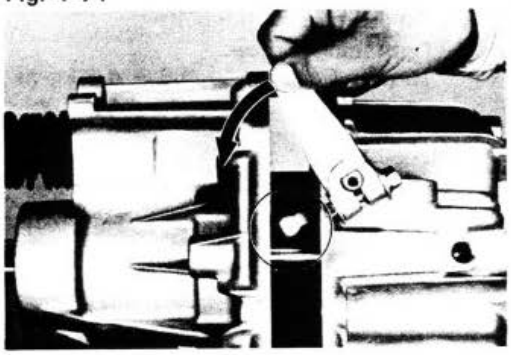
19	Spacer & Speedometer Drive Gear	25	Cover
20	Gasket & Transfer Case	26	Cover
21	O Ring & Lock Plate	27	Speedometer Driven Gear
22	Bearing Retainer	28	Locking Ball & Spring
23	Companion Flange	29	Locking Ball & Spring
24	Companion Flange	30	Shift Lever

Fig. 4-70



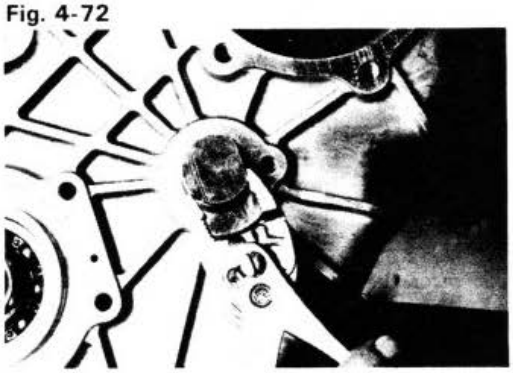
Stick the thrust washer to the case with MP grease

Fig. 4-71



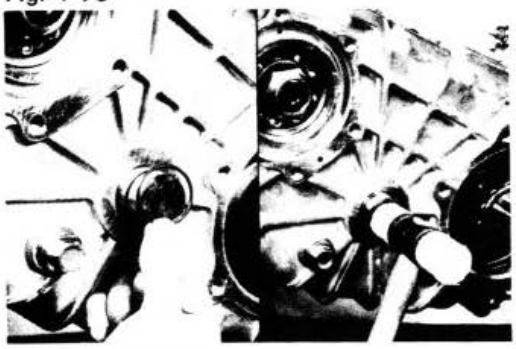
When installing the case, turn the select lever counterclockwise and engage the lever tip to the shaft groove.

Fig. 4-72



Align the shaft groove to the bolt hole.

Fig. 4-73

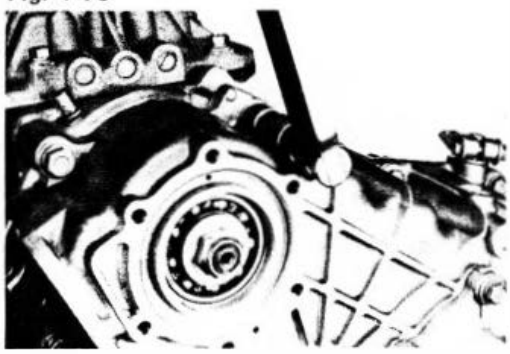


Install the O ring on the shaft and drive in the shaft by tapping with plastic hammer.

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

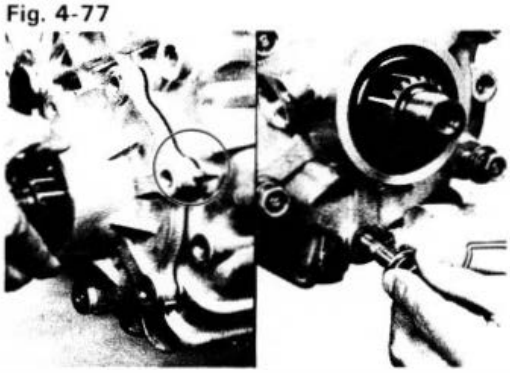
Thrust clearance

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.

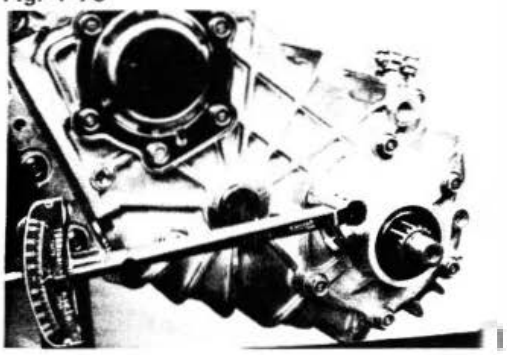
Fig. 4-77



Align the bearing retainer rib with case rib

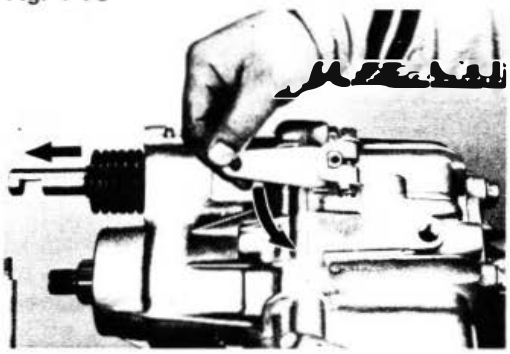
Apply liquid sealer to the bolt

Fig. 4-78



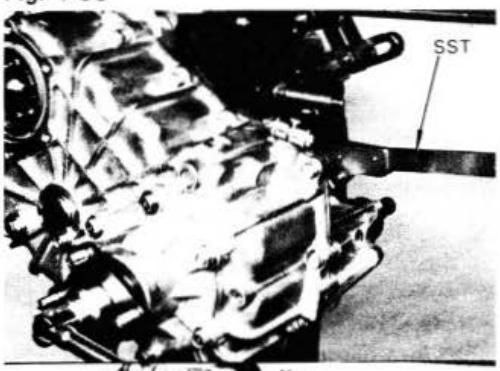
Tighten the bearing retainer
Tightening torque: 3.0 – 4.5 kg-m (22 – 23 ft-lb)

Fig. 4-79

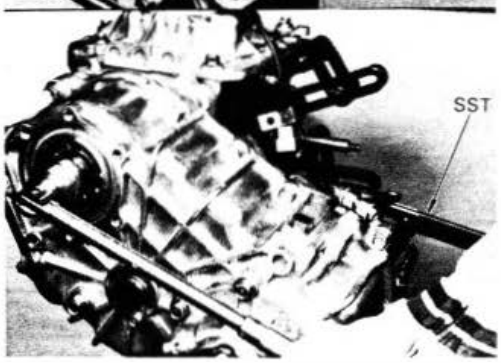


Shift the shift lever into the L4 position

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

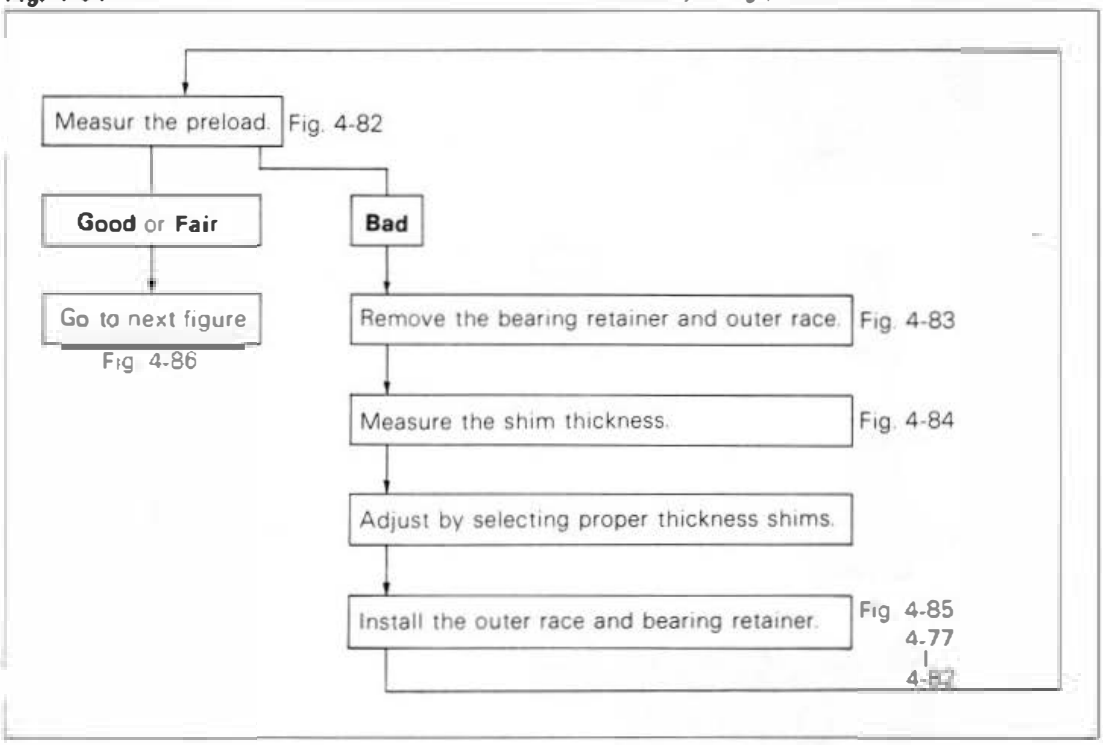
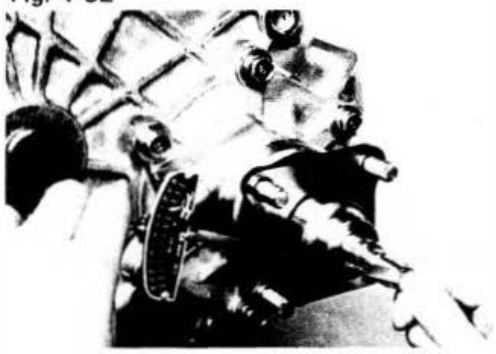


Fig. 4-82



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.

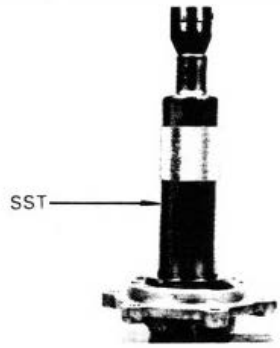
Fig. 4-84

2 Select the shim

Shim thickness mm (in.)

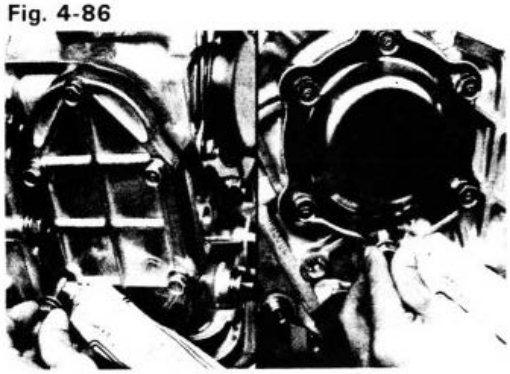
Mark	Thickness	Mark	Thickness
0	0.15 (0.0059)	10	1.0 (0.039)
4	0.4 (0.016)	11	1.1 (0.043)
5	0.5 (0.020)	12	1.2 (0.047)
6	0.6 (0.024)	13	1.3 (0.051)
7	0.7 (0.028)	14	1.4 (0.055)
8	0.8 (0.031)	15	1.5 (0.059)
9	0.9 (0.035)		

Fig. 4-85



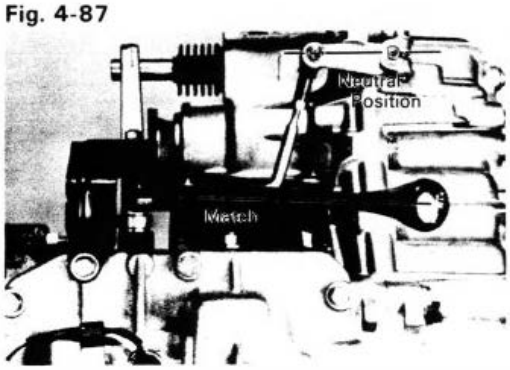
3 Install the outer race with SST
SST (09316-60010)

Fig. 4-86



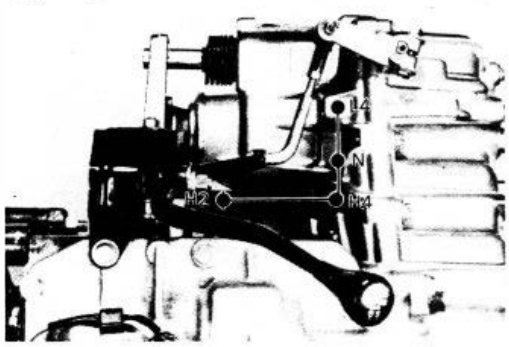
Apply liquid sealer to the thread

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

Install the transmission

SEE

TRANSMISSION

INSTALLATION SECTION

Fig. 3-103 to 3-108

TRANSFER (J30)

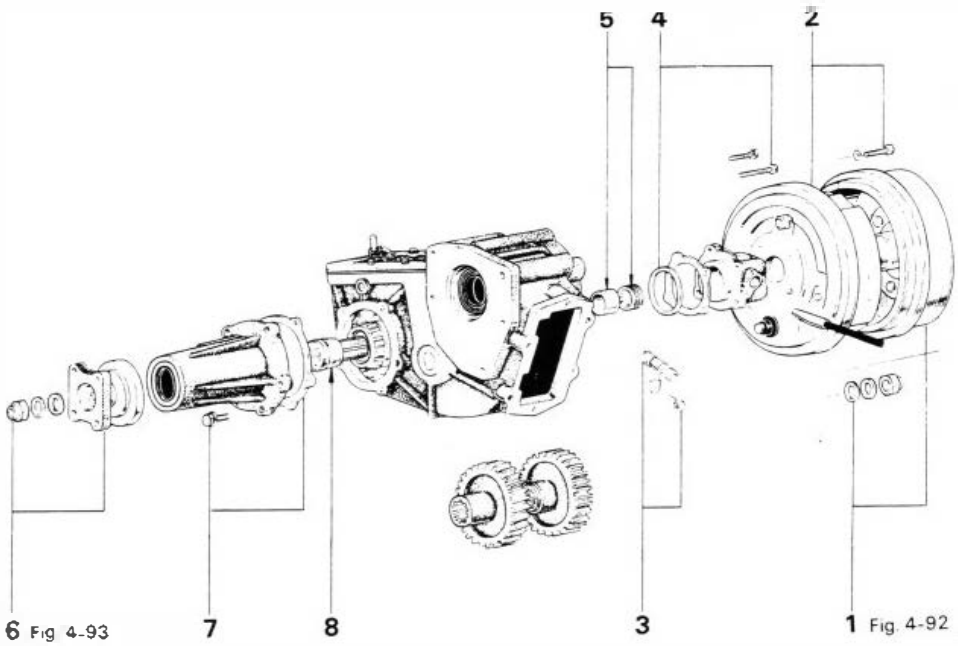
REMOVAL

Refer to section on 3-Speed Transmission

DISASSEMBLY

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

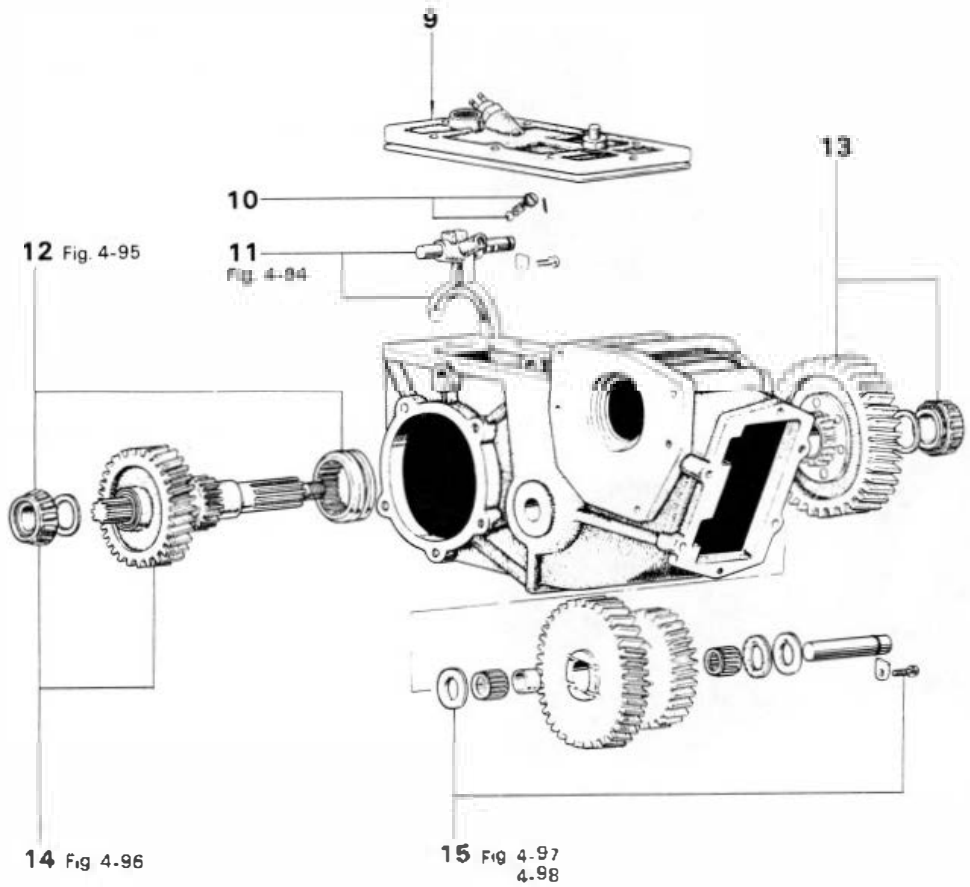
Fig. 4-90



1 Brake Drum, Plate, Shim, Plate & Nut
2 Backing Plate
3 Driven Gear
4 Bearing Rear Retainer & Shim
5 Drive Gear & Spacer
6 Companion Flange
7 Extension Housing
8 Clutch Sleeve

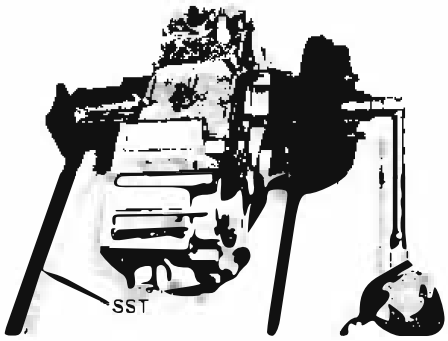
2 Disassemble the parts in the numerical order shown in the figure.

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

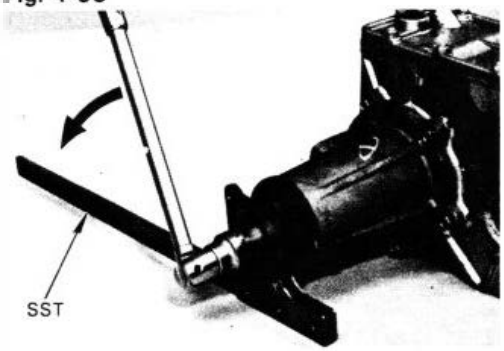
Fig. 4-92



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

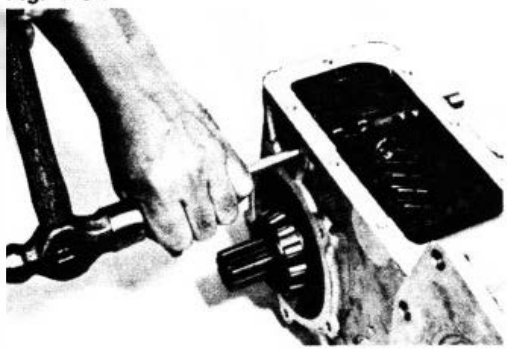
– Note –
Have the system in front drive at this time.

Fig. 4-93



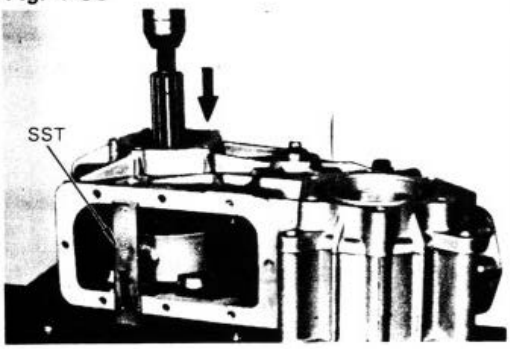
Loosen the staked parts of the nut
Using SST to keep the companion flange from turning, unscrew the nut
SST [09330-00020]

Fig. 4-94



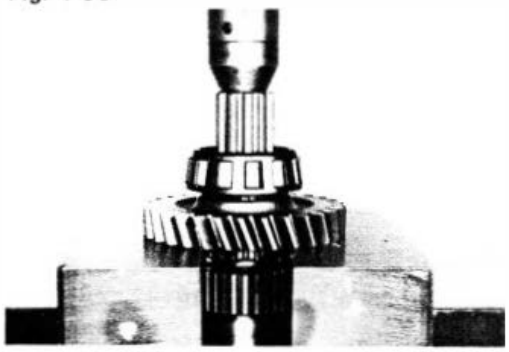
Drive out the shaft toward the rear.

Fig. 4-95



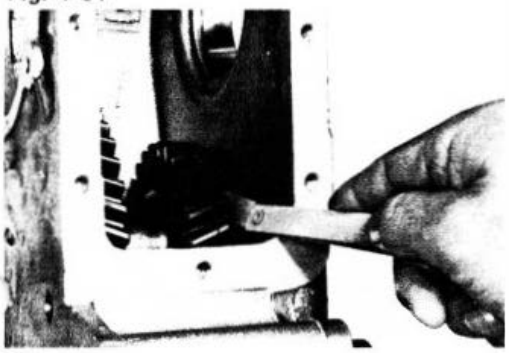
Set the SST between the low speed gear and case front side
Force out the output shaft toward the front with a press
SST [09318-60011]

Fig. 4-96



Using a press, remove the bearing

Fig. 4-97

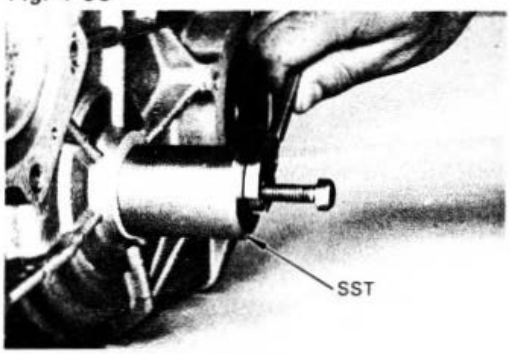


Messure the idler gear thrust clearance

Thrust clearance:

Limit 0.475 mm (0.0187 in.)

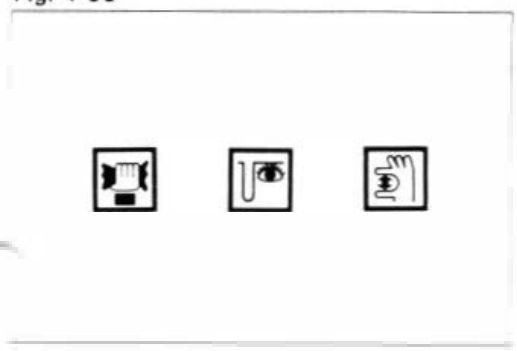
Fig. 4-98



Remove the shaft with SST

SST [09319-60010]

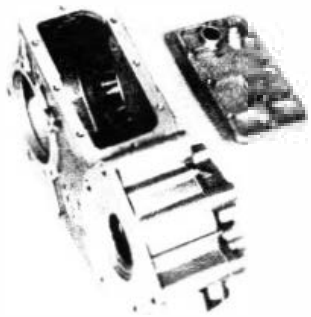
Fig. 4-99



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

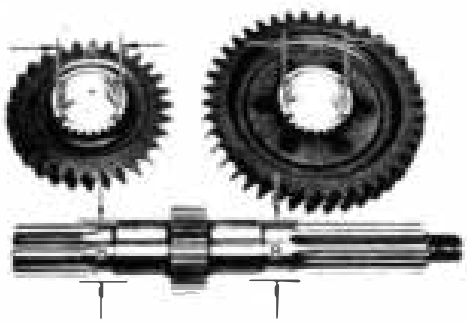
Inspect the parts indicated by arrows for wear or damage

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

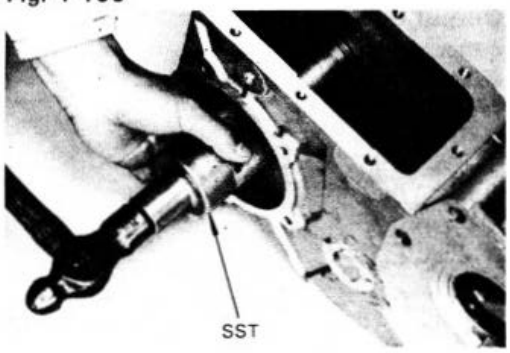
High & low speed output gear:

STD	**0.035—0.081 mm (0.0014—0.0032 in.)**
Limit	**0.081 mm (0.0032 in.)**

Fig. 4-104

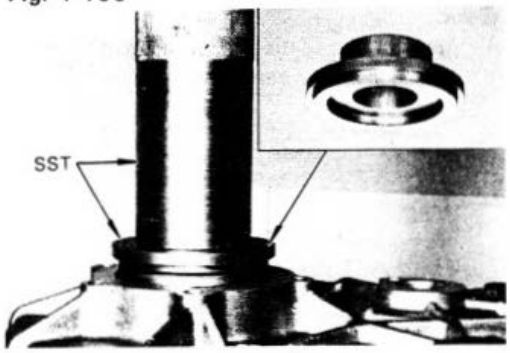
Bearing
Inspect for wear or damage

Fig. 4-105



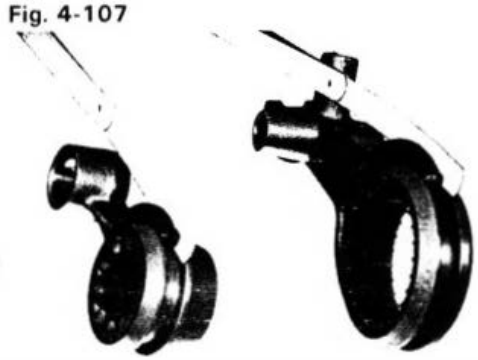
Replace The Bearing Race
1 Drive out the outer race with SST
SST [09316-60010]

Fig. 4-106



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

Fig. 4-107

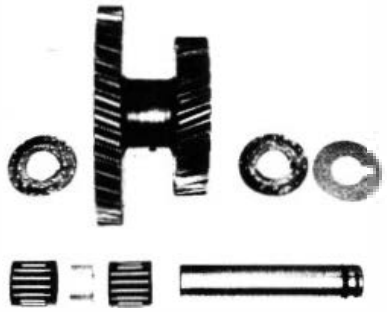


Sleeve & Fork
Check the clearance between the sleeves and the shift forks

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.)

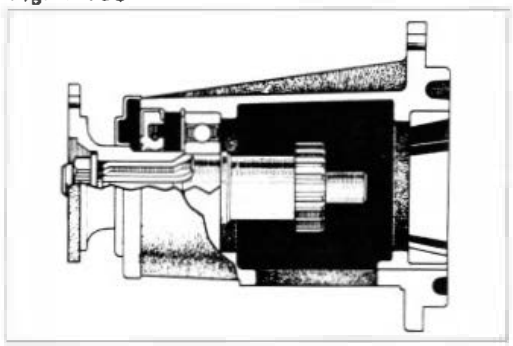
Fig. 4-108



Idler Gear

Inspect for wear or damage

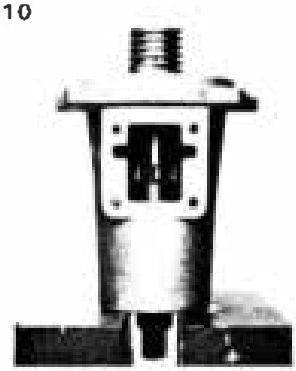
Fig. 4-109



Extension Housing

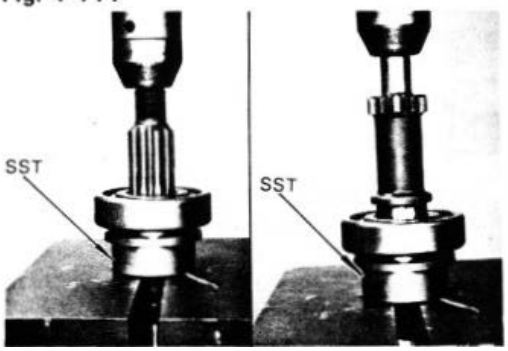
1 Inspect the shaft, bearing, and oil seal for wear or damage

Fig. 4-110



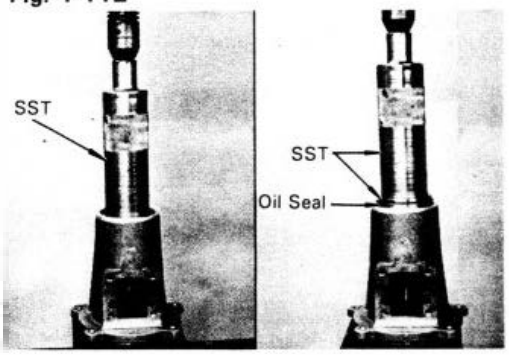
2 Replace the bearing
- (1) Remove the oil seal
- (2) Remove the snap ring
- (3) Using a press, remove the bearing together with the shaft

Fig. 4-111



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

Fig. 4-112

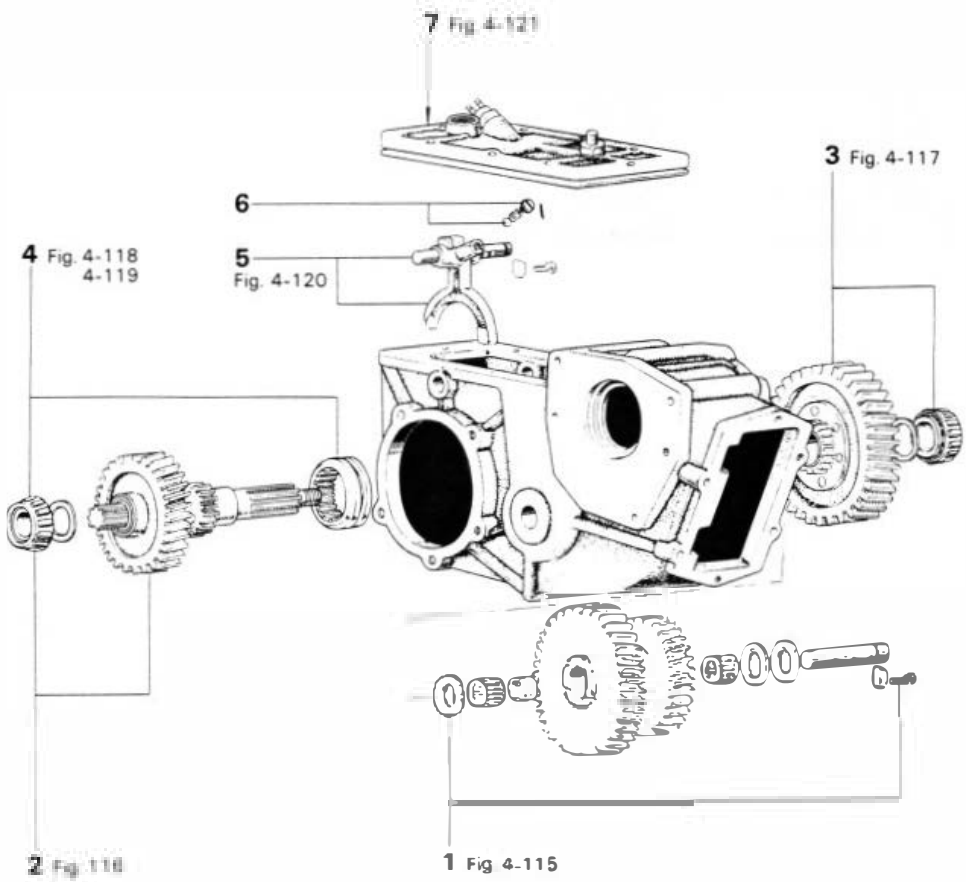


(5) Using SST, install the bearing together with the shaft
SST [09316-60010]
(6) Install the snap ring
(7) Install the oil seal with SST
SST [09316-60010]

ASSEMBLY

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

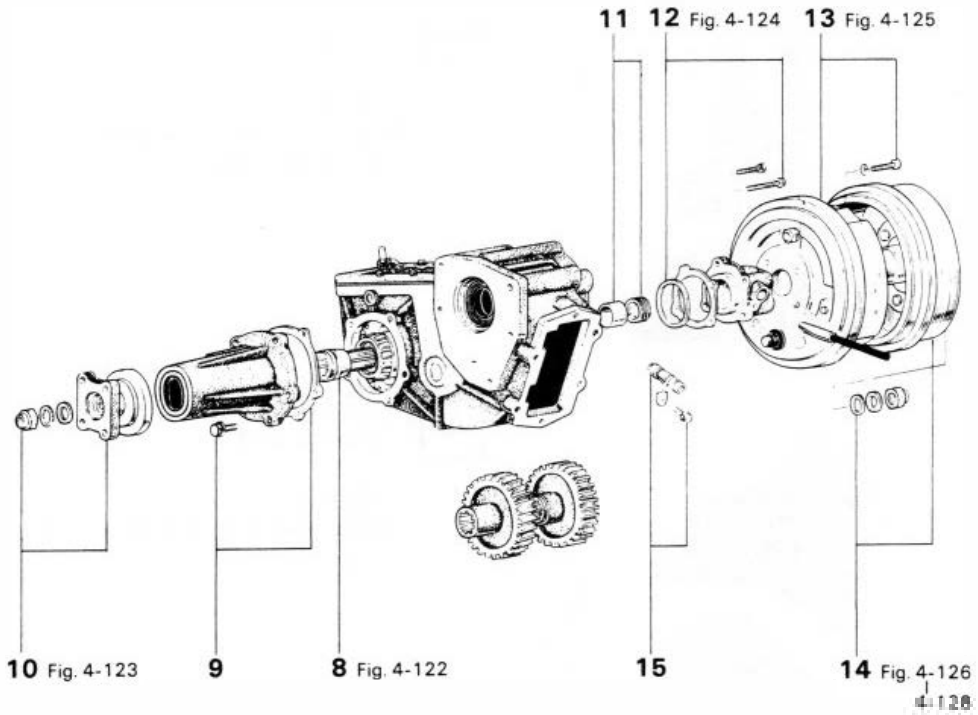
Fig. 4-113



1. Idler Gear & Shaft
2. High Speed Gear, Washer & Bearing
3. Low Speed Gear, Washer & Bearing
4. Clutch Sleeve, Gear & Output Shaft
5. Shift Fork & Shaft
6. Ball, Spring & Plug
7. Case Cover & Shift Inner Lever

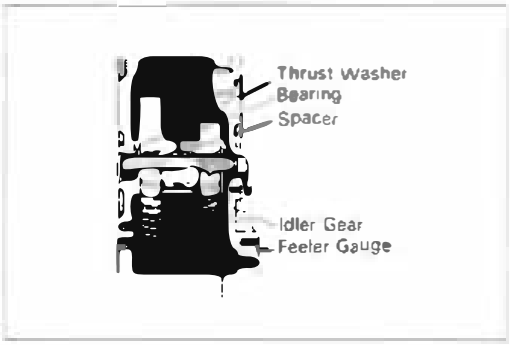
2 Assemble the parts in the numerical order shown in the figure

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

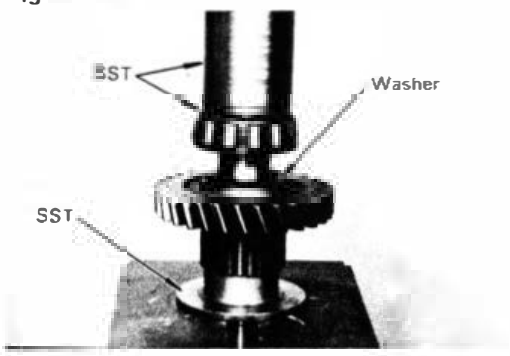


Install the idler gear assembly and shaft as illustrated.

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)

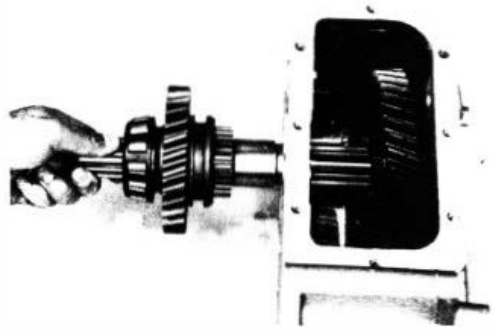
– Note –
Make sure that the gear is positioned in correct direction.

Fig. 4-117

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

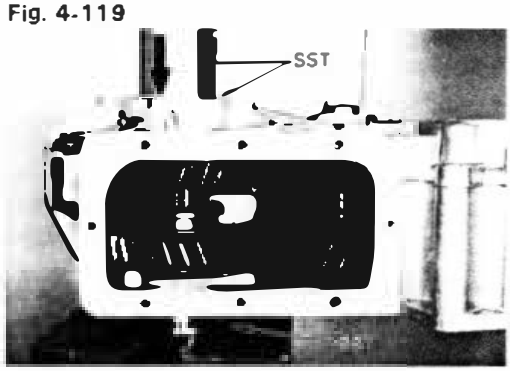
– Note –
Make sure that the gear is positioned in correct direction.

Fig. 4-118



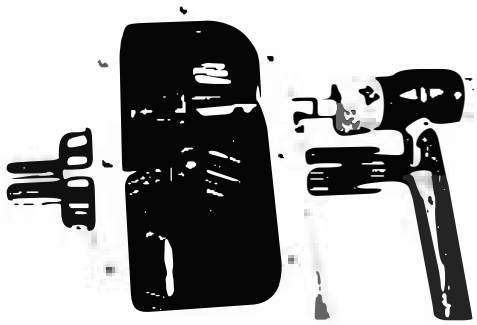
Install the clutch sleeve to the output shaft. Install the output shaft assembly to the case after inserting it through the low speed gear, washer and bearing.

Fig. 4-119



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

Fig. 4-120



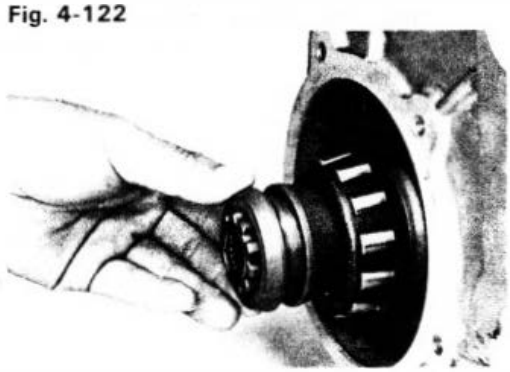
Drive in the shaft from the rear side of case

– 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

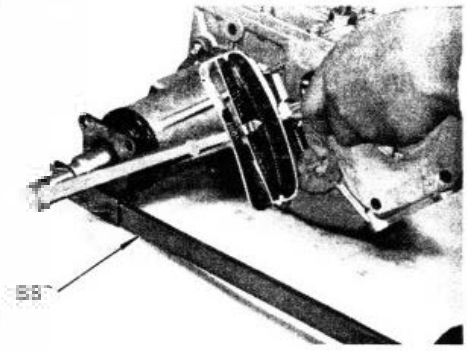
Fig. 4-122



Install the clutch sleeve to the output shaft

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

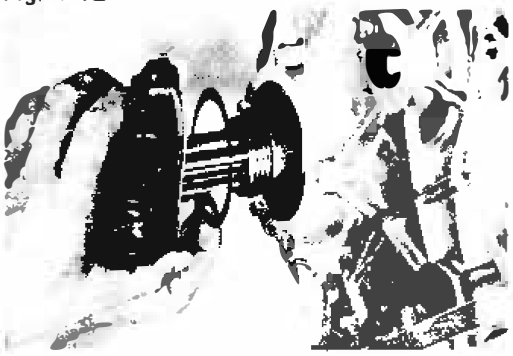
Fig. 4-123



Using SST to keep the companion flange from turning, screw on the nut. Stake the nut after installation.
SST [09330-00020]

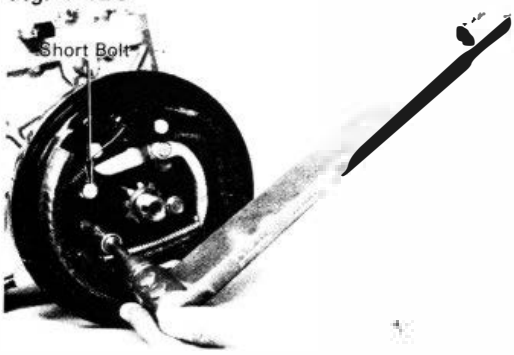
Tightening torque: 14.0 – 17.0 kg-m (102 – 122 ft-lb)

Fig. 4-124



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

Fig. 4-125

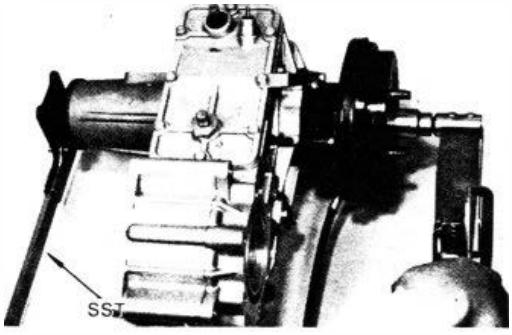


Install the backing plate assembly.

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

– Note –
Install the short bolt at upper left.

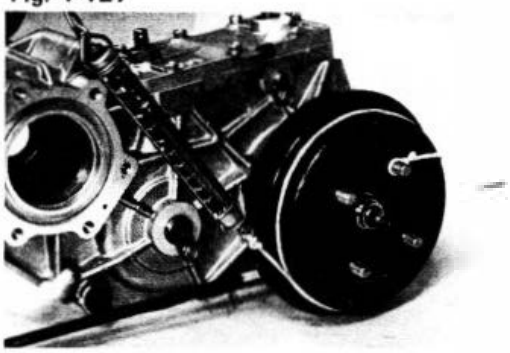
Fig. 4-126



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 (.00039)
90564-64023	0.15 (.00059)
90564-64024	0.20 (.00079)
90564-64025	0.25 (.00098)

INSTALLATION

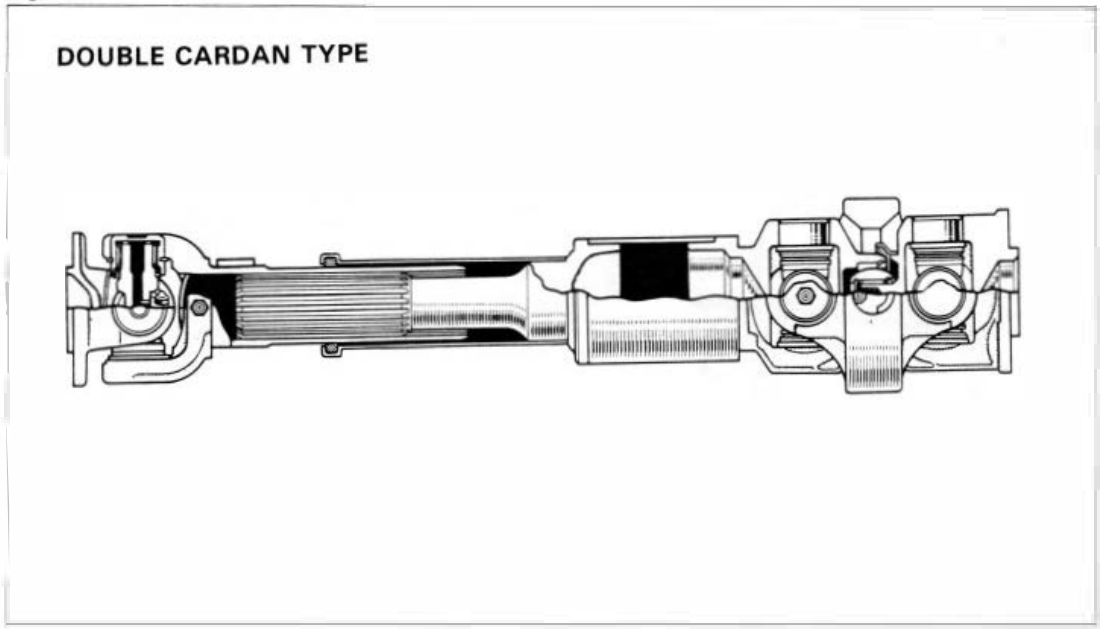
Refer to the instructions in the 3-Speed Transmission Section.

PROPELLER SHAFT

PROPELLER SHAFT

COMPONENTS

Fig. 5-1



REMOVAL

Remove the parts in the numerical order shown in the figure

Fig. 5-2

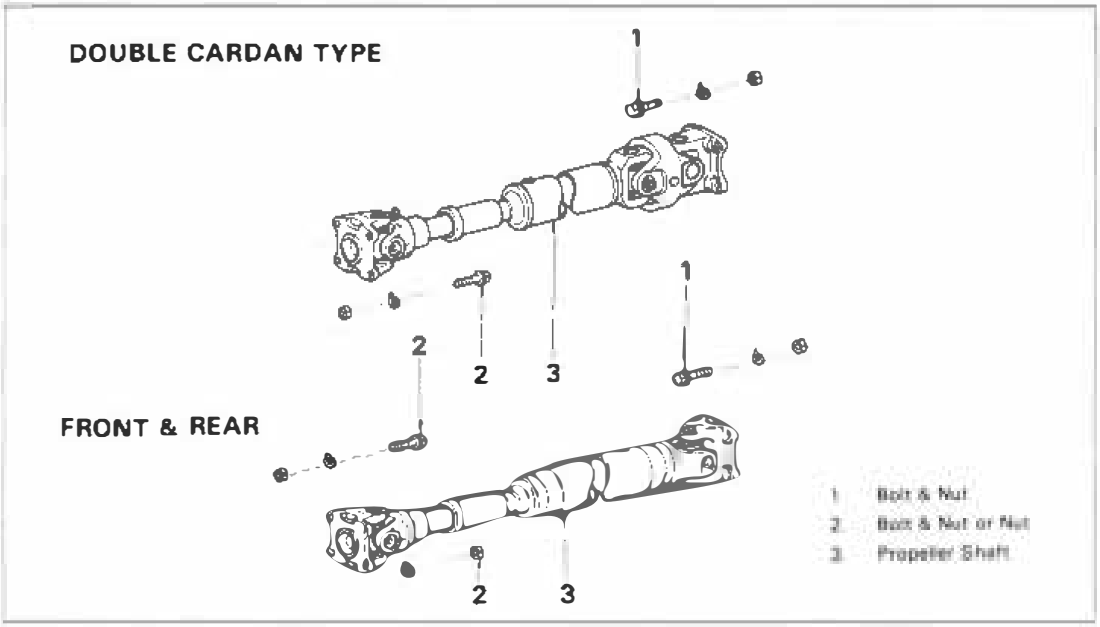
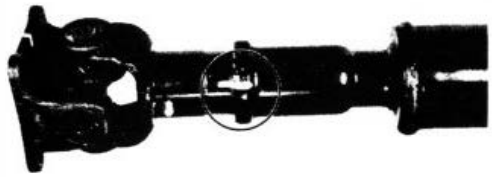


Fig. 5-3

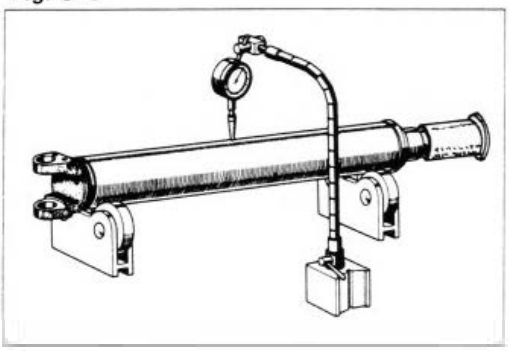


INSPECTION

Propeller Shaft

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

Fig. 5-4

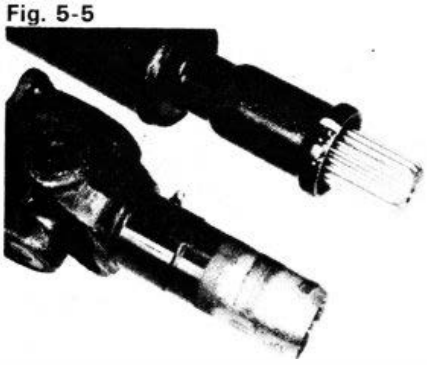


2 Inspect the propeller shaft for runout

Runout:

Limit 0.8 mm (0.031 in.)

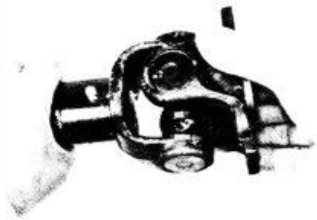
Fig. 5-5



Propeller Shaft & Sliding Yoke

Inspect for wear or damage

Fig. 5-6



Spider Bearing

Inspect for wear or damage

Spider axial play:

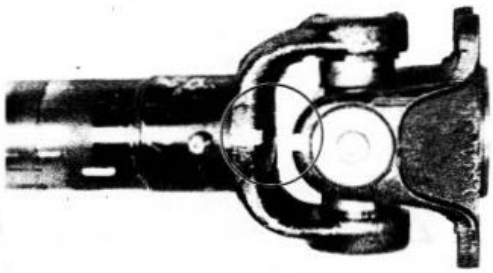
Less than 0.05 mm (0.0020 in.)

Fig. 5-7

Double Cardan Type Propeller Shaft

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

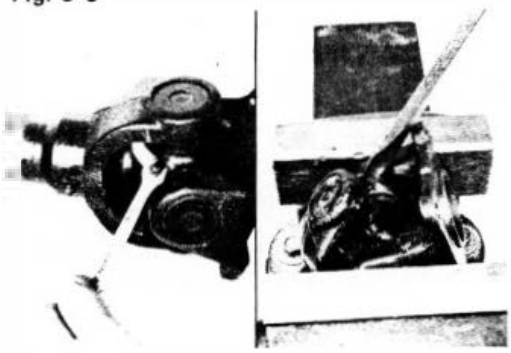
Fig. 5-8



Replace The Spider Bearing

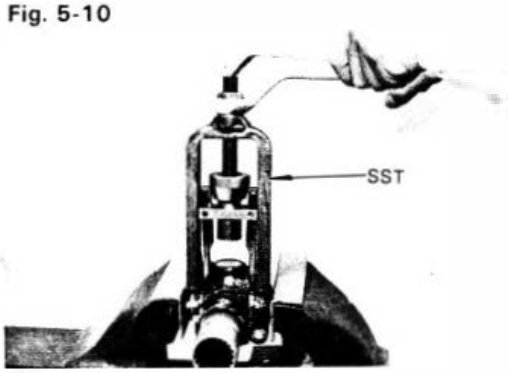
1. Place matchmarks on the flange yoke, spider and sleeve yoke (or propeller shaft).

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]

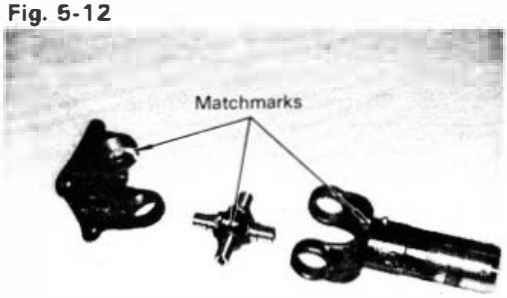
Fig. 5-11

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

— Note —

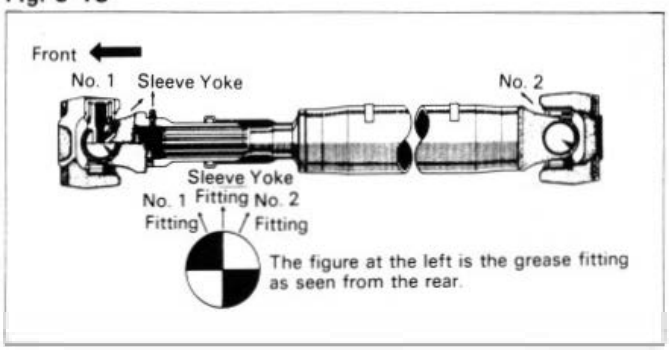
Remove the other bearing outer race of the sleeve yoke and the two bearing outer races of flange yoke by the same procedure.

Fig. 5-12



5 Aline matchmarks on flange yoke spider and sleeve yoke

Fig. 5-13

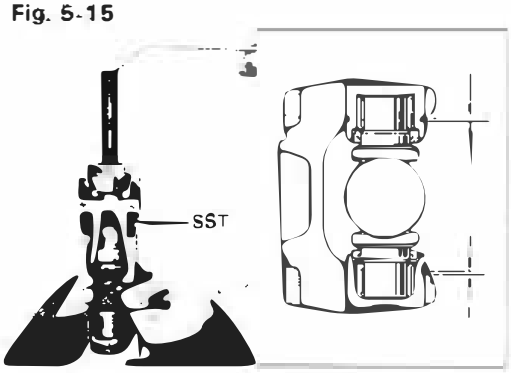


6. When replacing the spider, be sure that the grease fitting assembly holes are facing in the direction shown in the figure

Fig. 5-14

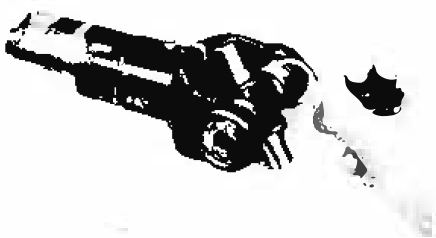
7 Coat the bearing rollers with MP grease and fit them into the outer races

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

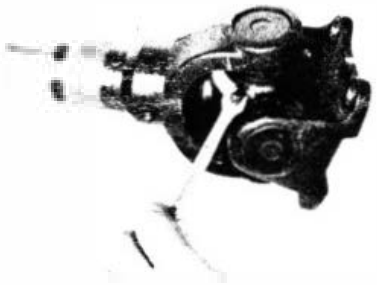
– Note –
Do not reuse snap rings.
Use the snap rings of the same thickness on both sides.

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

Fig. 5-18

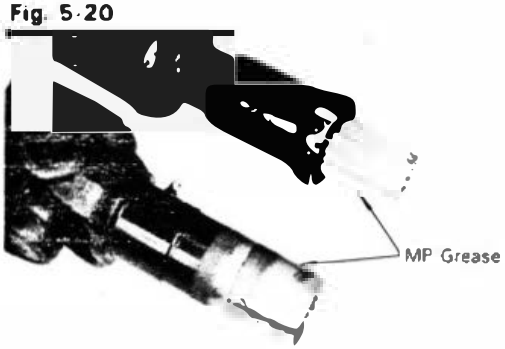
11 Check to see that the spider moves smoothly.
Check for axial play
Spider axial play:
Less than 0.05 mm
(0.0020 in.)

Fig. 5-19



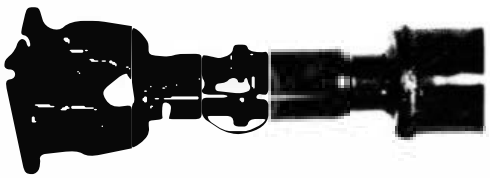
12 Install the grease fitting

Fig. 5-20



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

Fig. 5-21

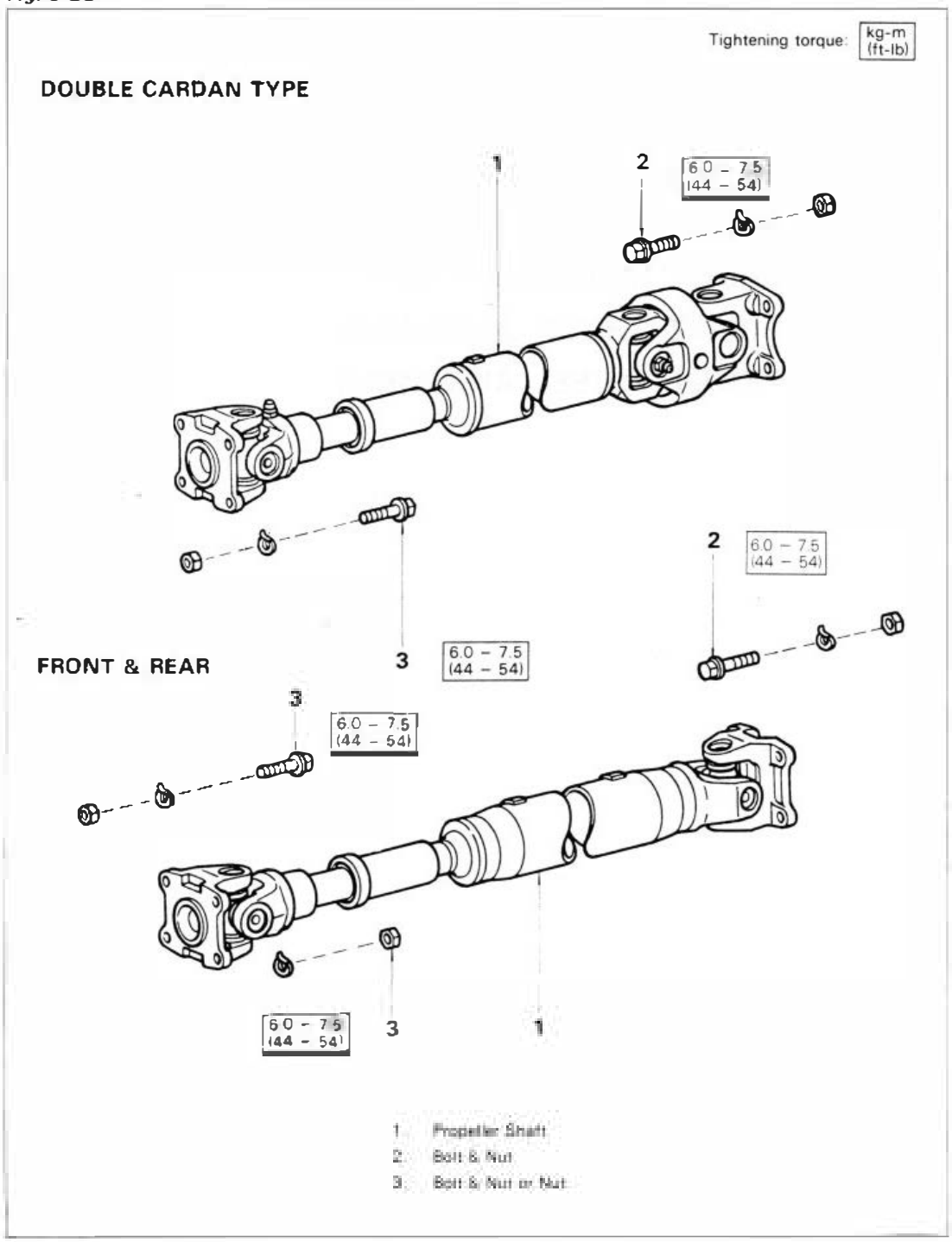


14 Aline the matchmarks and install the sleeve yoke to the propeller shaft

INSTALLATION

Install the parts in the numerical order shown in the figure

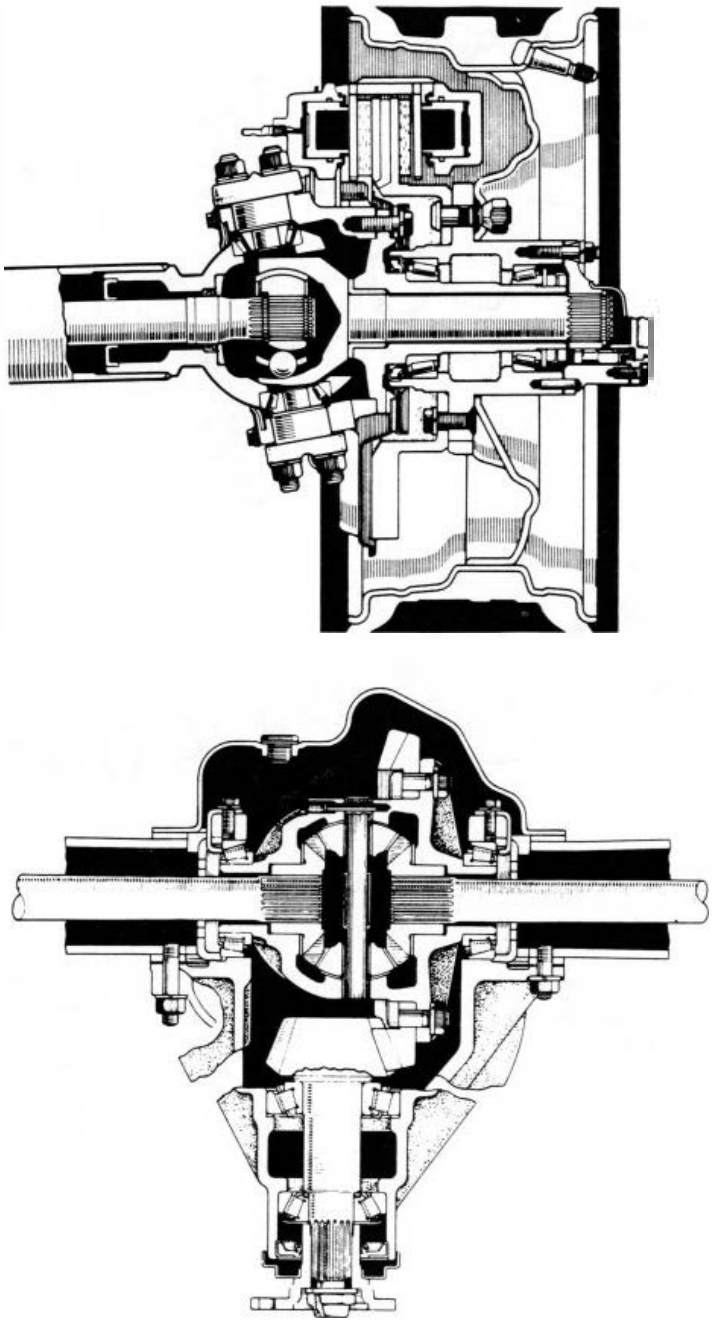
Fig. 5-22



FRONT AXLE & SUSPENSION

CUTAWAY VIEW

Fig. 6-1

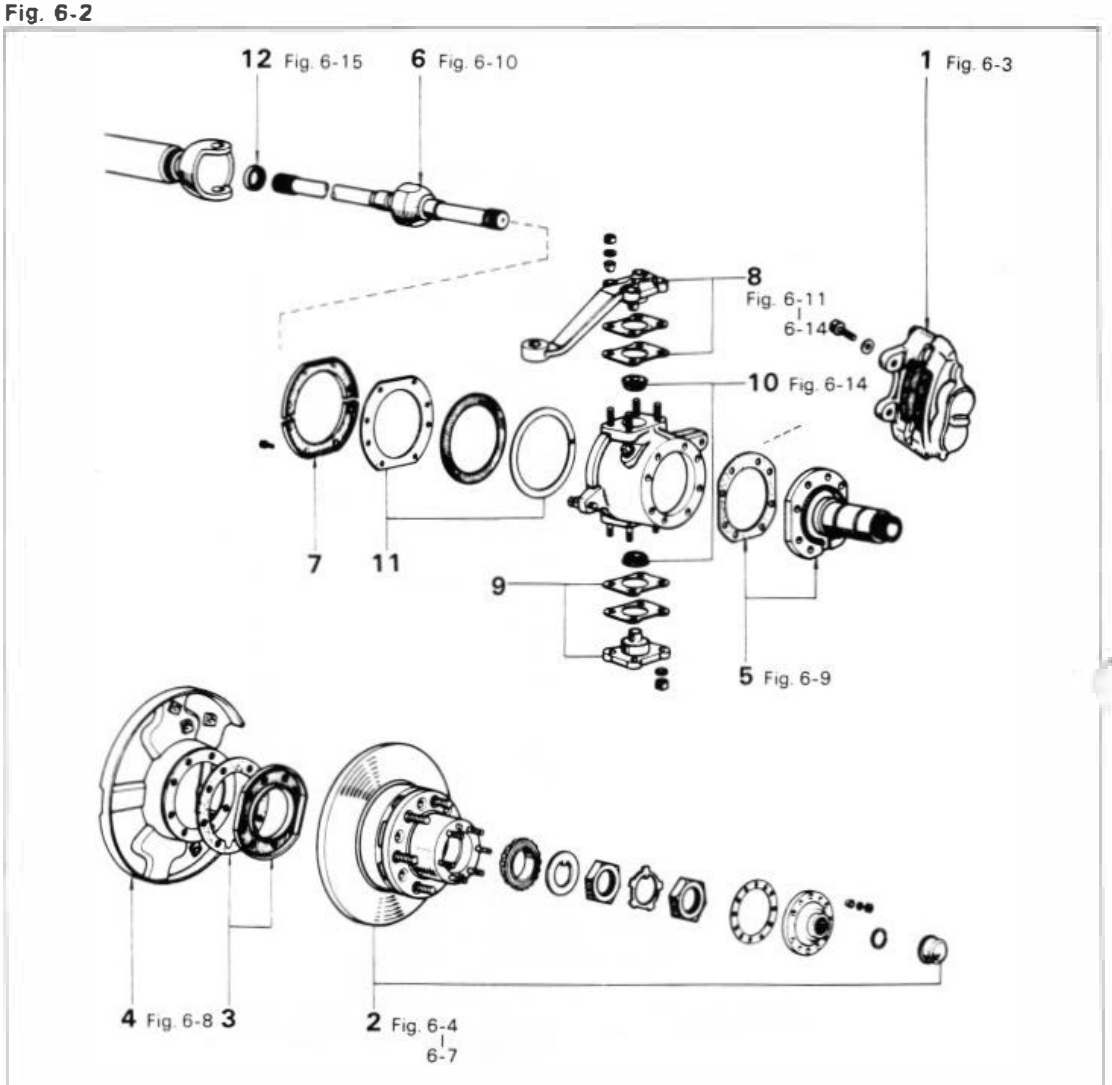


STEERING KNUCKLE & AXLE SHAFT

REMOVAL

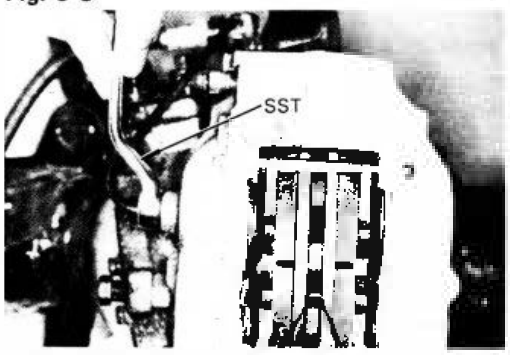
Remove the parts in the numerical order shown in the figure.

Fig. 6-2



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

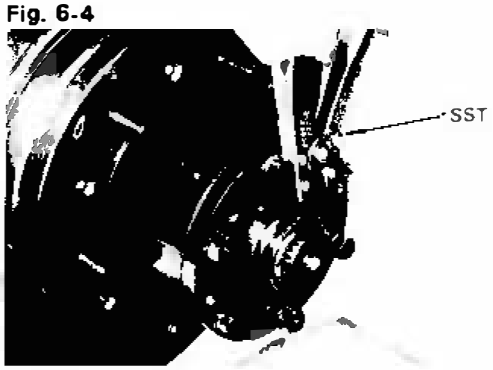
Fig. 6-3



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

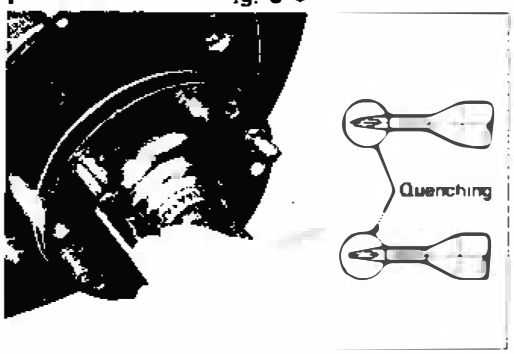
— Note —
For drum brakes, do not disconnect the brake tube or hose.

Fig. 6-4



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

Fig. 6-5

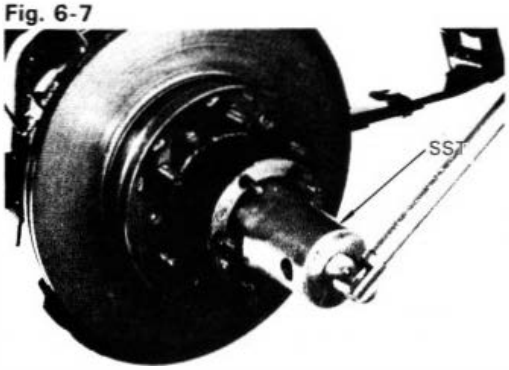


Remove the cone washers with a tapered punch

Fig. 6-6

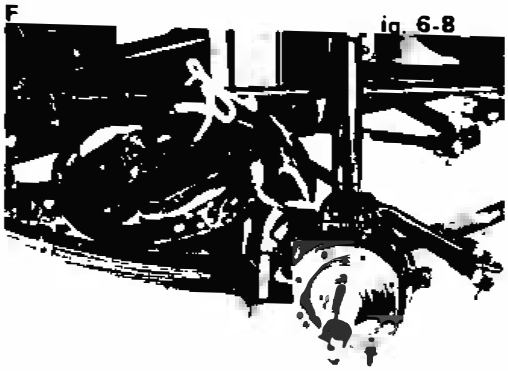
Remove the flange by tightening the bolts

Fig. 6-7



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

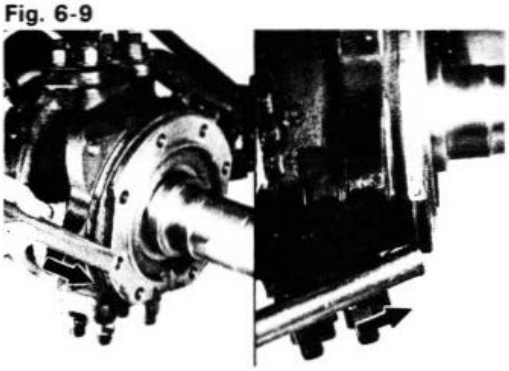
Fig. 6-8



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 toone side, remove the backing plate assembly and keep it supported with a cord.

Fig. 6-9

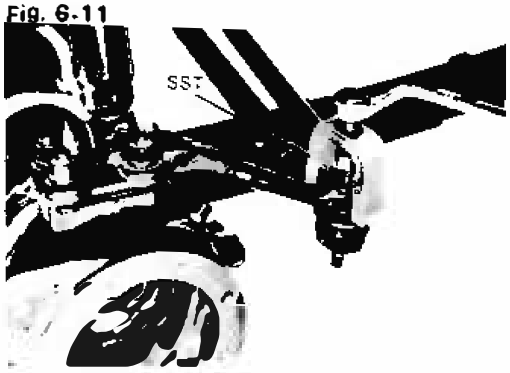


If the spindle does not come off easily, tap it off with a drift.

Fig. 6-10

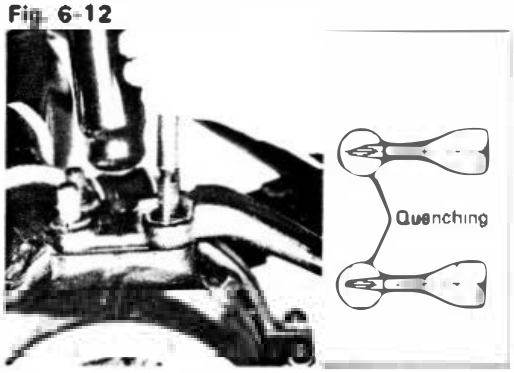
Position one flat part of the outer shaft upward and pull out the driveshaft.

Fig. 6-11



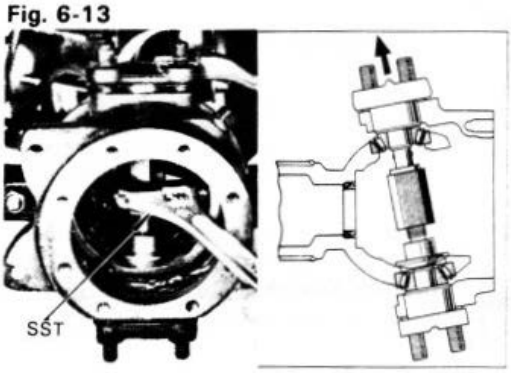
Remove the tie rod with SST.
SST [09611-22011]

Fig. 6-12



Remove the cone washers with a tapered punch

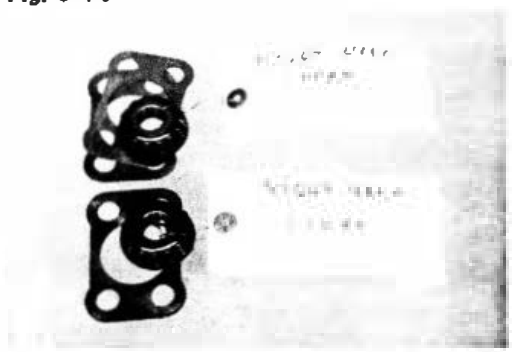
Fig. 6-13



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

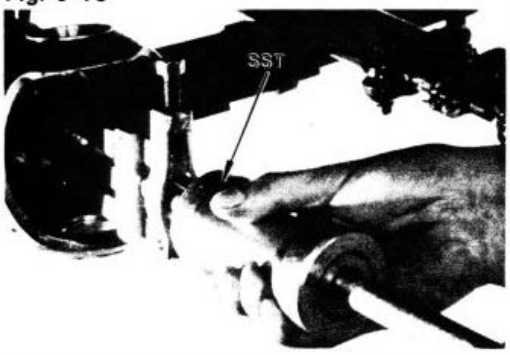
– Note –
Use SST without a collar.

Fig. 6-14



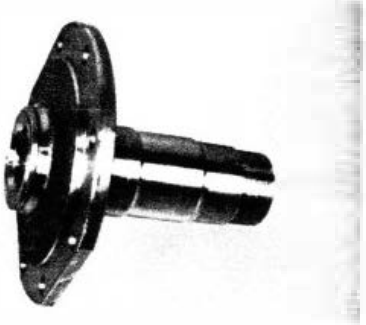
Mark the removed adjusting shims and bearings so as to enable reassembling them back to their proper positions

Fig. 6-15



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

Fig. 6-16

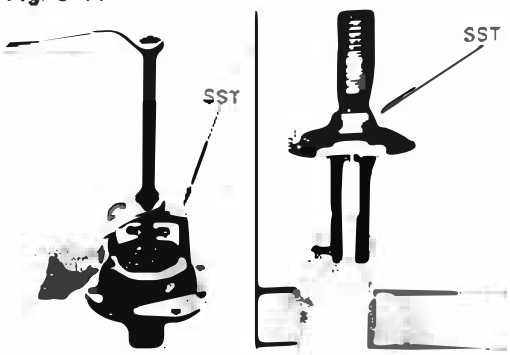


INSPECTION & PEPAIR

Knuckle Spindle

Inspect for wear or damage

Fig. 6-17



Replace The Bushing

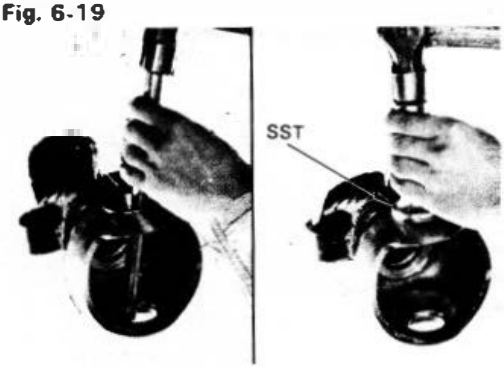
1. Remove the busing with SST
   SST [09612-65013]
2. Install a new bushing with a press and SST.
   SST [09608-35013]

Fig. 6-18

Steering Knuckle Bearing

Inspect for wear or damage

Fig. 6-19



Replace The Bearing Outer Race

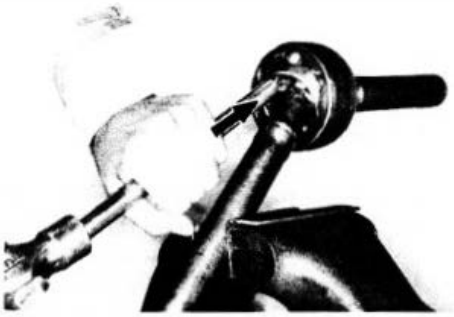
1. Remove the outer races with a drift.
2. Install the new outer races with SST.
   SST [09605-60010]

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.

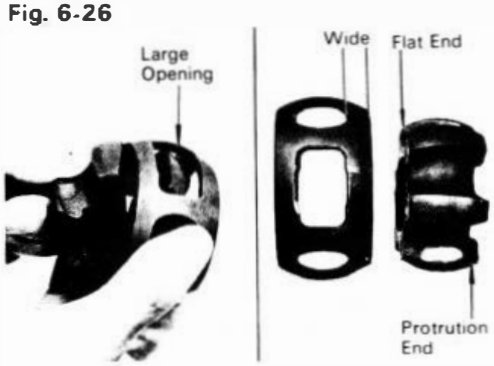
Fig. 6-24

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.

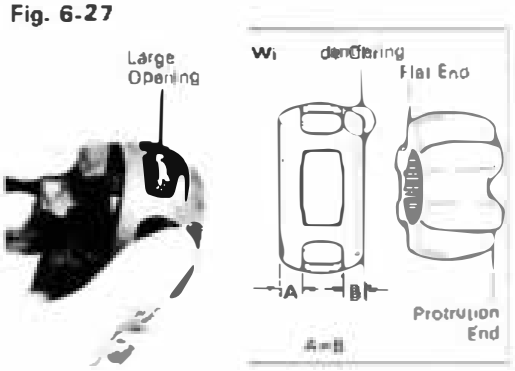
Fig. 6-26



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.

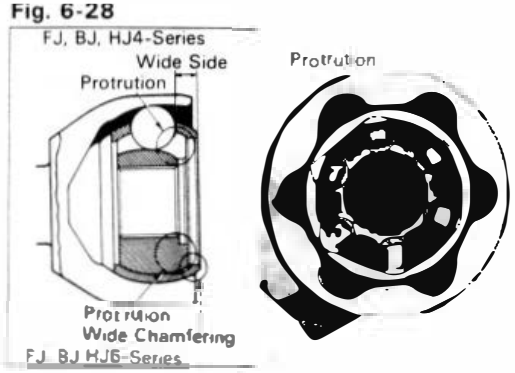
Fig. 6-27



(2) For FJ, BJ, HJ6_series
Make sure to position the protrution 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

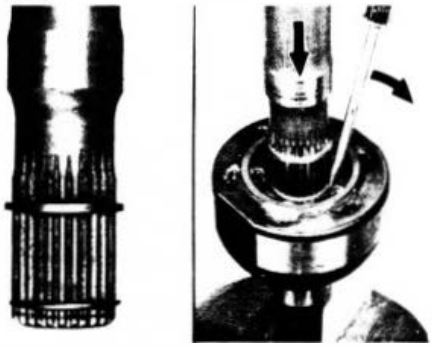
– Note –
FJ, BJ, HJ4_series
Make sure to position the cage wide side and race protrution end toward the outside.
FJ, BJ, HJ6_series
Make sure to position the cage wide chamfering side end race protrution end toward the outside.

Fig. 6-29

9 Fit the inner race and cage, and assemble the six bearingballs in the outer shaft

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

Fig. 6-30



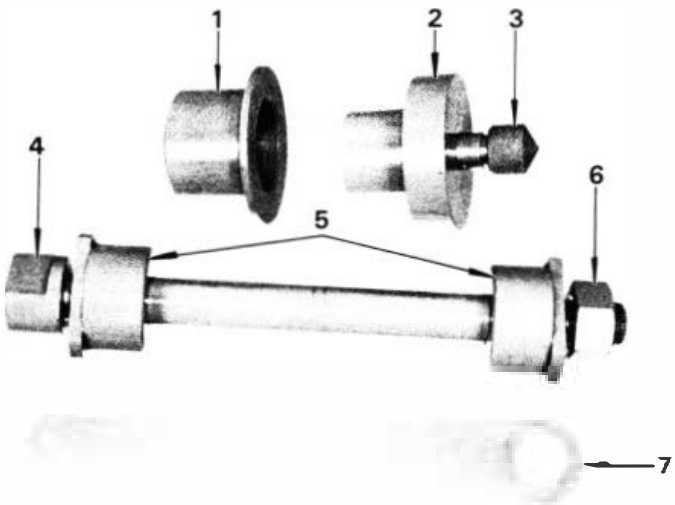
10 Install new snap rings on the inner shaft
11 Hold the outer shaft in a vise, and while keeping the snap ring (inner) compressed install the inner shaft to the outer shaft

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

ADJUSTMENT

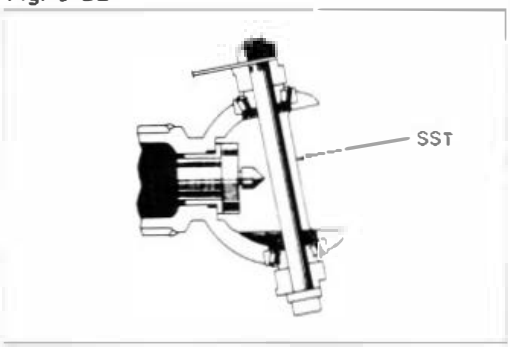
Whenever the axle housing or the steering knuckle is replaced, the front driveshaft alignment and knuckle bearing preload are adjusted with SST
SST [09634-60013]

Fig. 6-31



1. Adapter Ring
2. Adapter
3. Plug
4. Rod
5. Attachment
6. Nut
7. Lever

Fig. 6-32



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

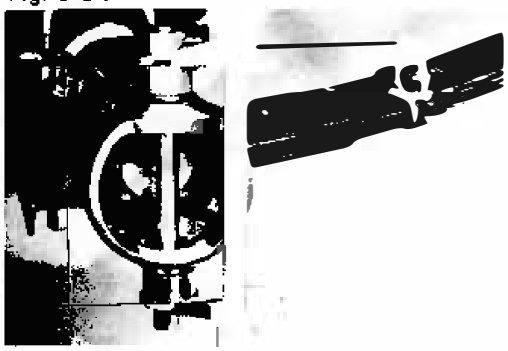
— Note —
Coat knuckle bearings lightly with molybdenum disulphide lithium base grease.

Fig. 6-33

2 Add preload to the bearing by tightening the nut.

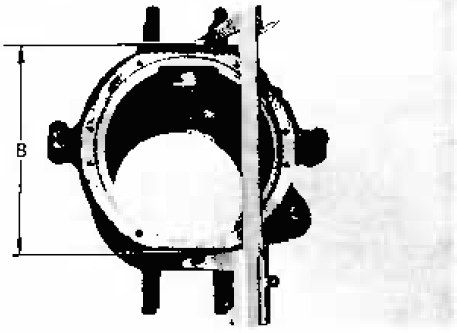
Preload (while turning):
1.8 — 3.8 kg
(4.0 — 8.4 lb)

Fig. 6-34



3 Measure the distance A

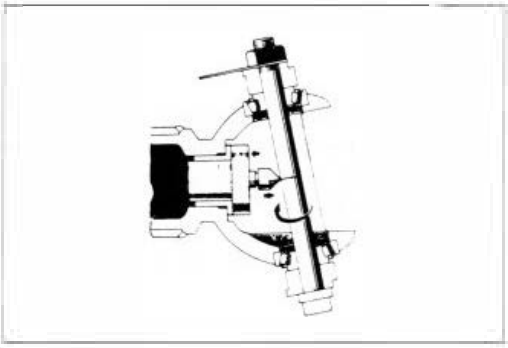
Fig. 6-35



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.

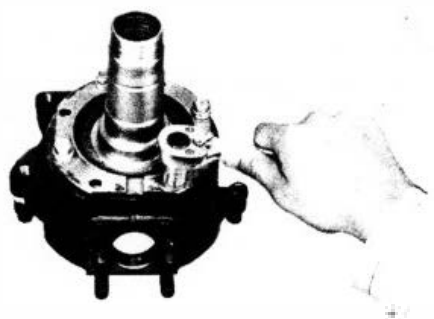
TOTAL SHIM THICKNESS C
C = A – B

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 (5), and turn the lever (7) so as to have a line scribed on the rod (5).

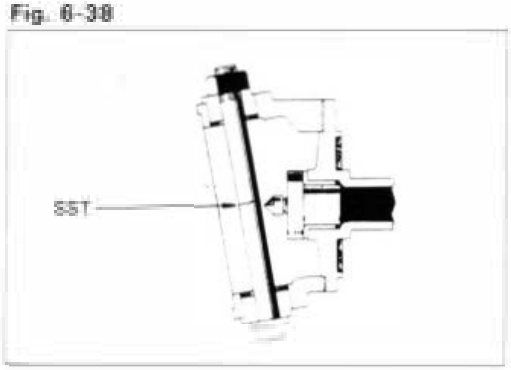
Fig. 6-37



8 Bolt on the knuckle spindle to the knuckle

– Note –
Install the bolt over two washers.

Fig. 6-38

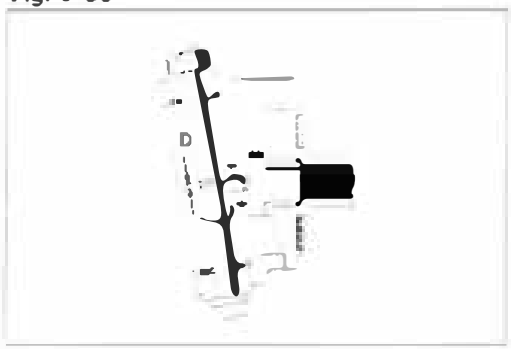


9 Dismount the SST from the housing, and mount it on the knuckle
SST [09634-60013]

– 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 onthe housing.**

Fig. 6-39



10 Turn the rod (5) and scribe another lineon 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 dis tance D less 3 mm (012 in)

LOWER SHIM THICKNESS E
E = D – 3mm

13 The thickness of the steering knuckle upper bearing shim F will be differenc 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.

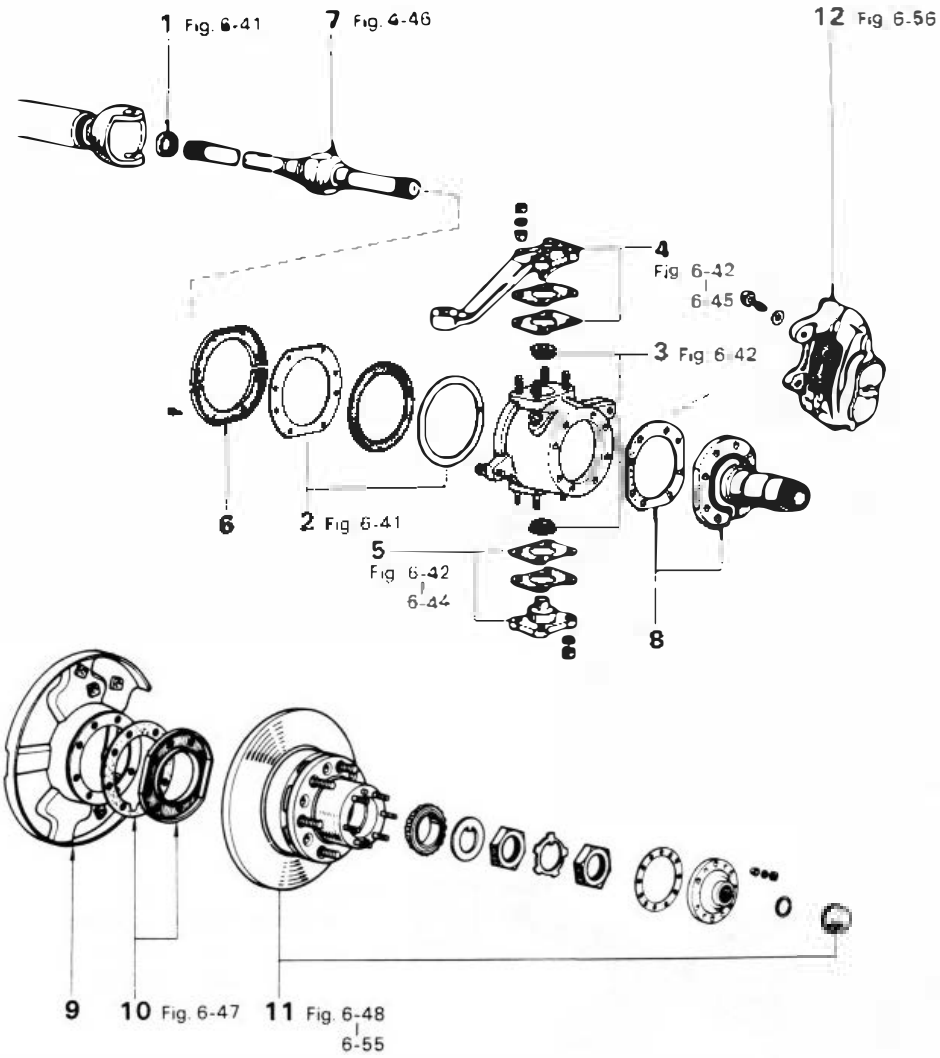
Adjusting shimsizes

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

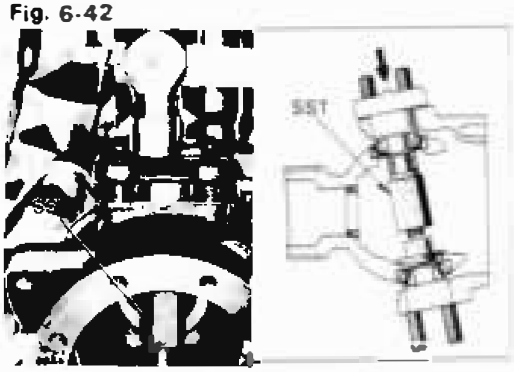


1. Oil Seal
2. Oil Seal
3. Steering Knuckle & Bearing
4. Knuckle Arm & Shim
5. Bearing Cap & Shim
6. Oil Seal Retainer
7. Drive Shaft
8. Knuckle Spindle & Gasket
9. Dust Cover
10. Dust Seal & Gasket
11. Front Axle Hub with Brake Disc
12. Disc Brake Cylinder

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

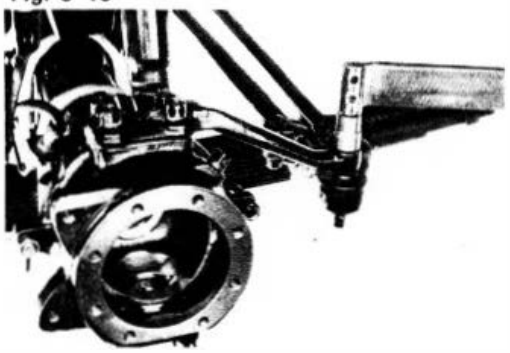
Tightening torque: 8.5 – 11.0 kg-m (62 – 79 ft-lb)

Fig. 6.44

Measure the knuckle bearing preload

Preload (while rotating):
1.8 – 3.8 kg
(4.0 – 8.4 lb)

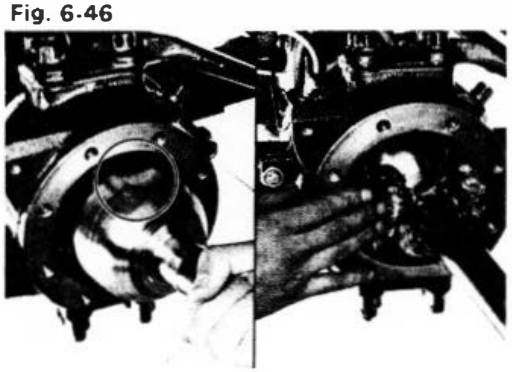
Fig. 6-45



Install the tie rod

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

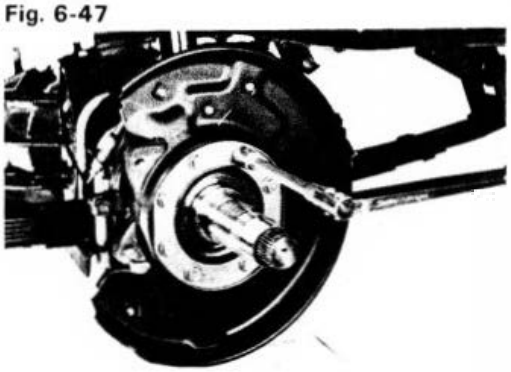
Fig. 6-46



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

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

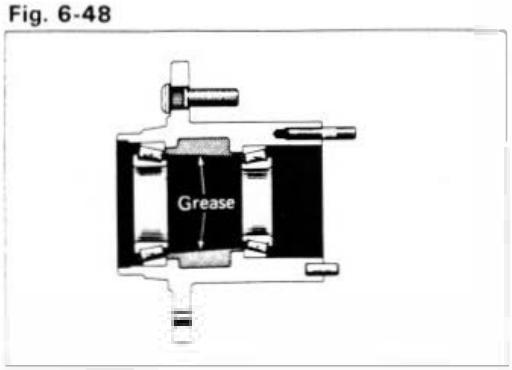
Fig. 6-47



Tighten the bolts

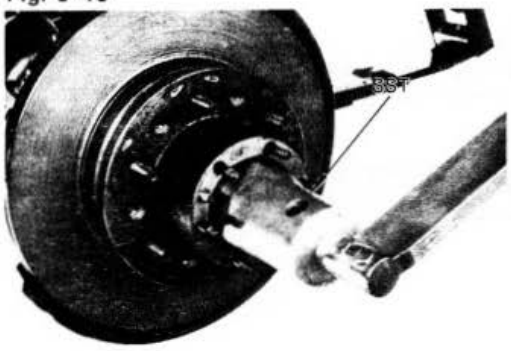
Tightening torque: 4.0 – 5.5 kg-m (29 – 39 ft-lb)

Fig. 6-48



Pack MP grease into the hub

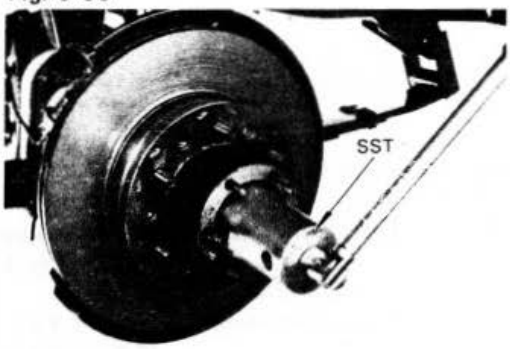
Fig. 6-49



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

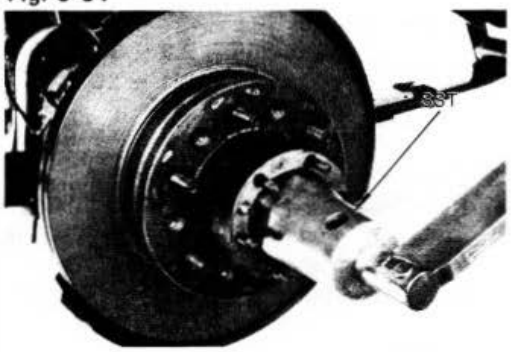
Tightening torque: 6.0 kg-m (43 ft-lb)

Fig. 6-50



Loosen the adjusting nut
SST [09607-60020]

Fig. 6-51



Retighten the adjusting nut

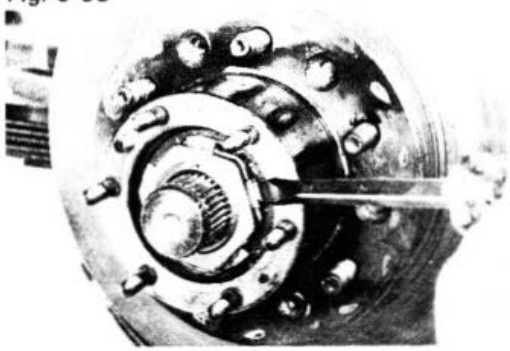
Tightening torque: 0.4 – 0.7 kg-m (35 – 60 in.-lb)

Fig. 6-52

Measure the revolving weight at the hub bolt

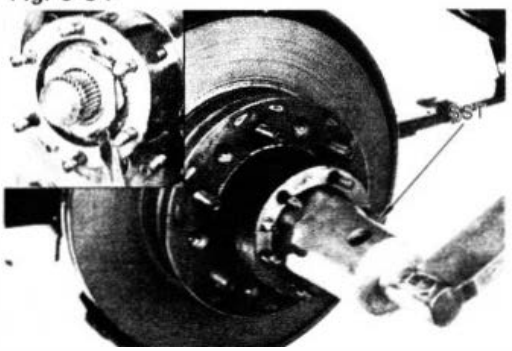
Preload (starting): 2.8 – 5.7 kg (6.2 – 12.6 lb)

Fig. 6-53



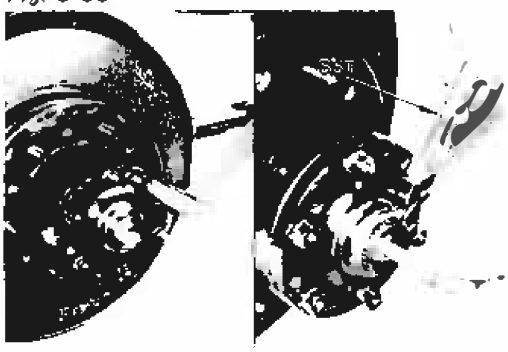
Lock the adjusting nut by bending one of the lock washer teeth inward

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

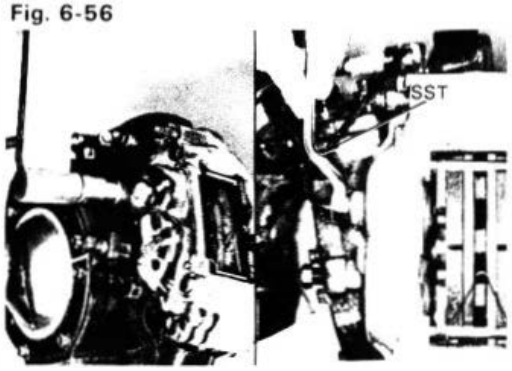
Fig. 6-55



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

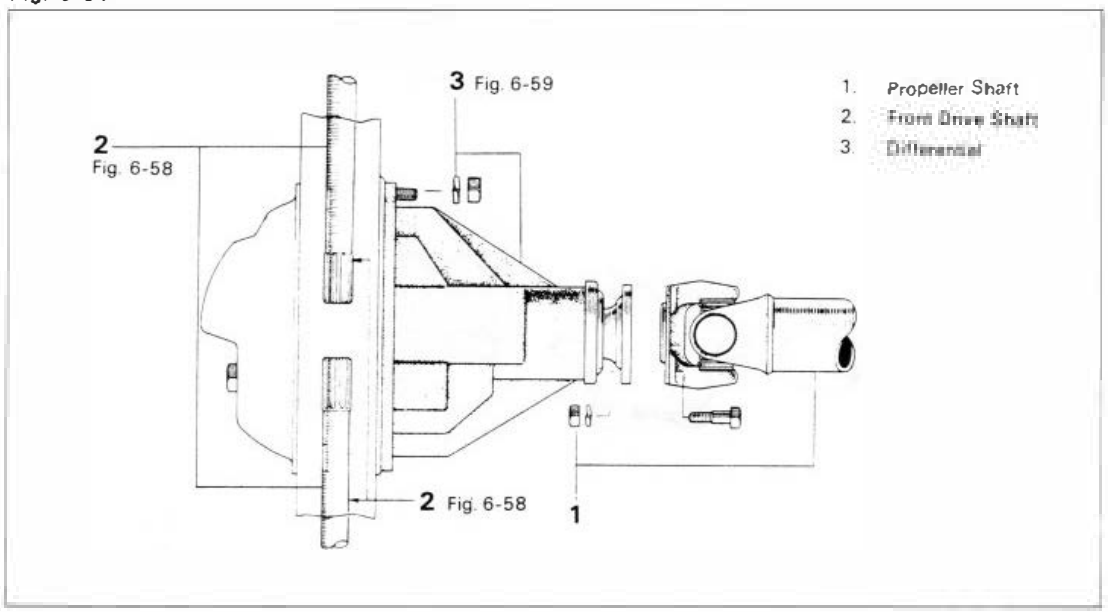


Fig. 6-58

SEE

STEERING KNUCKLE & AXLE SHAFT REMOVAL SECTION

Fig. 6-3 to 6-15

Remove the axle shafts

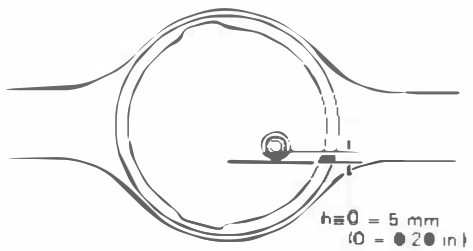
DISASSEMBLY & ASSEMBLY

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 inhypoid gear oil SAE90, API GL-5

Capacity:

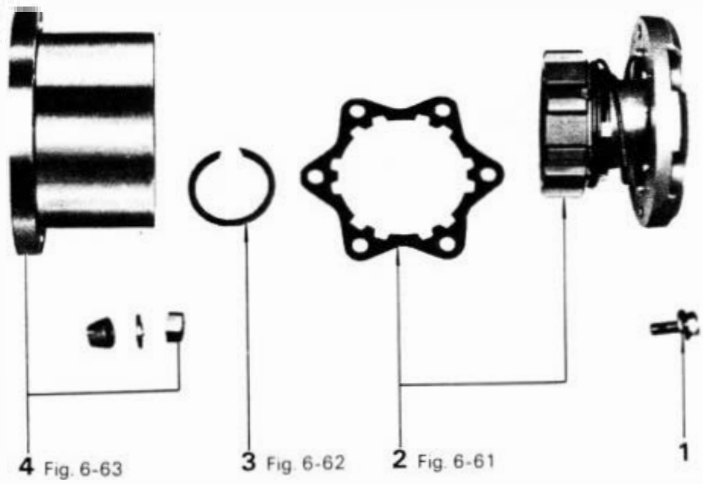
STD **2.5 liters (2.6 US qt, 2.2 Imp.qt)**

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

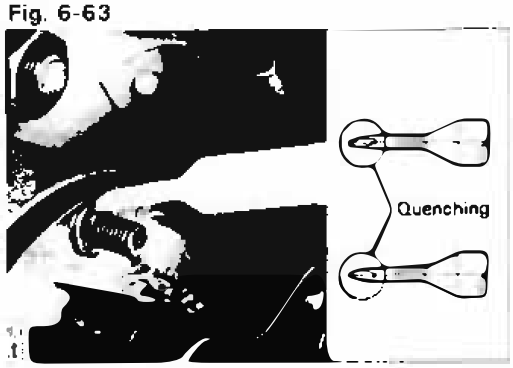
Remove the free wheel hub cover

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

Fig. 6-62

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

Fig. 6-63

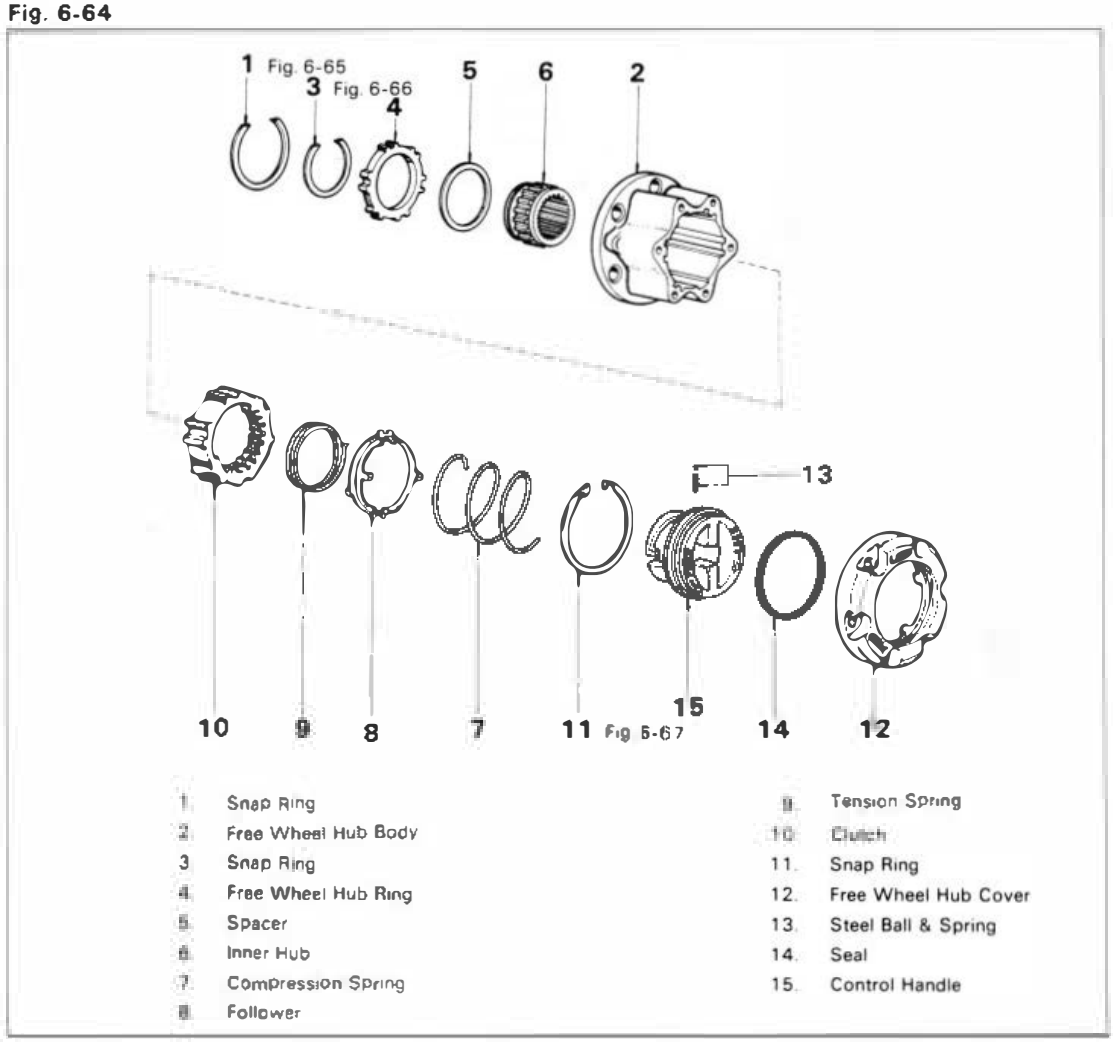


Remove the cone washer

DISASSEMBLY

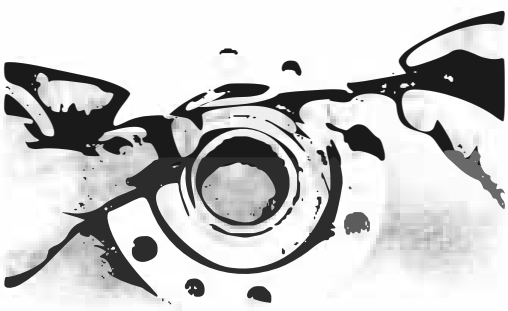
Disassemble the parts in the numerical order shown in the figure.

Fig. 6-64



1. Snap Ring
2. Free Wheel Hub Body
3. Snap Ring
4. Free Wheel Hub Ring
5. Spacer
6. Inner Hub
7. Compression Spring
8. Follower
9. Tension Spring
10. Clutch
11. Snap Ring
12. Free Wheel Hub Cover
13. Steel Ball & Spring
14. Seal
15. Control Handle

Fig. 6-65

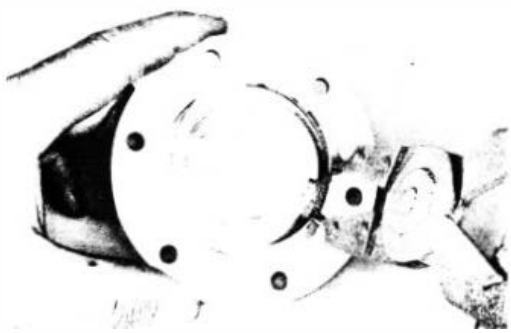


Remove the snap ring and free wheel hub ring

Fig. 6-66

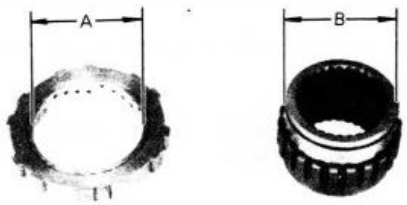
Remove the snap ring from the inner hab with SST
SST [09905-00012]

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

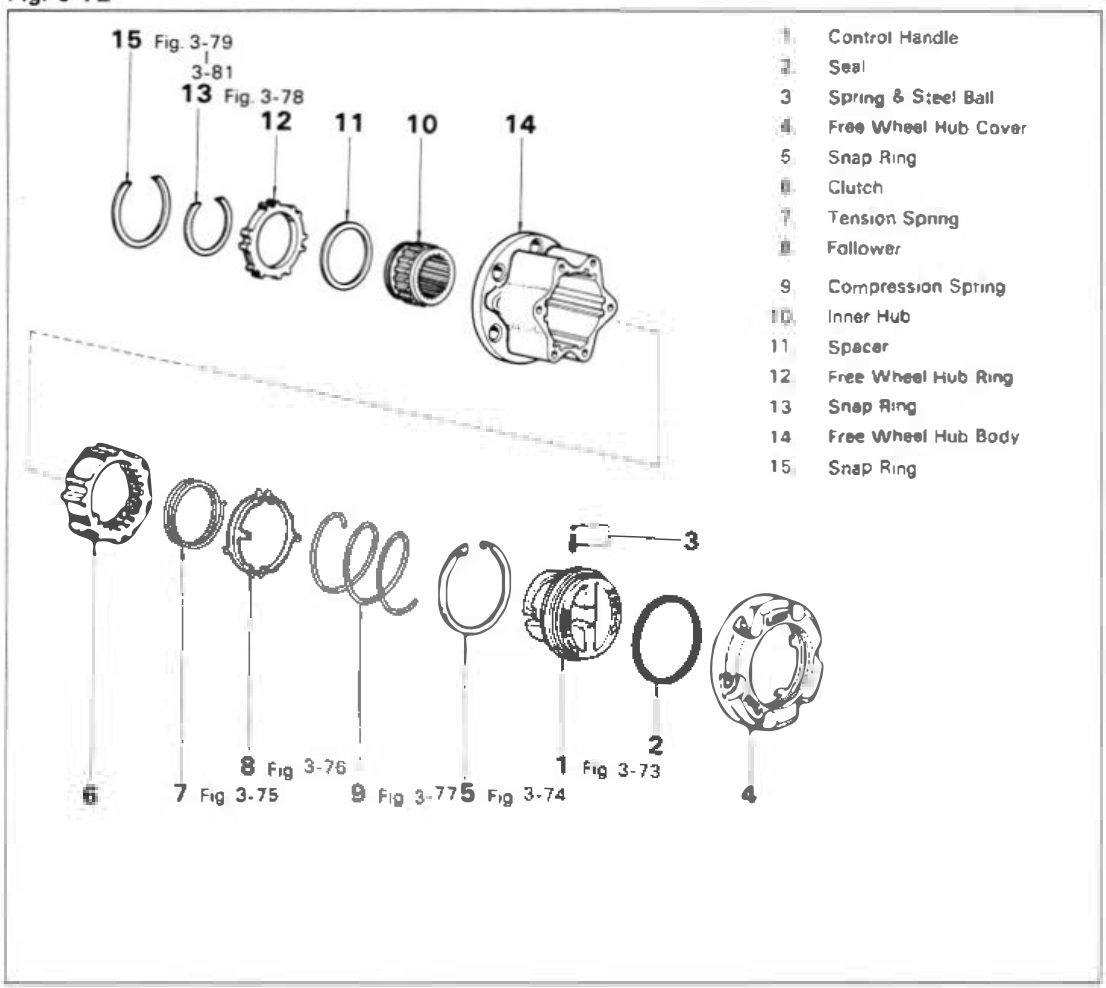
Fig. 6-71

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

ASSEMBLY

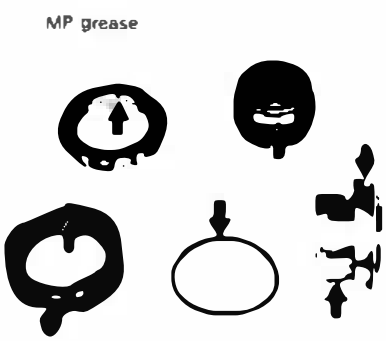
Assemble the parts in the numerical order shown in the figure.

Fig. 6-72



1. Control Handle
2. Seal
3. Spring & Steel Ball
4. Free Wheel Hub Cover
5. Snap Ring
6. Clutch
7. Tension Spring
8. Follower
9. Compression Spring
10. Inner Hub
11. Spacer
12. Free Wheel Hub Ring
13. Snap Ring
14. Free Wheel Hub Body
15. Snap Ring

Fig. 6-73

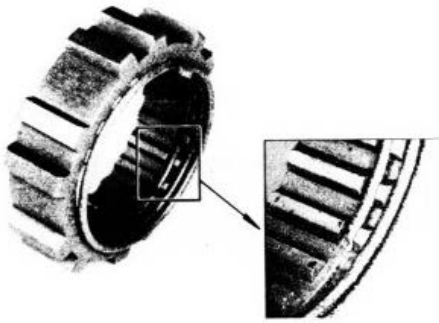


⚠ Apply MP grease on the arrow mark portion before assembling.

Fig. 6-74

Install the handle in the cover.

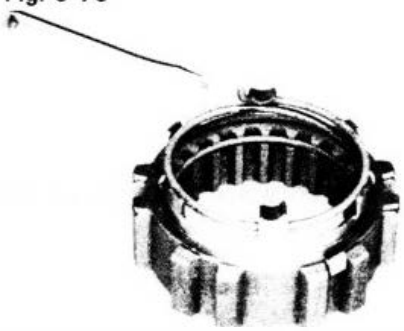
Fig. 6-75



Install the tension spring in the clutch.

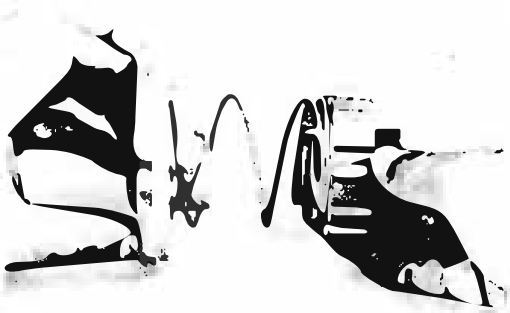
– Note –
Fit the spring end into the clutch spring so as to be aligned with the initial groove.

Fig. 6-76



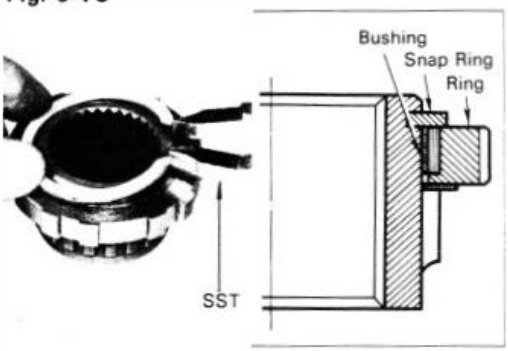
Fit follower pawl together with spring bent portion.

Fig. 6-77



Install the clutch and spring into the handle assembly.

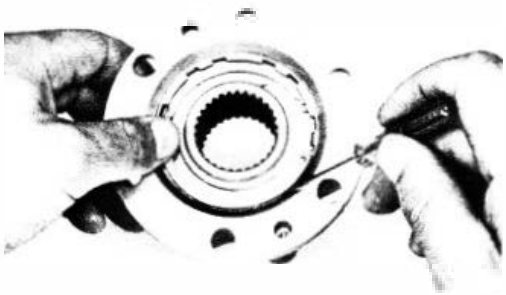
Fig. 6-78



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

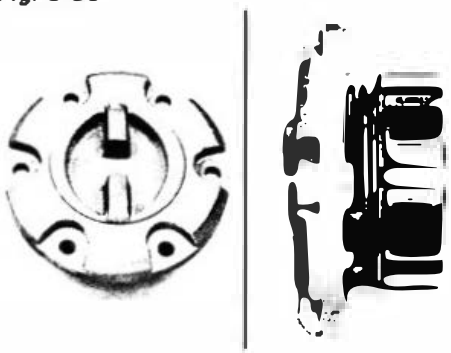
– Note –
Make sure that ring is assembled in the correct direction as shown in the illustration.

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

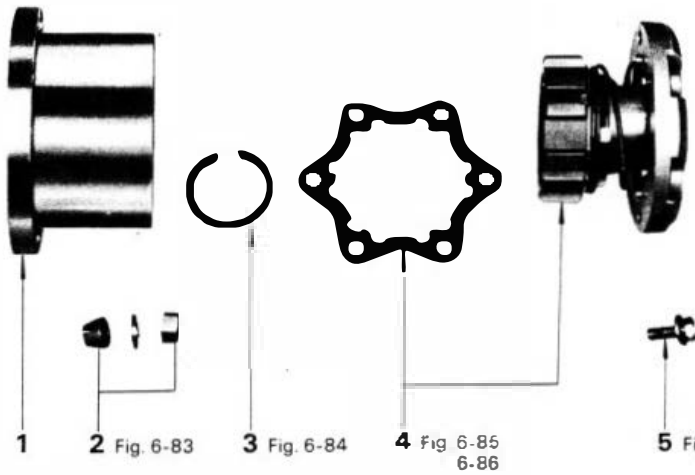
Fig. 6-81

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

INSTALLATION

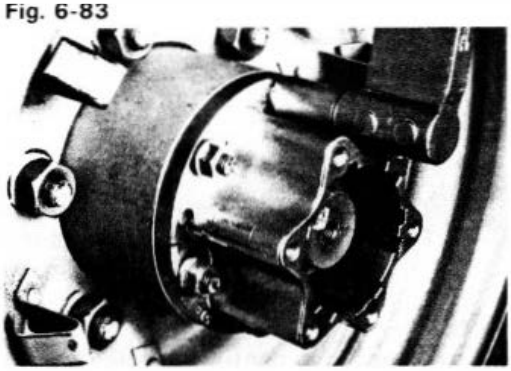
Install the parts in the numerical order shown in the figure

Fig. 6-82



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

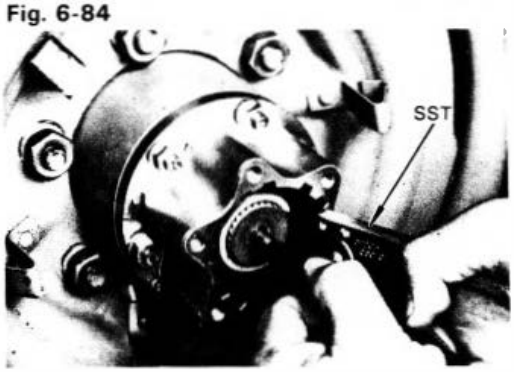
Fig. 6-83



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]

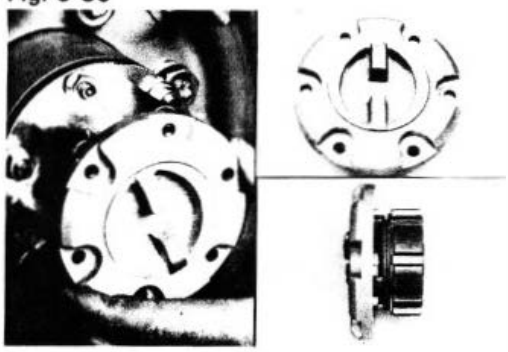
– Note –
Gripping a bolt, pull the axle shaft out to install the snap ring.

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.

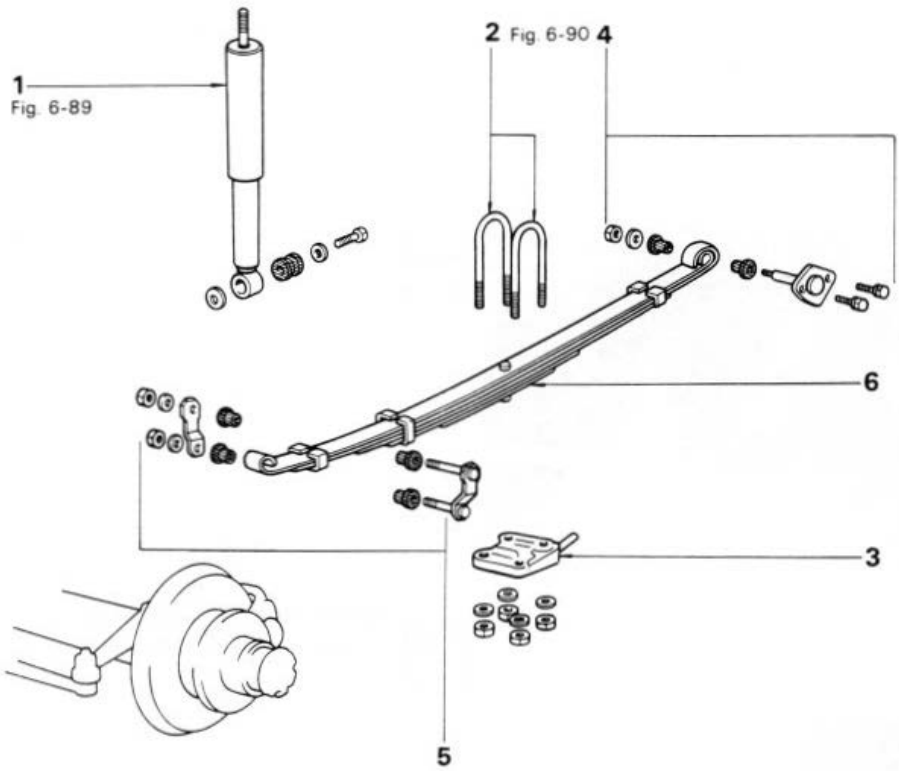
FRONT SUSPENSION

LEAF SPRING

REMOVAL

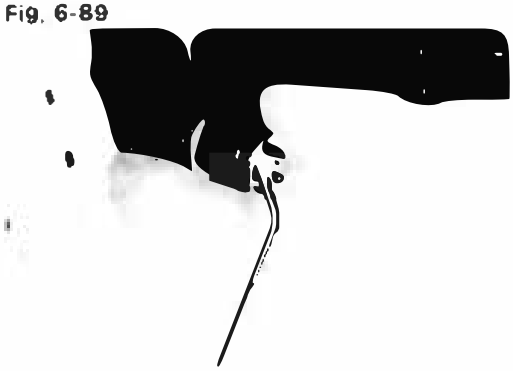
Remove the parts in the numerical order shown in the figure.

Fig. 6-88



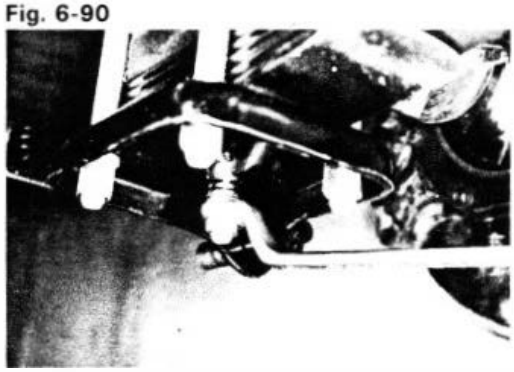
1 Shock Absorber
2 U Bolt
3 Spring Seat
4 Hanger Pin
5 Shackle Pin
6 Leaf Spring

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

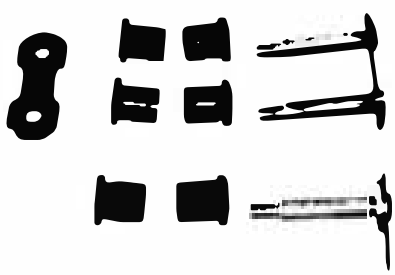


Support the front axle housing with a jack, and remove the U bolts.

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

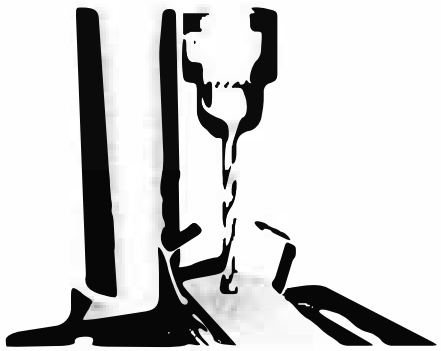
Replace The Leaf

1. Pry up the spring clip

Fig. 6-94

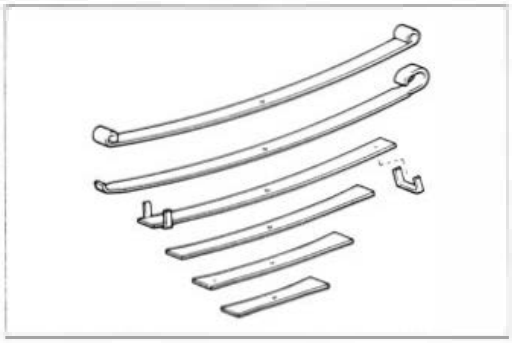
2. Secure the spring with a vise, and remove the spring center bolt.
3. Disassemble the leaf spring.

Fig. 6-95



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

Fig. 6-96

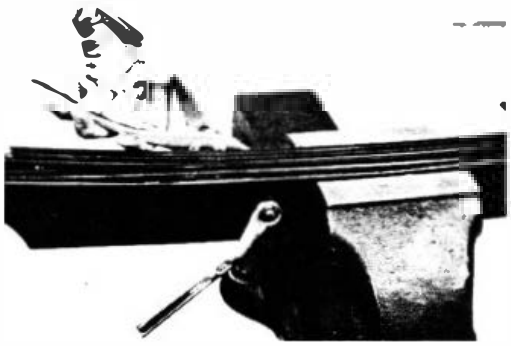


5. Inspect the leaves for damage or weakness.

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.

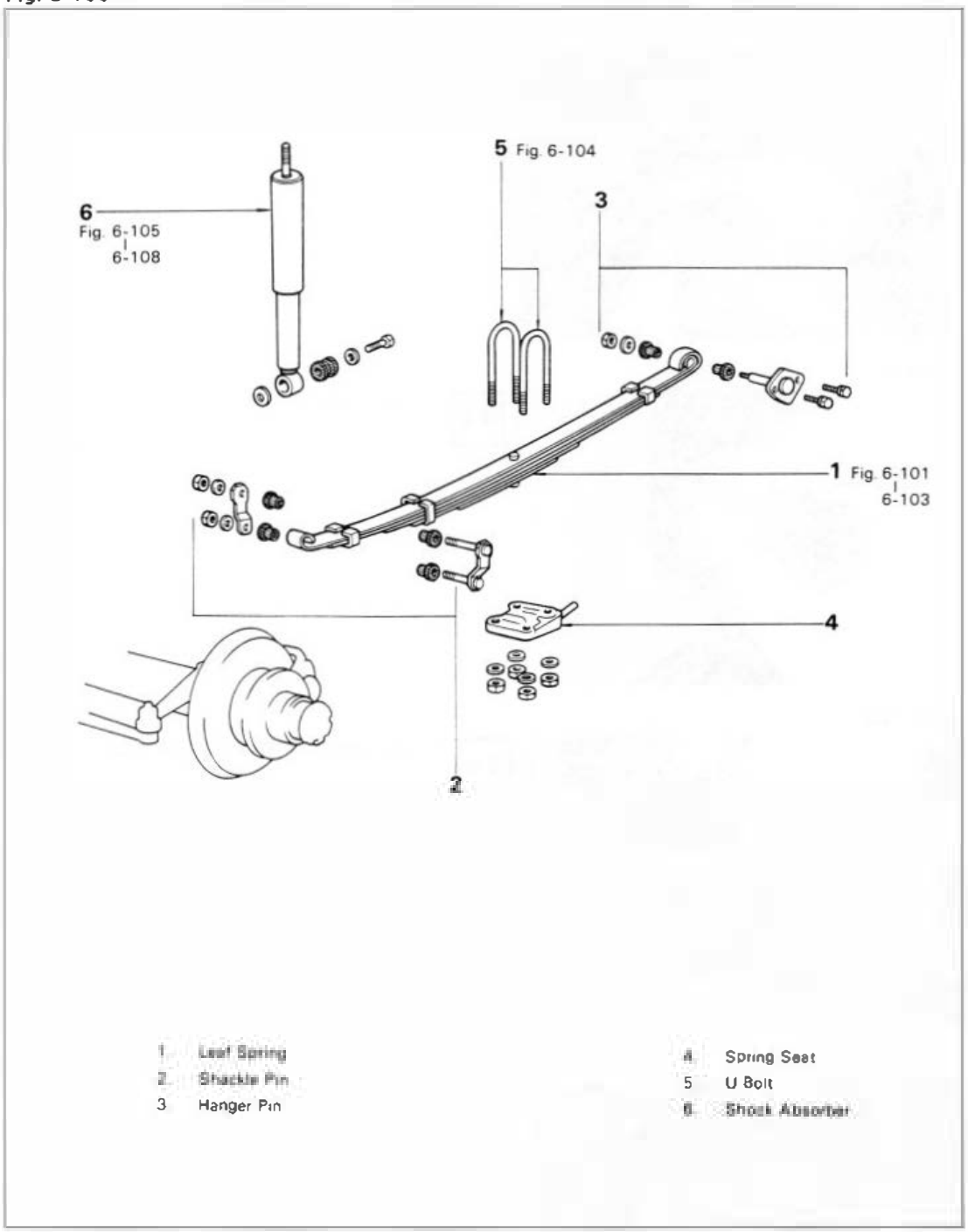
Fig. 6-99

8 Bend the clip into the position.

INSTALLATION

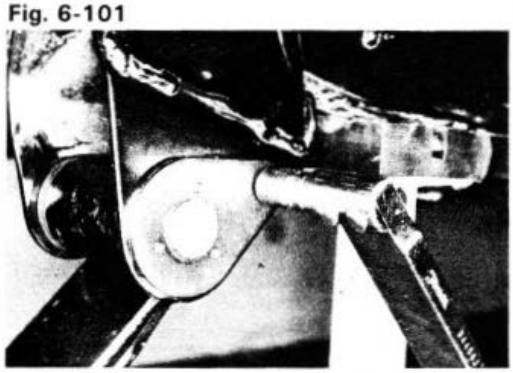
Install the parts in the numerical order shown in the figure.

Fig. 6-100



1. Leaf Spring
2. Shackle Pin
3. Hanger Pin
4. Spring Seat
5. U Bolt
6. Shock Absorber

Fig. 6-101



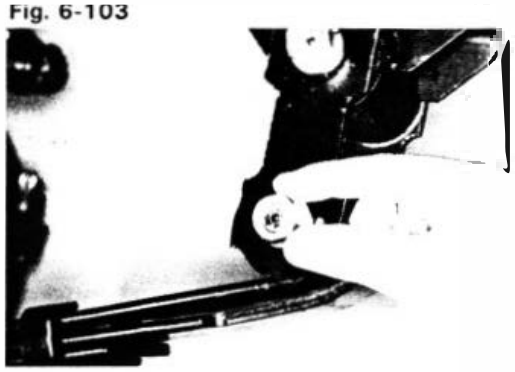
Install the hanger pin

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

Fig. 6-102

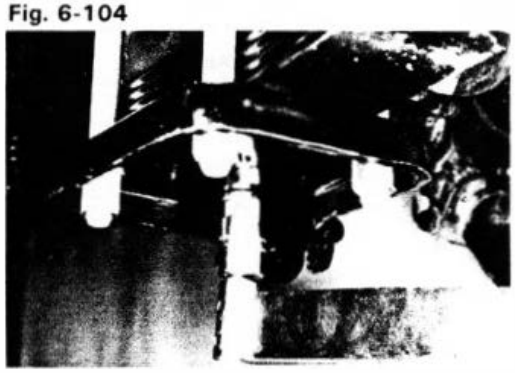
Finger tighten the nut

Fig. 6-103



Finger tighten the shackle pin nuts

Fig. 6-104



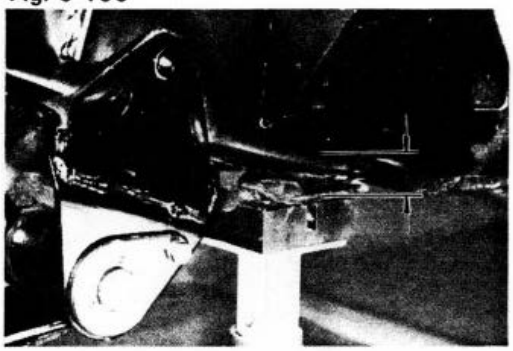
Install the U bolt

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

Fig. 6-105

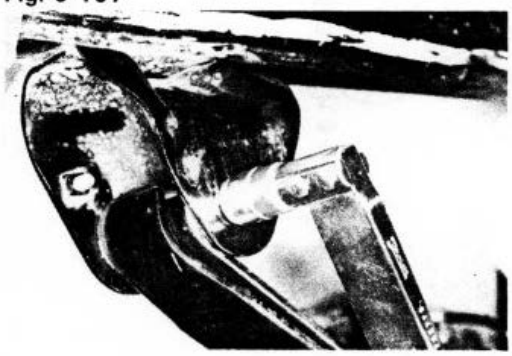
Connect the shock absorber
Tightening torque: 5.0 – 5.8 kg-m (37 – 41 ft-lb)

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

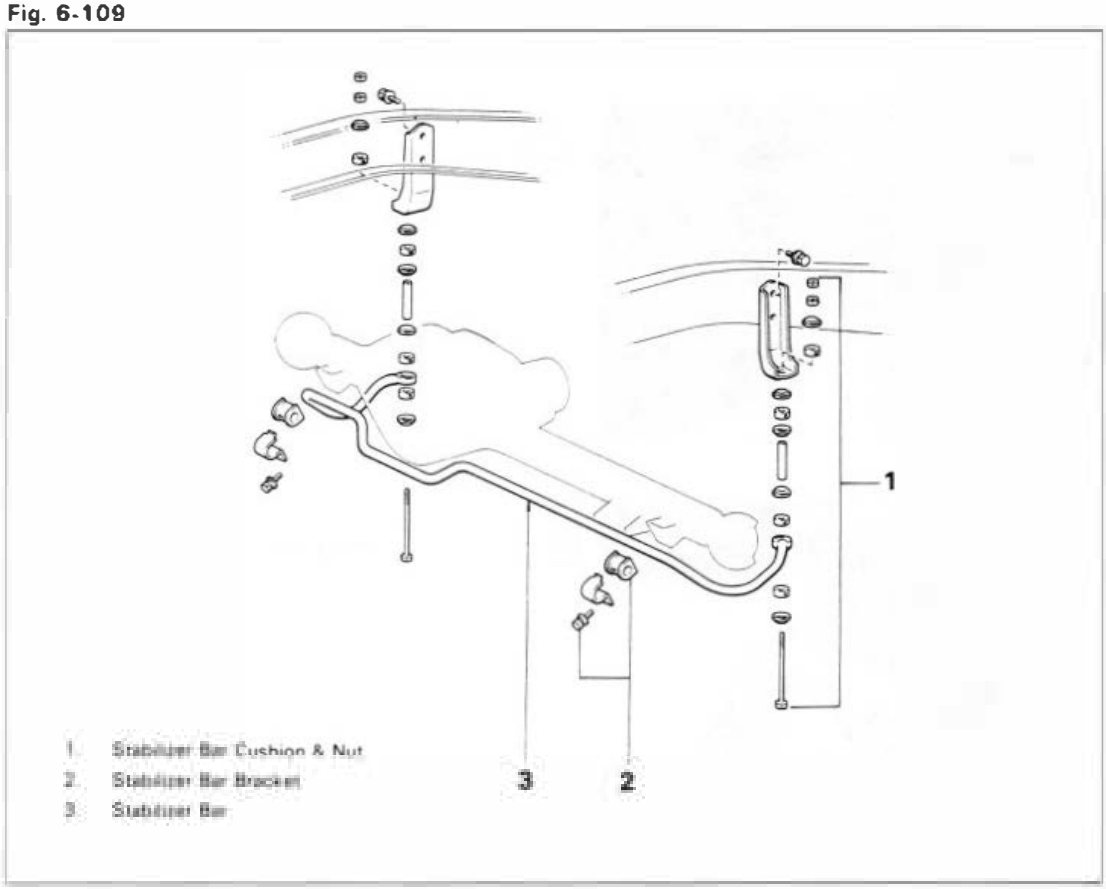
Tighten the shackle pin nuts.
Tightening torque: 7.5—11.0 kg-m (55—79 ft-lb)

FRONT STABILIZER BAR

REMOVAL

Remove the parts in the numerical order shown in the figure

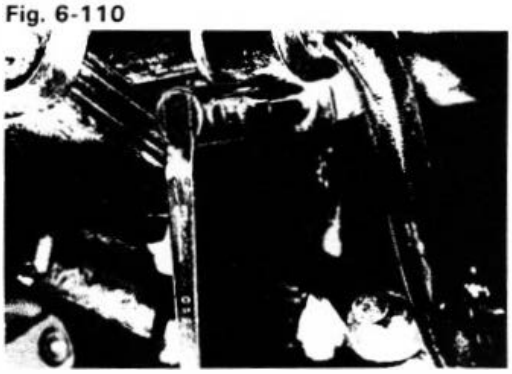
Fig. 6-109



INSTALLATION

Perform the removal procedure in reverse order

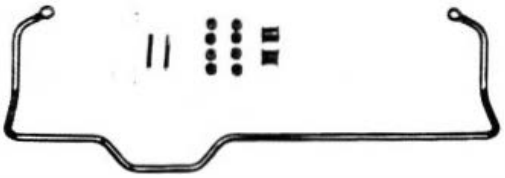
Fig. 6-110



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

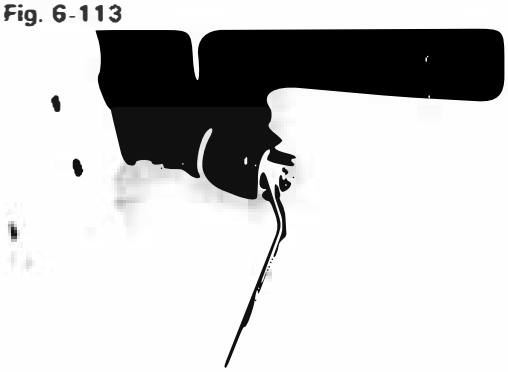
FRONT SHOCK ABSORBER

REMOVAL

Fig. 6-112

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

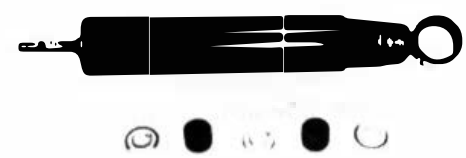
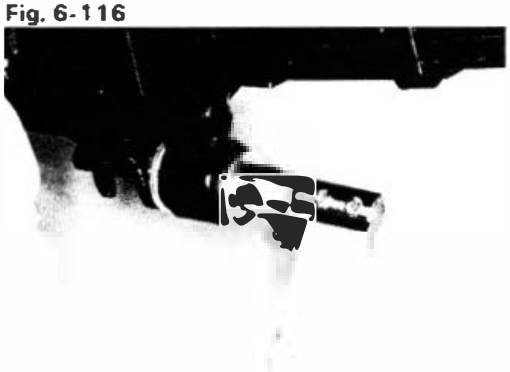


Fig. 6-115

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

Fig. 6-116



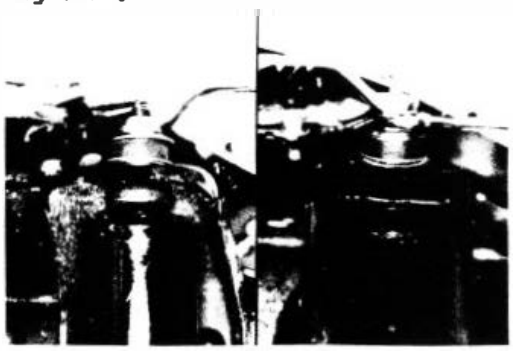
INSTALLATION

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)

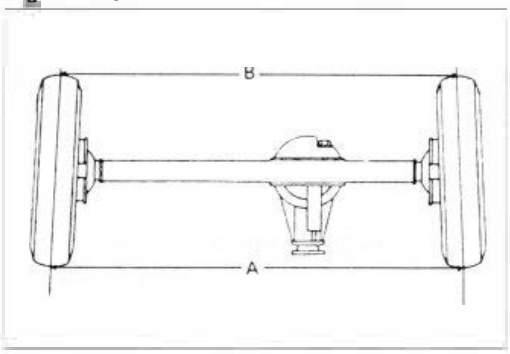
FRONT WHEEL ALIGNMENT

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



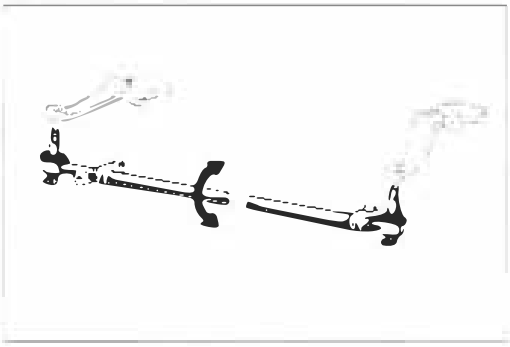
Toe-in

Measure the toe-in.

Toe-in:

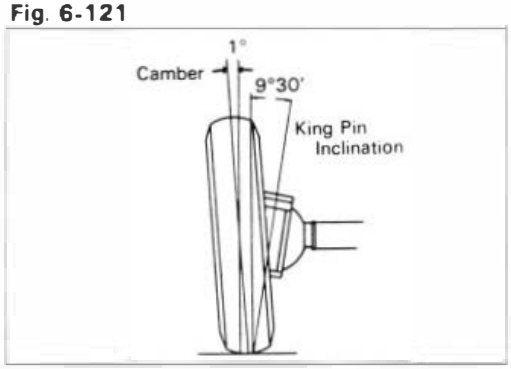
Bias tire	**4 ± 2 mm (0.10 ± 0.08 in.)**
Redial tire	**1 ± 2 mm (0.04 ± 0.08 in.)**

Fig. 6-120



To adjust, turn the tie rod adjusting tube.

Fig. 6-121



Camber & King Pin Angle

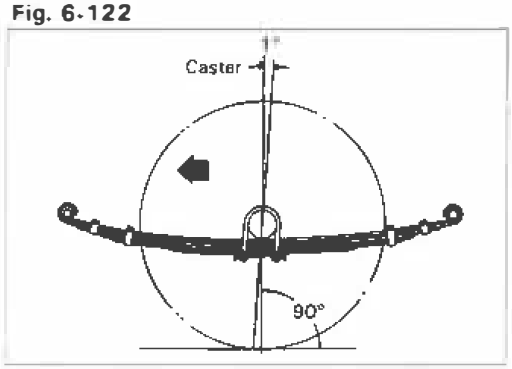
Measure the camber and king pin angle

Camber angle: 1° ± 45'
King pin inclination: 9°30'

– Note –

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

Fig. 6-122



Caster

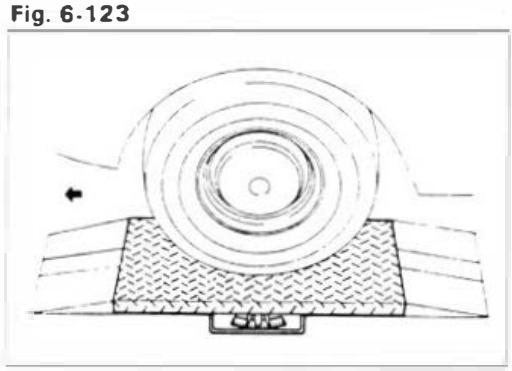
Measure the caster

Caster angle:
FJ, BJ, HJ4_series 1° ± 45'
FJ, BJ, HJ6_series 1°05' ± 45'

– Note –

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

Fig. 6-123



Side Slip

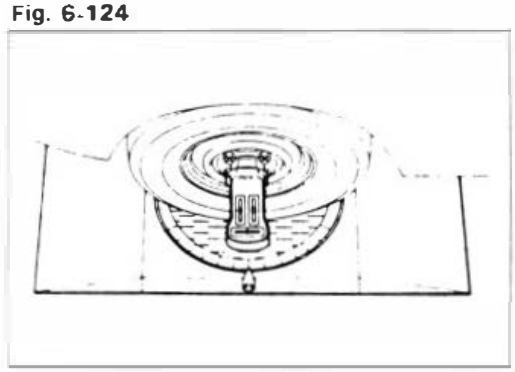
Measure the sideslip

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.

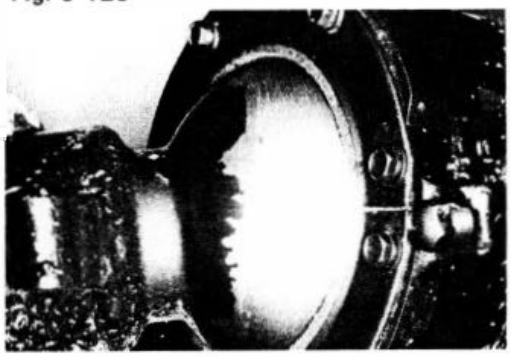
Fig. 6-124



Turning Angle

Inside wheel angle: 29 – 32°
Outside wheel angle: 30° (Reference)

Fig. 6-125



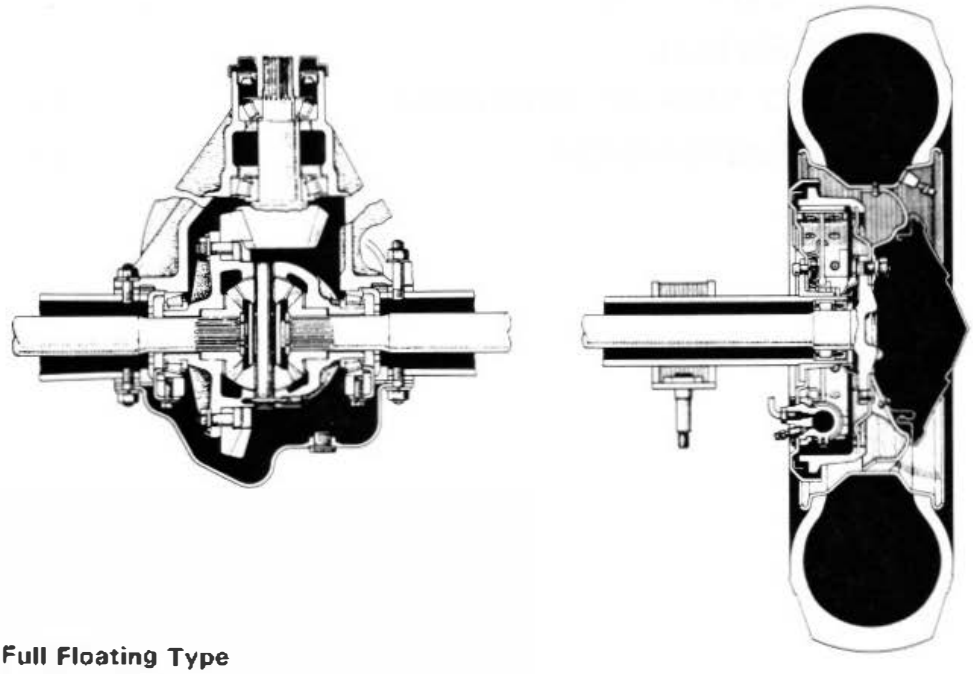
If not within limits, adjust the steering angles to standard values with knuckle stopper.

REAR AXLE & SUSPENSION

CUTAWAY VIEW

Fig. 7-1

Semi-Floating Type



Full Floating Type

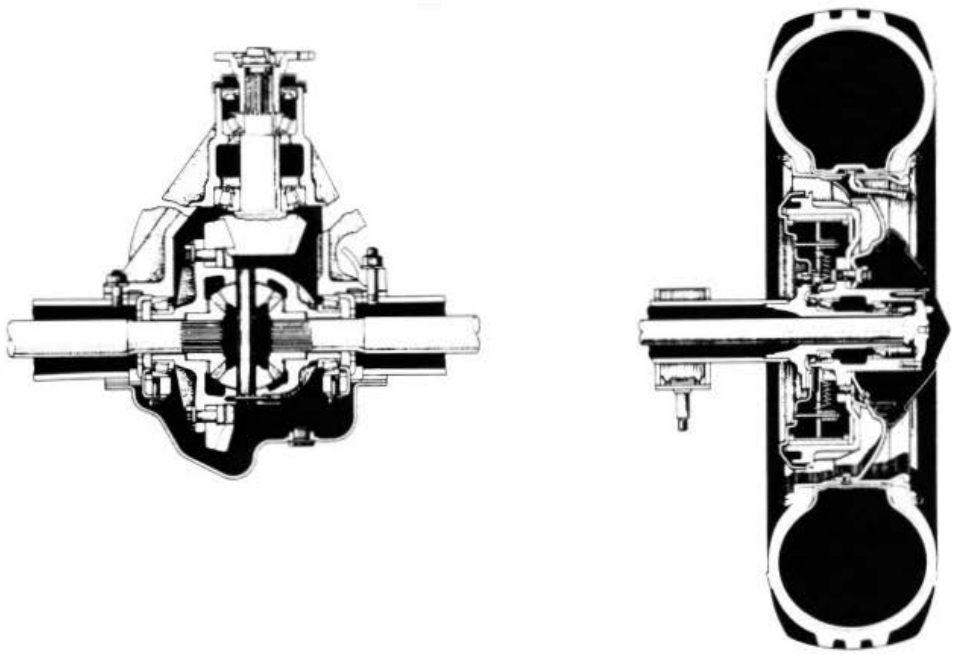
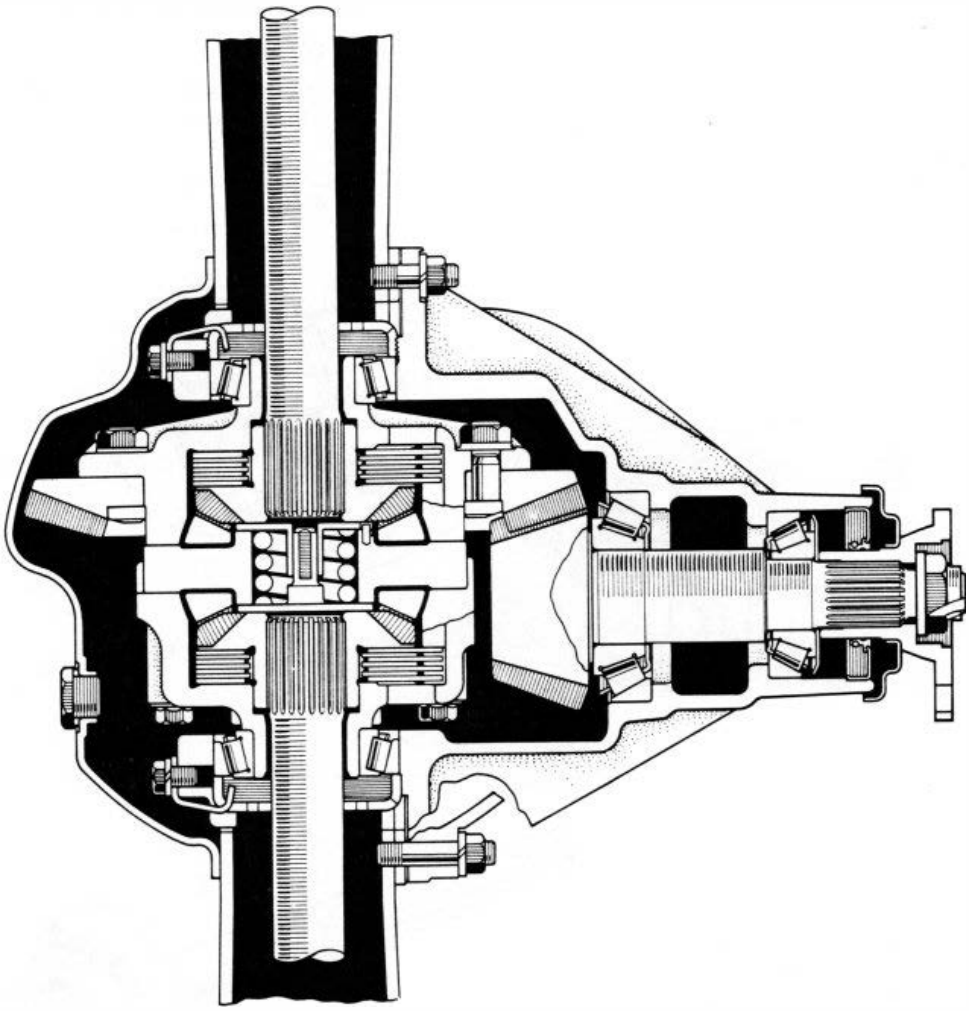


Fig. 7-2

LIMITED SLIP DIFFERENTIAL



REAR AXLE SHAFT (SEMI-FLOATING TYPE)

REMOVAL

Remove the parts in the numerical order shown in the figure

Fig. 7-3

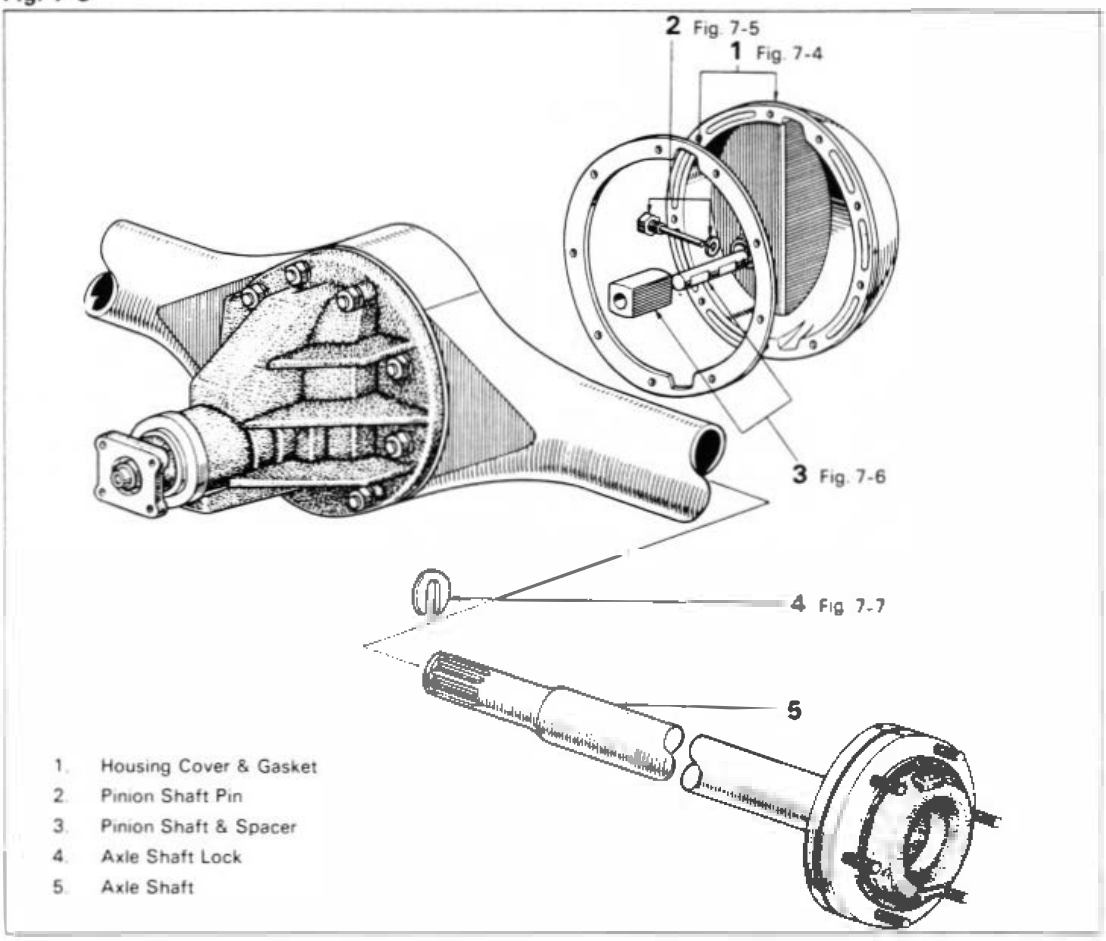
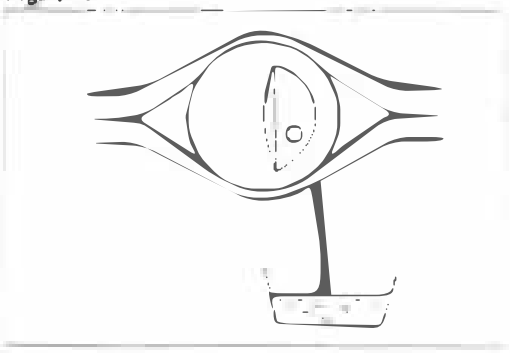
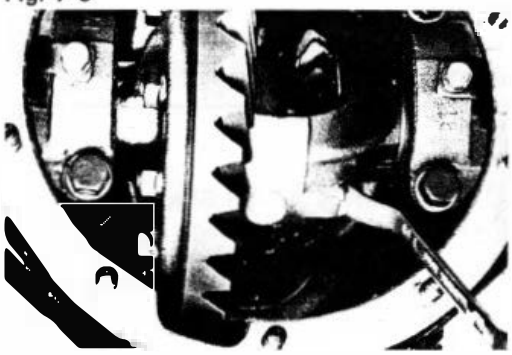


Fig. 7-4



⚠ Remove the drain and filler plugs and drain the oil

Fig. 7-5



Remove the pinion shaft pin

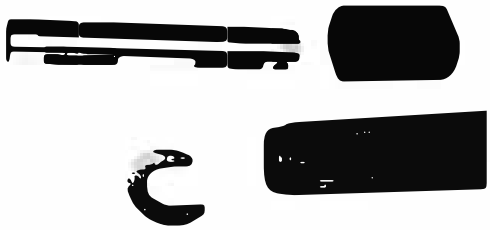
Fig. 7-6

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

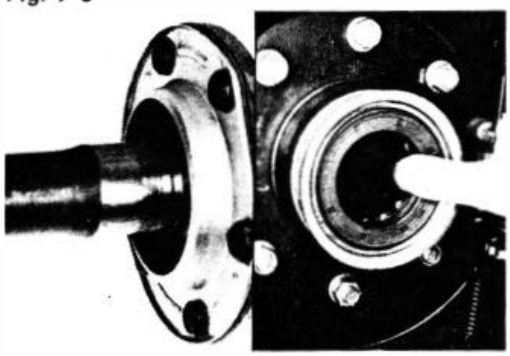


INSPECTION

Axle Shaft & Pinion Shaft Spacer

Inspect for wear or damage

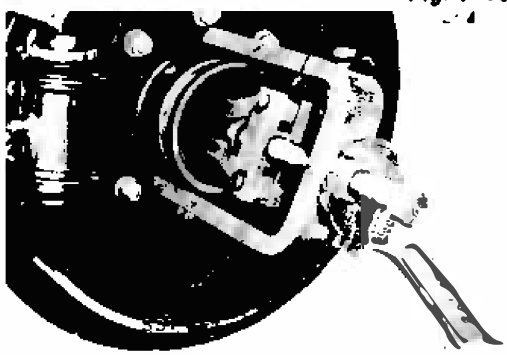
Fig. 7-9



Axle Shaft Bearing

Inspect for wear or damage

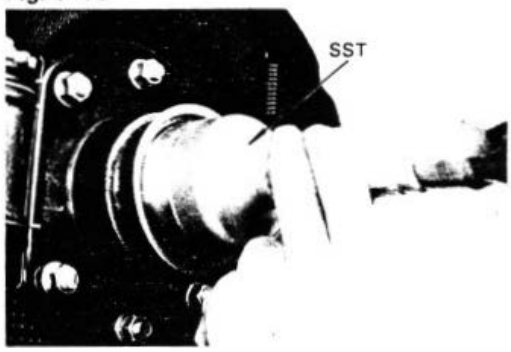
Fig. 7-10



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

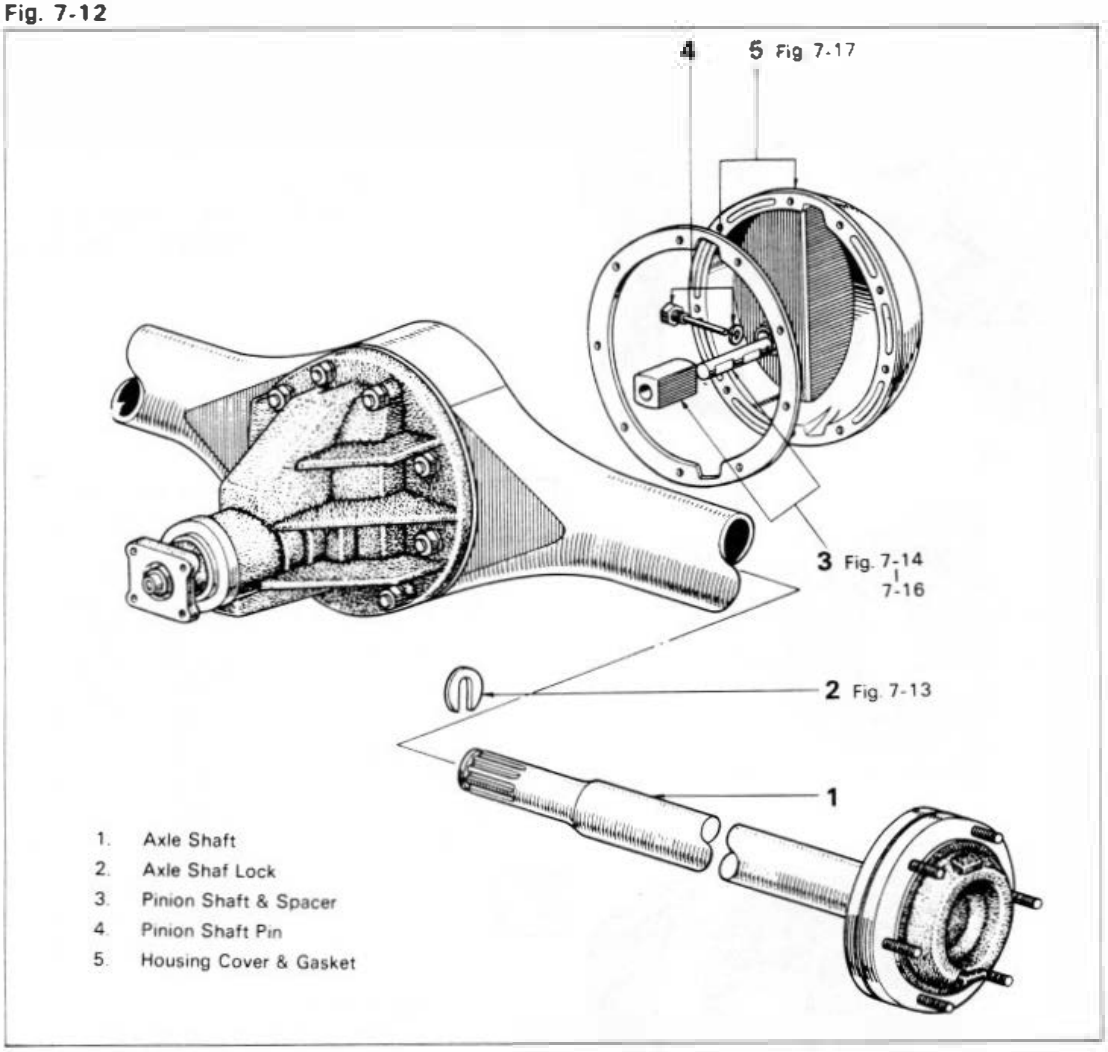
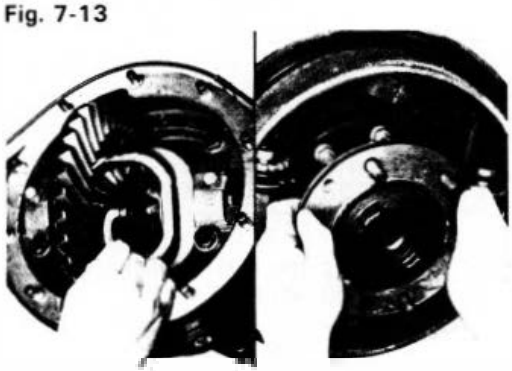
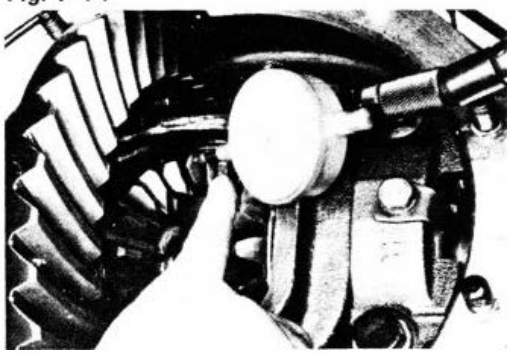


Fig. 7-13



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

Fig. 7-14



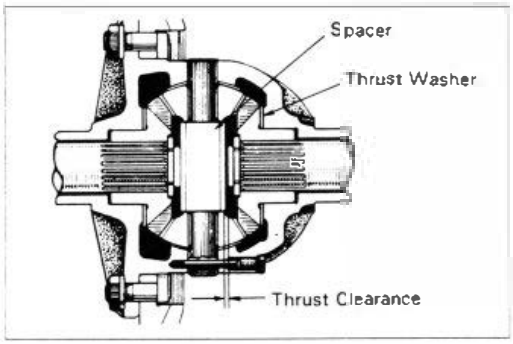
Measure the differential gear backlash

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.

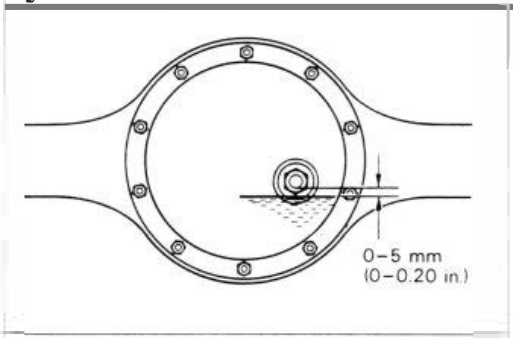
Clearance:

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	29.4 (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 filf in hypoid gear oil LSD, SAE90, API GL-5.

REAR AXLE SHAFT (FULL FLOATING TYPE)

COMPONENTS

Fig. 7-18

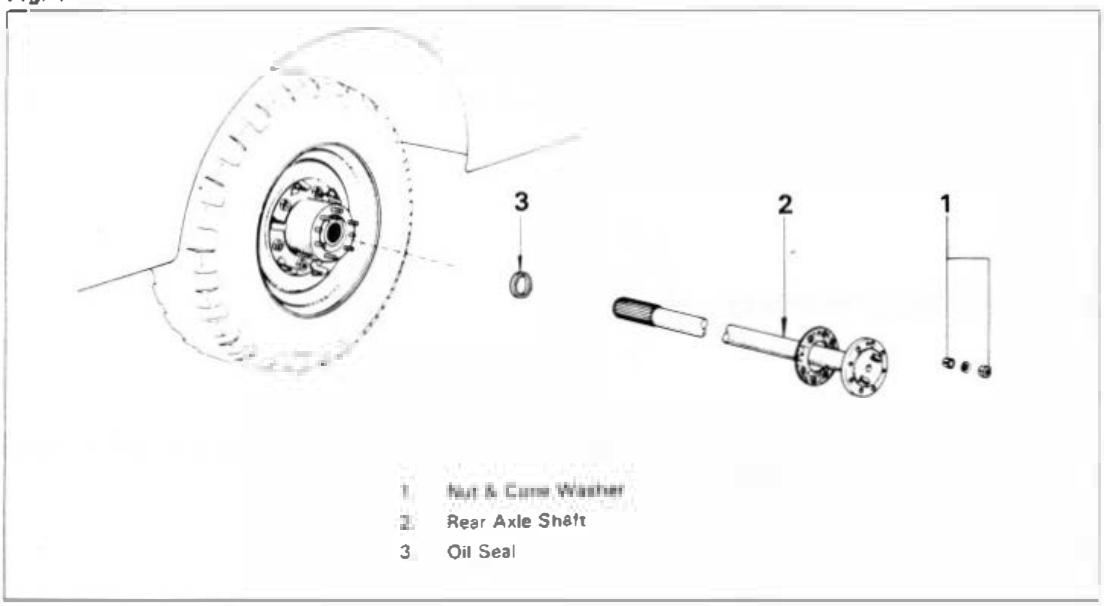
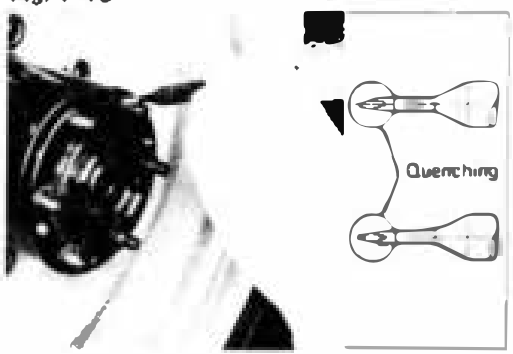


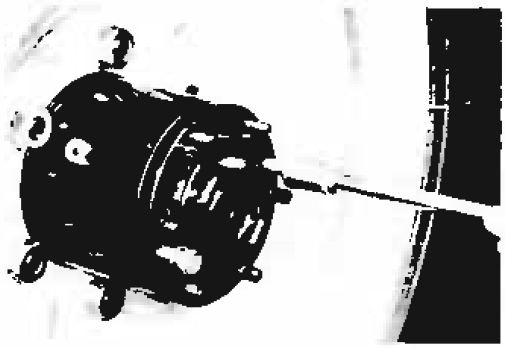
Fig. 7-19



REMOVAL

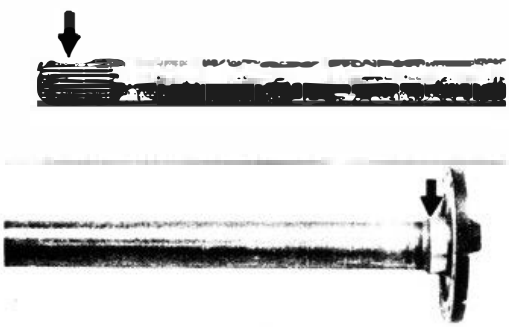
1. Remove the nuts and cone washers with a tapered punch.

Fig. 7-20



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

Fig. 7-21

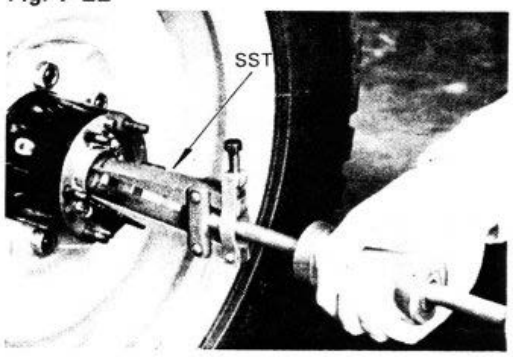


INSPECTION & REPAIR

Rear Axle Shaft

Inspect the parts identified by arrows for wear or damage

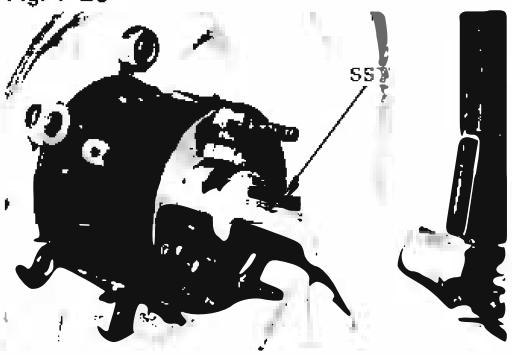
Fig. 7-22



Replace The Rear Axle Shaft Oil Seal

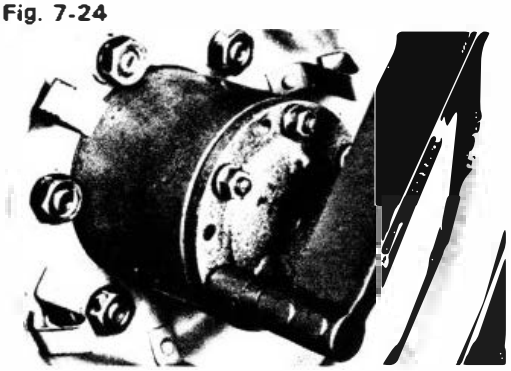
1. Remove the oil seal with SST.
   SST [09308-00010]

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

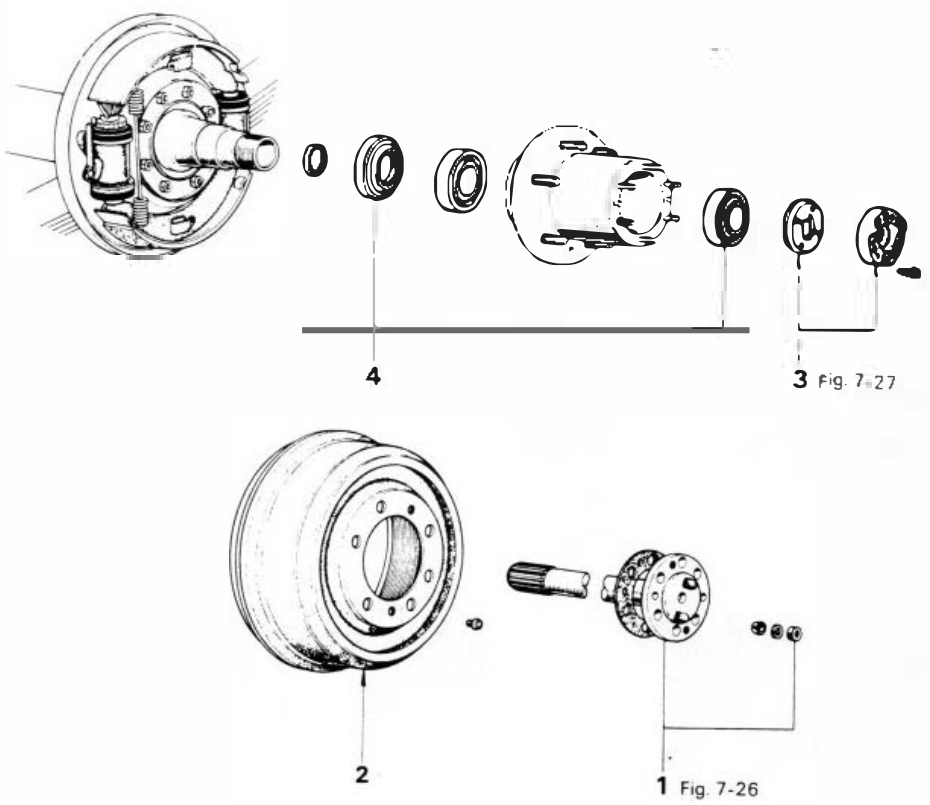
Tightening torque: 2.8 – 3.5 kg-m (21 – 25 ft-lb)

REAR AXLE HUB (FULL FLOATING TYPE)

REMOVAL

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

Fig. 7-25



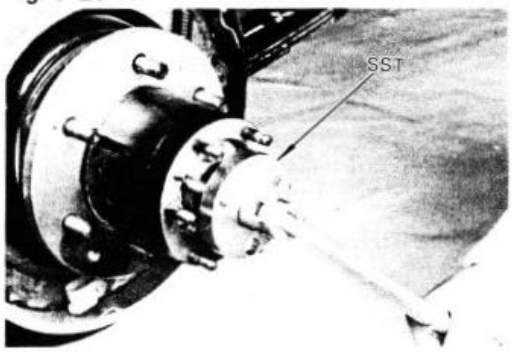
1. Rear Axle Shaft
2. Brake Drum
3. Adjusting Nut & Lock Washer
4. Axle Hub

Fig. 7-26

Remove the rear axle shaft

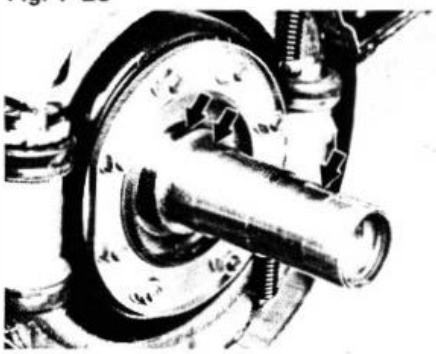
SEE
REAR AXLE SHAFT
(FULL FLOATING TYPE)
REMOVAL SECTION
Fig. 7-19 & 7-20

Fig. 7-27



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

Fig. 7-28

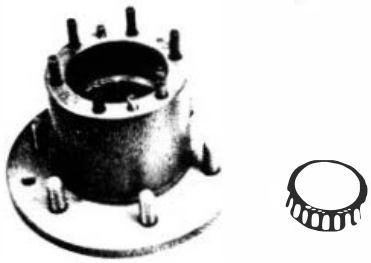


INSPECTION & REPAIR

Rear Axle Housing

Inspect the parts identicated by arrows for wear or damage.

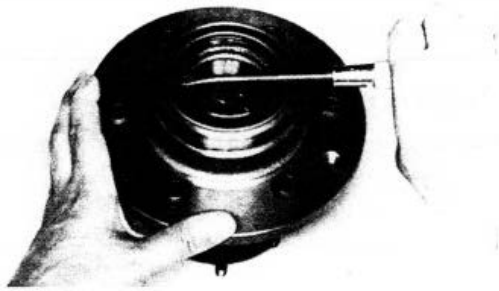
Fig. 7-29



Rear Axle Hub & Bearing

Inspect the bearings and oil seal for wear or damage

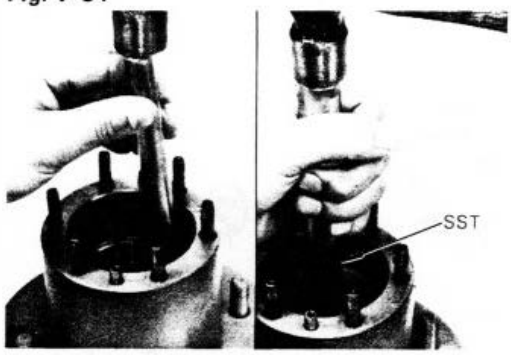
Fig. 7-30



Replace The Bearing

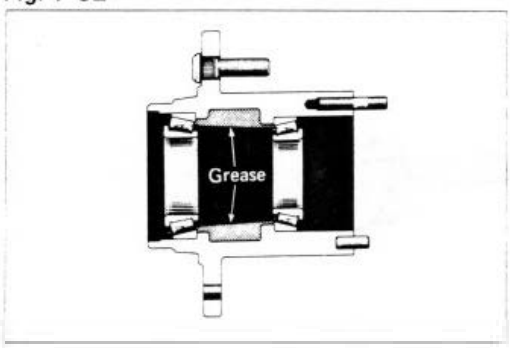
1. Remove the oil seal with a screw driver

Fig. 7-31



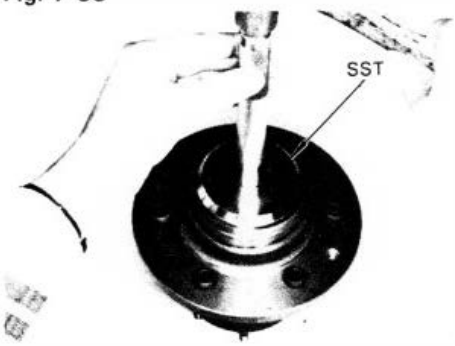
2. Remove the bearing outer races with a drift.
3. Install the new bearing outer races with SST.
   SST [09608-35013]

Fig. 7-32



4. Pack MP grease into the hub and bearings

Fig. 7-33

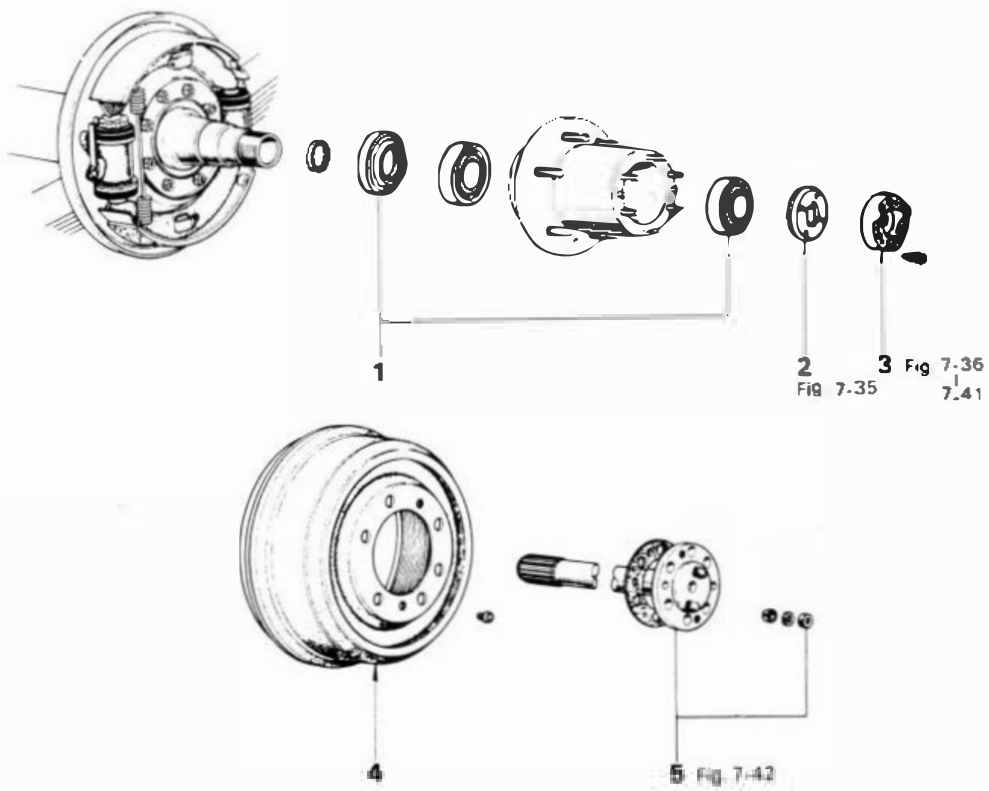


5. Install the inner bearing and oil seal with SST
   SST [09608-35013]
6. Apply MP grease on the oil seal

INSTALLATION

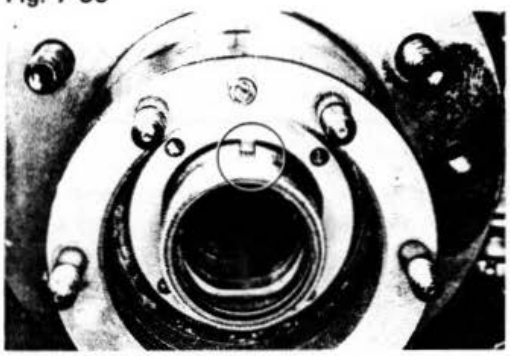
Install the parts in the numerical order shown in the figure.

Fig. 7-34



1. Rear Axle Hub
2. Lock Plate
3. Adjusting Nut
4. Brake Drum
5. Rear Axle Shaft

Fig. 7-35

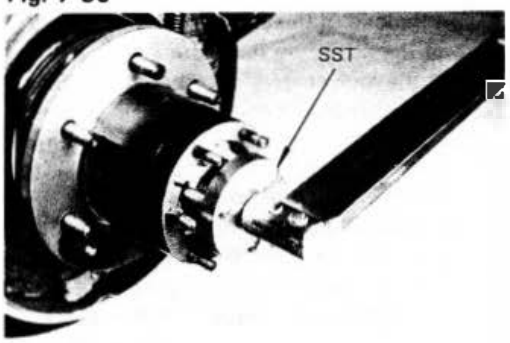


Install the lock plate.

—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]

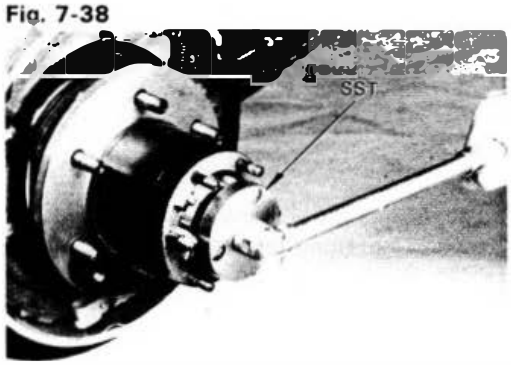
Tightening torque: 6.0 kg-m (43 ft-lb)

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

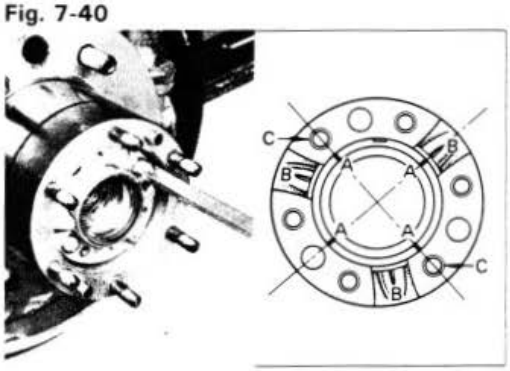


With SST, loosen the adjusting nut until it can be rotated by hand
Then, add the preload a little at time by tightening the nut
SST [09509-25011]

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

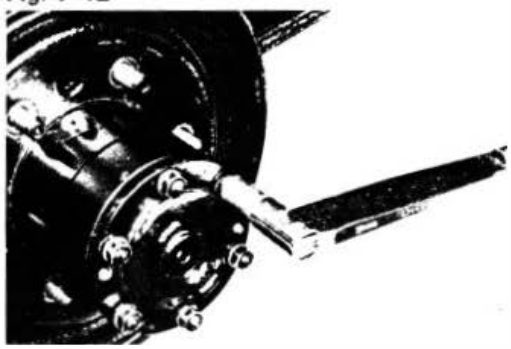


Align the one of the axle housing slots A with one of the adjusting nut slots B.
Install the lock screws into the holes C which are at right angles to the aligned slots A and B.
Tightening torque: 0.4 – 0.7 kg-m (35 – 60 in.-lb)

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

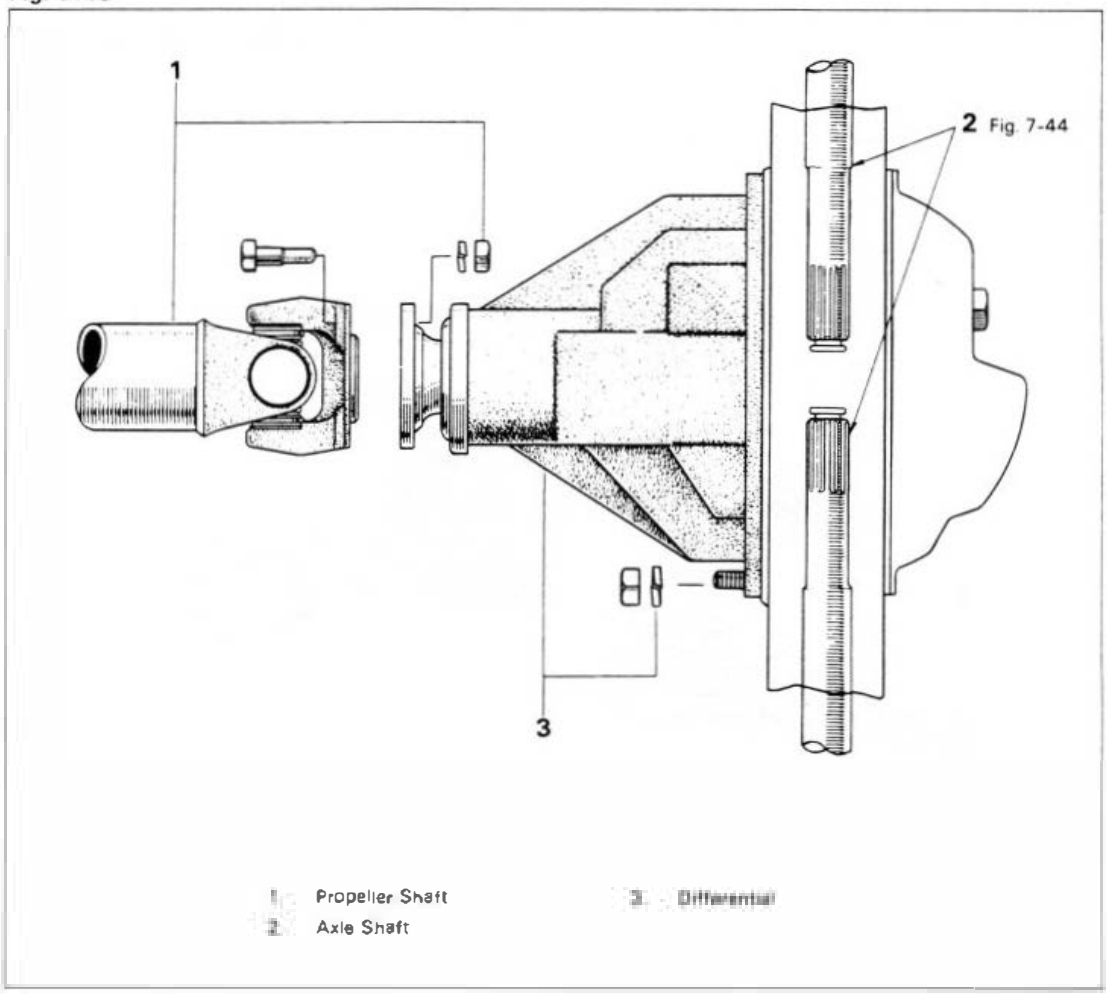


Fig. 7-44

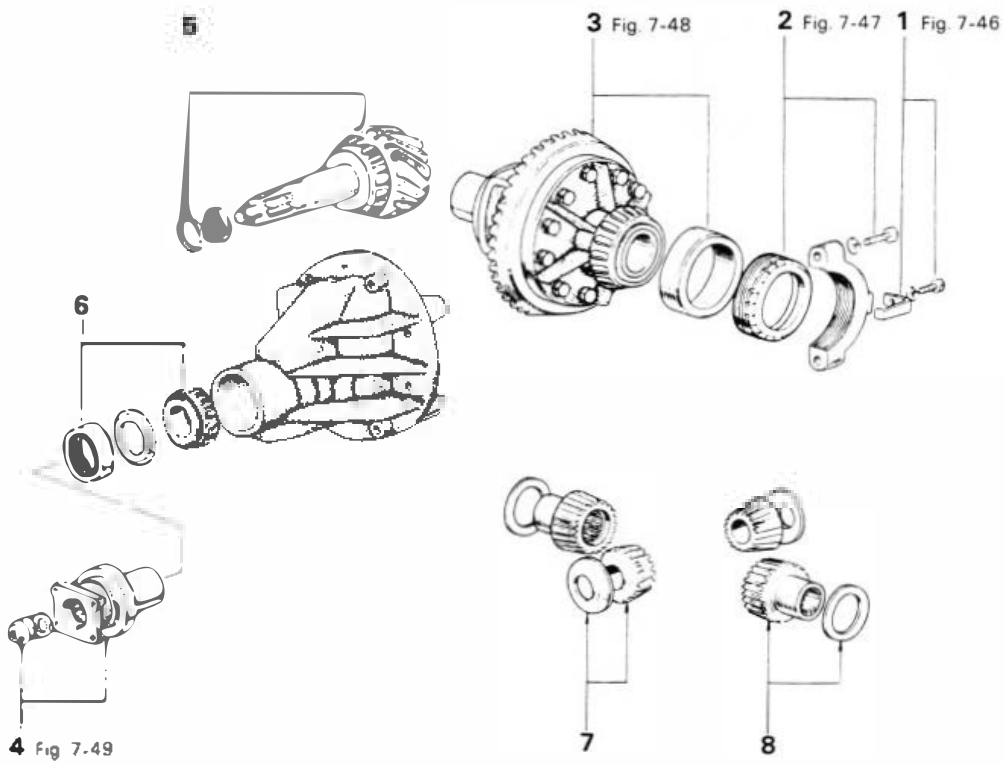
Remove the axle shafts

SEE
REAR AXLE SHAFT
(SEMI-FLOATING TYPE)
REMOVAL SECTION
Fig. 7-4 to 7-7,
7-19 & 7-20

DISASSEMBLY

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

Fig. 7-45



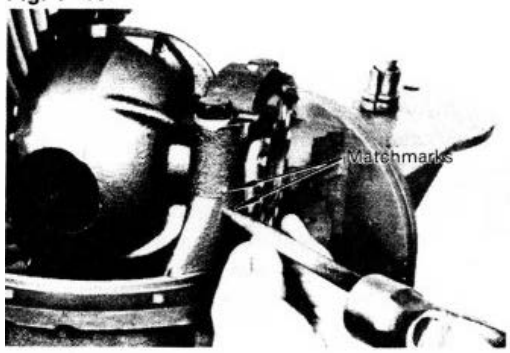
1. Adjust Nut Lock
2. Bearing Cap & Adjusting Nut
3. Ring Gear, Cap & Bearing
4. Joint Flange
5. Drive Pinion, Bearing, Shim & Washer
6. Oil Seal, Slinger & Bearing
7. Pinion & Thrust Washer
8. Side Gear & Thrust Washer

Fig. 7-46

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

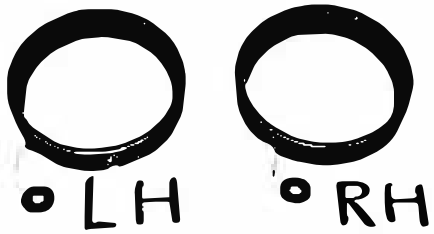
Runout:
Limit 0.10 mm (0.0039 in.)

Fig. 7-47



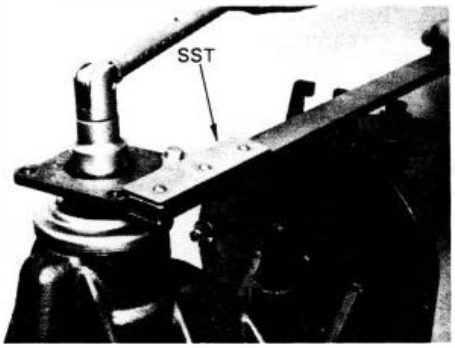
Place matchmarks on the bearing caps.

Fig. 7-48



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

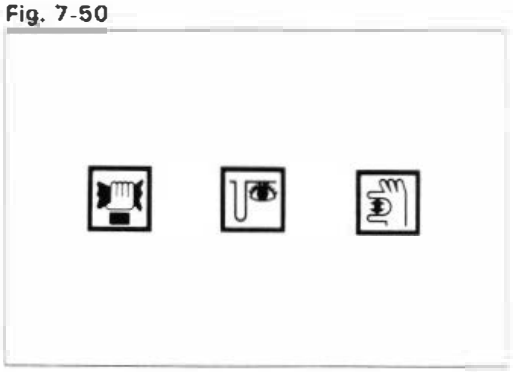
Fig. 7-49



Loosen the staked parts of the nut, and remove the nut with SST.
SST [09330-0●●20]

—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

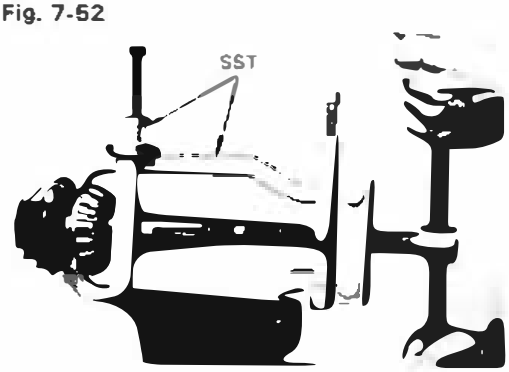
Wash the disassembled parts and inspect them on the following points
Replace any part found defective

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

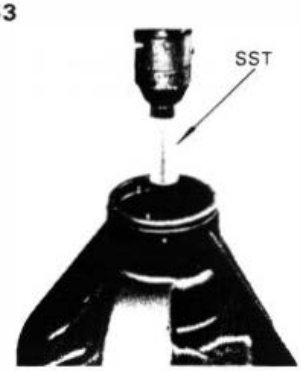


Replace The Bearing

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

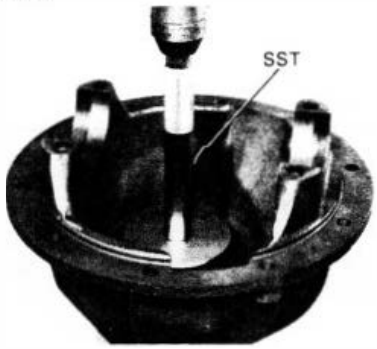
—**Note**—
If there is not enough clearance for the SST to hook on, draw out the bearing slightly with a chisel.

Fig. 7-53



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

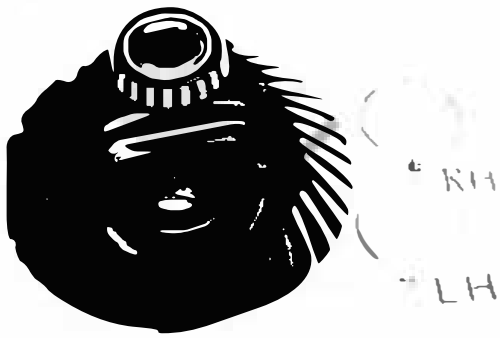
Fig. 7-54



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.

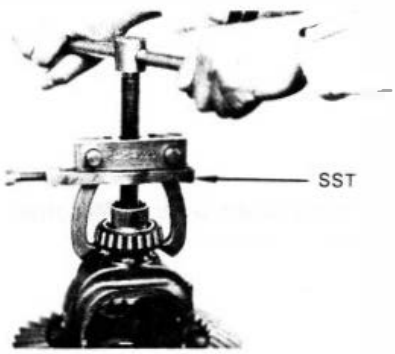
Fig. 7-55



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

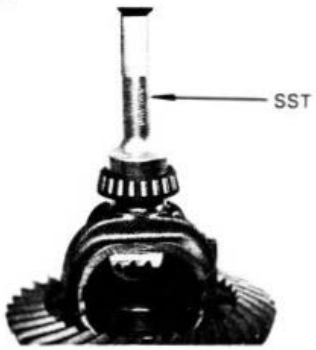
Fig. 7-56



Replace The Side Bearing

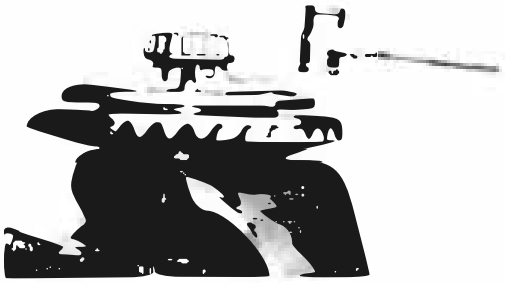
1 Remove the bearing with SST
SST [09950-20014]

Fig. 7-57



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

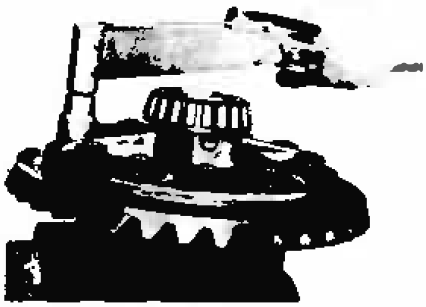
Fig. 7-58



Replace The Ring Gear

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

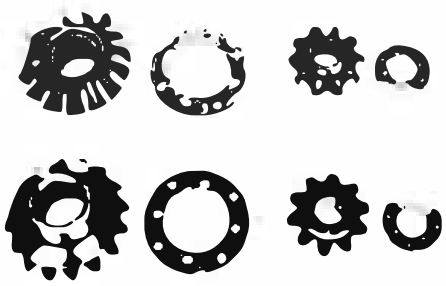
Fig. 7-59



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

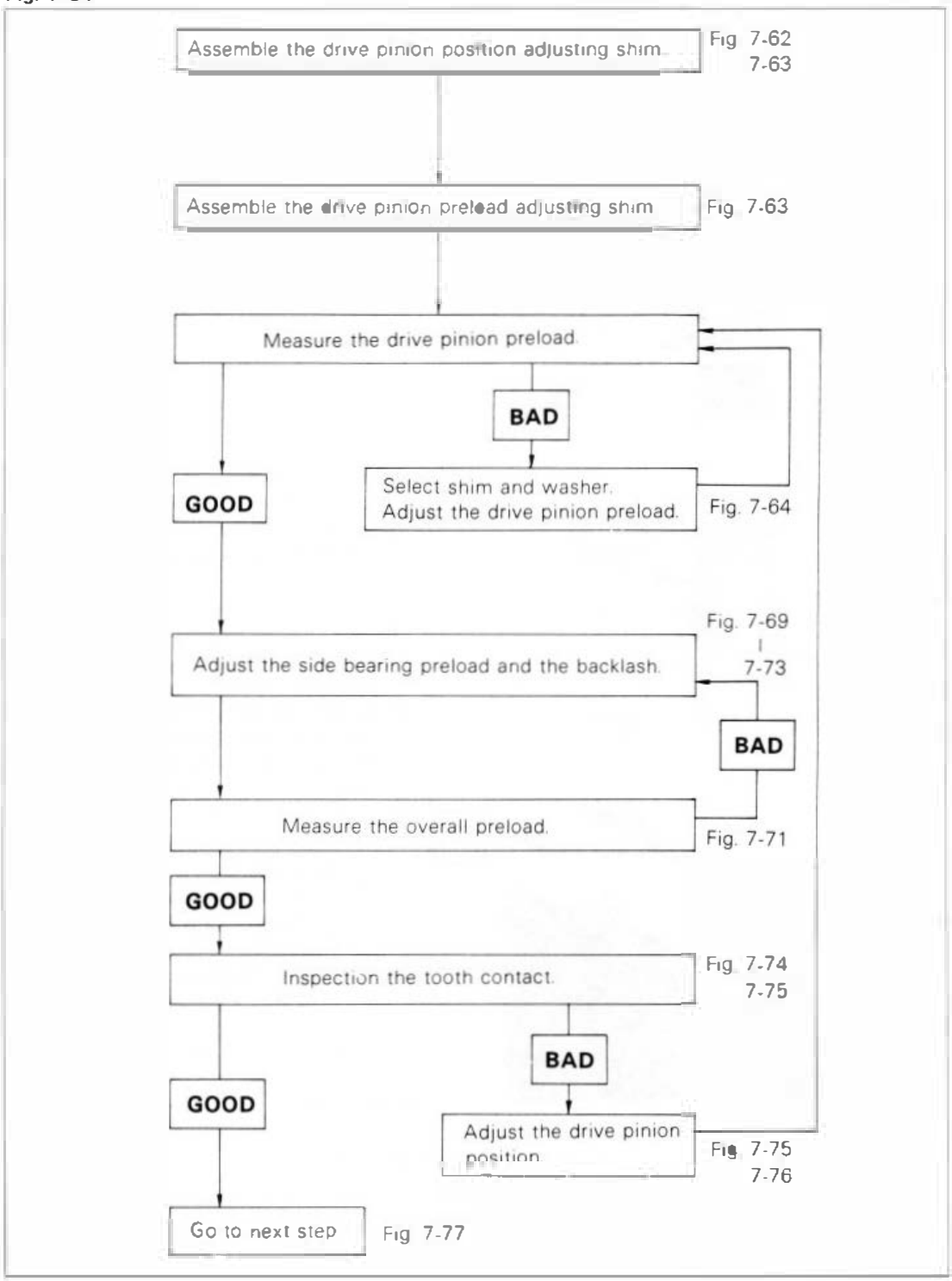
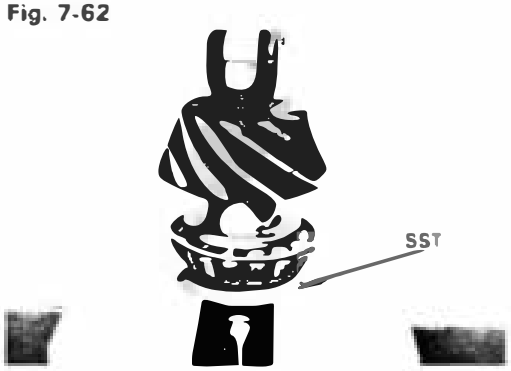
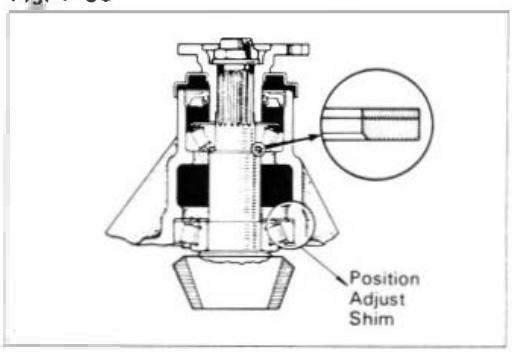


Fig. 7-62



Install the bearing to the drive pinion with SST
SST [09506-350 10]

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

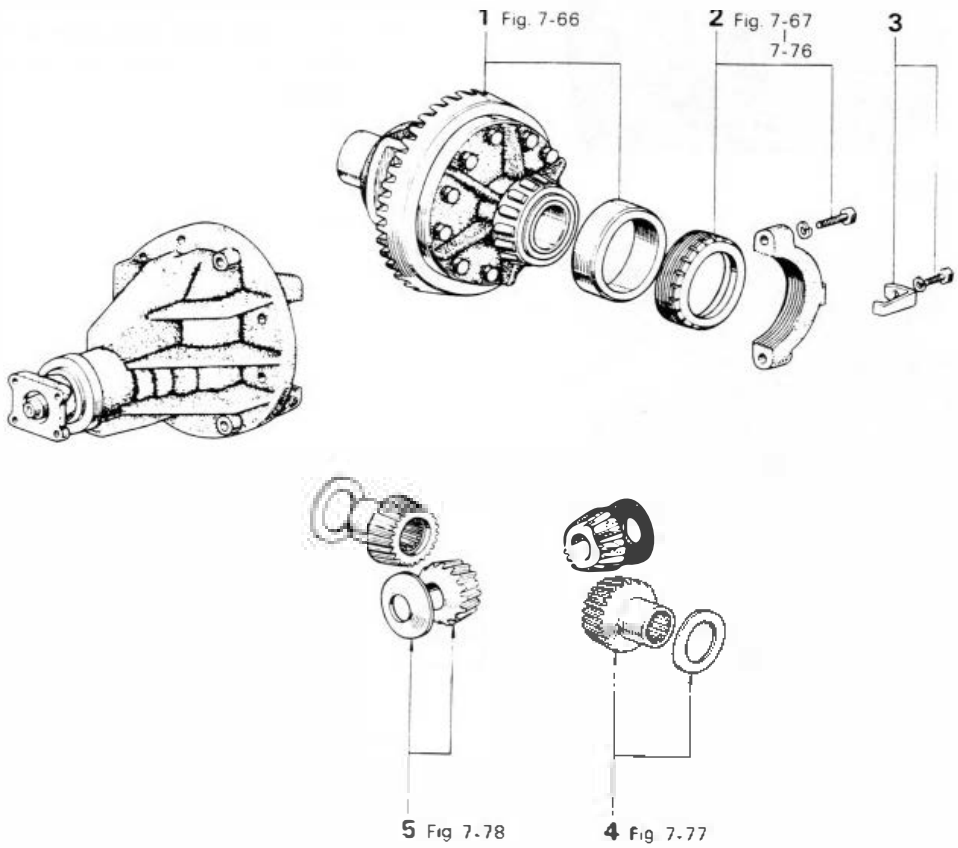
Part No	Thickness mm (in)	Part No	Thickness mm (in)
90564-30035	0 25 (0 0098)	90560-30188	2 86 — 2 88 (0 1126 — 0 1134)
90550-30184	2 74 — 2 76 (0 1079 — 0 10 87)	90550-30190	2 89 — 2 91 (0 1138 — 0 1146)
90560-30185	2 77 — 2 79 (0 1091 — 0 1098)	90560-30191	2 92 — 2 94 (0 1150 — 0 1157)
90560-30186	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)	90560-30 199	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

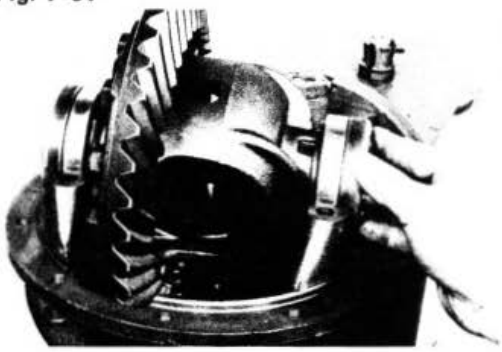
Fig. 7-66

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

—Note—

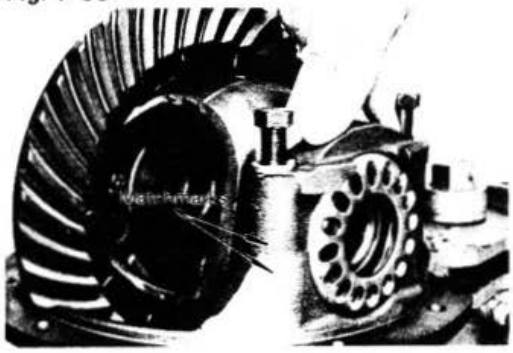
1. **Use care not to intermix the left and right bearing cups.**
2. **Make sure that backlash has been provided between the ring gear and drive pinion.**

Fig. 7-67



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

Fig. 7-68

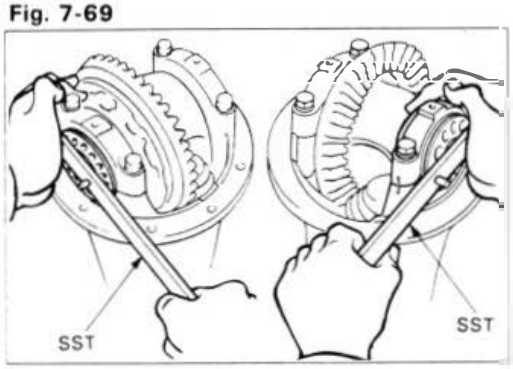


2. Screw in the two bearing cap bolts two or three turns and press down the bearing cap with hand.

—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

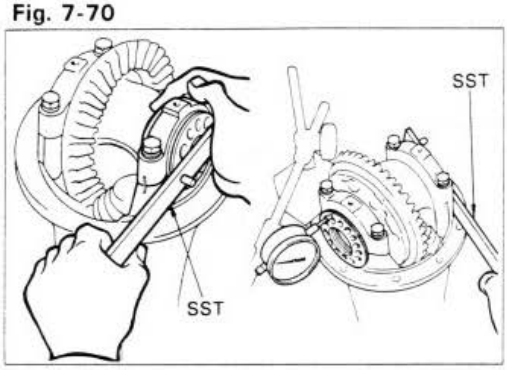


Adjust The Side Bearing Preload

SST [09504-00010]

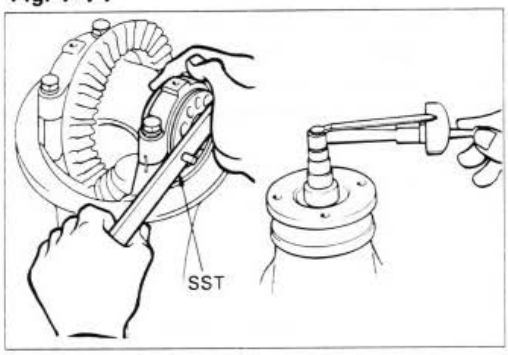
1. Tighten the bearing cap bolts until the spring washers are slightly compressed.
2. Tighten the adjusting nut on the ring gear side with SST so that the ring gear has a backlash of about 0.2 mm (0.008 in).
3. With SST, tighten firmly the adjusting nut on the drive pinion side in order to snug down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

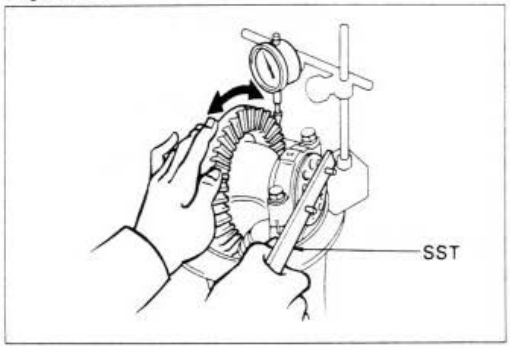
Fig. 7-71



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

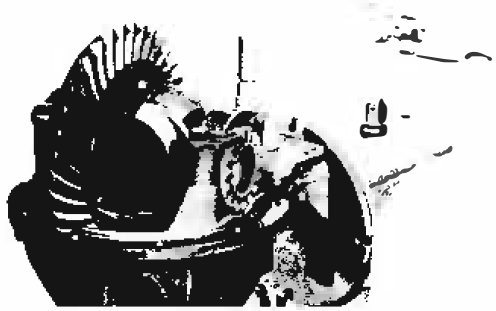


Adjust The Backlash

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 bet weent he ring gear and drive pini on teet h by coat ing 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 adjust ing lock nut on each bear ing cap, and stake th e companion flange nut.

Fig. 7- 75

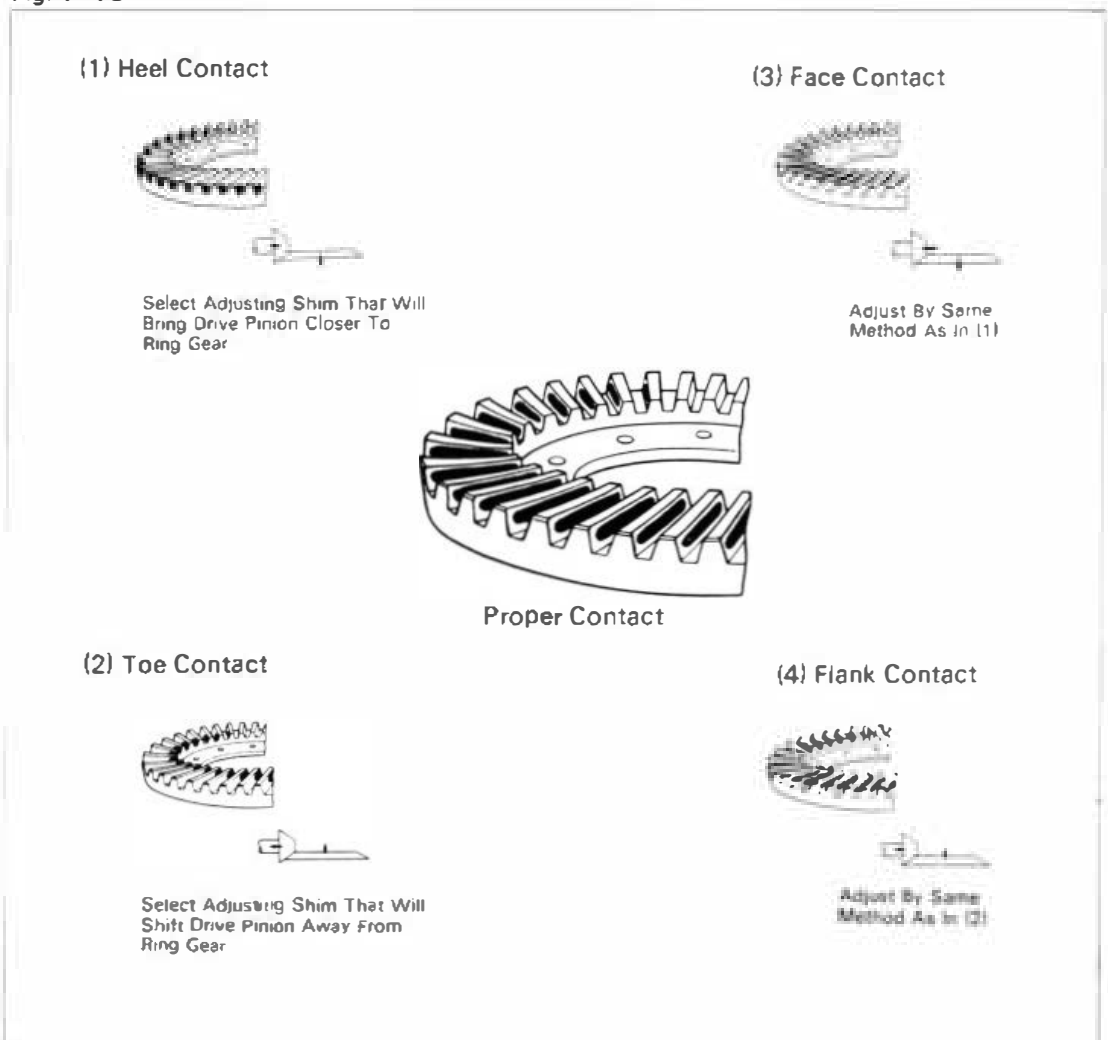
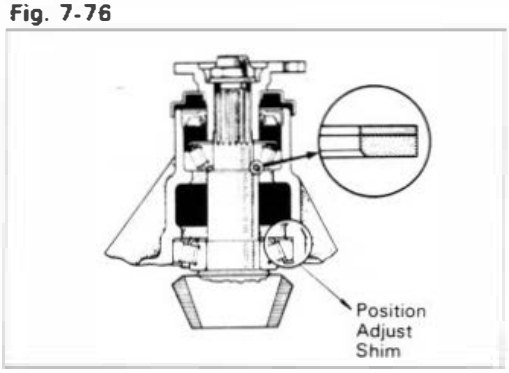


Fig. 7-76



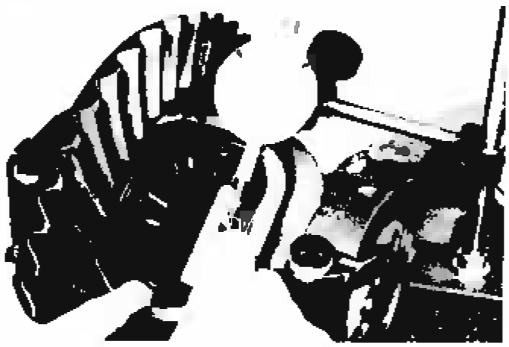
Adjusting shim thickness

Part No	Thickness mm (in)
90564-68001	025 (00098)
90564-68002	0.30 (00118)
90564-68003	0.35 (0.0138)
90564-68004	040 (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 thicknessside 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)

INSTALLATION

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

Fig. 7-79

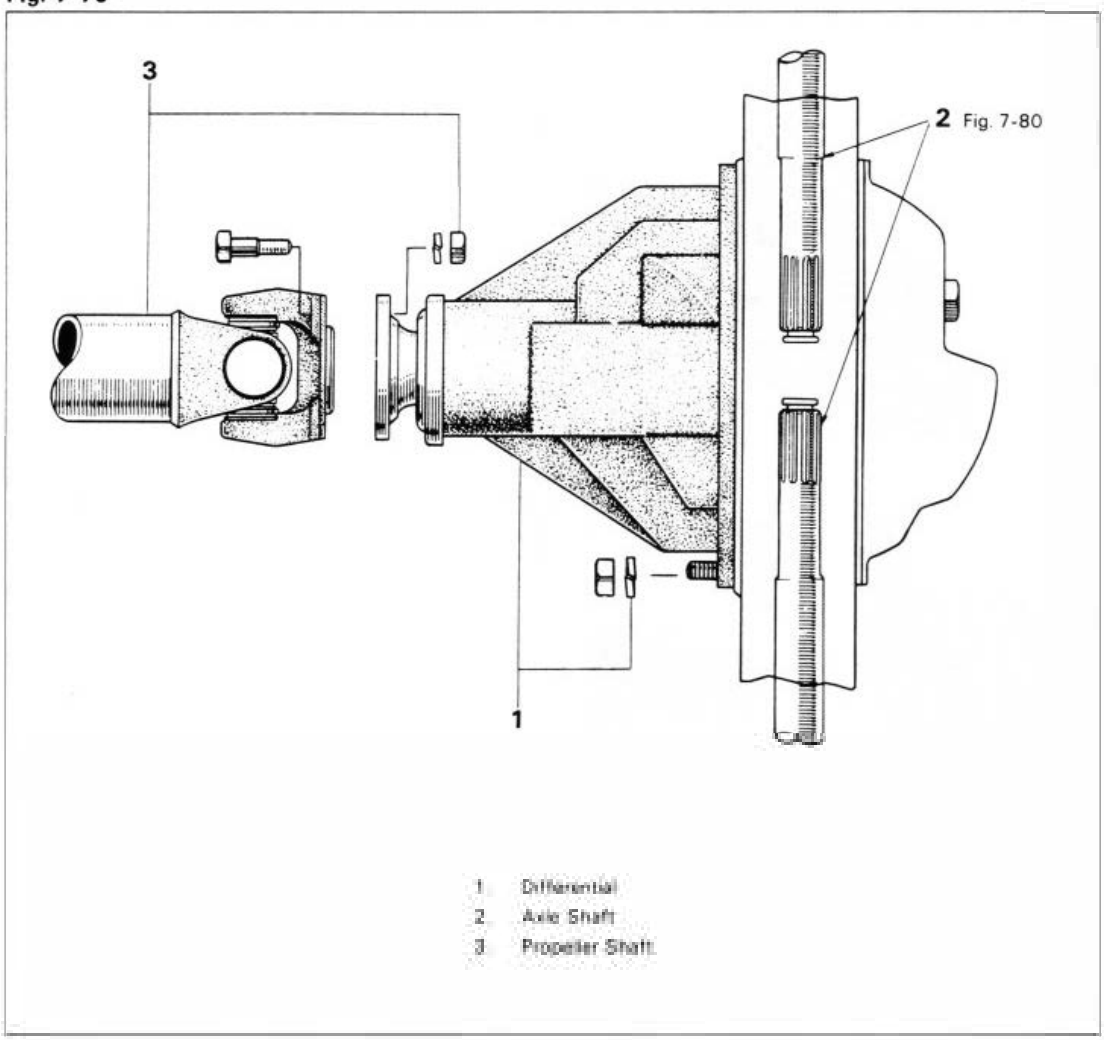


Fig. 7-80

SEE
REAR AXLE SHAFT
(SEMI-FLOATING TYPE)
INSTALLATION SECTION
Fig. 7-13 to 7-17, 7-24

Install the axle shafts.

—Note—
Measurement of differential gear backlash shall be excluded.

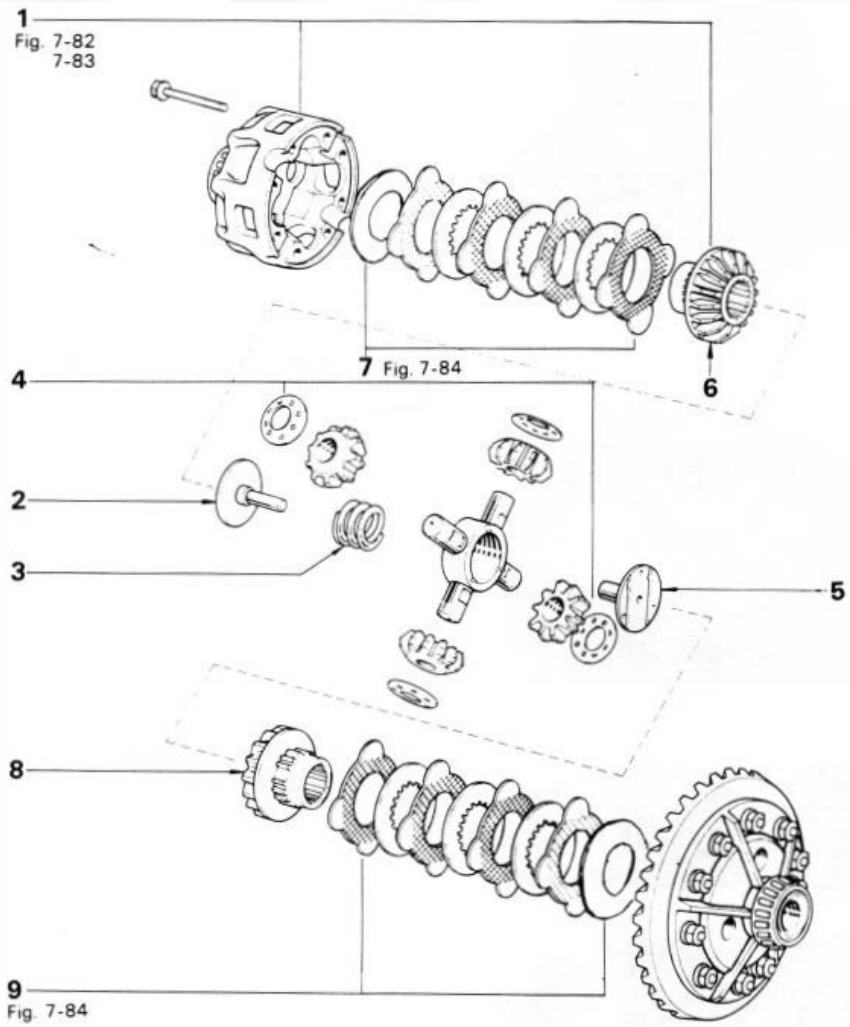
LIMITED SLIP DIFFERENTIAL

DIFFERENTIAL CASE

DISASSEMBLY

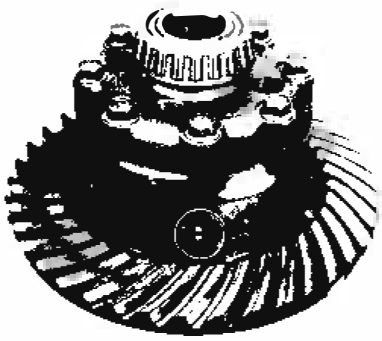
Disassemble the parts in the numerical order shown in the figure

Fig. 7-81



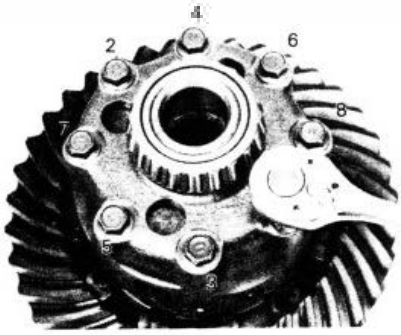
1. Differential Case RH, Adjusting Shim, Thrust Washer, Clutch Plate & Side Gear
2. Spring Retainer RH
3. Compression Spring
4. Differential Spider, Pinion & Pinion Thrust Washer
5. Spring Retainer LH
6. Side Gear
7. Thrust Washer, Clutch Plate & Adjusting Plate
8. Side Gear
9. Side Gear Thrust Washer, Clutch Plate & Adjusting Plate

Fig. 7-82



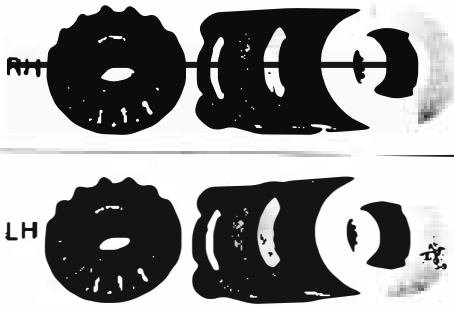
Place matchmarks on the RH and LH differntial case

Fig. 7-83



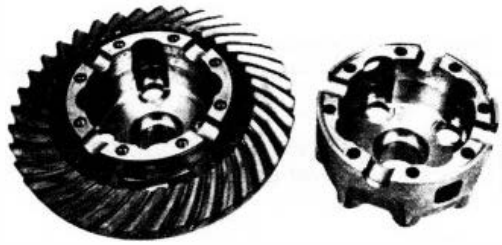
Loosen each bolt a little at a time, and in the sequence shown in the figure.

Fig. 7-84



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

Fig. 7-85

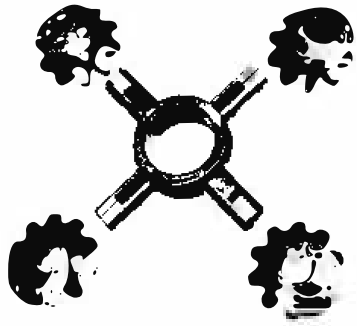


INSPECTION

Differential Case

Check for wear or damage

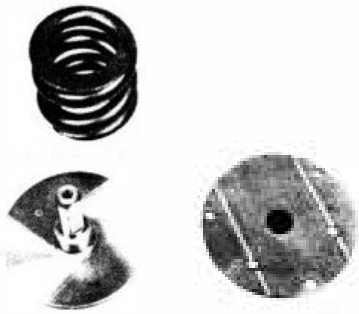
Fig. 7-86



Defferential Spider, Pinion & Pinion Thrust Washer

Check for wear or damage

Fig. 7-87



Spring Retainer & Compression Spring

Check for wear or damage

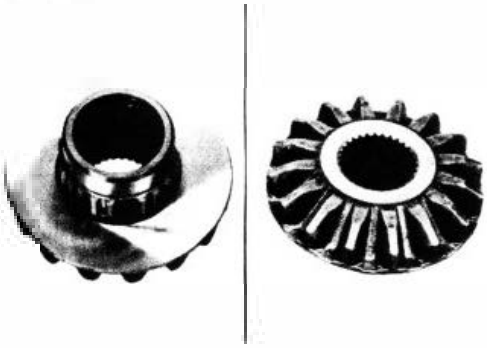
Fig. 7-88

Measure the free length of the spring

Free length:

Compression spring 38.6 mm (1.520 in.)

Fig. 7-89



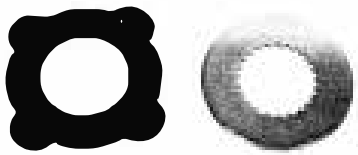
Side Gear

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



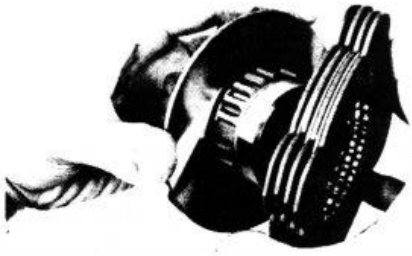
Clutch Plate & Side Gear Thrust Washer

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



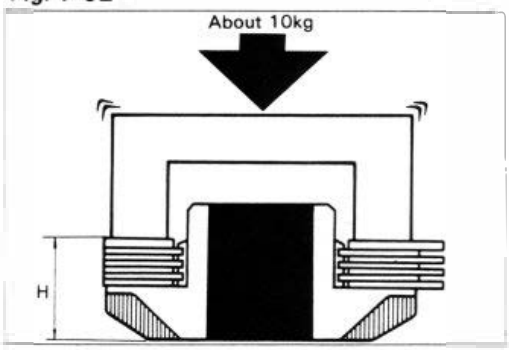
Select The Adjusting Shim

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

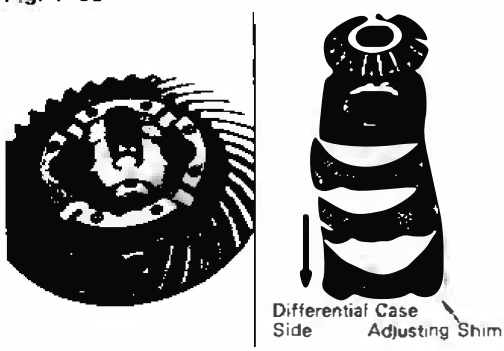
Part No.	Thickness mm (in.)
90564-54001	0.20 (.00079)
90564-54002	0.25 (0.0098)
90564-54003	0.30 (.00118)
90564-54004	.035 (0.0138)

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.)

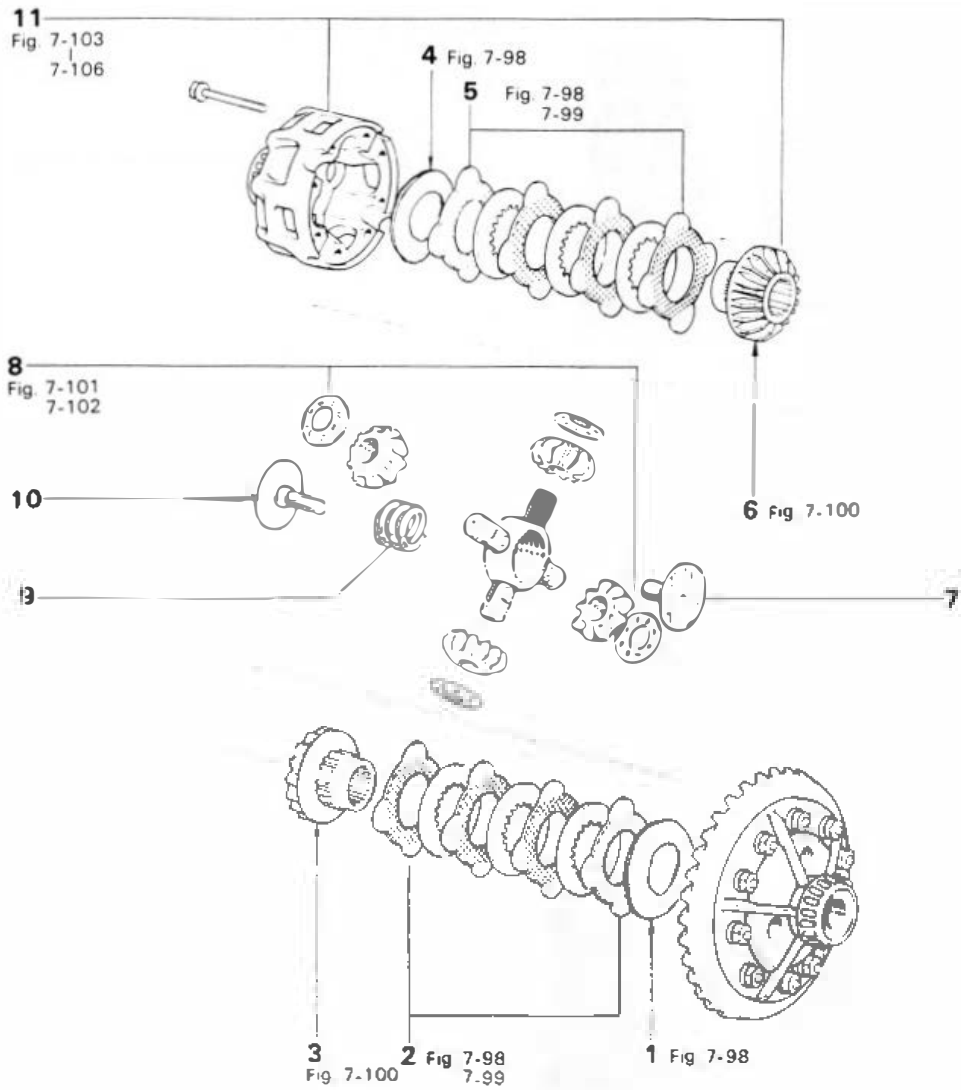
–Note–

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

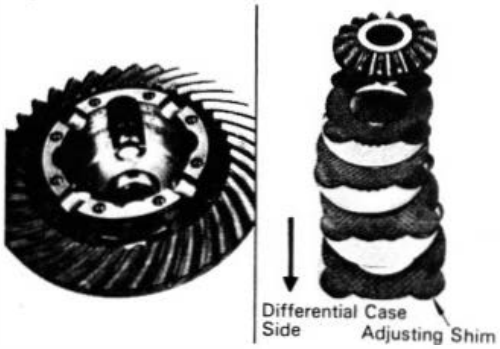
Assemble the parts in the numerical order shown in the figure

Fig. 7-97



1. Adjusting Shim
2. Thrust Washer & Clutch Plate
3. Side Gear
4. Adjusting Shim
5. Thrust Washer & Clutch Plate
6. Side Gear
7. Spring Retainer LH
8. Differential Spider, Pinion & Thrust Washer
9. Spring
10. Spring Retainer RH
11. Differential Case RH, Adjusting Shim, Thrust Washer, Clutch Plate & Side Gear

Fig. 7-98



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

—Note—
Coat the thrustwasher 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.

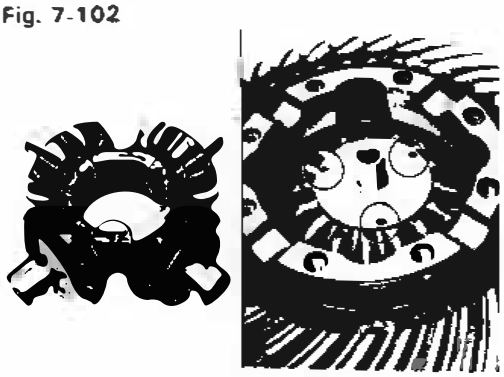
Fig. 7-100

Coat the side gear with hypoid gear oil LSD.

Fig. 7-101

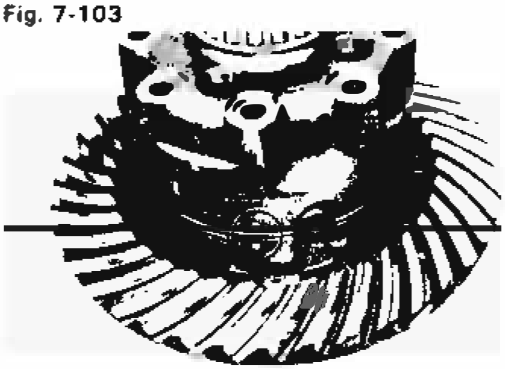
Coat the pinion gear with hypoid gear oil LSD.

Fig. 7-102



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

Fig. 7-103

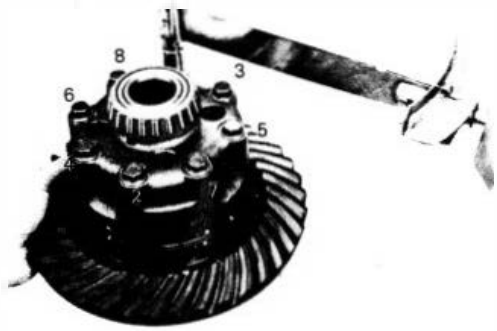


Align the matchmarks and assemble the differential cases

Fig. 7-104

Mesh the sidegear and pinion gears

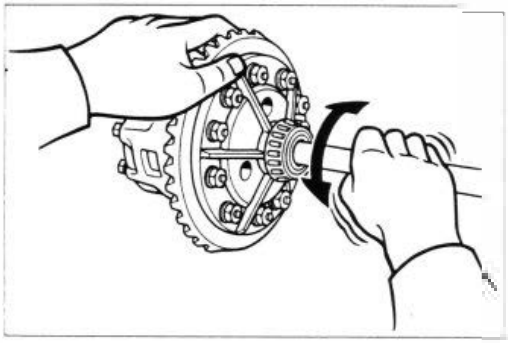
Fig. 7-105



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

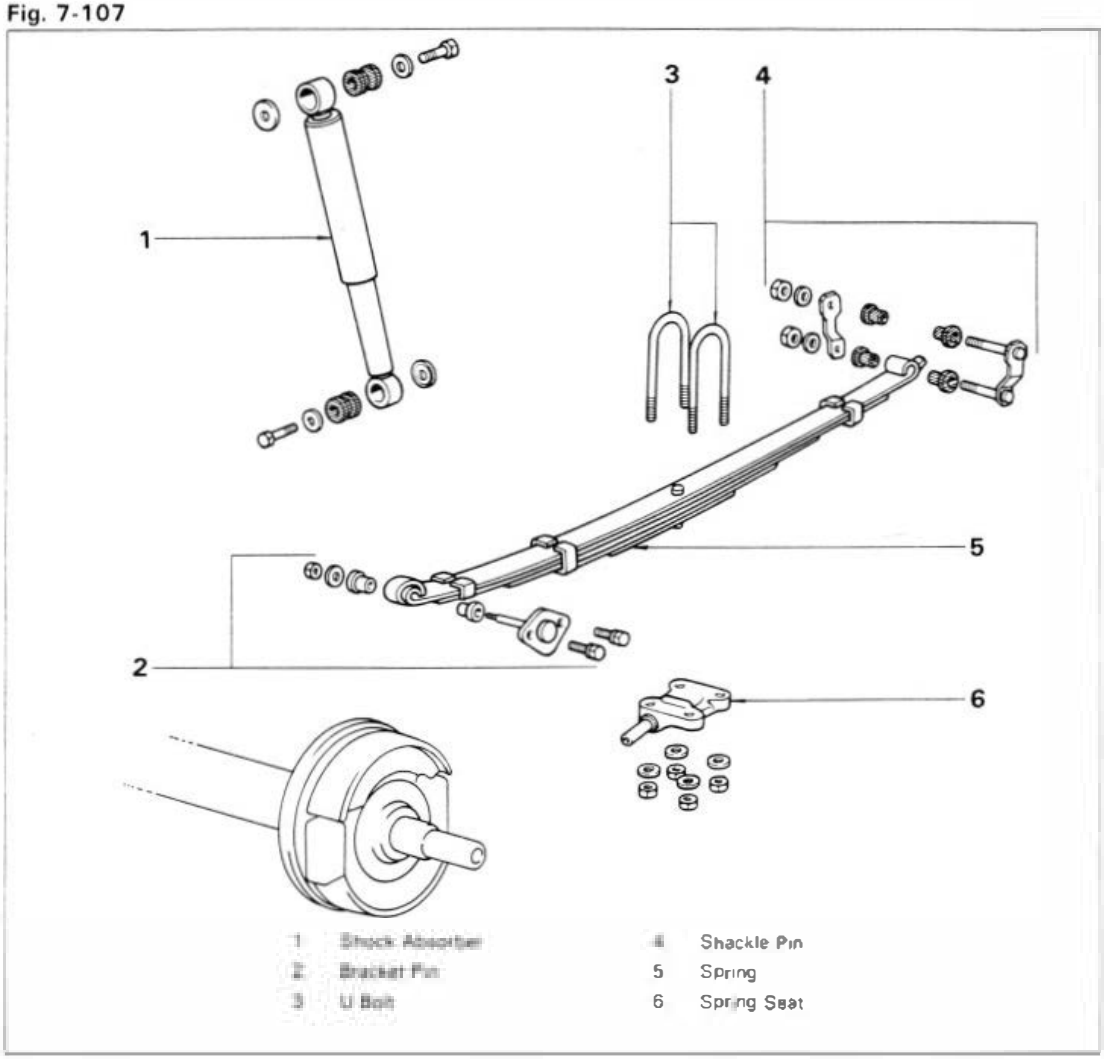


Fig. 7-108

Disassemble and assemble the rear suspension.

SEE

FRONT SUSPENSION

SECTION

Fig. 6-88 to 6-118

STEERING

CUTAWAY VIEW

Fig. 8-1

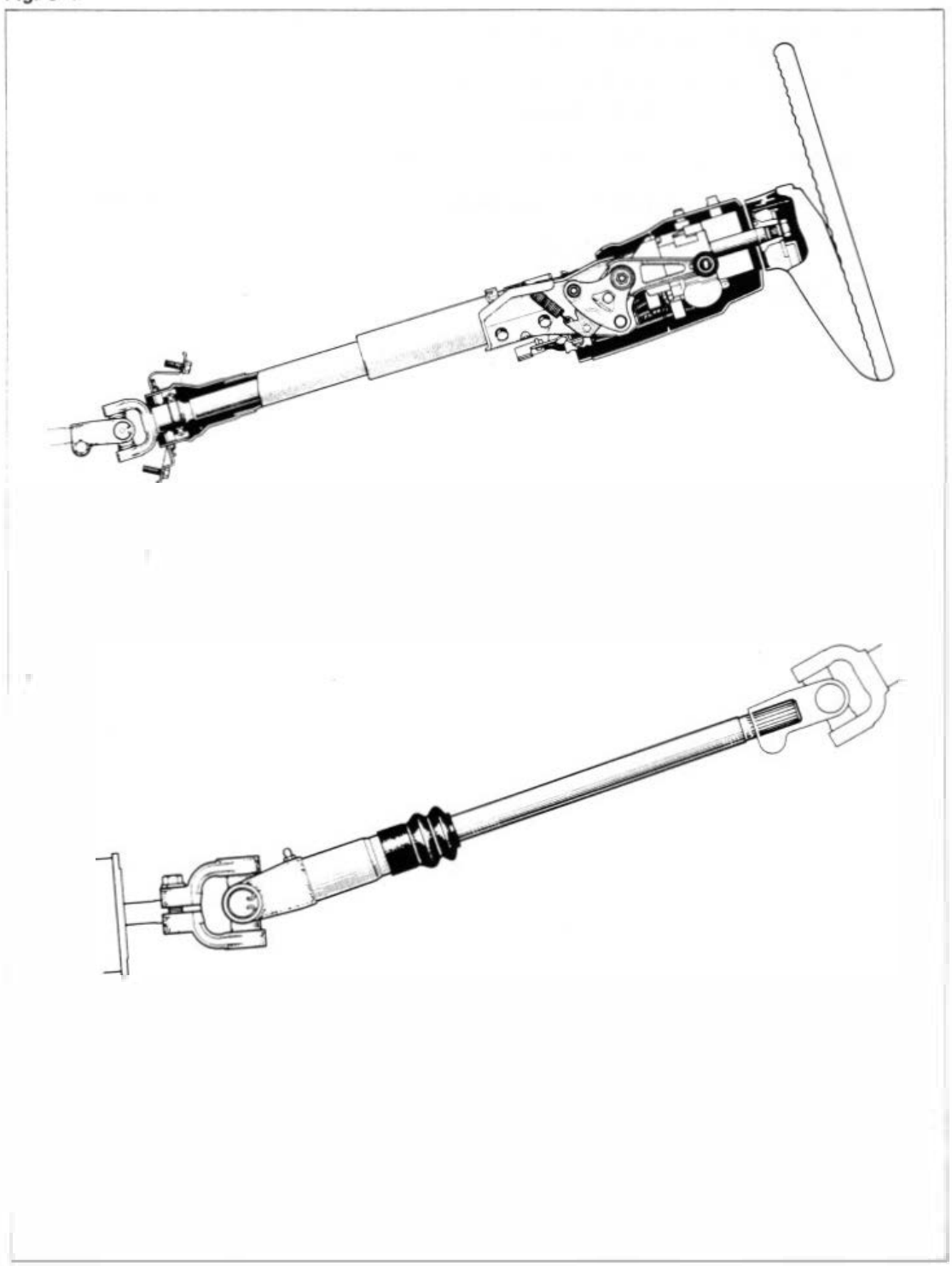
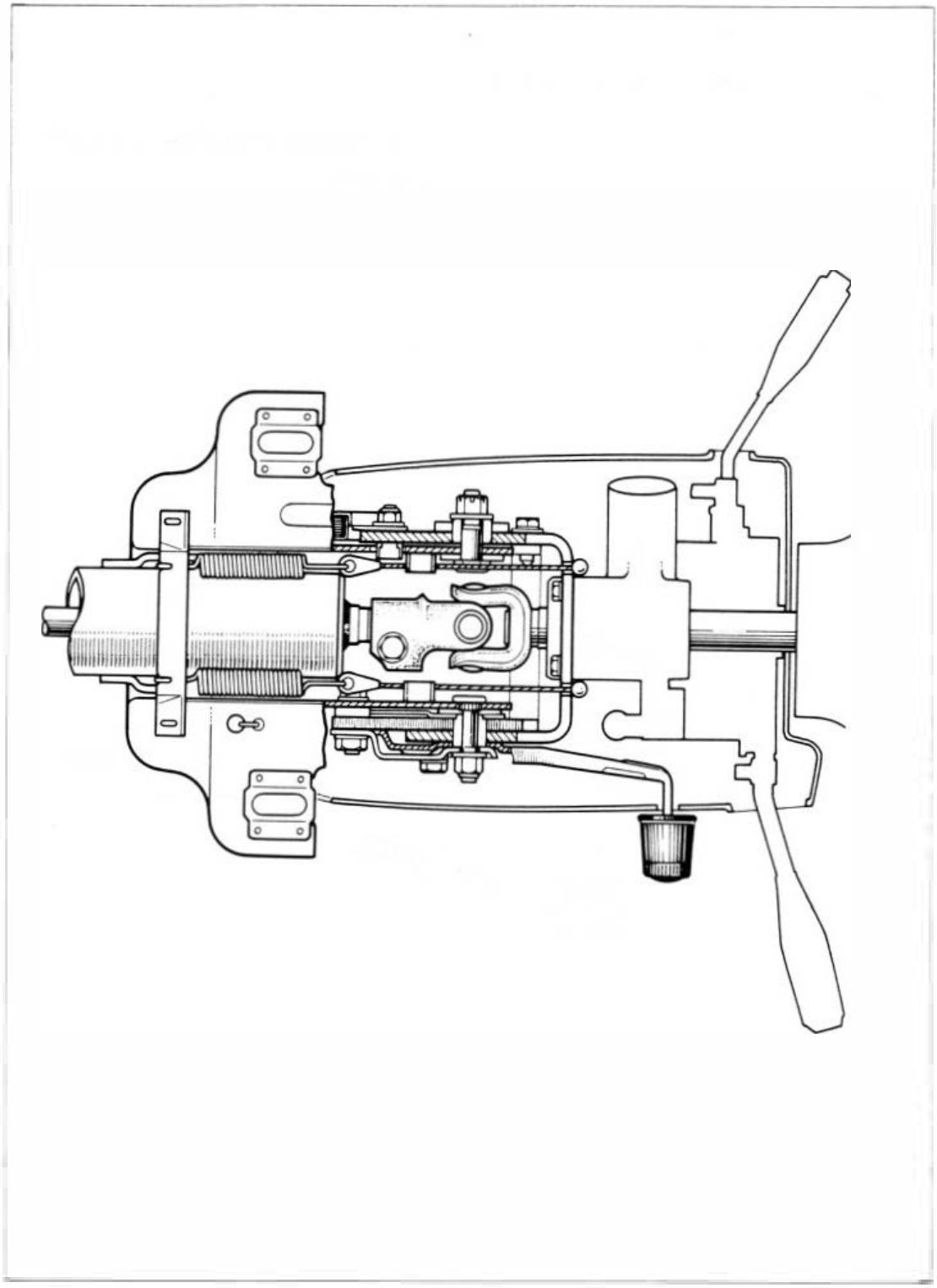


Fig. 8-2

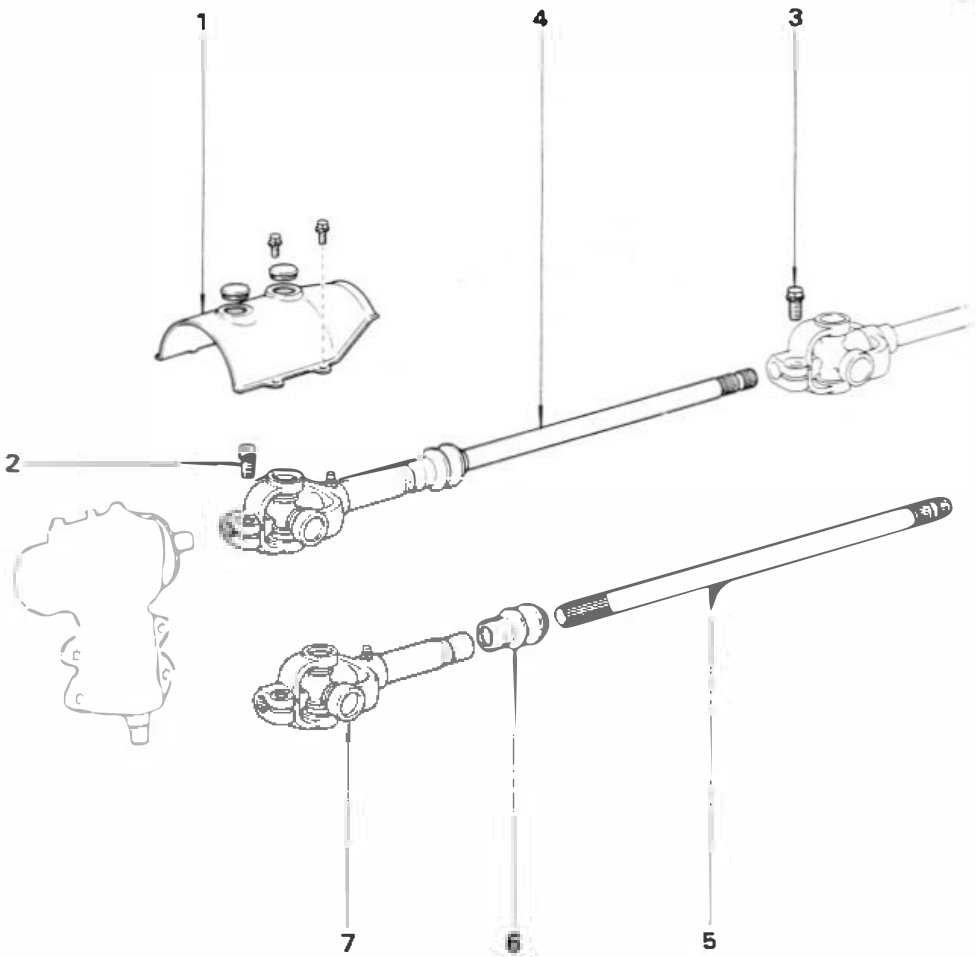


INTERMEDIATE SHAFT

REMOVAL

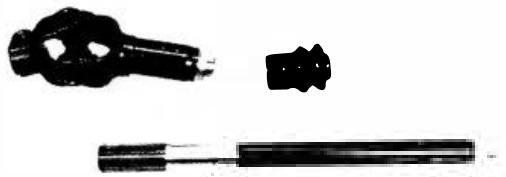
Remove the parts in the numerical order shown in the figure

Fig. 8-3



1. Dust Cover
2. Lock Bolt
3. Lock Bolt
4. Intermediate Shaft & Yoke
5. Sliding Shaft
6. Boot
7. Yoke

Fig. 8-4



INSPECTION & REPAIR

Shaft

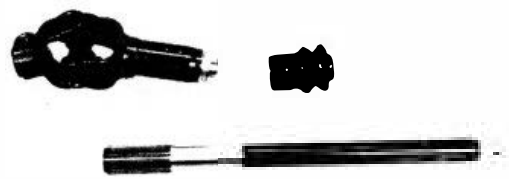
Check for wear, bending or damage.

Fig. 8-5

Spline

Check for wear or damage.

Fig. 8-6



Boot

Check for damage.

Fig. 8-7

Spider Bearing

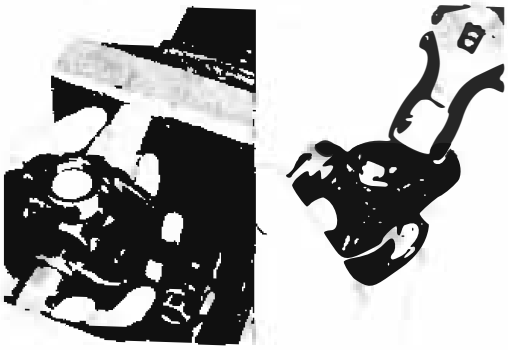
Check for wear or damage.

Fig. 8-8

Replace The Spider Bearing

1. Remove the snap rings

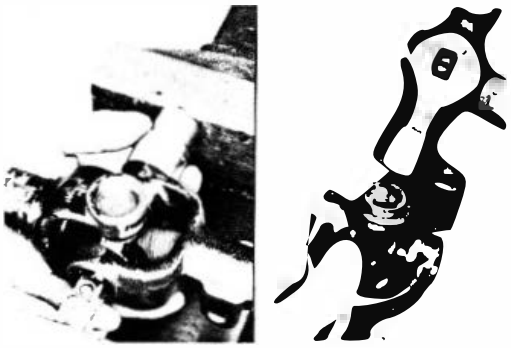
Fig. 8-9



2 Remove the bearing outer race with a vice and socket wrench

3 Tap out the bearing outer race

Fig. 8-10

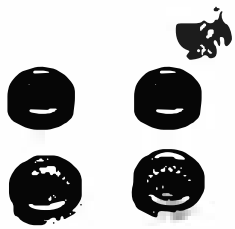


4 Remove the bearing outer race on the opposite side

– Note –

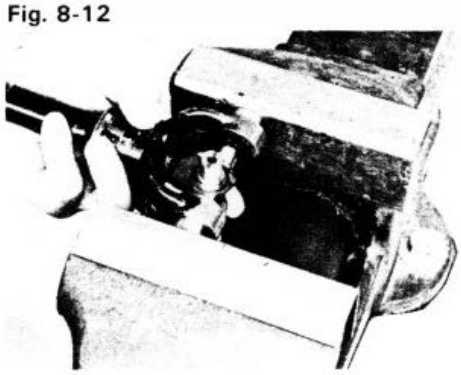
Remove the shaft side bearings by the same procedure.

Fig. 8-11



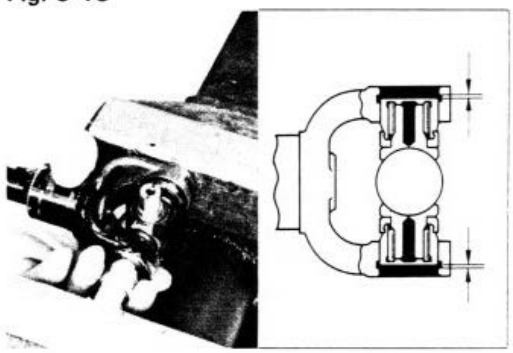
5 Apply MP grease to the new bearings

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 –

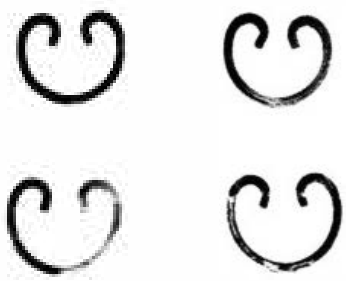
Install the yoke side bearings by the same procedure.

9. Select snap rings that will provide minimum play

Spider axial play:

Less than 0.05 mm (0.0020 in.)

Fig. 8-14



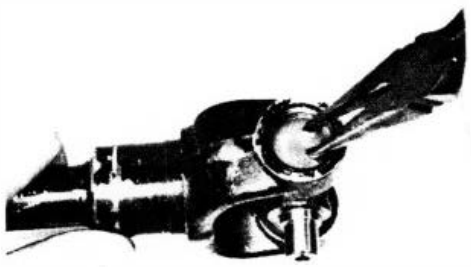
Snap ring thickness

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)

– Note –

1. **Do not reuse the snap rings.**
2. **Use the snap rings of the same thickness at both sides.**

Fig. 8-15



10. Install the snap rings

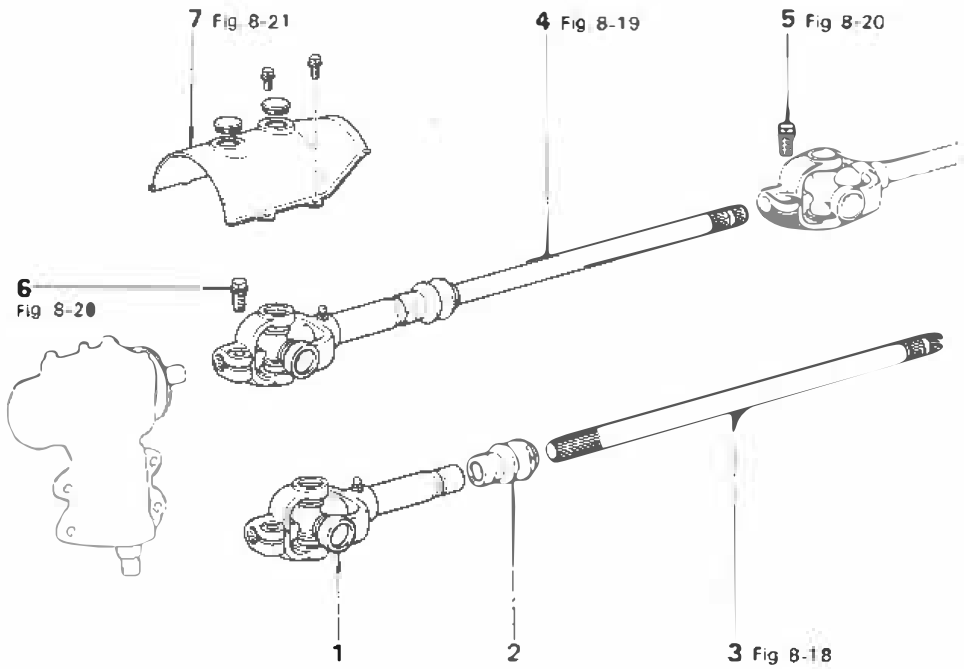
Fig. 8-16

11 Check to see that spider moves smoothly

ASSEMBLY & INSTALLATION

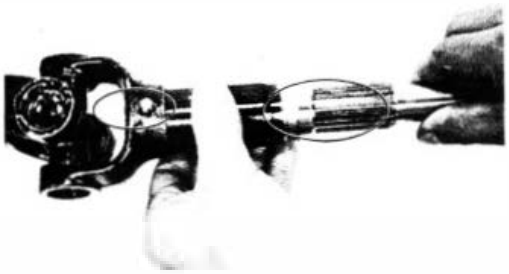
Assemble and install the parts in the numerical order shown in the figure.

Fig. 8-17



1 Yoke
2 Boot
3 Sliding Shaft
4 Intermediate Shaft & Yoke
5 Lock Bolt
6 Lock Bolt
7 Dust Cover

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

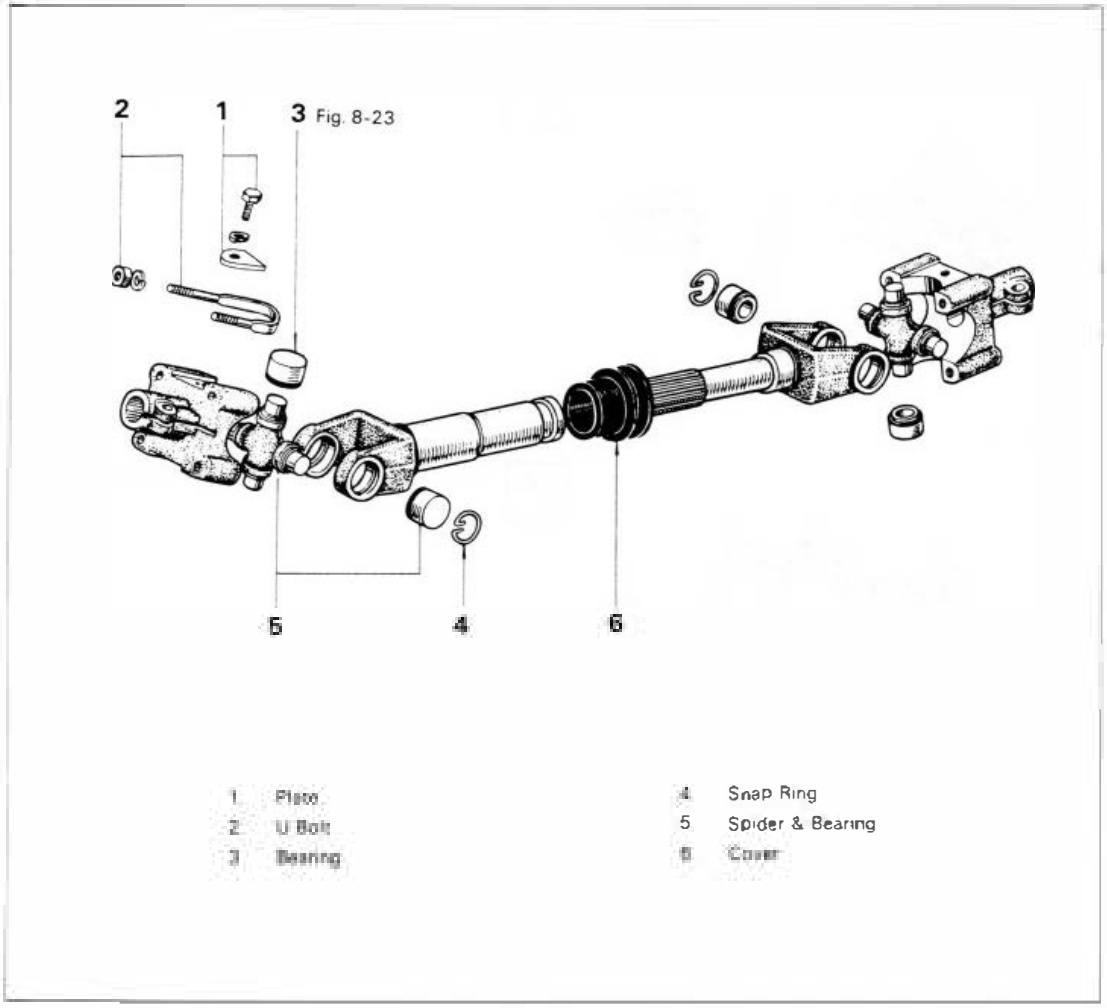


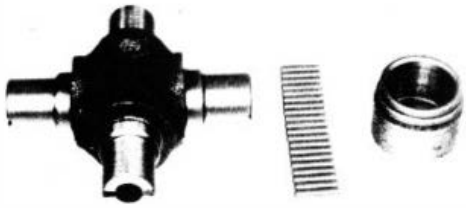
Fig. 8-23

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.

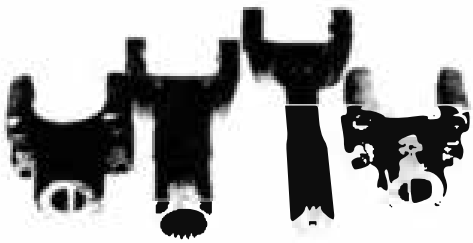
Fig. 8-24



INSPECTION

Inspect the spider and bearing for wear or damage.

Fig. 8-25

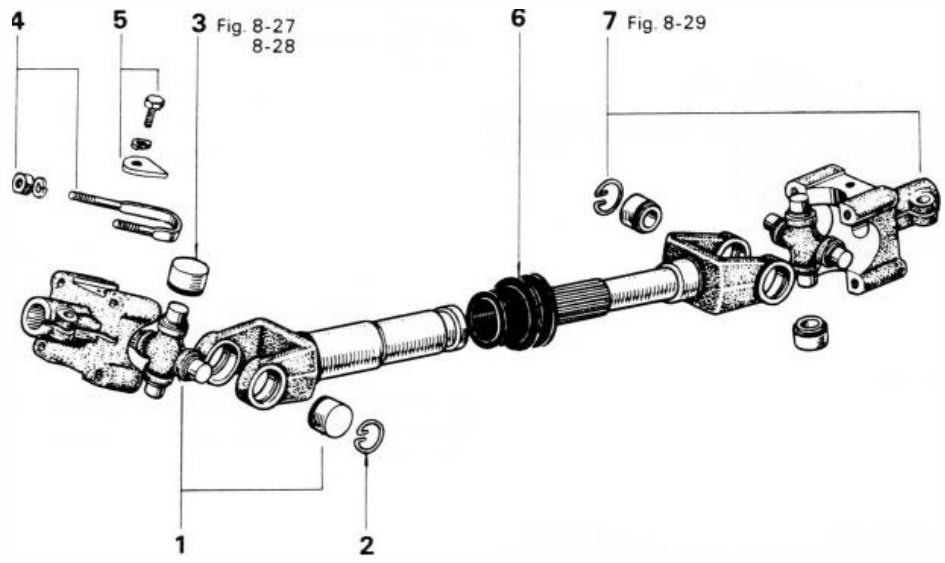


Inspect the splines for wear or damage

ASSEMBLY

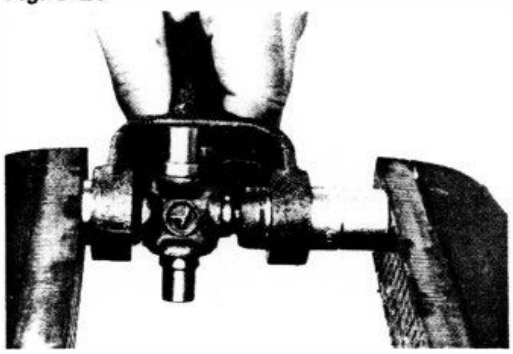
Assemble the parts in the numerical order shown in the figure

Fig. 8-26



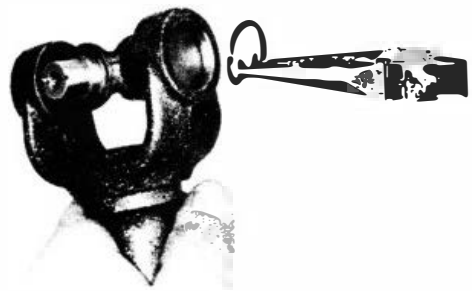
1. Spider & Bearing
2. Snap Ring
3. Bearing
4. U Bolt
5. Plate
6. Cover
7. Slide Yoke

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

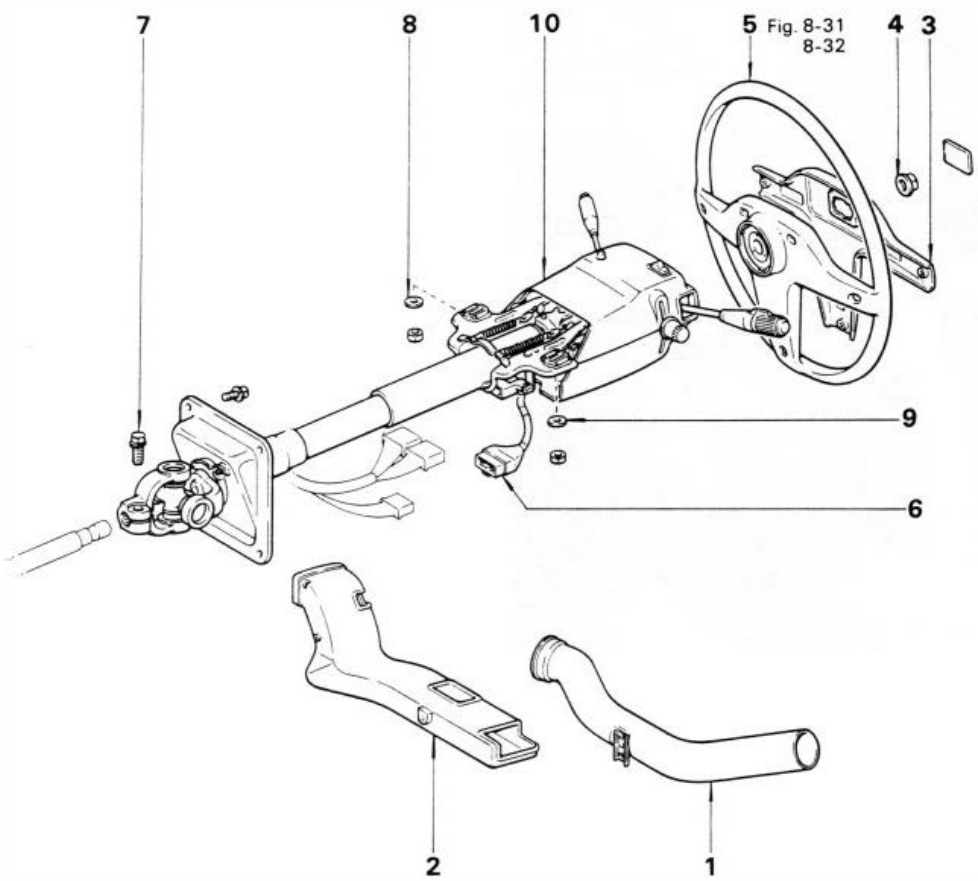
Make the assembly so that the steering yokes will be positioned in the same direction.

TILT TYPE STEERING COLUMN & MAIN SHAFT

REMOVAL

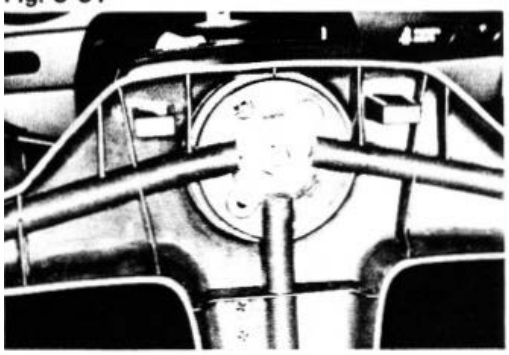
Remove the parts in the numerical order shown in the figure.

Fig. 8-30



1	Duct	6	Connector
2	Duct	7	Lock Bolt
3	Safety Pad	8	Nut
4	Nut	9	Nut
5	Steering Wheel	10	Steering Column

Fig. 8-31



⚠ Place matchmarks on the steering wheel and main shaft.

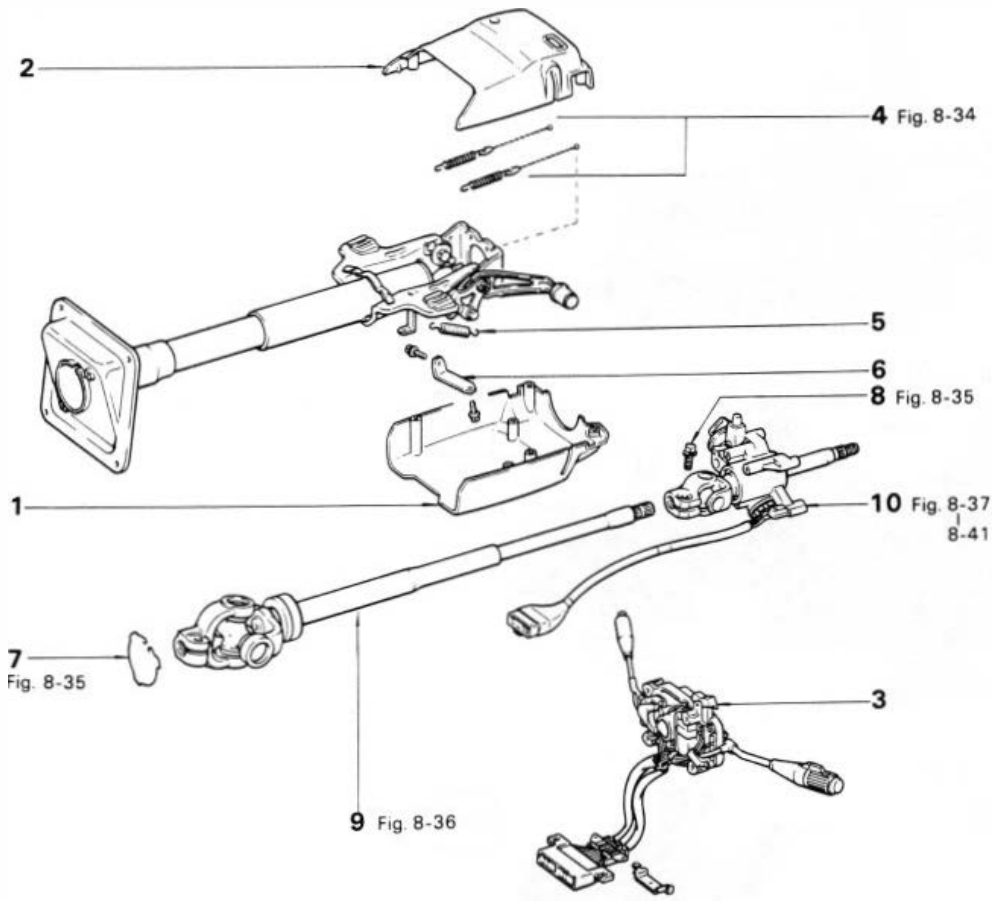
Fig. 8-32

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

DISASSEMBLY

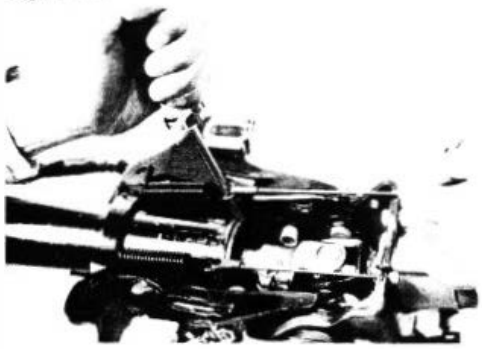
1 Disassemble the parts in the numerical order shown in the figure

Fig. 8-33



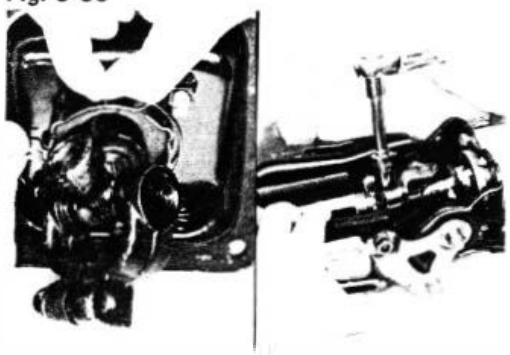
1	Lower Column Cover	6	Reinforcement
2	Upper Column Cover	7	Ring
3	Combination Switch	8	Lock Bolt
4	Spring & Cord	9	Main Shaft
5	Spring	10	Upper Bracket

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

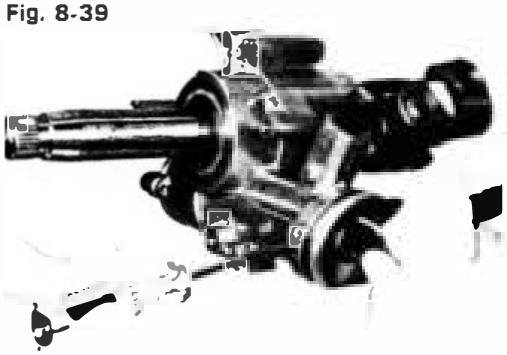


Fig. 8-40

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

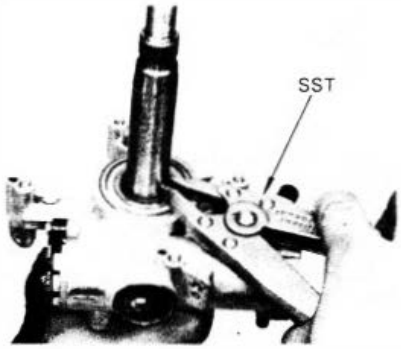
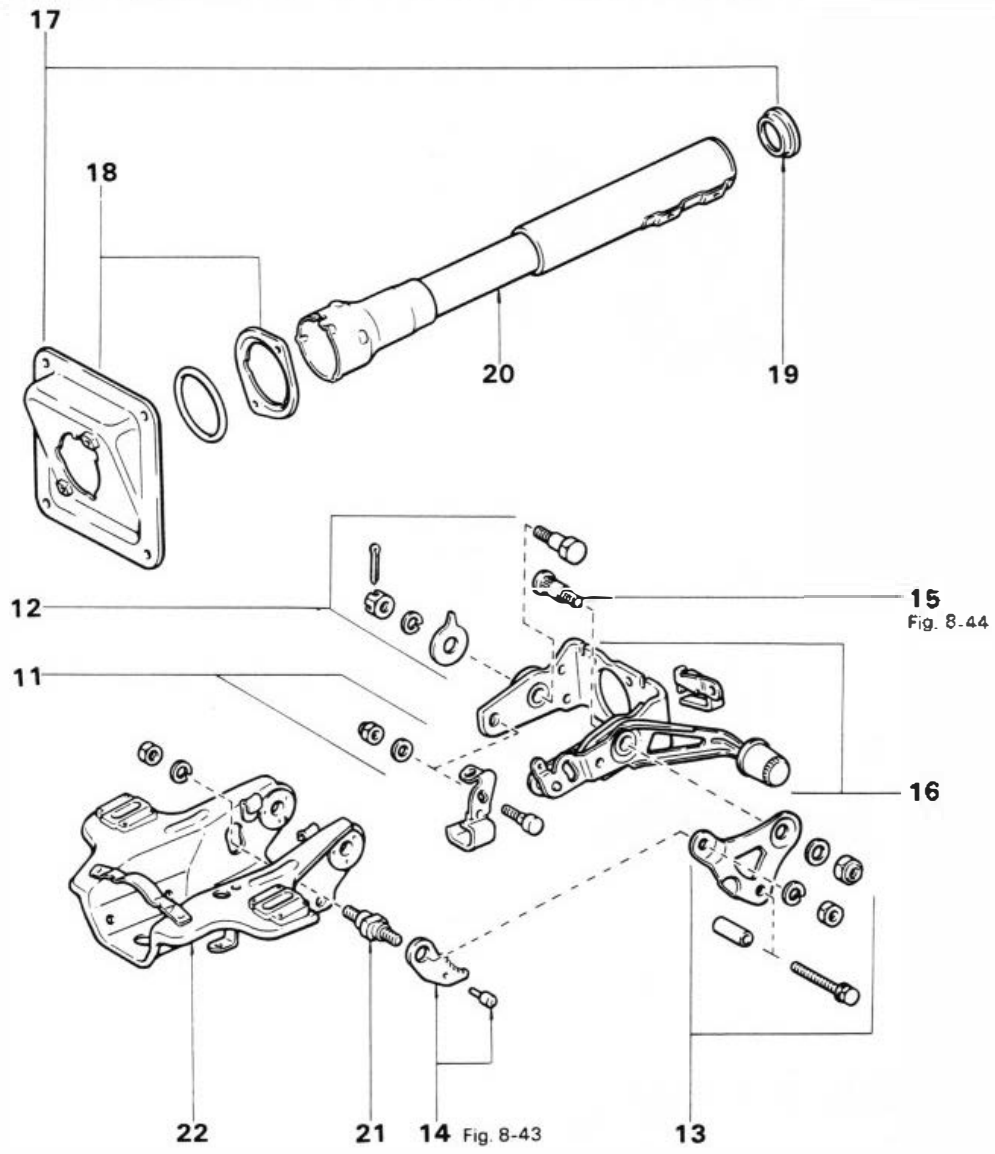


Fig. 8-41

Remove the upper bracket from the shaft

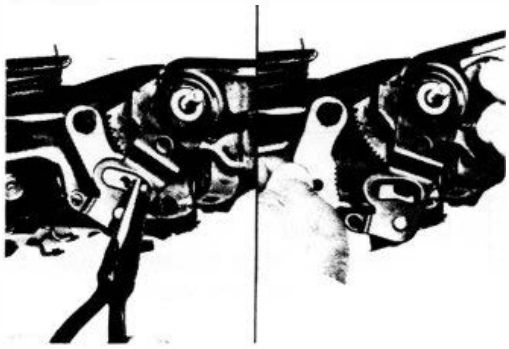
2. Disassemble the parts in the numerical order shown in the figure.

Fig. 8-42



11	Support Stopper Bolt	16	Support & Lever
12	Cotter Pin, Bolt, Nut & Adjusting Shim	17	Column & Hole Cover
13	Tilt Lever Retainer	18	Hole Cover
14	Release Pin & Pawl	19	Dust Seal
15	Bolt	20	Column Tube
		21	Pawl Set Bolt
		22	Breakaway Bracket

Fig. 8-43

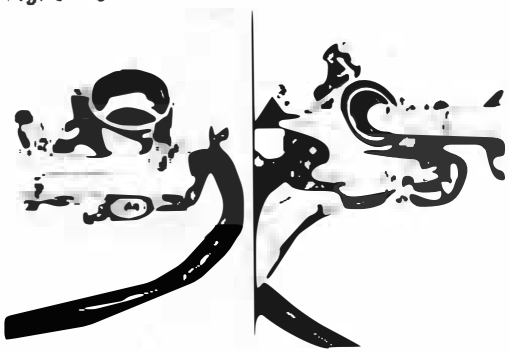


Pull out the reclining pawl release pin and remove the tilt steering pawl.

Fig. 8-44

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

Fig. 8-45

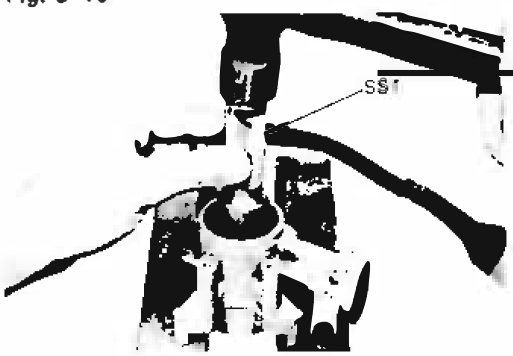


INSPECTION & REPAIR

Upper Bracket

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

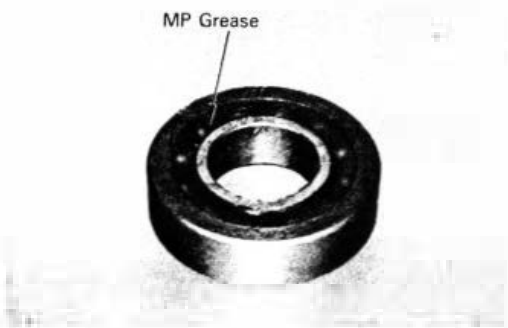
Fig. 8-46



Replace The Bearing

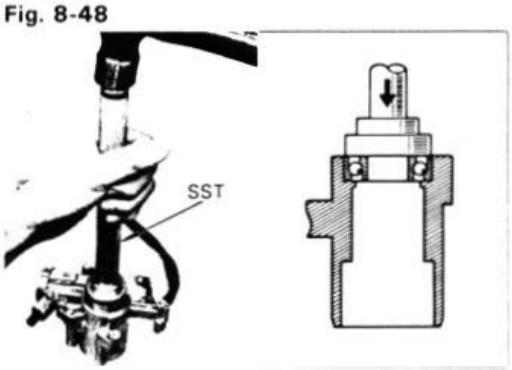
1. Remove the bearing with SST.
   SST [09620-30010]

Fig. 8-47



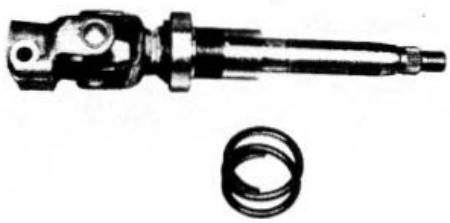
2. Pack MP grease into the new bearing.

Fig. 8-48



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

Fig. 8-49



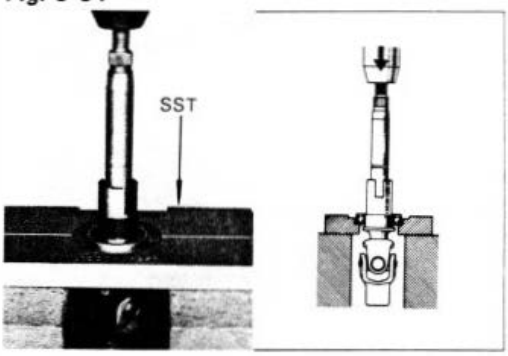
Main Shaft, Thrust Collar & Spring

1. Inspect for wear or damage

Fig. 8-50

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

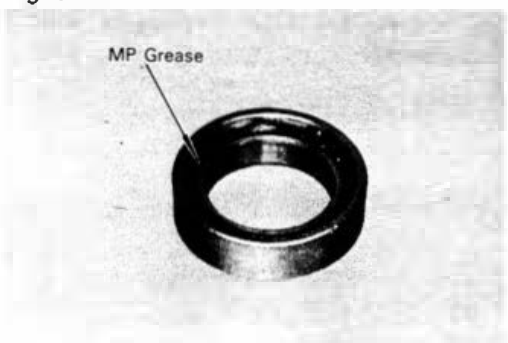
Fig. 8-51



Replace The Bearing

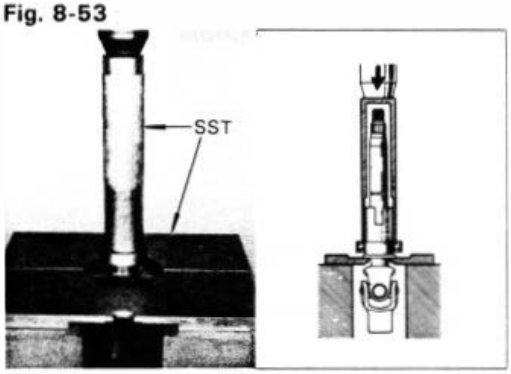
1. Remove the bearing witha press and SST SST [09527-20011]

Fig. 8-52



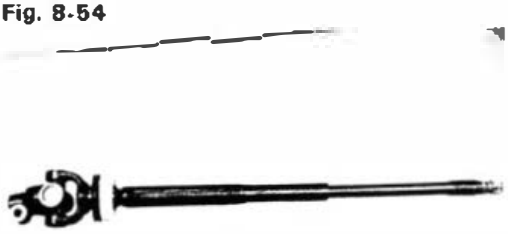
2. Pack MP grease into the new bearing

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

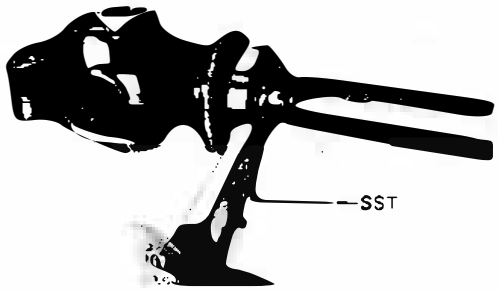
Fig. 8-55

3. Inspect the bearing

Fig. 8-56

4. Inspect the spider bearings for wear or damage

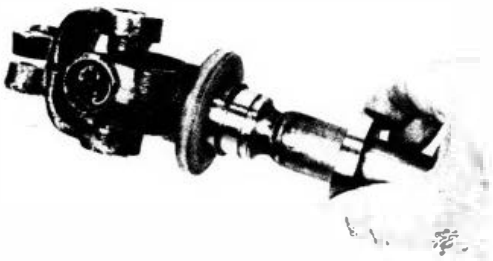
Fig. 8-57



Replace The Bearing

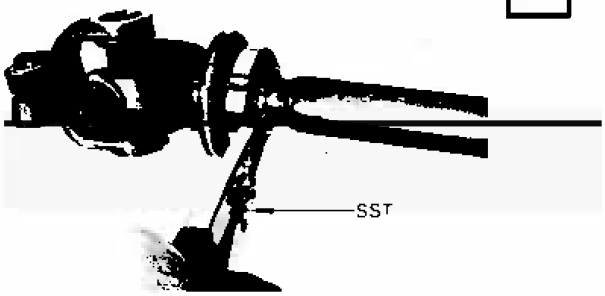
1. Remove the snap ring with SST
   SST [09905-00012]

Fig. 8-58



2. Replace the bearing

Fig. 8-59



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

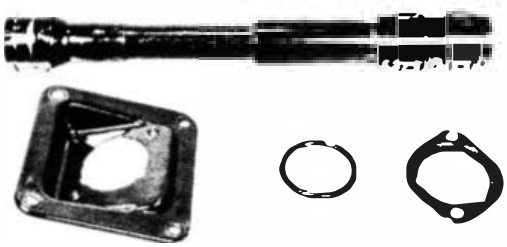
Fig. 8-60

Replace The Spider Bearing

Replace the spider bearing

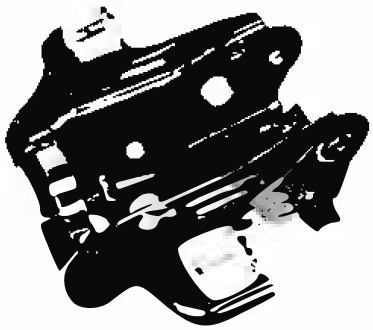
SEE
INTERMEDIATE
SHAFT SECTION
Fig. 8-8 to 8-16

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.

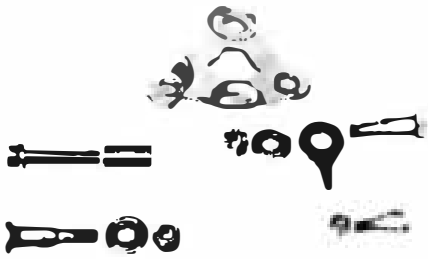
Fig. 8-64

2. Inspect the pawl for wear or damage.

Fig. 8-65

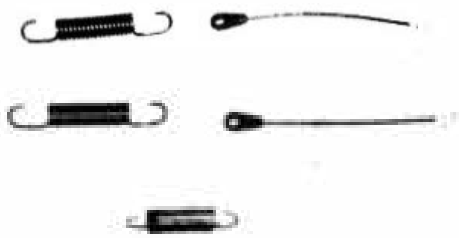
3 Inspect the support, collar and lever for wear or damage.

Fig. 8-66



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

Fig. 8-67

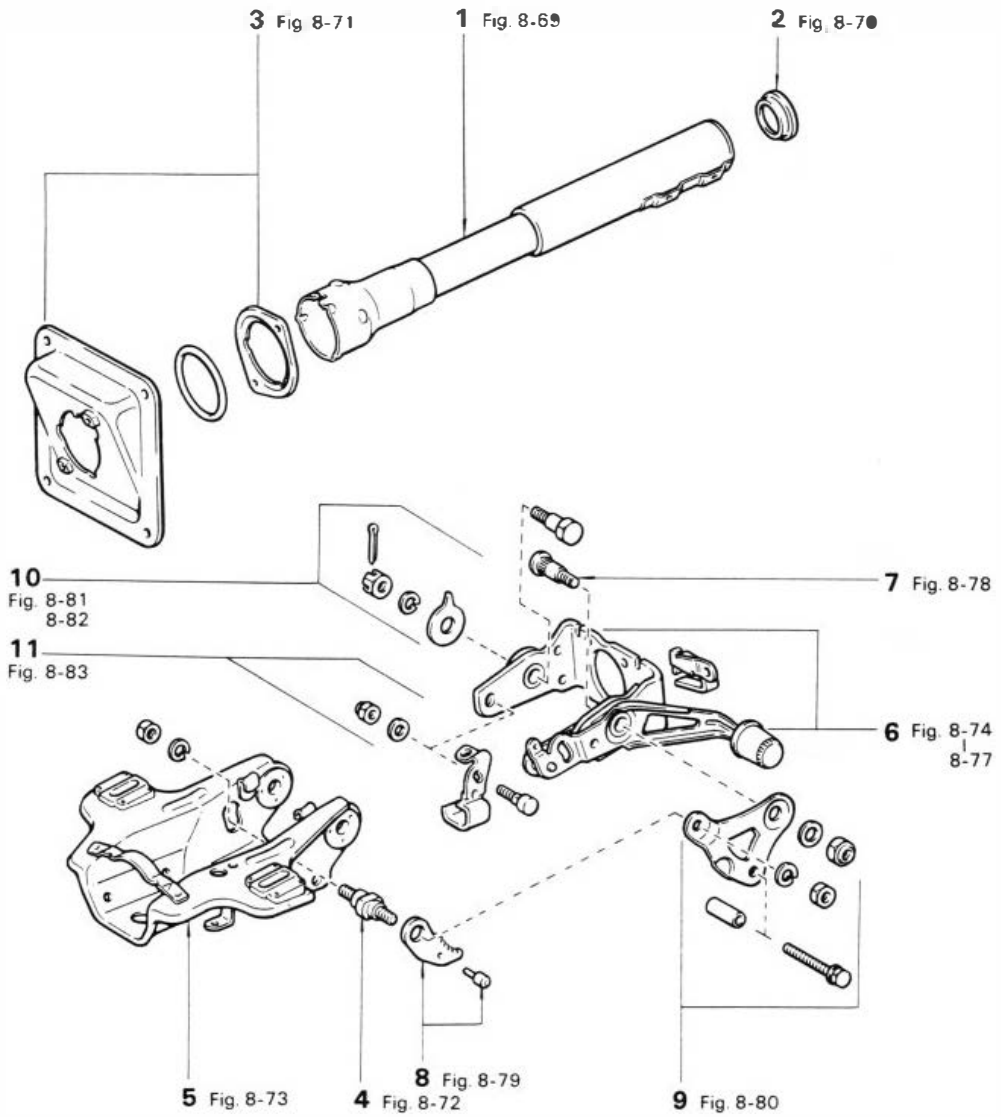


Spring & Cord
Inspect for wear or damage.

ASSEMBLY

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

Fig. 8-68



1 Column Tube
2 Dust Seal
3 Hole Cover
4 Pawl Set Bolt
5 Breakaway Bracket
6 Support & Lever
7 Bolt
8 Release Pin & Pawl
9 Tilt Lever Retainer
10 Adjusting Shim, Bolt, Nut & Cotter Pin
11 Support Stopper Bolt

– Note –
Coat all rubbing parts with MP grease.

Fig. 8-69

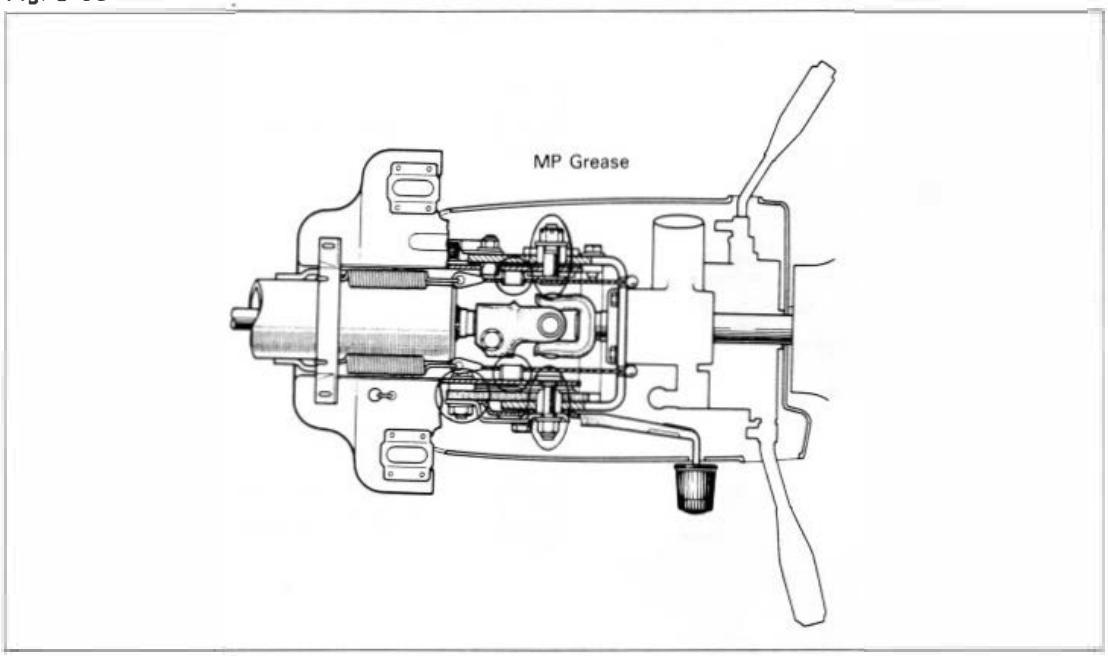
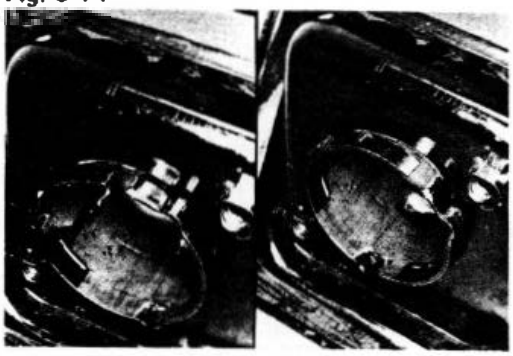


Fig. 8-70

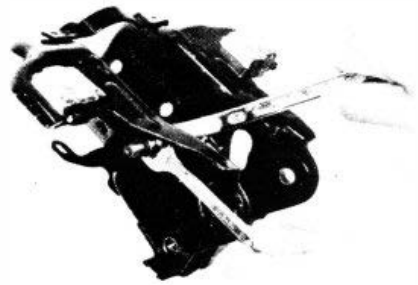
Stick the dust seal with adhesive

Fig. 8-71



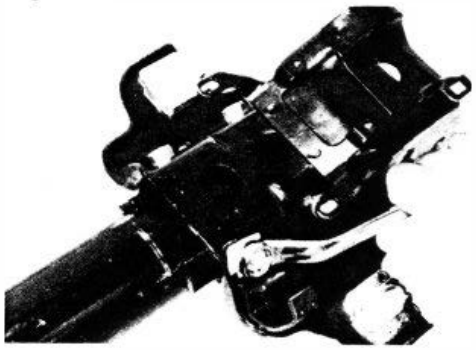
Align the protrusion so that it fits into the column tube groove

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 – 17.995	(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)

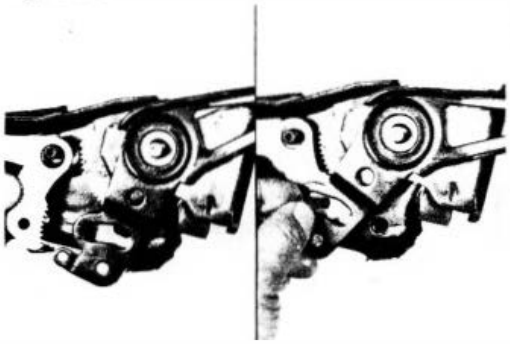
Fig. 8-77

Install the lever on the support and collars

Fig. 8-78

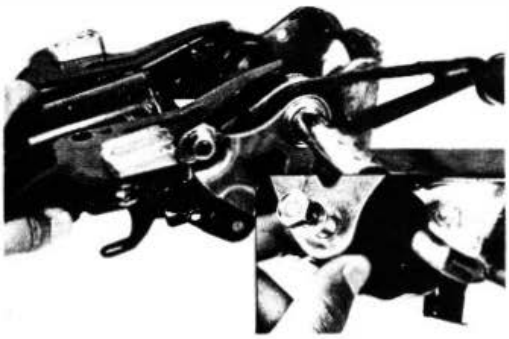
Drive in the serration bolt.

Fig. 8-79



Install the tilt steering pawl and the reclining release pin.

Fig. 8-80



Install the collar one of thepart
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

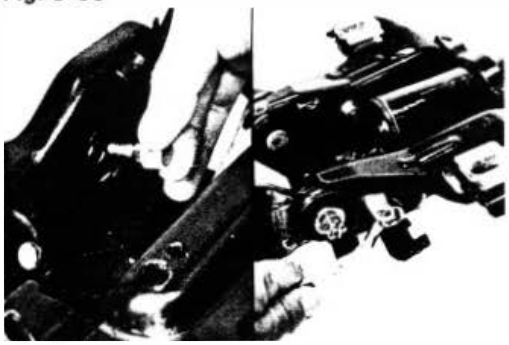
Shim thickness mm (in)

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)

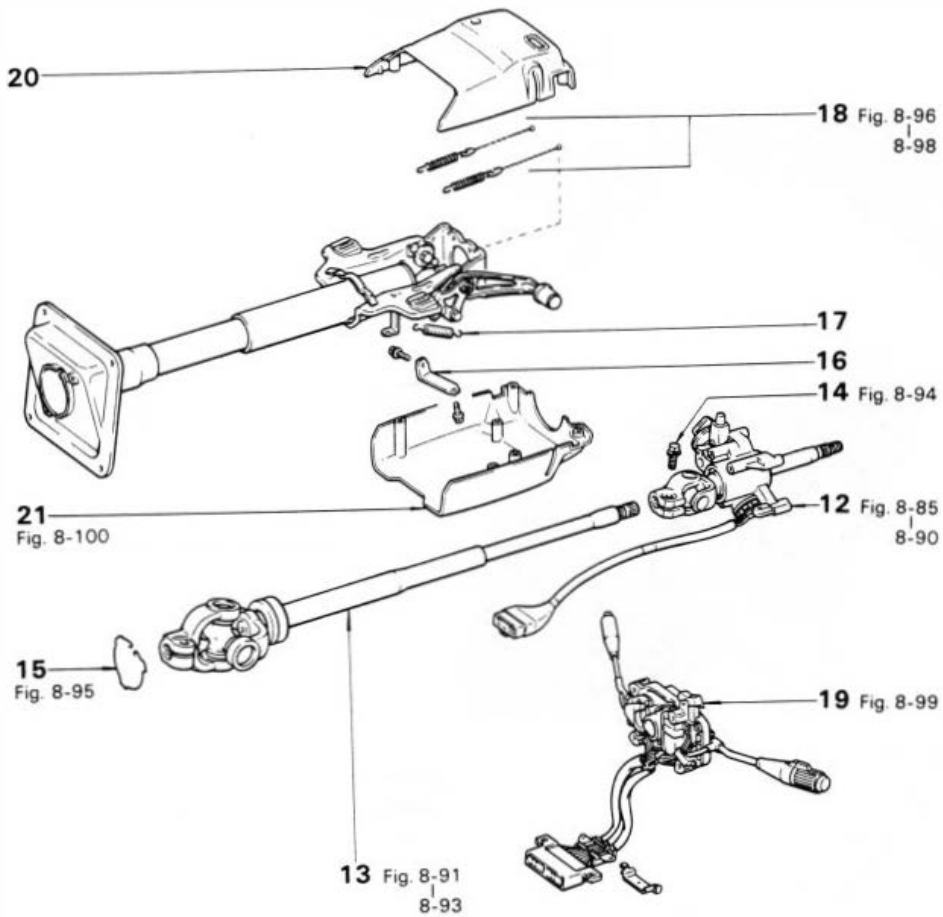
Fig. 8-83



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



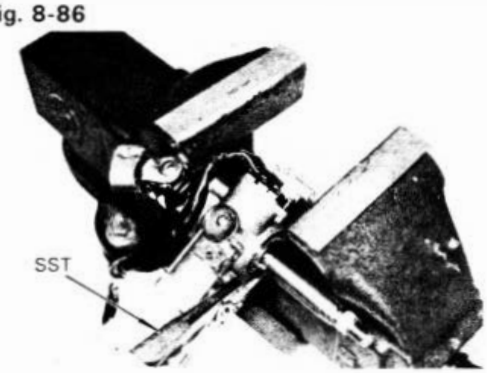
12. Upper Bracket
13. Main Shaft
14. Lock Bolt
15. Ring
16. Reinforcement
17. Spring
18. Spring & Cord
19. Combination Switch
20. Upper Column Cover
21. Lower Column Cover

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.

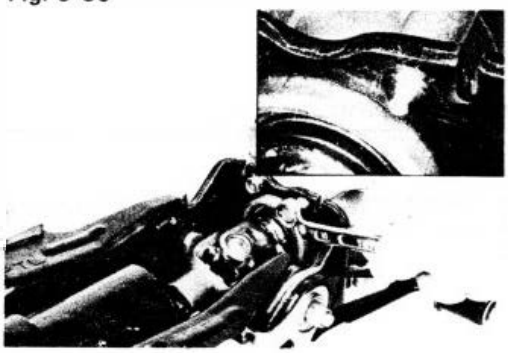
Fig. 8-87

3. Insure that the upper bracket bearing turns smoothly.

Fig. 8-88

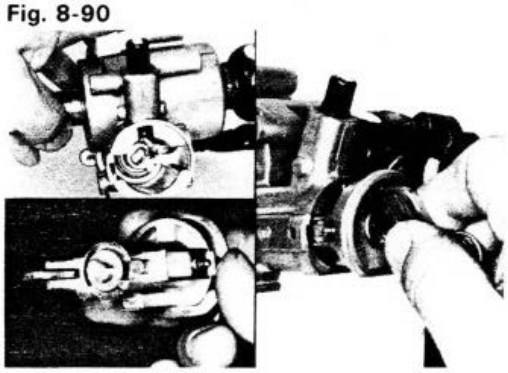
4. Install the upper bracket.
   Tightening torque: 0.6 — 0.9 kg-m (53 — 78 in.-lb)

Fig. 8-89



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

Fig. 8-90

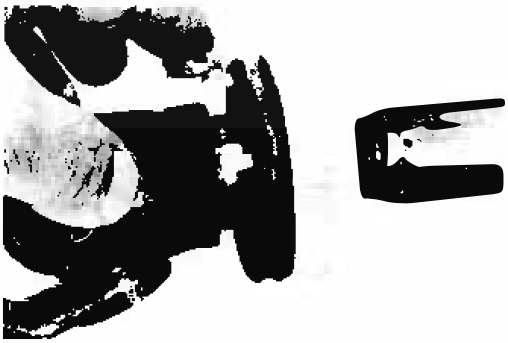


6. Turn the ignition key to the ACC position, and install the key cylinder into the upper bracket.

Fig. 8-91

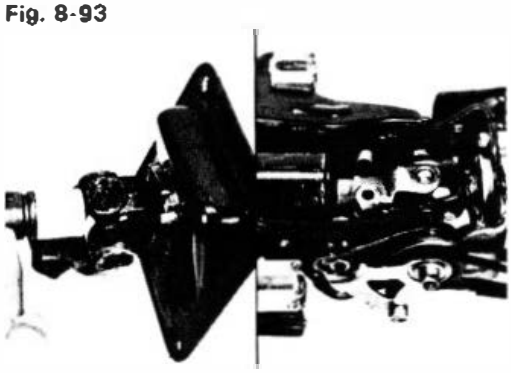
Install the ● ring on the outer race and teflon ring.

Fig. 8-92



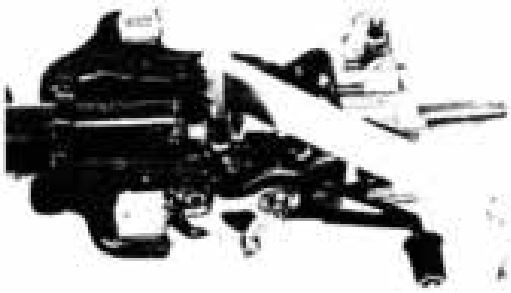
Coat MP grease on the shaft and oil seal.

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)

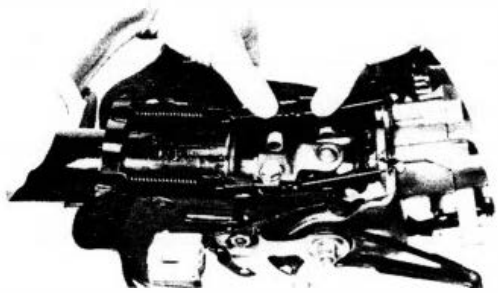
Fig. 8-95

Be sure that the retainer is properly assembled

Fig. 8-96

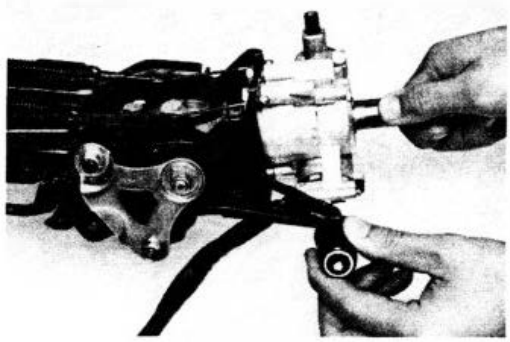
Extend the spring with screwdriver when install the spring and cord.

Fig. 8-97



Hook the cords

Fig. 8-98

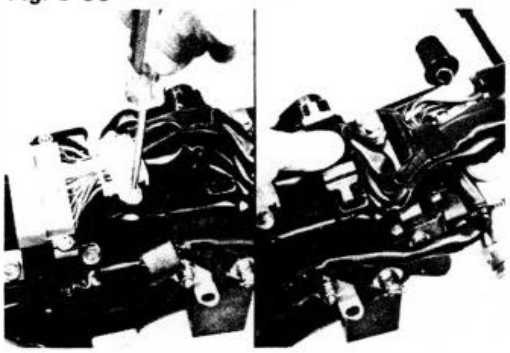


Check the operation of the tilt steering lever and support

– Note –

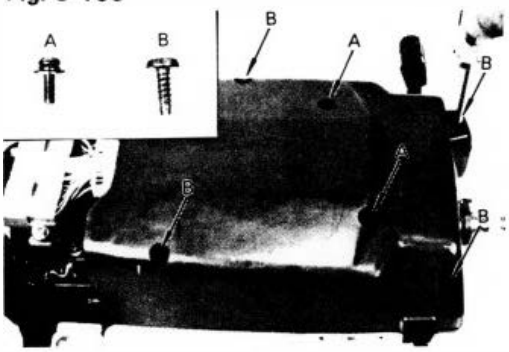
1. **Insure that there is no axial or horizontal play at the end of the main shaft.**
2. **Insure that the main shaft is locked securely in all 6 positions.**

Fig. 8-99



Install the connector and wiring band on the column.

Fig. 8-100

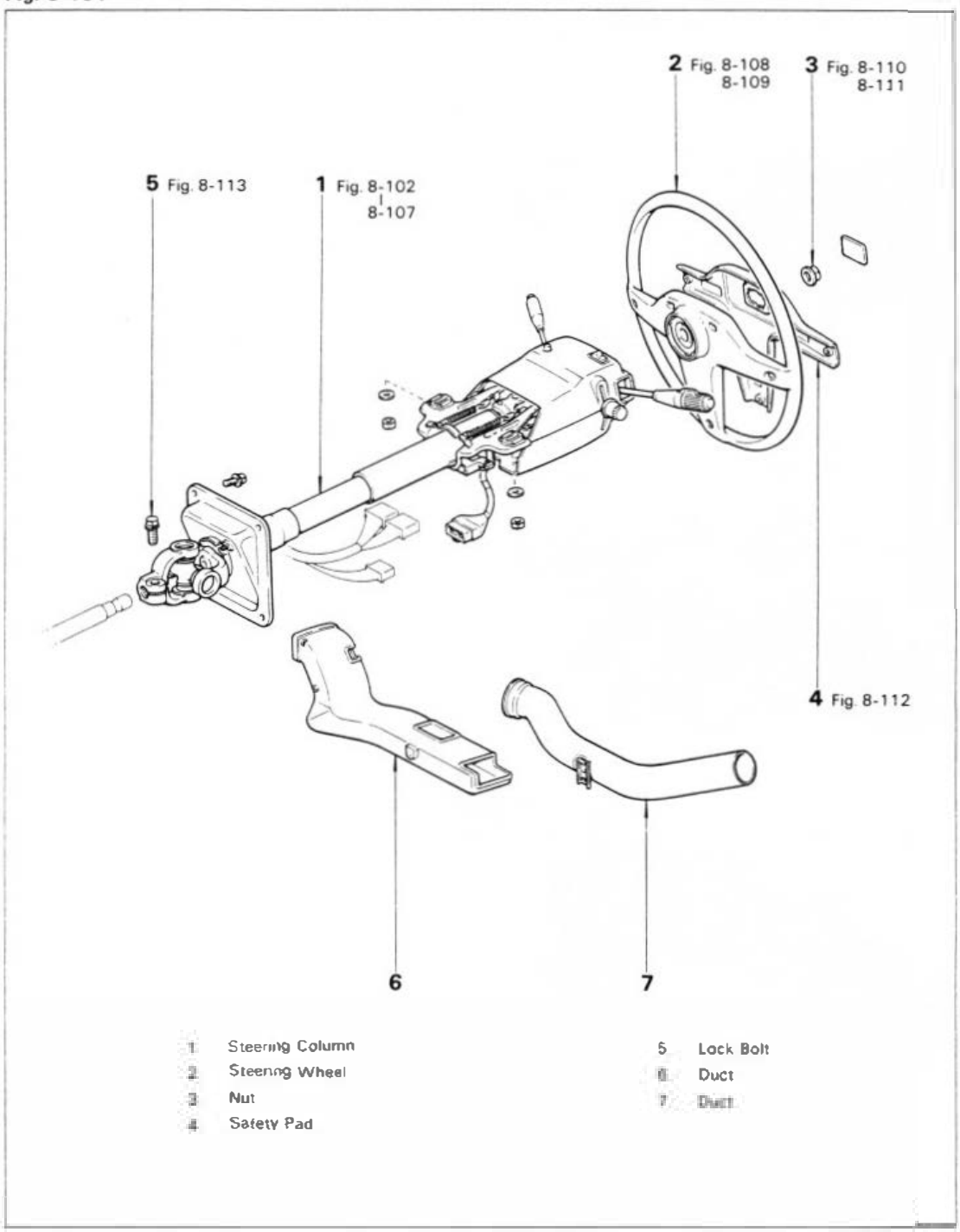


Install the column cover

INSTALLATION

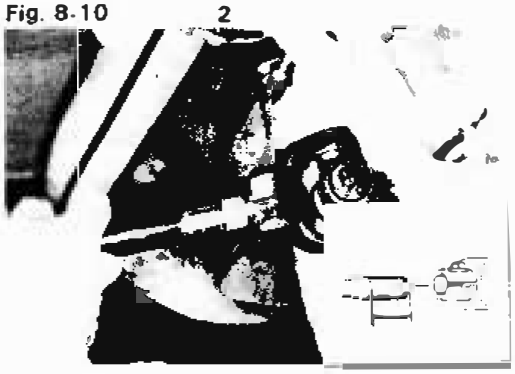
Install the parts in the numerical order shown in the figure

Fig. 8-101



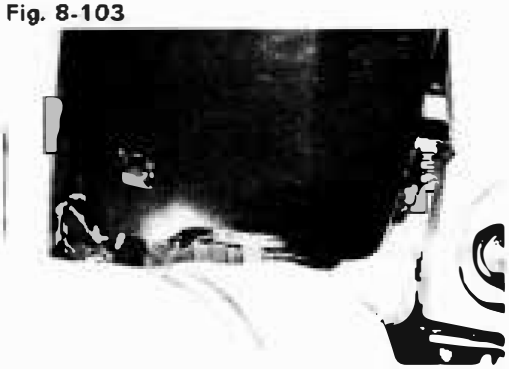
1. Steering Column
2. Steering Wheel
3. Nut
4. Safety Pad
5. Lock Bolt
6. Duct
7. Duct

Fig. 8-10 2



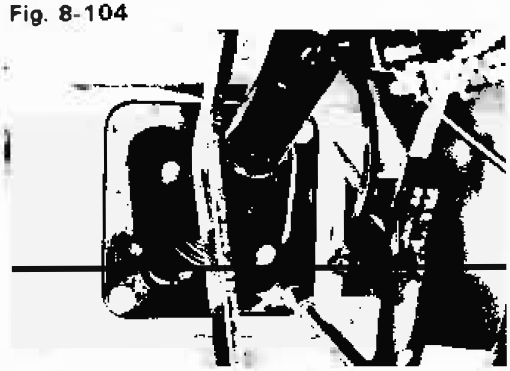
Align the non-toothed portions of intermediate shaft and yoke.

Fig. 8-103



Temporarily tighten the breakaway bracket nuts.

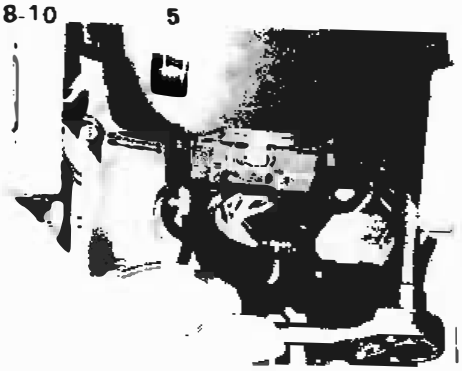
Fig. 8-104



Tighten the column hole cover.

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

Fig. 8-10 5



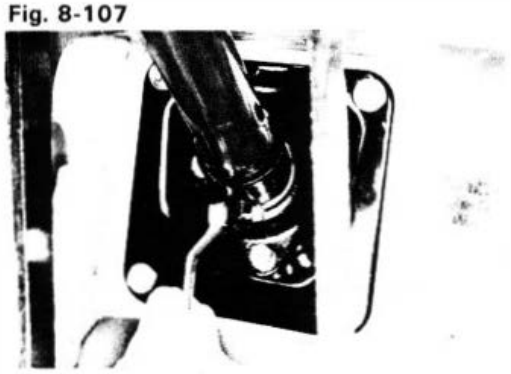
Tighten the breakaway bracket nuts.

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



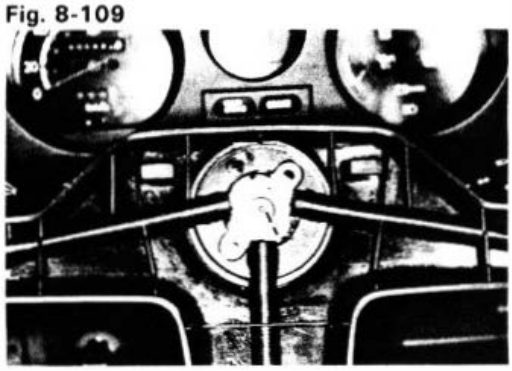
Tighten the column tube clamp

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

Fig. 8-108

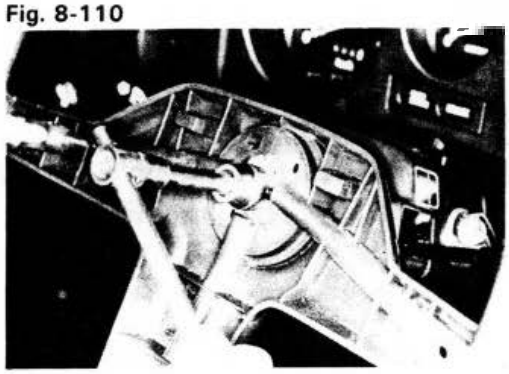
Align the turn signal cancel cam claw and the steering wheel, and then assemble them

Fig. 8-109



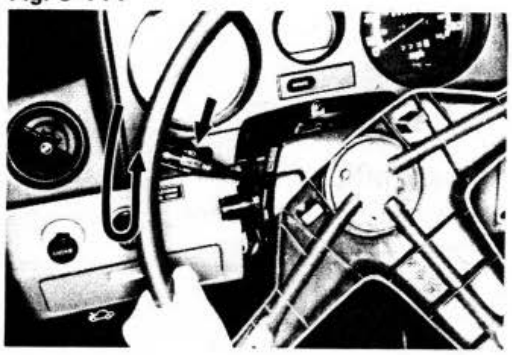
Align the matchmarks on the steering wheel and the main shaft

Fig. 8-110



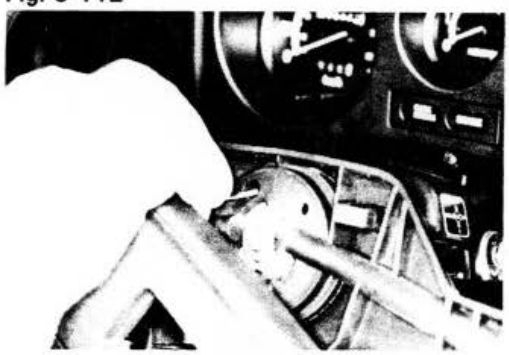
Tighten the steering wheel mounting nut.
Tightening torque: 3.0 – 4.0 kg-m (22 – 28 ft-lb)

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)

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

Fig. 8-114

SEE

TILT TYPE STEERING

COLUMN & MAIN

SHAFT REMOVAL SECTION

Fig. 8-30 to 3-32

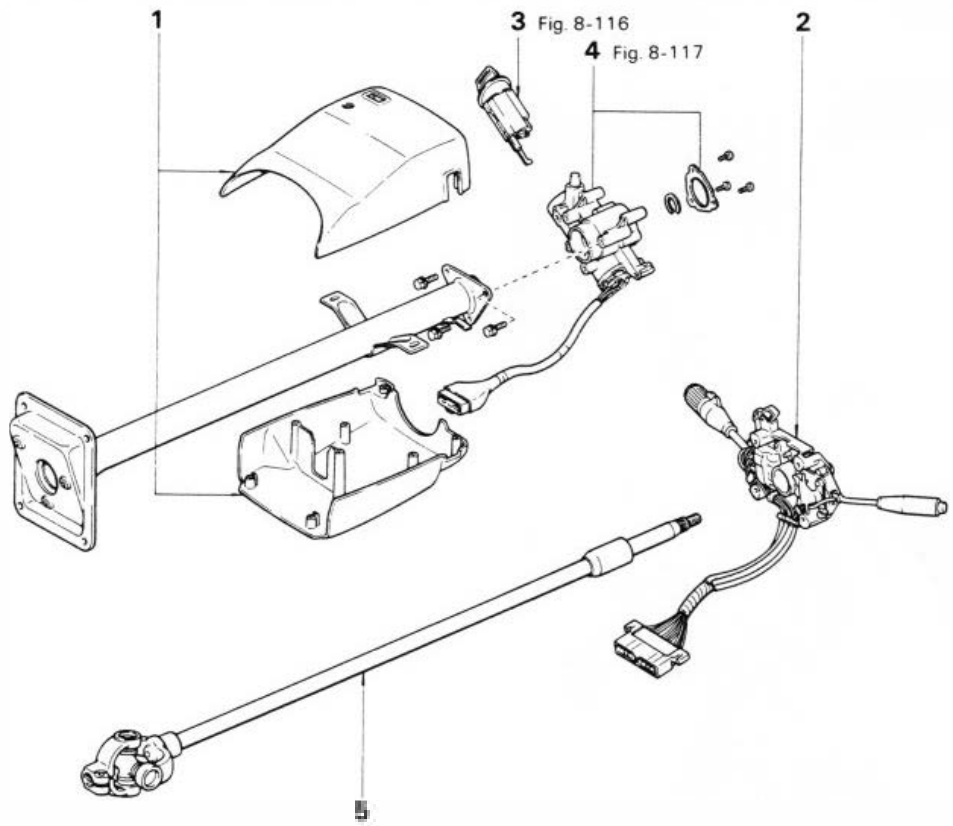
REMOVAL

Remove the steering column.

DISSAEMBLY

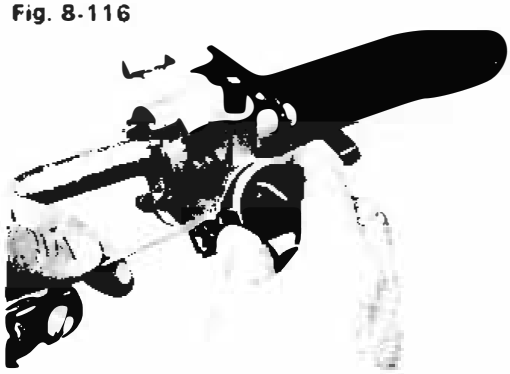
Disasemble the parts in the numerical order shown in the figure.

Fig. 8-115



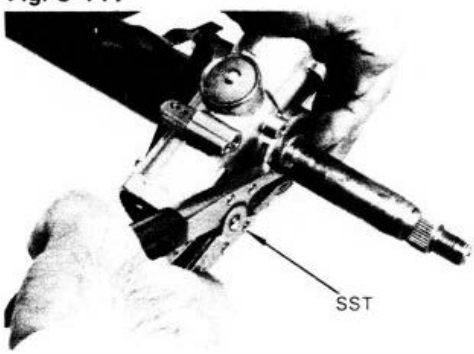
1 Column Cover
2 Combination Switch
3 Ignition Key Cylinder
4 Upper Bracket
5 Main Shaft

Fig. 8-116



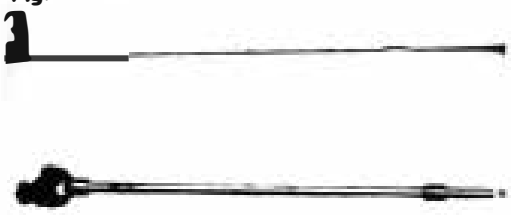
Position the key at ACC and push the knob. At this time, remove the key cylinder.

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

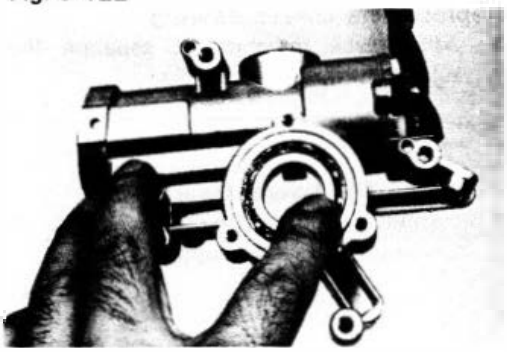
Replace the spider bearing

Fig. 8-121

Upper Bracket

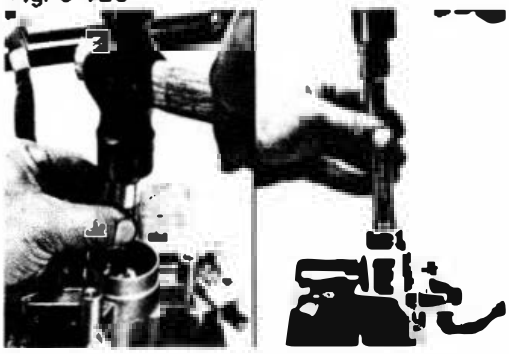
1 Check the steering lock system

Fig. 8-122



2 Check the bearing for rotation condition

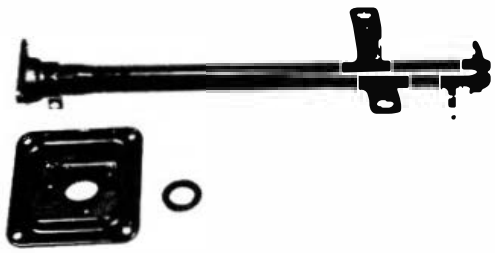
Fig. 8-123



Replace The Upper Bearing

1 Remove the bearing
2 Install the bearing until itsupper 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

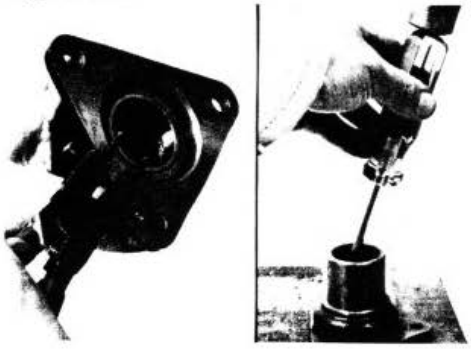
Replace The Lower Bearing

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

Fig. 8-127

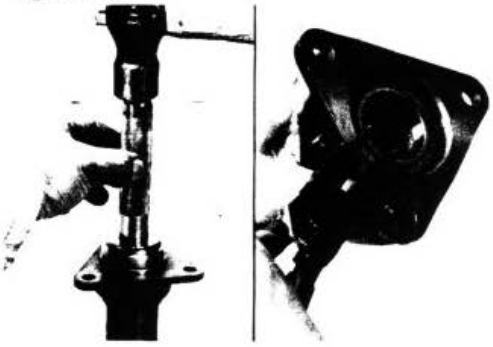
2 Remove the hole cover

Fig. 8-128



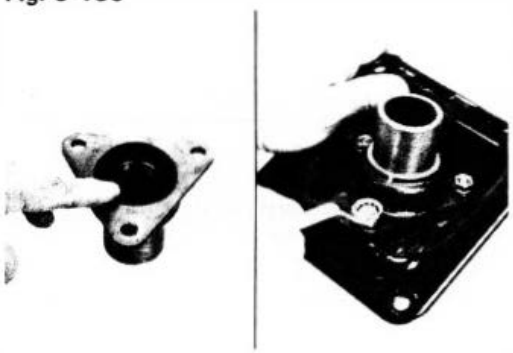
3 Remove the snap ring and bearing

Fig. 8-129



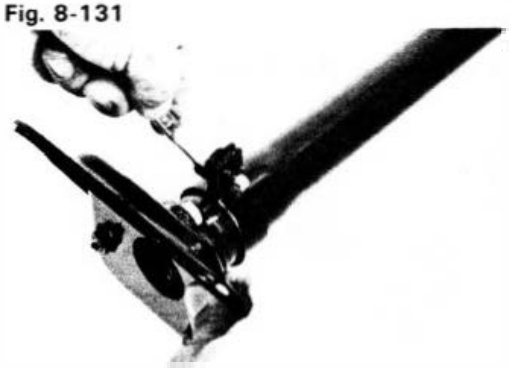
4 Install the new bearing and snap ring

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

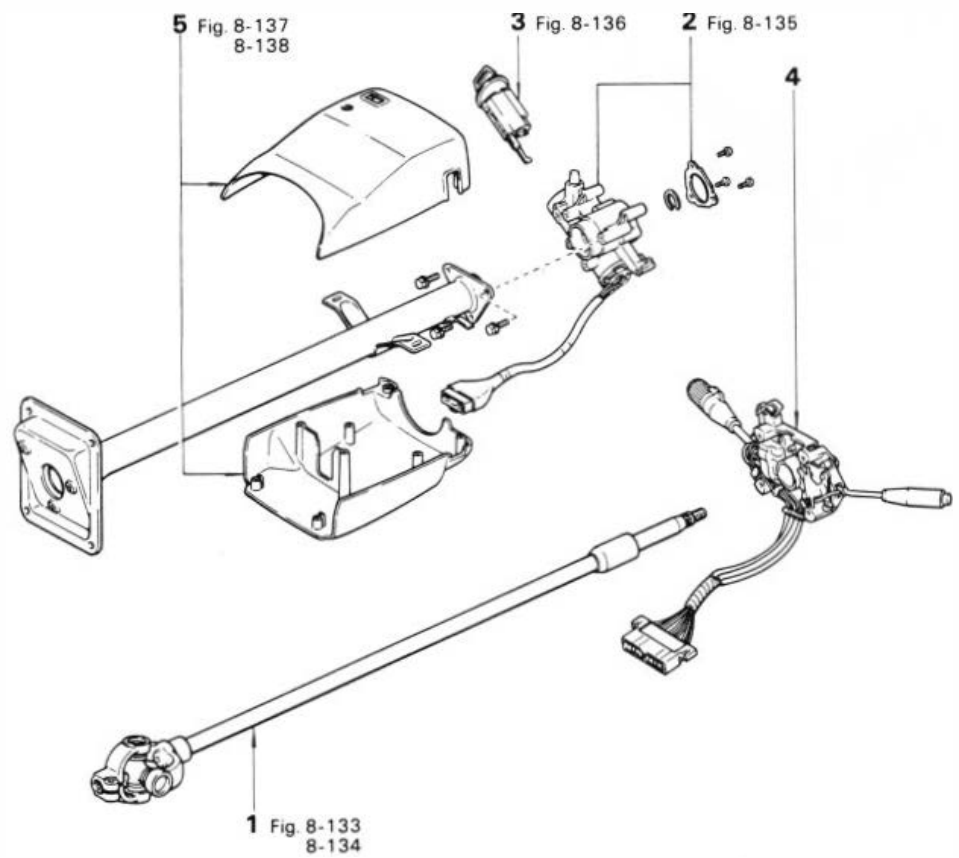
— Note —

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

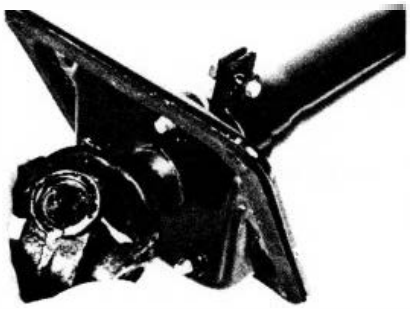


1. Main Shaft
2. Upper Bracket
3. Ignition key Cylinder
4. Combination Switch
5. Column Cover

Fig. 8-133

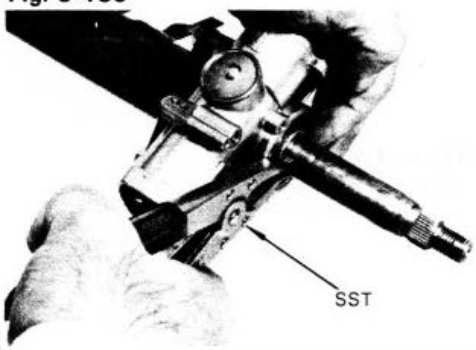
Coat the dust seal with MP grease

Fig. 8-134



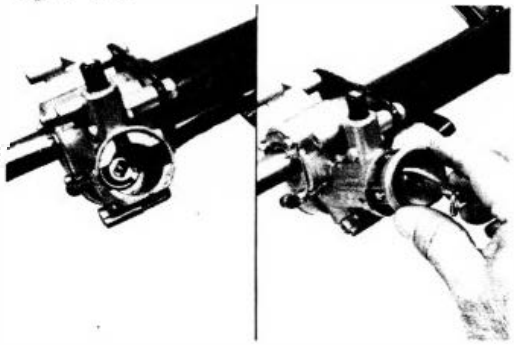
Apply MP grease to the dust seal and make sure it doesn't turn over when inserting the main shaft.

Fig. 8-135



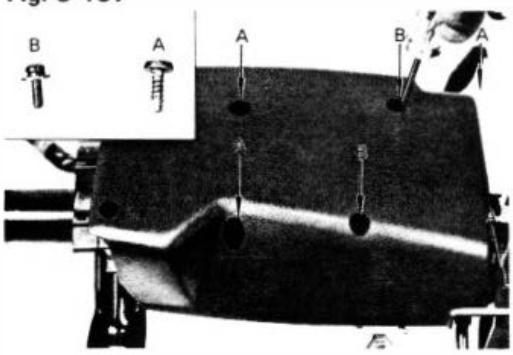
Install the snap ring with SST
SST [09905-00012]

Fig. 8-136



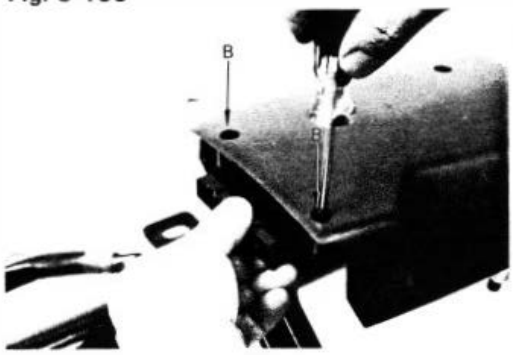
Turn the key to the ACC position, and install the key cylinder

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

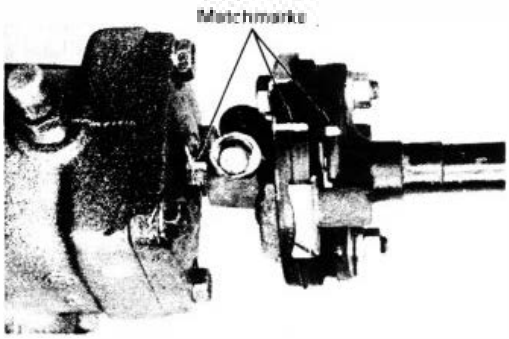
Remove the parts in the numerical order shown in the figure.

Fig. 8-140

Fig. 8-141

1. Lock Bolt
2. Oil Cover Bolt
3. Upper Bracket
4. Steering Column

Fig. 8-141

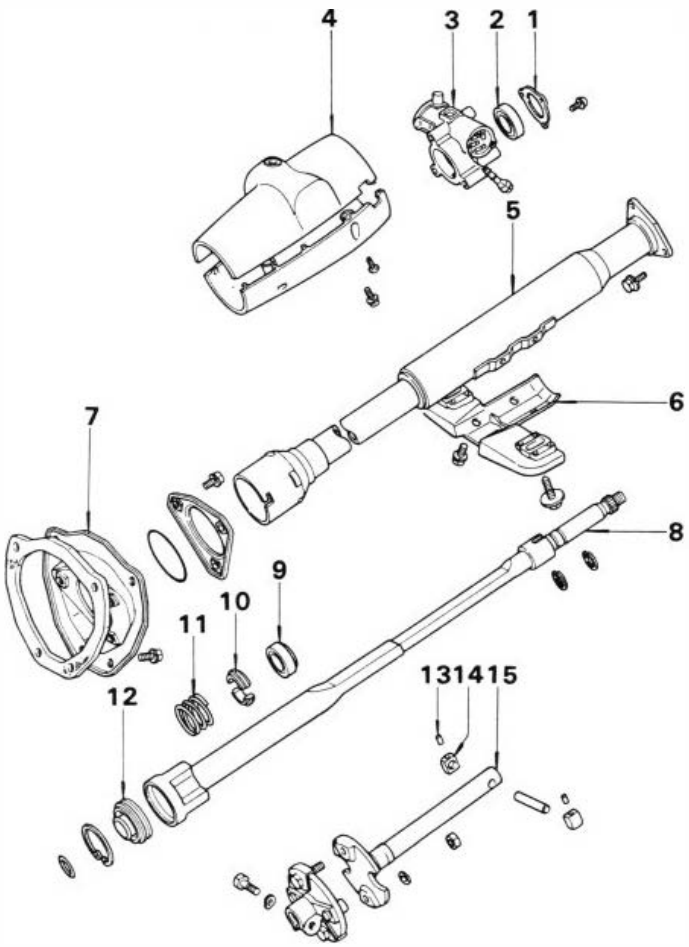


⚠ Place matchmarks on the gear box, couplings, and main shaft.

COMPONENTS

Fig. 8-142

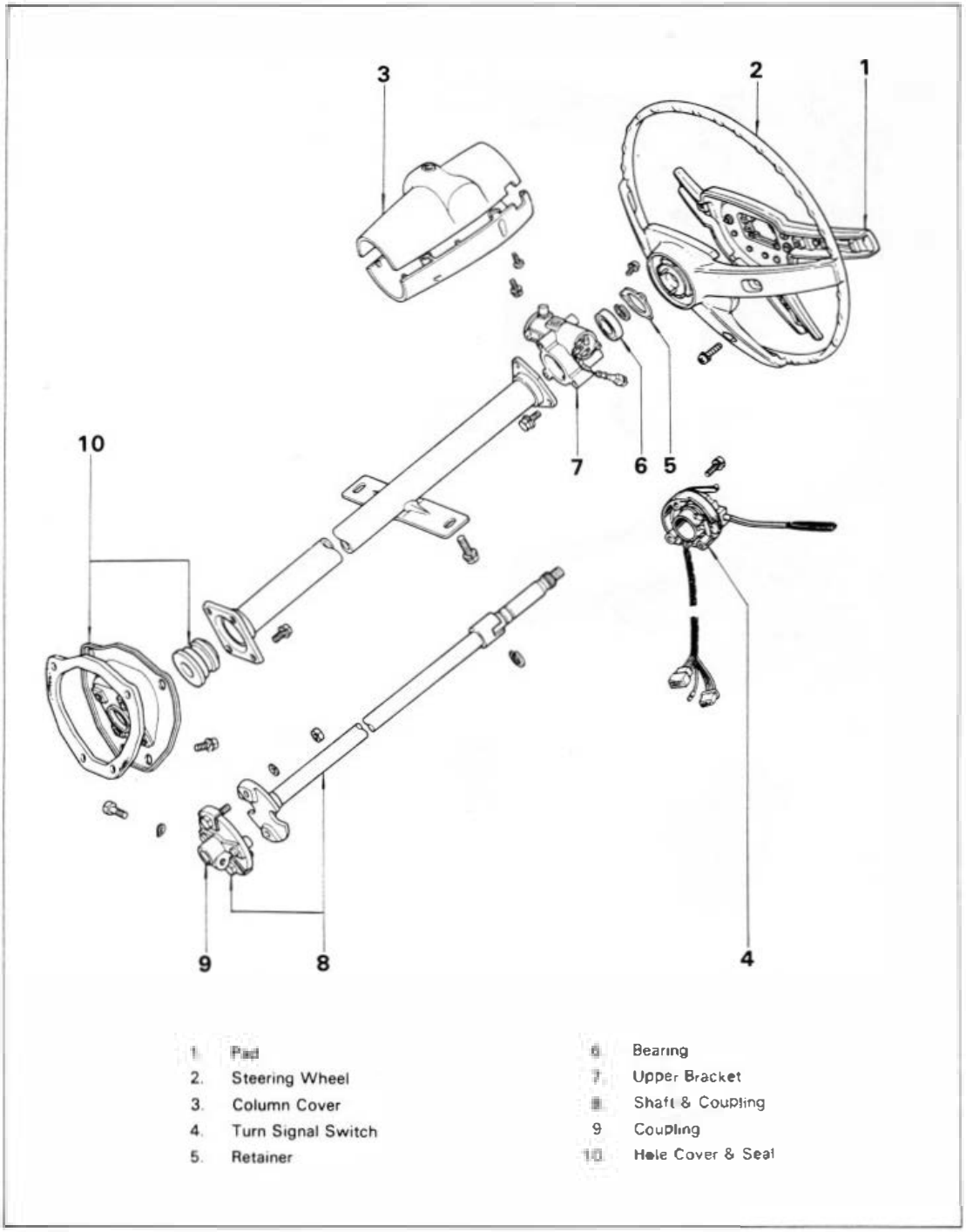
1. Retainer
2. Bearing
3. Upper Bracket
4. Column Cover
5. Column Tube
6. Breakaway Bracket
7. Hole Cover
8. Main Shaft
9. Bearing
10. Retainer
11. Spring
12. Cover
13. Anti-rattle
14. Block
15. Shaft



DISASSEMBLY

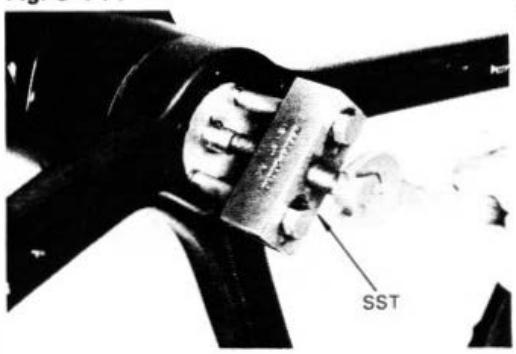
Disassemble the parts in the numerical order shown in the figure.

Fig. 8-143



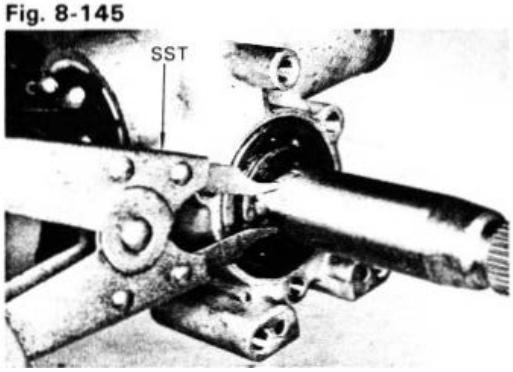
1. Pad
2. Steering Wheel
3. Column Cover
4. Turn Signal Switch
5. Retainer
6. Bearing
7. Upper Bracket
8. Shaft & Coupling
9. Coupling
10. Hole Cover & Seal

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
Reform 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

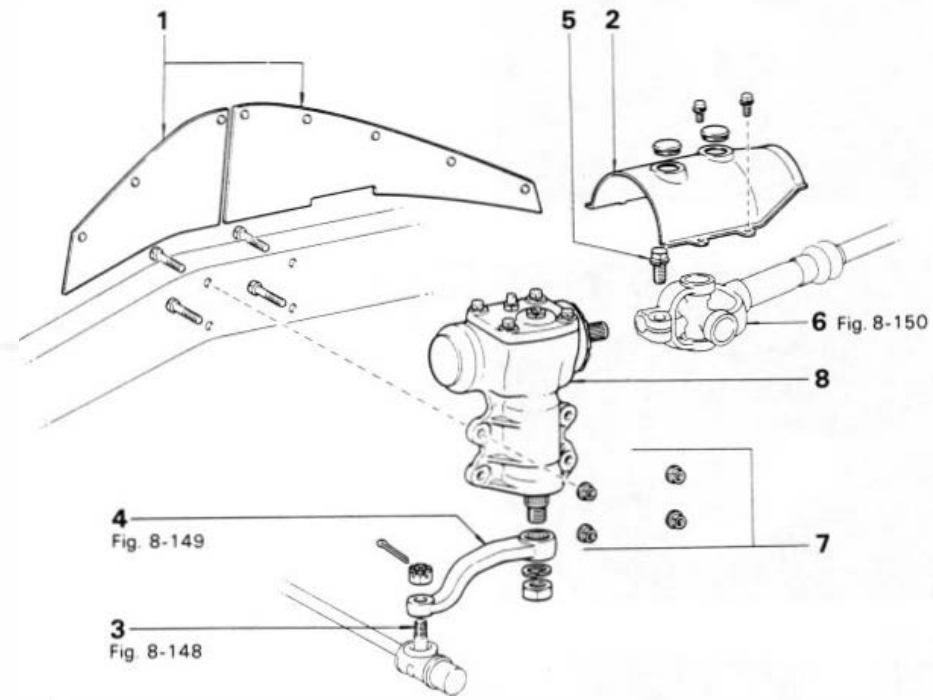
– Note –
Align the matchmarks when installing the steering column assembly.

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

REMOVAL

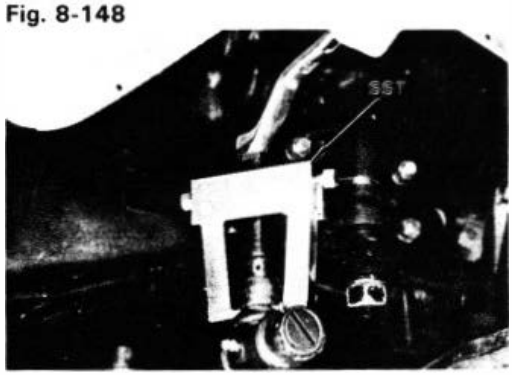
Remove the parts in the numerical order shown in the figure.

Fig. 8-147



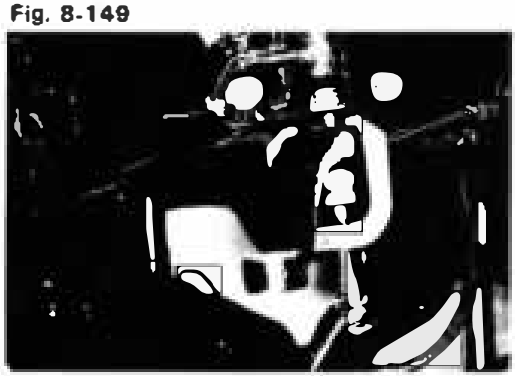
1 Dust Cover
2 Joint Cover
3 Relay Rod End
4 Pitman Arm
5 Lock Bolt
6 Intermediate Shaft
7 Mounting Nut & Bolt
8 Gear Housing

Fig. 8-148



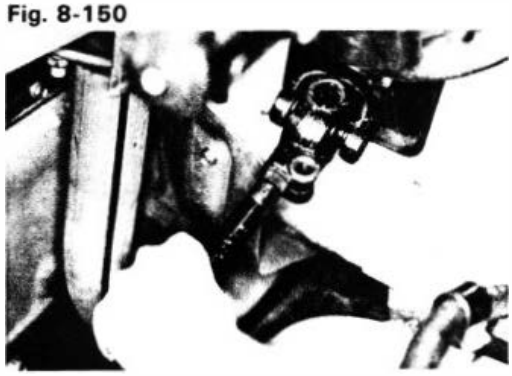
Remove the pitman arm with SST
SST [09628-62010]

Fig. 8-149



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

Fig. 8-150

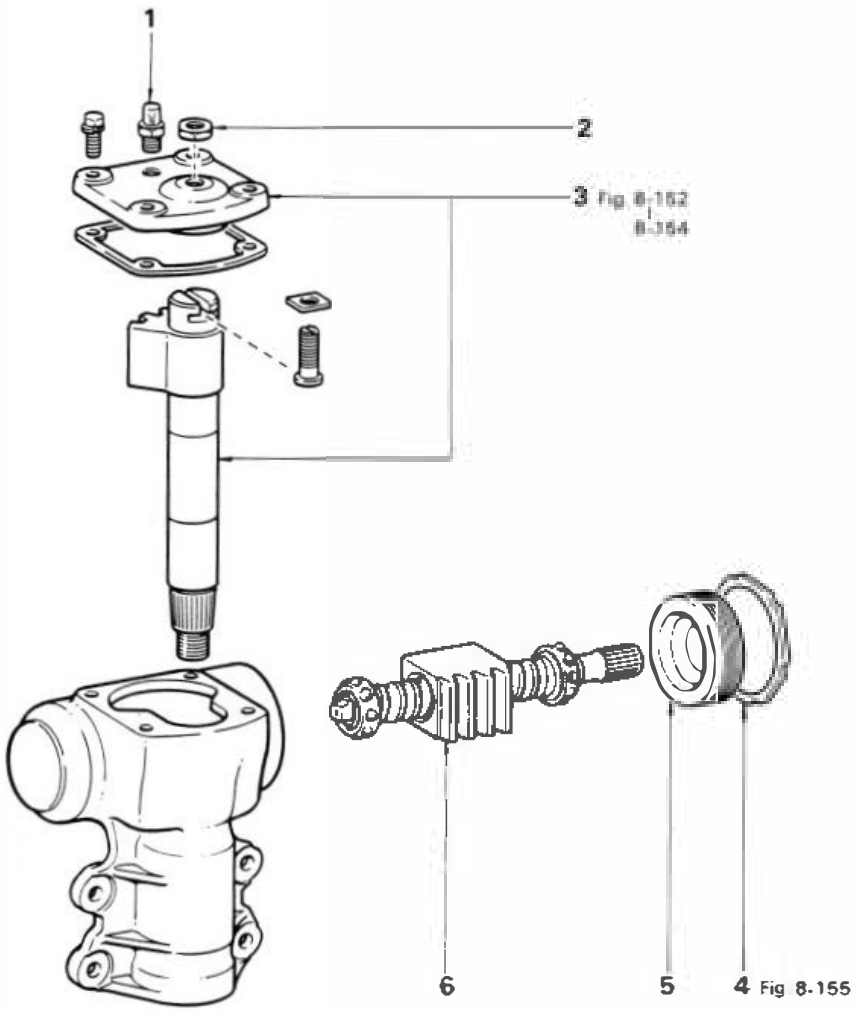


Remove the intermediate shaft

DISASSEMBLY

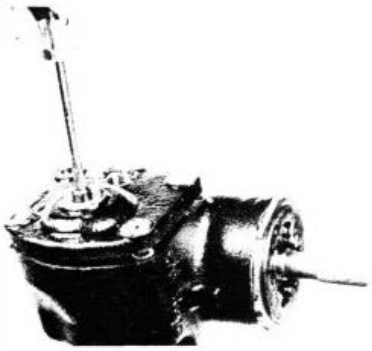
Disassemble the parts in the numerical order shown in the figure.

Fig. 8-151



1. Breather Plug
2. Lock Nut
3. End Cover & Sector Shaft
4. Lock Nut
5. Bearing Adjusting Nut
6. Worm Shaft

Fig. 8-152

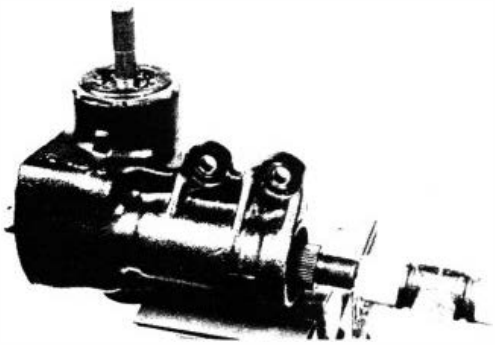


Screw in the bolt to remove the cover

Fig. 8-153

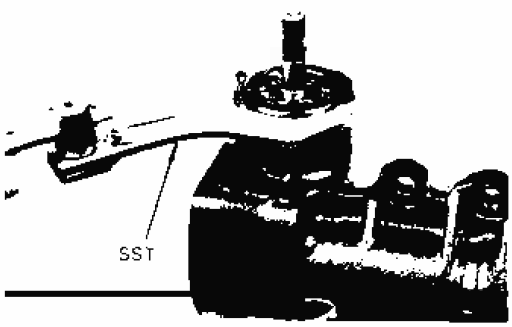
Pour out the remaining oil before removing the sector shaft.

Fig. 8-154



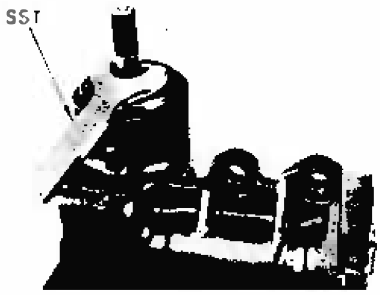
Remove the sector shaft by tapping the bottom end with a plastic hammer

Fig. 8-155



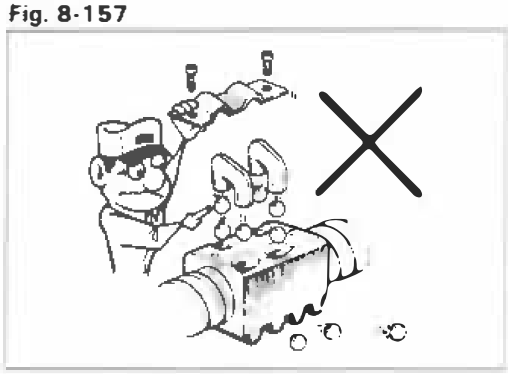
Loosen the lock nut with SST
SST [09617-22010]

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

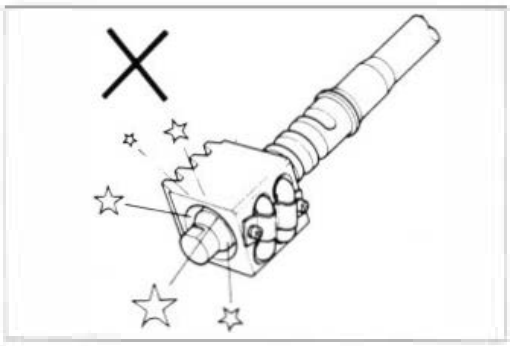
INSPECTION & REPAIR
Worm & Nut
Inspect the worm and nut for wear or damage

Fig. 8-159

Check the turning condition of nut

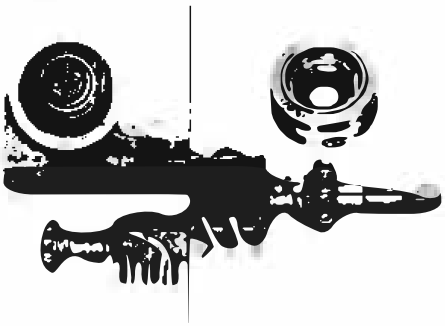
– Note –
It should revolve smoothly by own weight.

Fig. 8-160



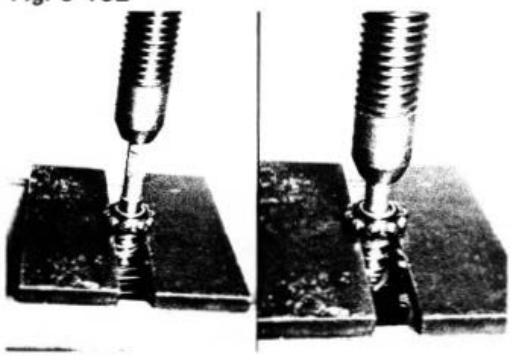
– Note –
To prevent ball damage, do not strike the ball nut against the ends of the worm.

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

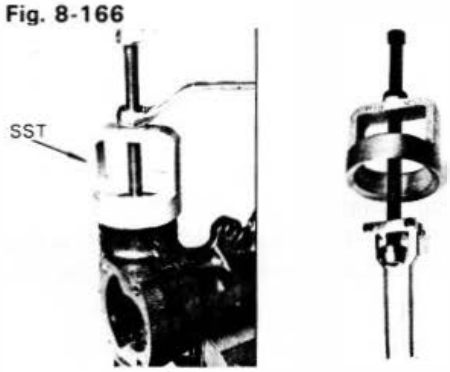
Fig. 8-164

3 Install the worm bearing

Fig. 8-165

4 Replace the outer race

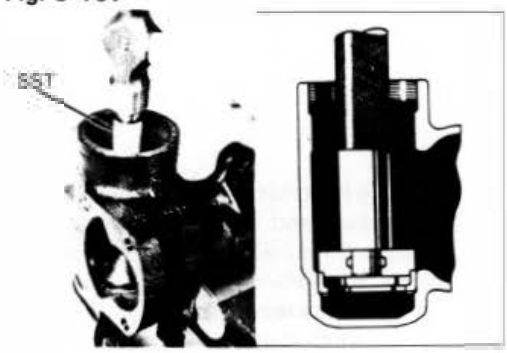
Fig. 8-166



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 adjustingscrew for wear or damage

Fig. 8-171

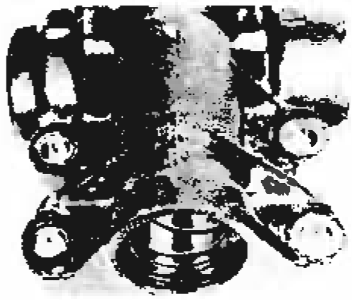
3 Measurethe thrust clearance between the sector shaft and the adjusting bolt. Then select a thrust washer that will provide minimum clearance.

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)	

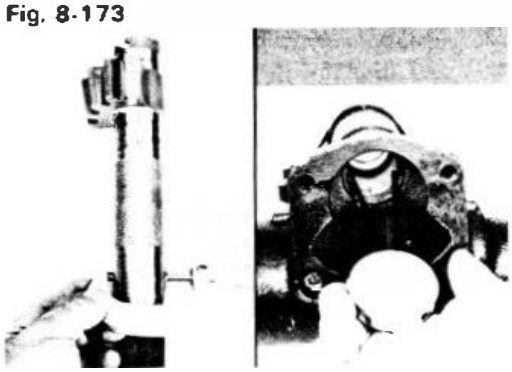
Fig. 8-17



Bushing

1. Inspect for wear or damage

Fig. 8-173

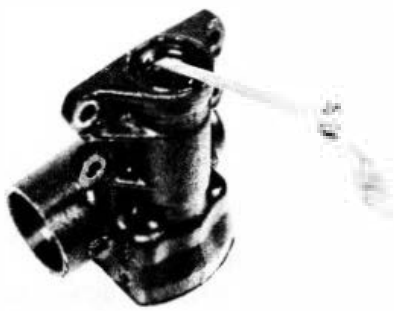


2. Check the oil clearance

Oil clearance:

STD	0.009—0.060 mm (0.0004—0.0024 in.)
Limit	0.10 mm (0.0039 in.)

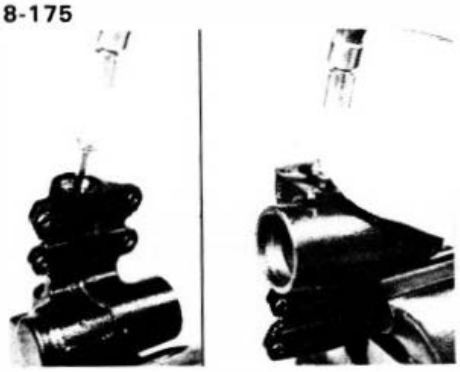
Fig. 8-174



Replace The Bushing

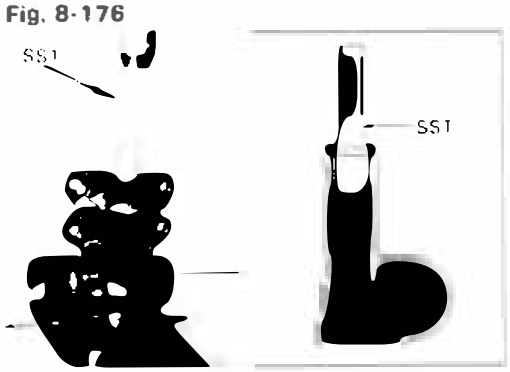
1. Remove the oil seal

Fig. 8-175



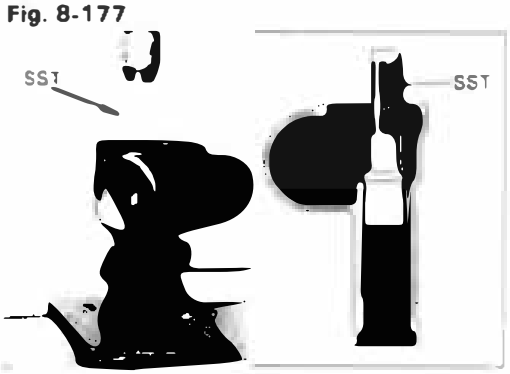
2. Remove the two bushings

Fig. 8-176



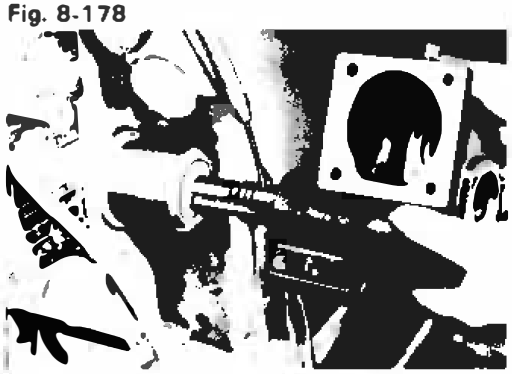
3. Install the outer bushing with SST.
SST [09615-37010]

Fig. 8-177



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

Fig. 8-178

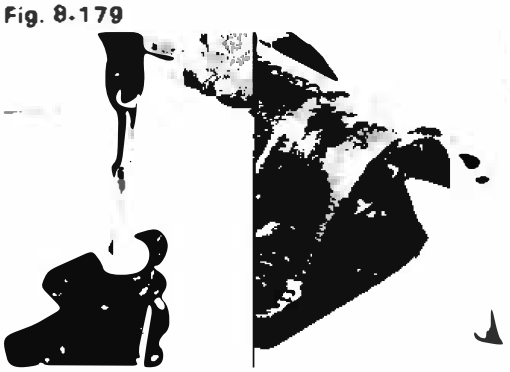


5. Hone the inner surface of the bushings until standard oil clearance is obtained between the bushings and sector shaft.

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

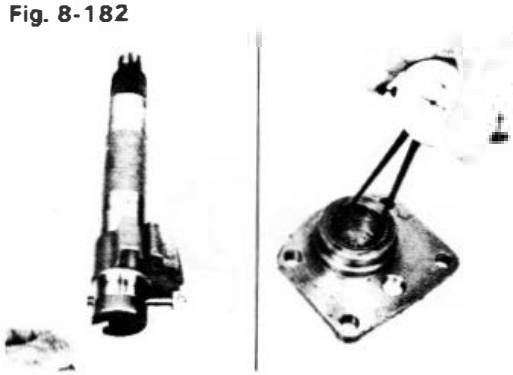
Fig. 8-180

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

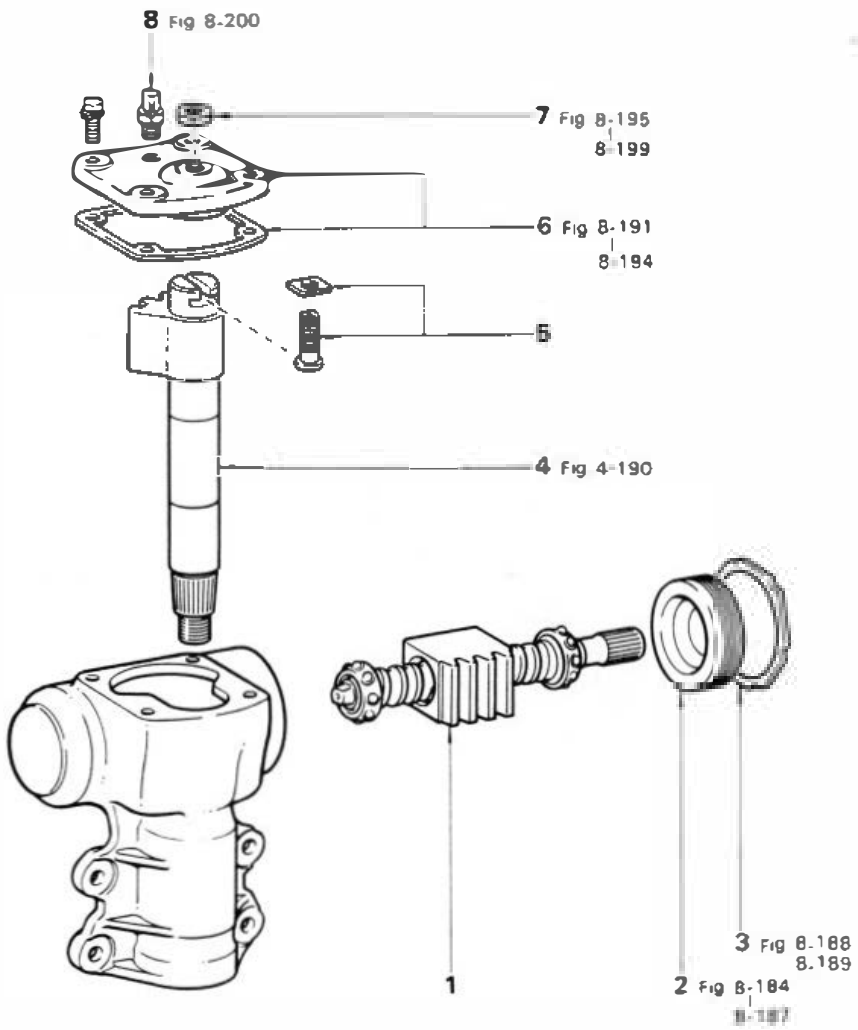
Oil clearance:

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

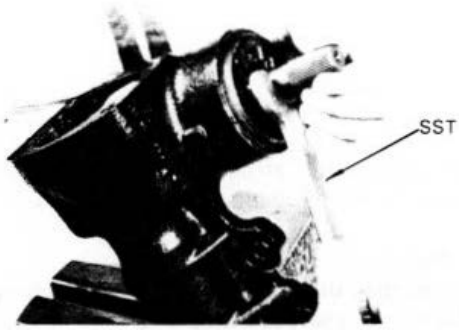
Fig. 8-184

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.

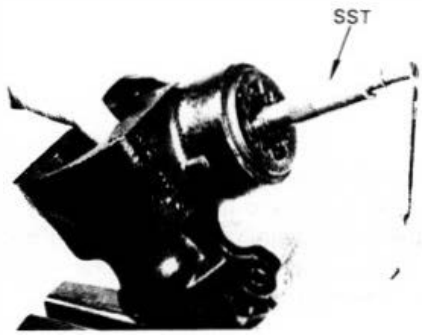
Fig. 8-186



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

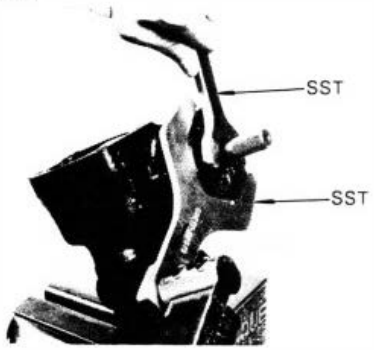


Measure the bearing preload with SST and a torque meter
SST [09616-00010]

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

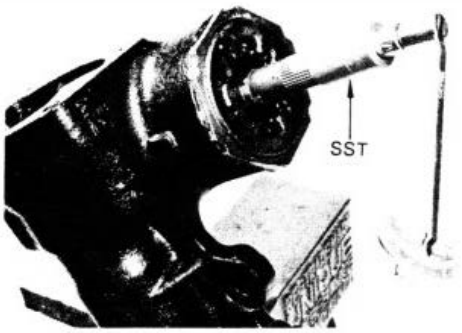
– Note –
Check to see that both the right and left rotations are identical.

Fig. 8-188



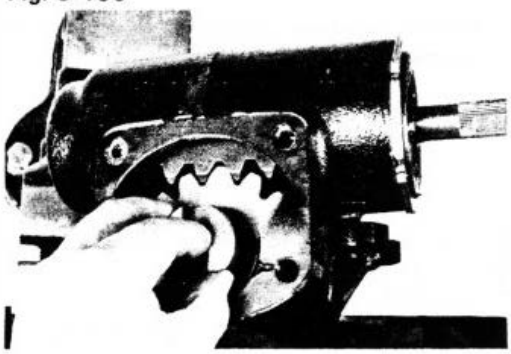
Tighten the lock nut with SST.
SST [09616-22010]
[09617-22010]
Tightening torque: 23.0—26.0 kg-m (167—188 ft-lb)

Fig. 8-189



After tightening the lock nut, make sure that the bearing preload has not changed.
SST [09616-00010]

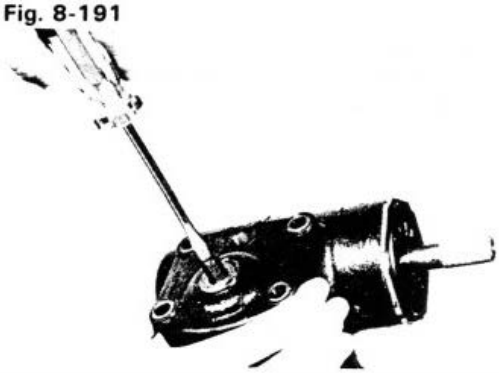
Fig. 8-190



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.

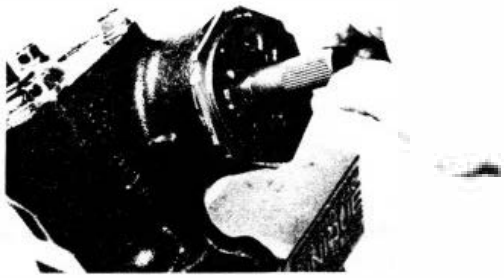
1. Before tightening the set bolts, completely loosen the adjusting screw with a screwdriver.

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)

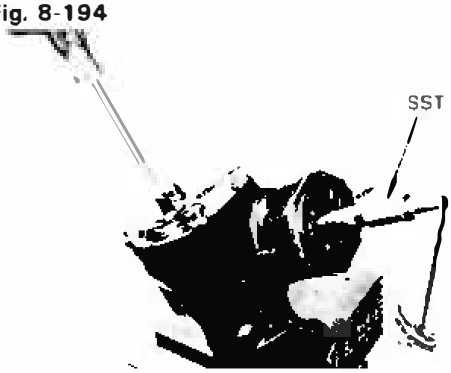
Fig. 8-193



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)

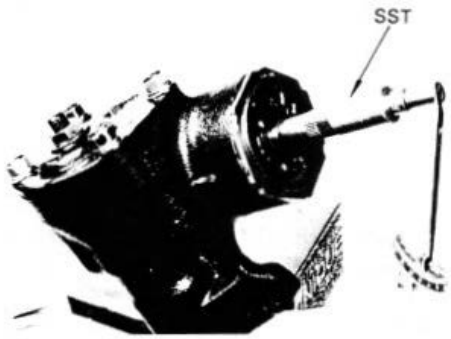
– Note –
Preload measurement should be made with the meshing in the center (neutral) position.

Fig. 8-195

Tighten the lock nut.

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

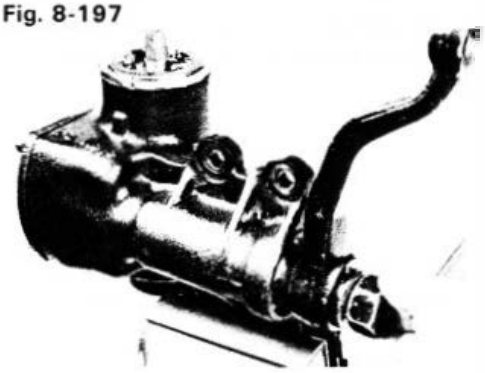
Fig. 8-196



After tightening the lock nut, recomfirm 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

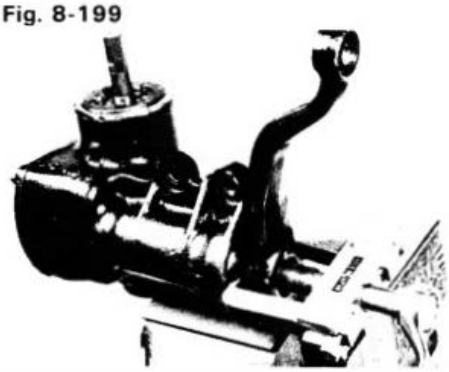
— Note —
Align the matchmarks on the pitman arm and sector shaft.

Fig. 8-198

Measure the sector shaft backlash

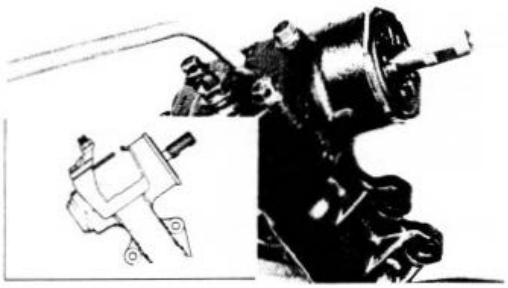
— Note —
Sector shaft should have no backlash within 100 degrees on the left and right side of neutral position.

Fig. 8-199



After checking the backlash, remove the pitman arm

Fig. 8-200



⚠ Replenish with gear oil

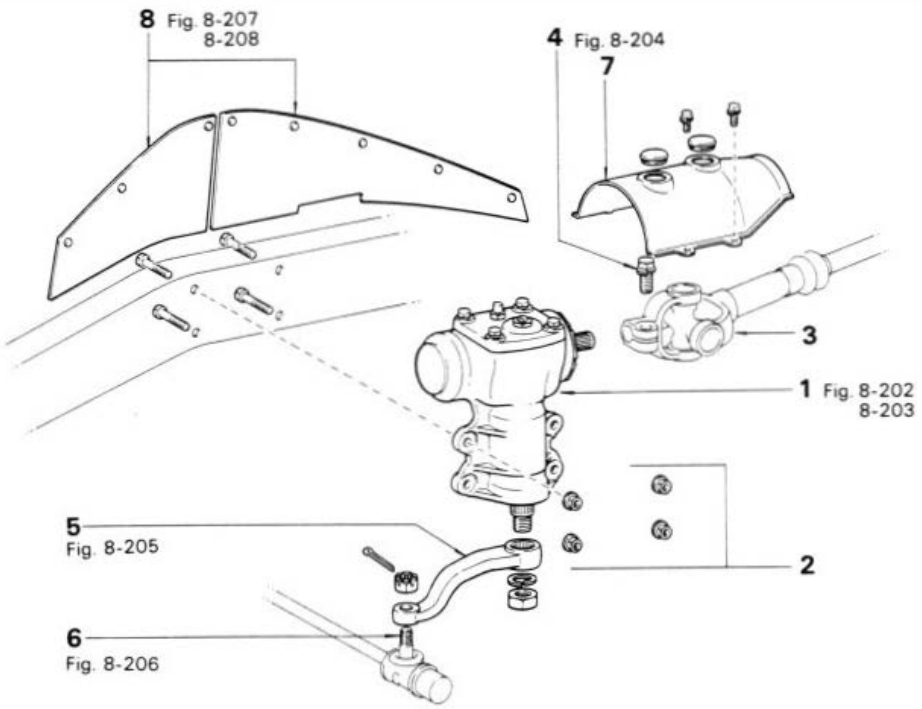
Capacity: 500 cc
(30.5 cu in.)

Oil level:
API GL-5, SAE 90

INSTALLATION

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

Fig. 8-201

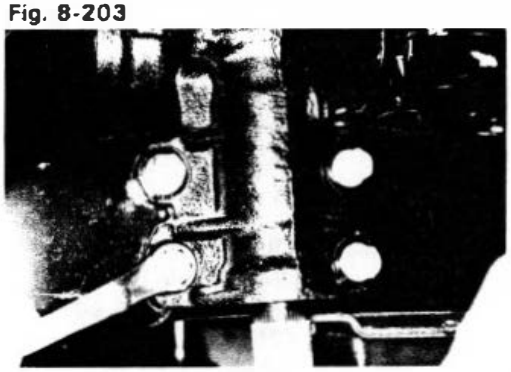


1. Gear Housing
2. Mounting Bolt & Nut
3. Intermediate Shaft
4. Lock Bolt
5. Pitman Arm
6. Relay Rod End
7. Cover
8. Dust Cover

Fig. 8-202

Align the slit on yoke to the shaft groove

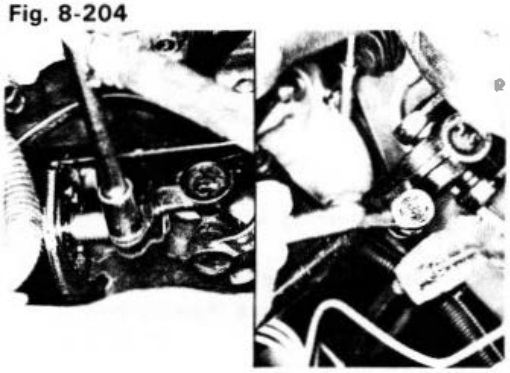
Fig. 8-203



Tighten the gear housing set bolts

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

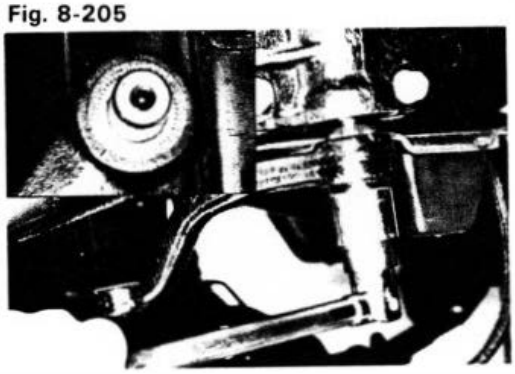
Fig. 8-204



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

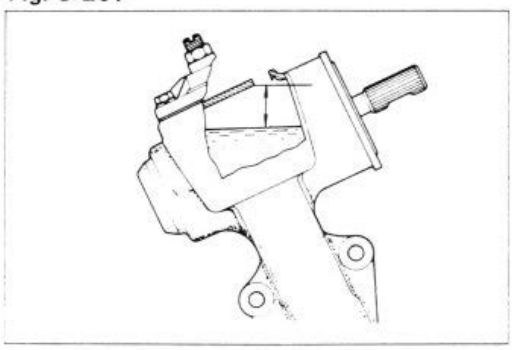
Tightening torque: 16.5 – 19.5 kg-m (120 – 141 ft-lb)

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.

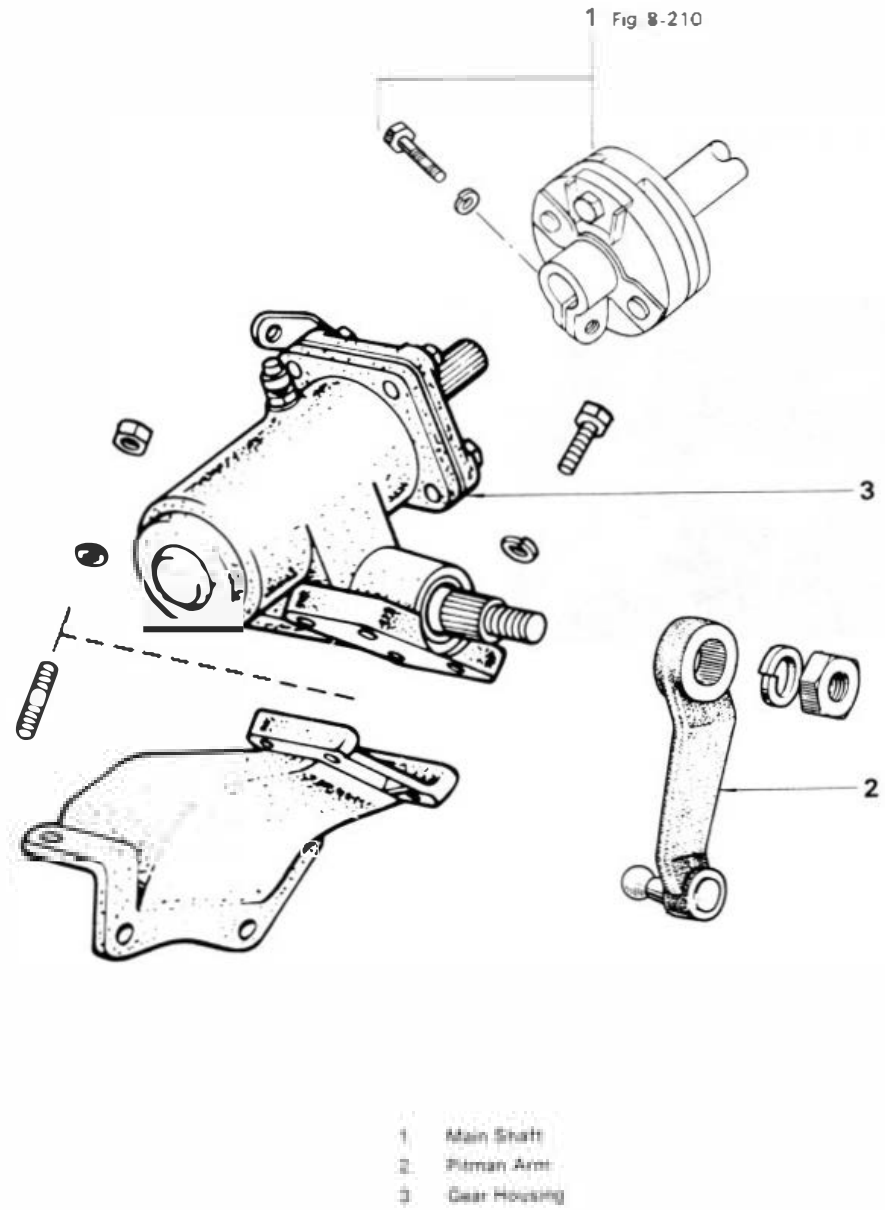
Steering wheel play:
Less than 30 mm (1.18 in.)

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

REMOVAL

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

Fig. 8-209



1. Main Shaft
2. Pitman Arm
3. Gear Housing

Fig. 8-210

Remove the steering wheel and main shaft

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

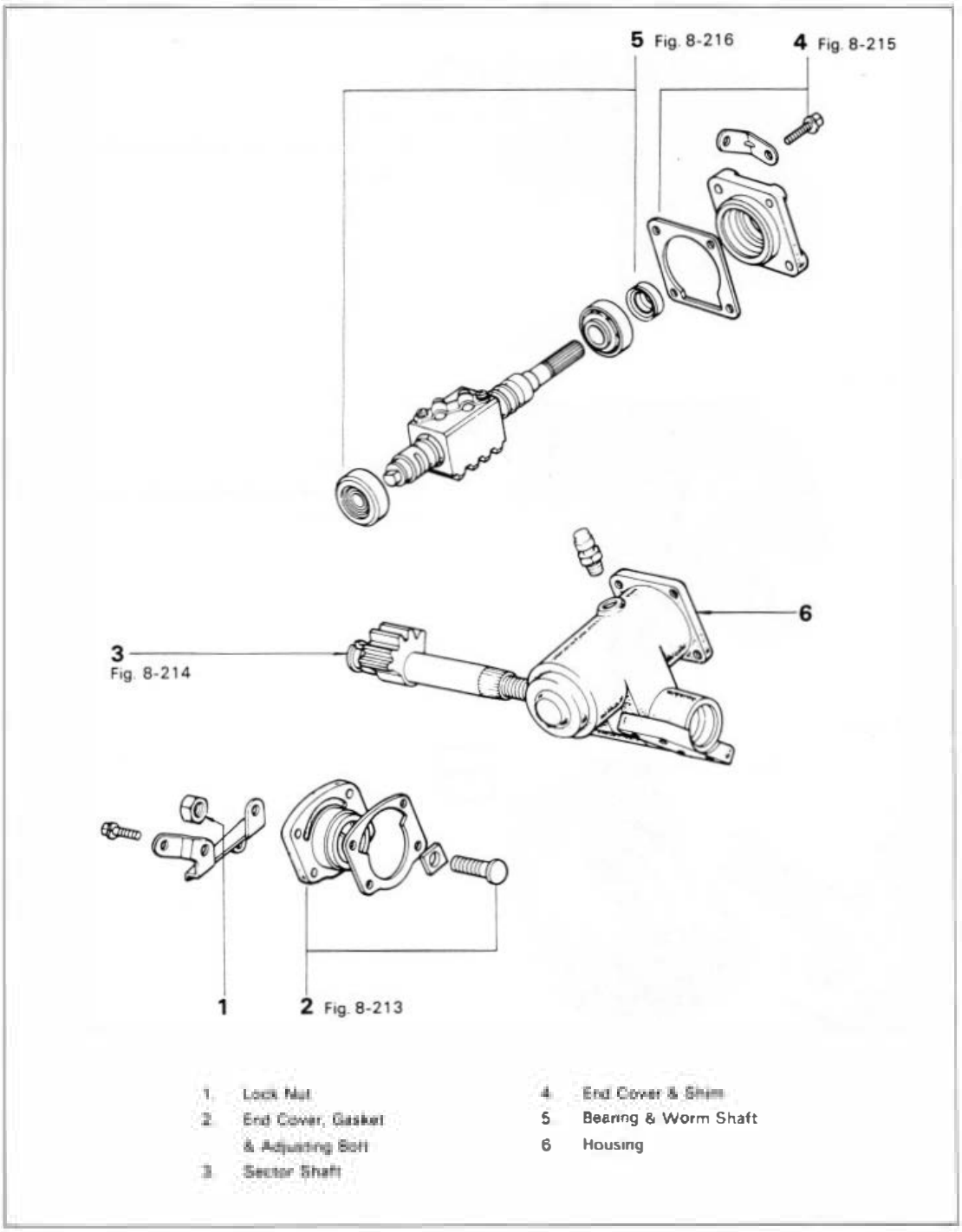
Fig. 8-211

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

DISASSEMBLY

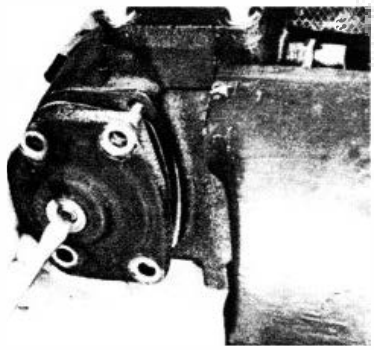
Disassemble the parts in the numerical order shown in the figure.

Fig. 8-212



1. Lock Nut
2. End Cover, Gasket & Adjusting Bolt
3. Sector Shaft
4. End Cover & Shim
5. Bearing & Worm Shaft
6. Housing

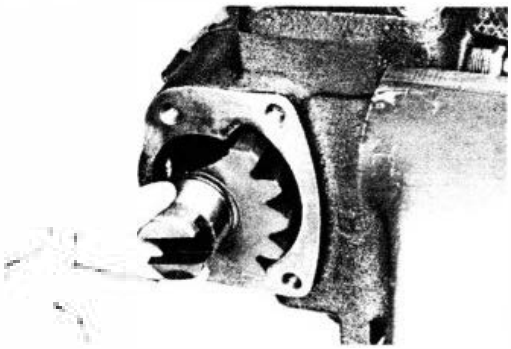
Fig. 8-213



Screw in the bolt and remove the cover

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

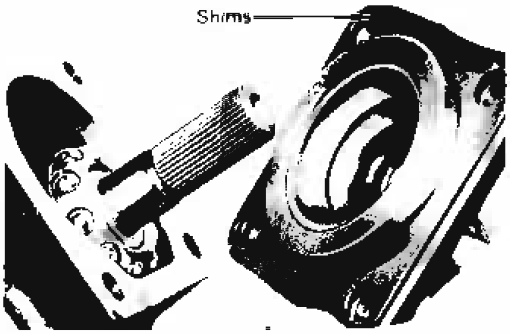
Fig. 8-214



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

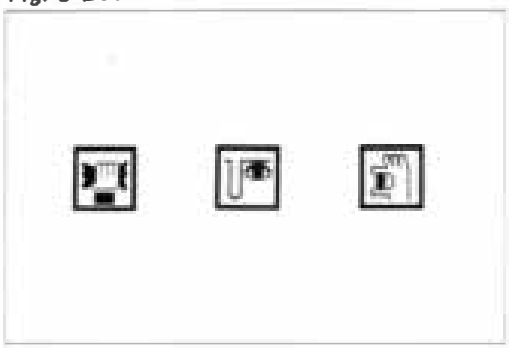
F . 8-216 ig

Remove the worm assembly

— Note —

1. **Keep the bearings in proper order so that they can be ressembled to their initial positions.**
2. **Do not attem pt 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.**

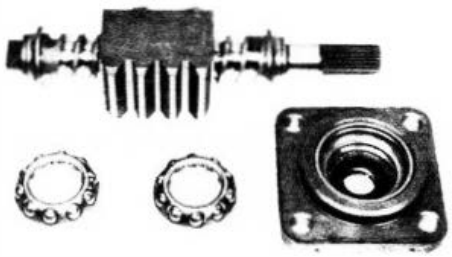
Fig. 8-217



INSPECTION

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

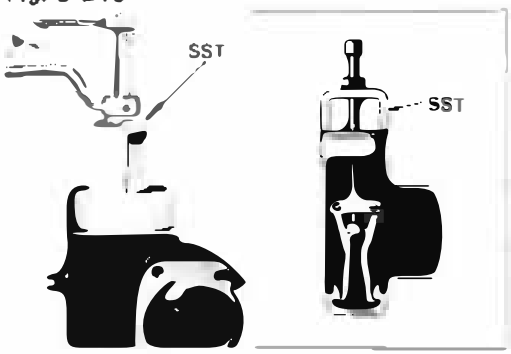
Fig. 8-218



Steering Worm & Bearing

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

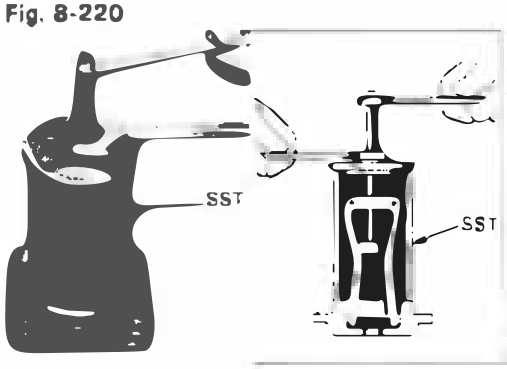
Fig. 8-219



Replace The Worm Bearing Outer Race

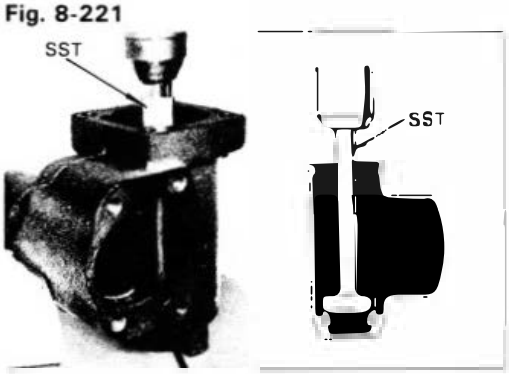
1 Remove the outer race at housing end with SST
SST [09612-65013]

Fig. 8-220



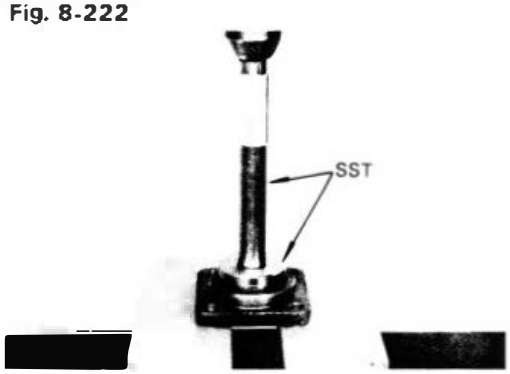
2 Remove the outer race at end cover end with SST
SST [09612-30012]

Fig. 8-221



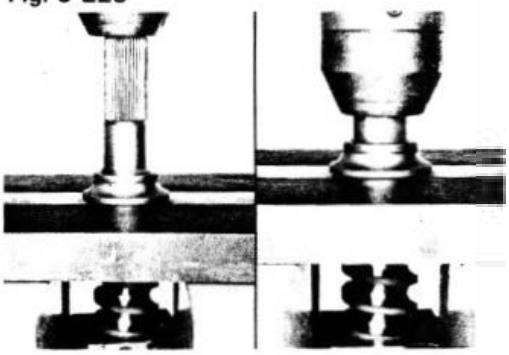
3 Install the outer race at housing end with SST.
SST [09608-35013]

Fig. 8-222



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

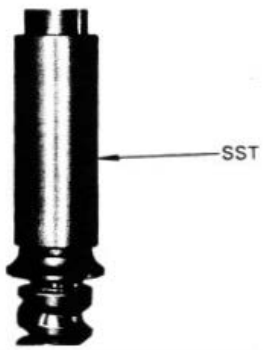
Fig. 8-223



Replace The Inner Race

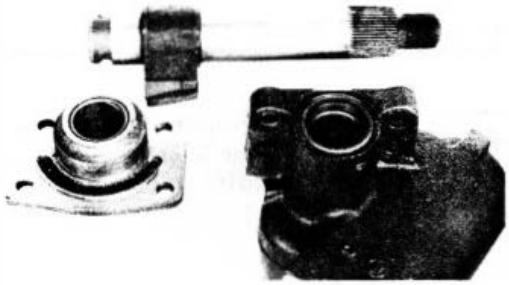
1 Force out the inner race with a press.

Fig. 8-224



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

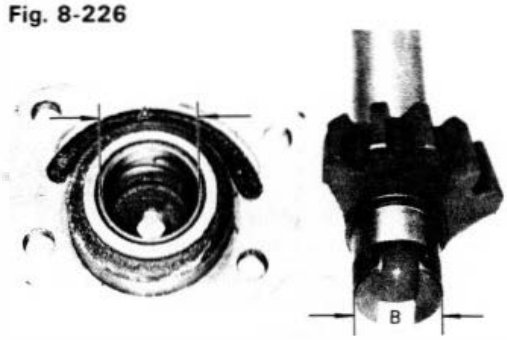
Fig. 8-225



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

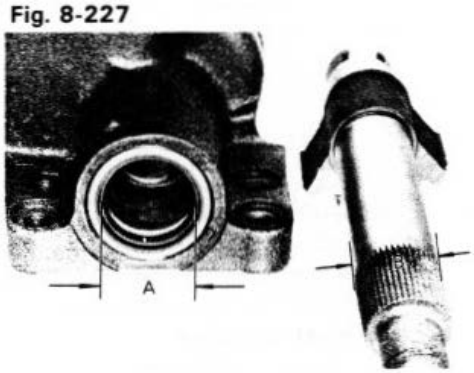
Fig. 8-226



2 Check the sector shaft oil clearance (A – B)

Oil clearance:
Limit 0.1 mm (0.004 in.)

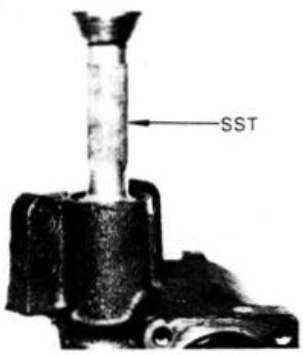
Fig. 8-227



3 Check the sector shaft oil clearance (A – B)

Oil clearance:
Limit 0.1 mm (0.004 in.)

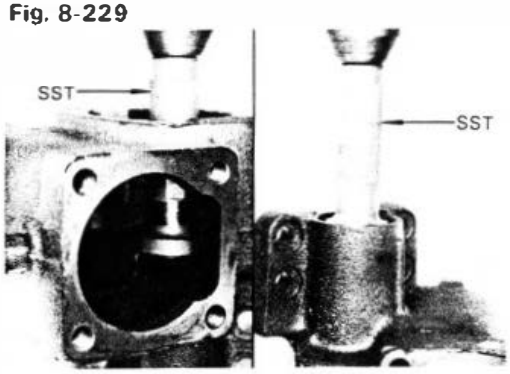
Fig. 8-228



Replace The Gear Housing

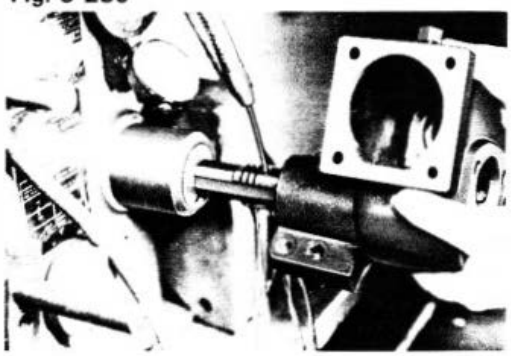
1 Remove the oil seal
2 Press out the two bushings at the same time in the same direction with SST
SST [09307-12010]

Fig. 8-229



3 Press in the bushings from each end of the gear housing with SST
SST [09307-12010]

Fig. 8-230

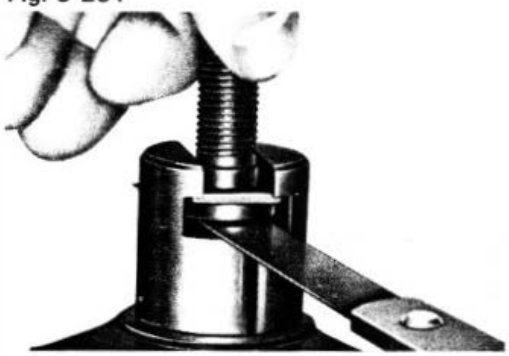


4 Hone the bushings with a pinhole grinder or similar means until standard oil clearance is obtained between the bushings and the sector shaft

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.)

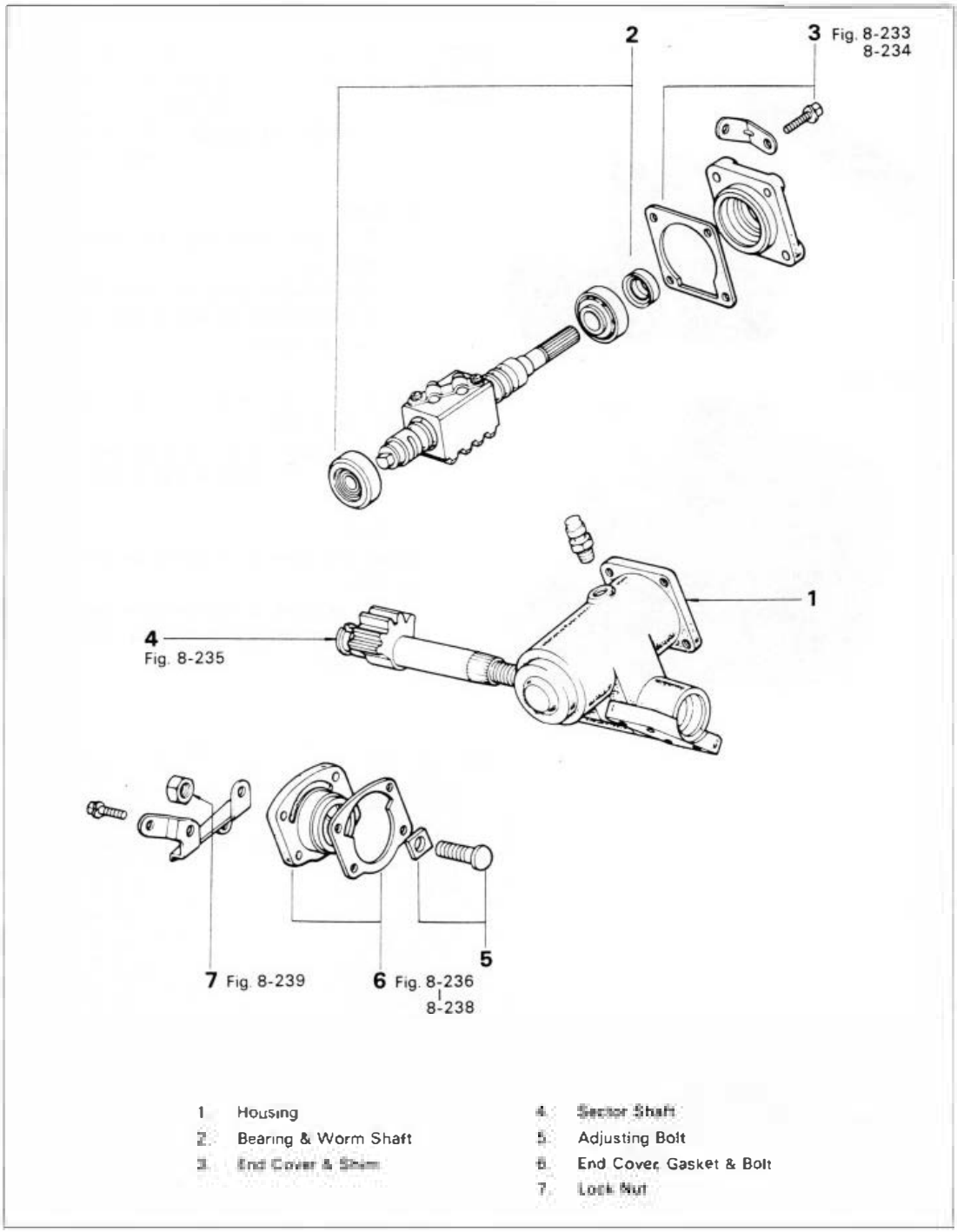
Thrust washer thickness mm (in.)

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

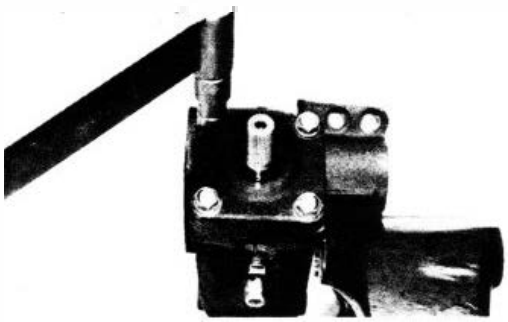
Assemble the parts in the numerical order shown in the figure

Fig. 8-232



1. Housing
2. Bearing & Worm Shaft
3. End Cover & Shim
4. Sector Shaft
5. Adjusting Bolt
6. End Cover Gasket & Bolt
7. Lock Nut

Fig. 8-233



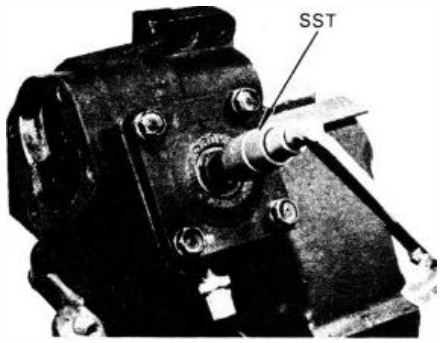
Install the cover over the same amount of shims removed at disassembly, and tighten the cover bolts at specified torque

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

– Note –

1. **Have the wormbearing 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 –

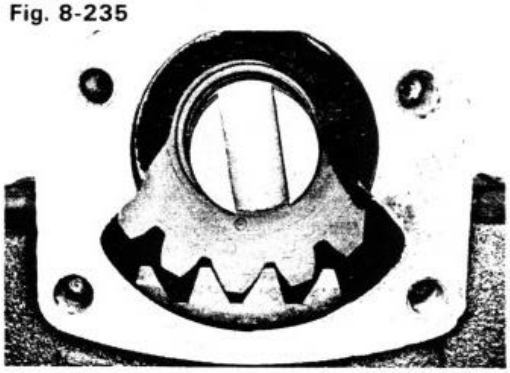
Read the scale just when the worm starts to turn.

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 (0.002 0)
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

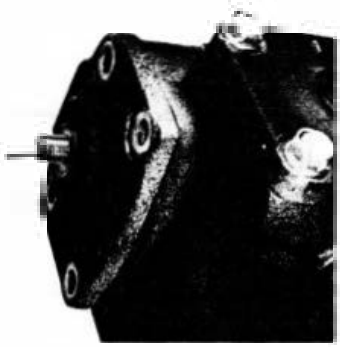


Position the worm ball nut at the center and insert the sector shaft

– Caution –

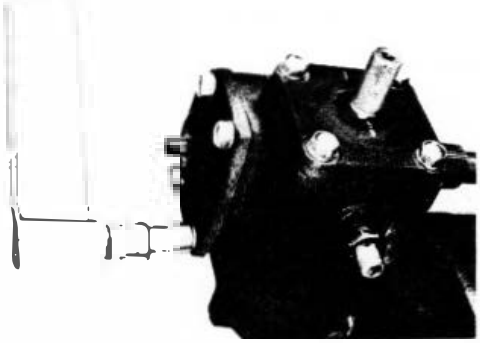
Make sure that the worm ball nut and the sector are meshing together at the center.

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 backlaish when the worm is rotated within 45 degrees to either side from center position.

Tighten the adjusting screwlock nut.

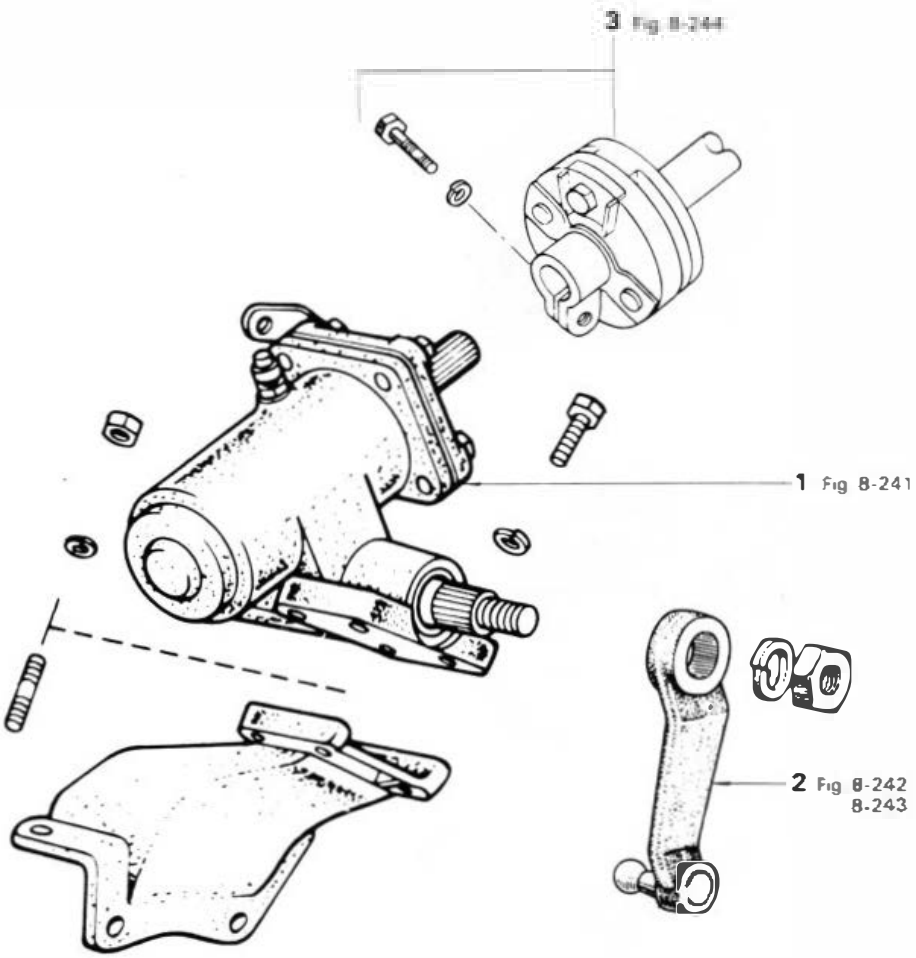
– Note –

After tightening, recheck the preload.

INSTALLATION

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

Fig. 8-240



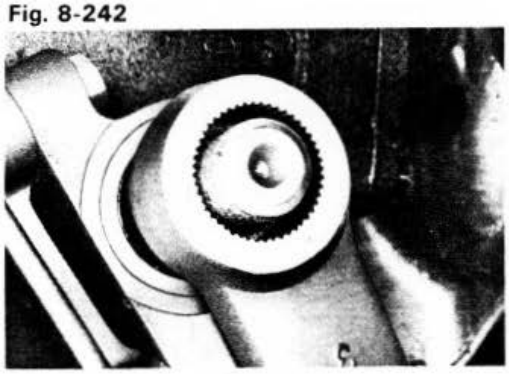
1. Gear Housing
2. Pitman Arm
3. Main Shaft

Fig. 8-241

Tighten the bolts and nuts at the specified torque

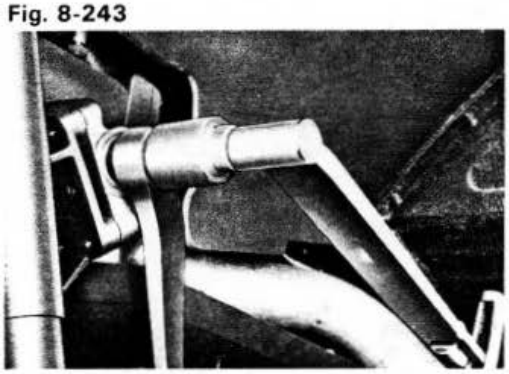
Tightening torque: 4.0 – 4.5 kg-m (29 – 32 ft-lb)

Fig. 8-242



Align the matchmarks on the pitman arm and sector shaft

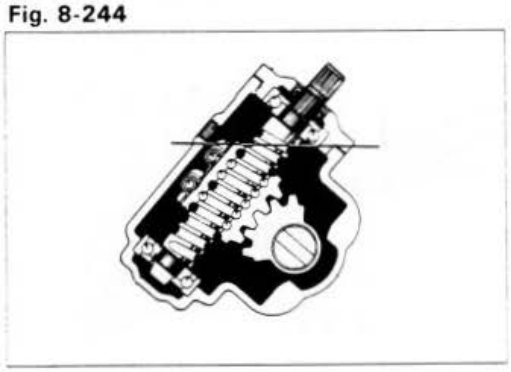
Fig. 8-243



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

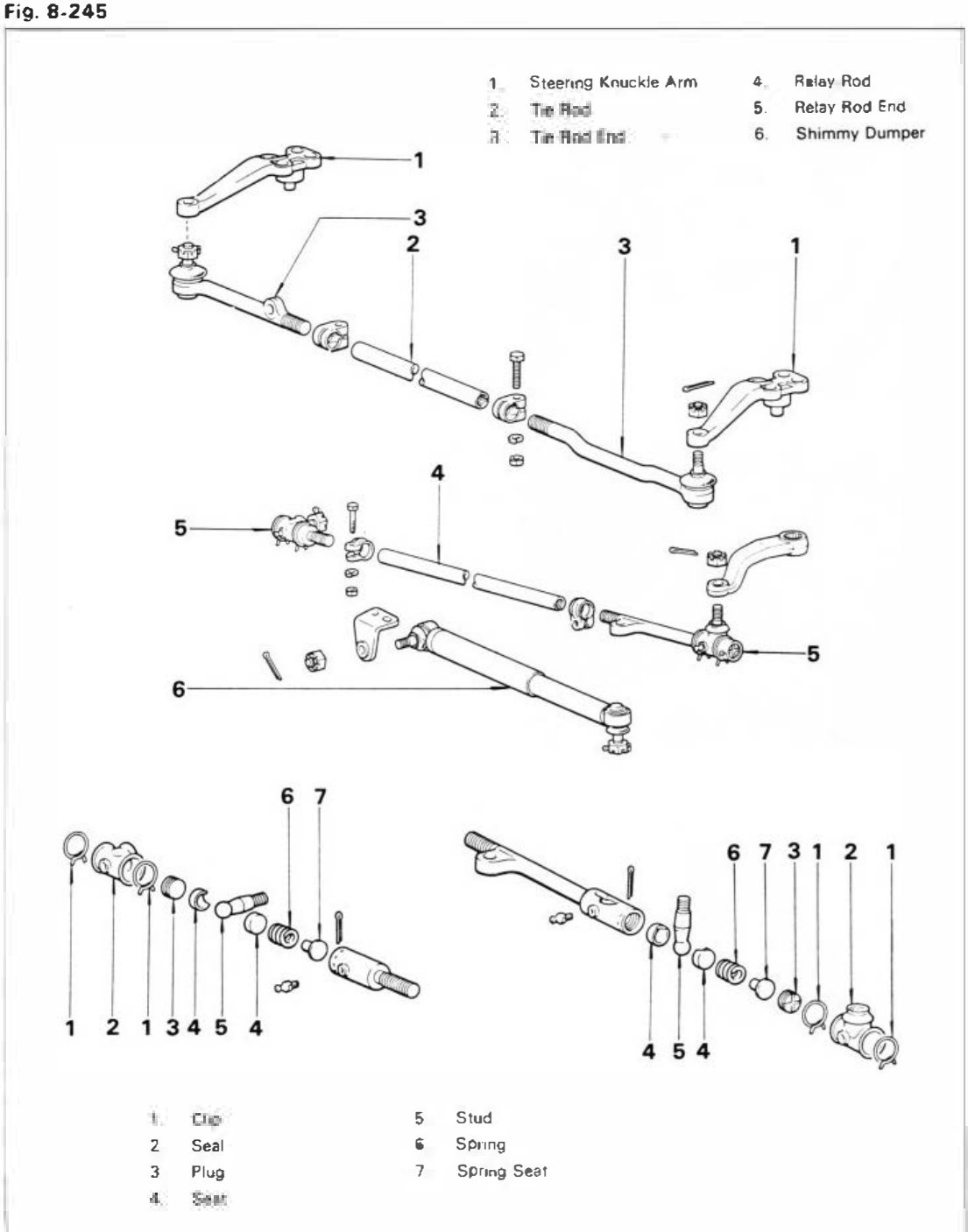
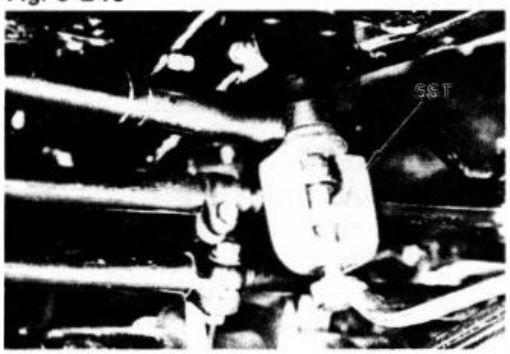


Fig. 8-246

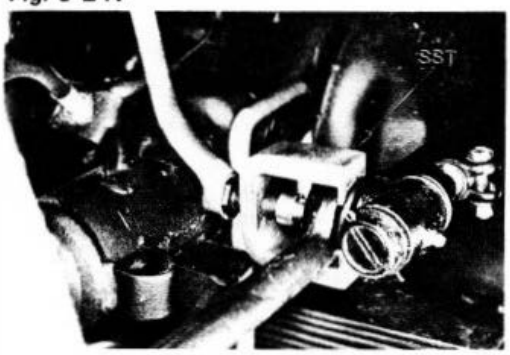


RELAY ROD

REMOVAL

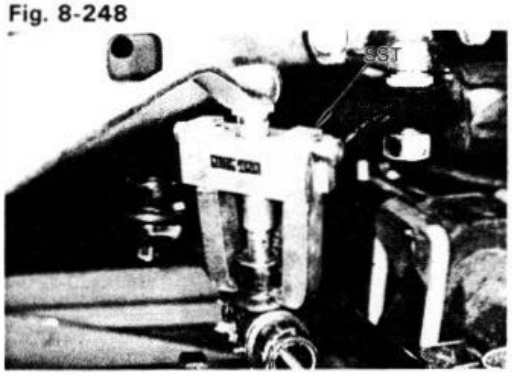
Disconnect the dumper from the relay rod with SST
SST [09611-22011]

Fig. 8-247



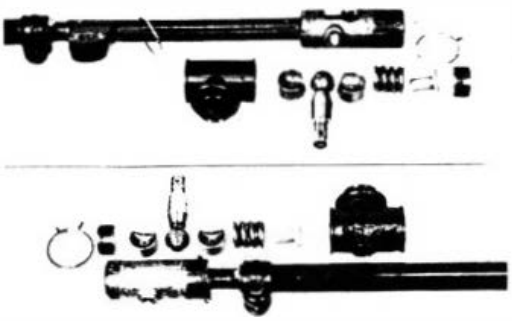
Disconnect the pitman side stud with SST
SST [09611-20014]

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

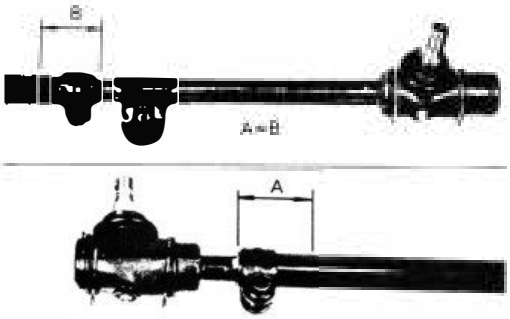


Fig. 8-251

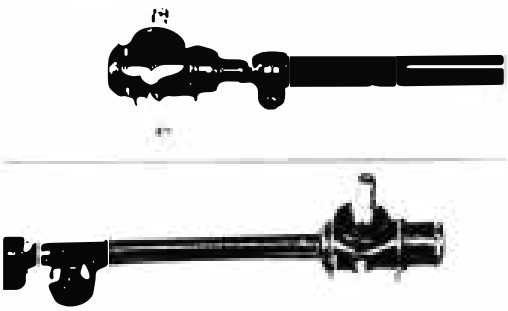
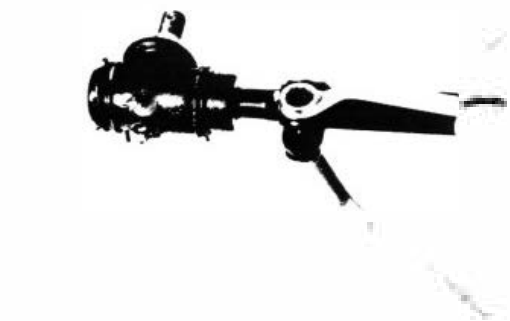


Fig. 8-252

Fig. 8-253



ADJUSTMENT

Adjust the relay rod length end

1 Screw the end into the tube equally on both ends

2 Adjust the rod length

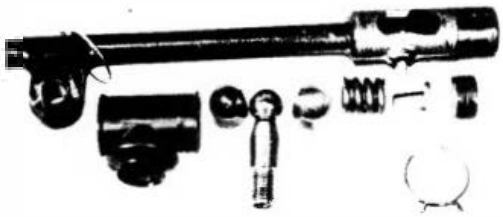
Relay rod length: 836 mm (32.91 in.)

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



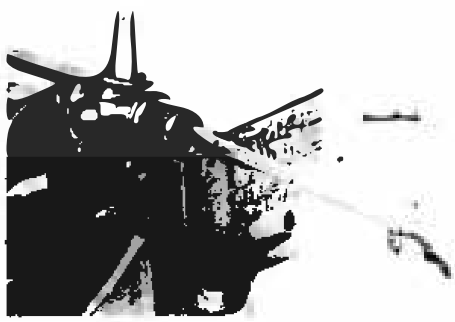
Adjust the plug tightness.

1 Install the damper side as shown in the figure.

Fig. 8-255

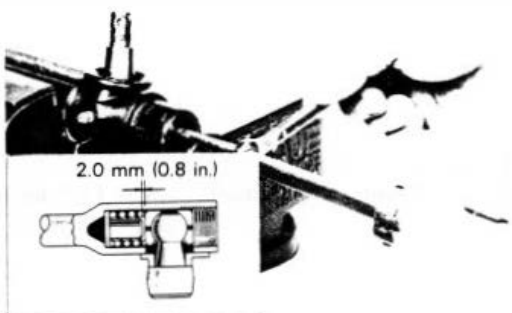
2 Install the tie rod side as shown in the figure.

Fig. 8-256



3 Tighten the plug down completely. Be sure that the spring seat and bolt seat come into contact.

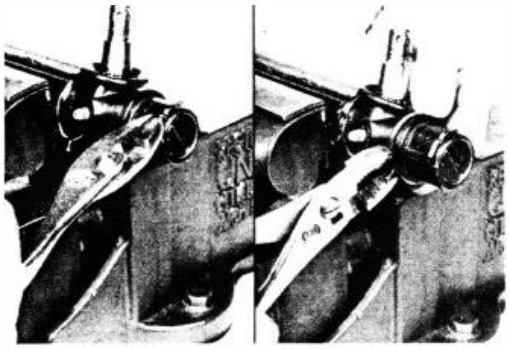
Fig. 8-257



4 Loosen the plug one and one a third turns

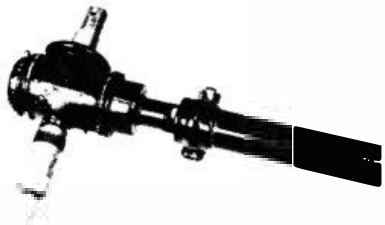
Spring seat and bolt seat clearance: 2.0 mm (0.079 in.)

Fig. 8-258



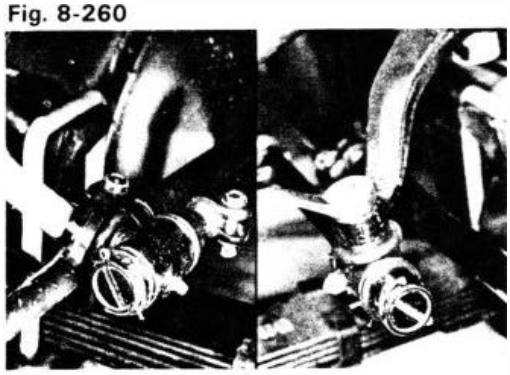
5. Assemble the cotter pin and clip

Fig. 8-259



6 Grease where necessary

Fig. 8-260

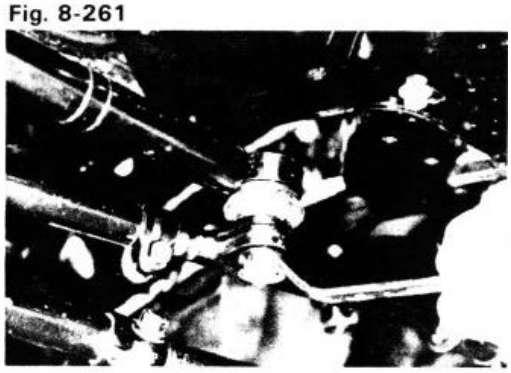


INSTALLATION

Tighten the nut

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

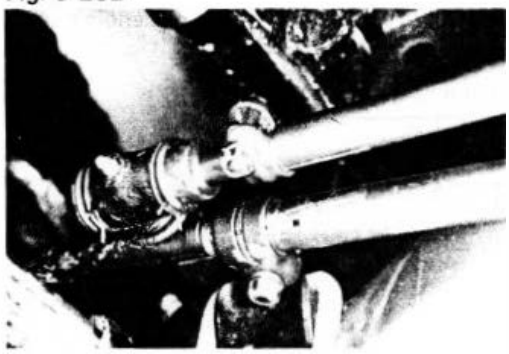
Fig. 8-261



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.

F ig 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

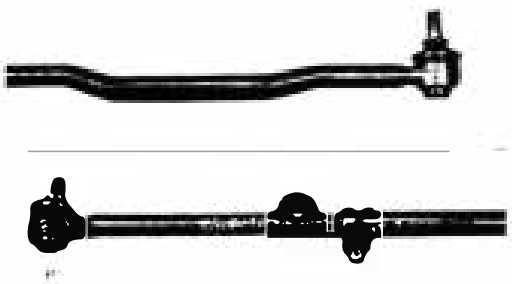
Fig. 8-267

ADJUSTMENT

Adjust the tie rod length

1 Screw the ends into the tube equally

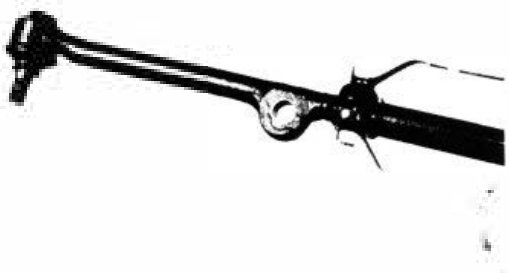
Fig. 8-268



2 Temporarily adjust the tie rod length

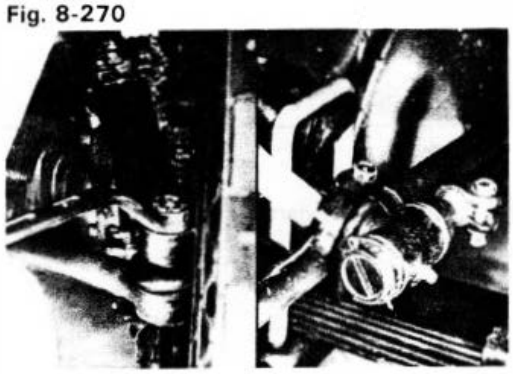
Tei rod end length: 1.267.4 mm (49.898 in.)

Fig. 8-269



3 Temporarily install both side tube clamps

Fig. 8-270



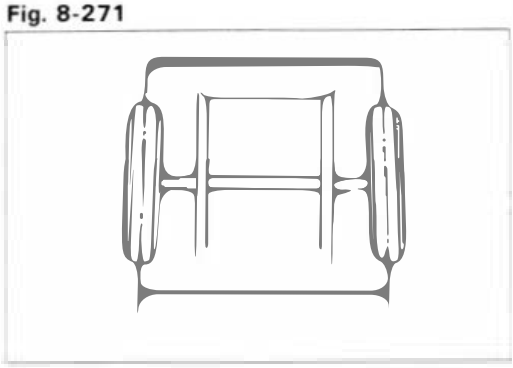
INSTALLATION

Tighten the nut

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

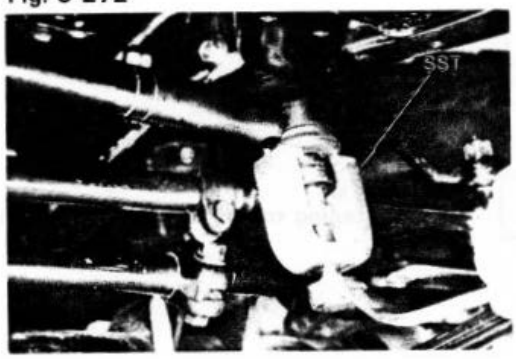
Install the cotter pin

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

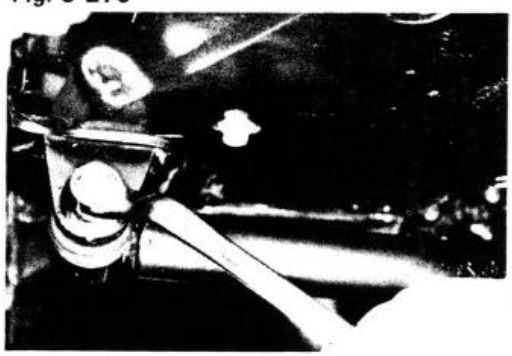
INSPECTION

1. Check for damage or oil leakage

Fig. 8-275

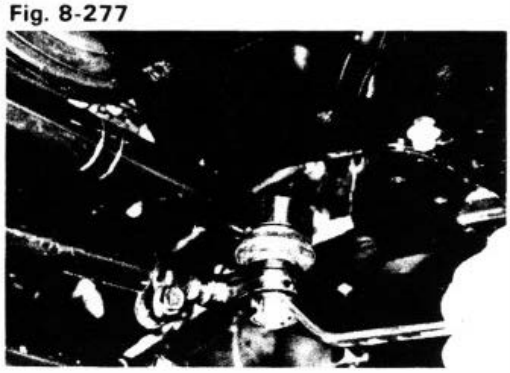
Check the operation
Apply an even pressure and insure that the tension is equal throughout the stroke

Fig. 8-276



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

Fig. 8-277



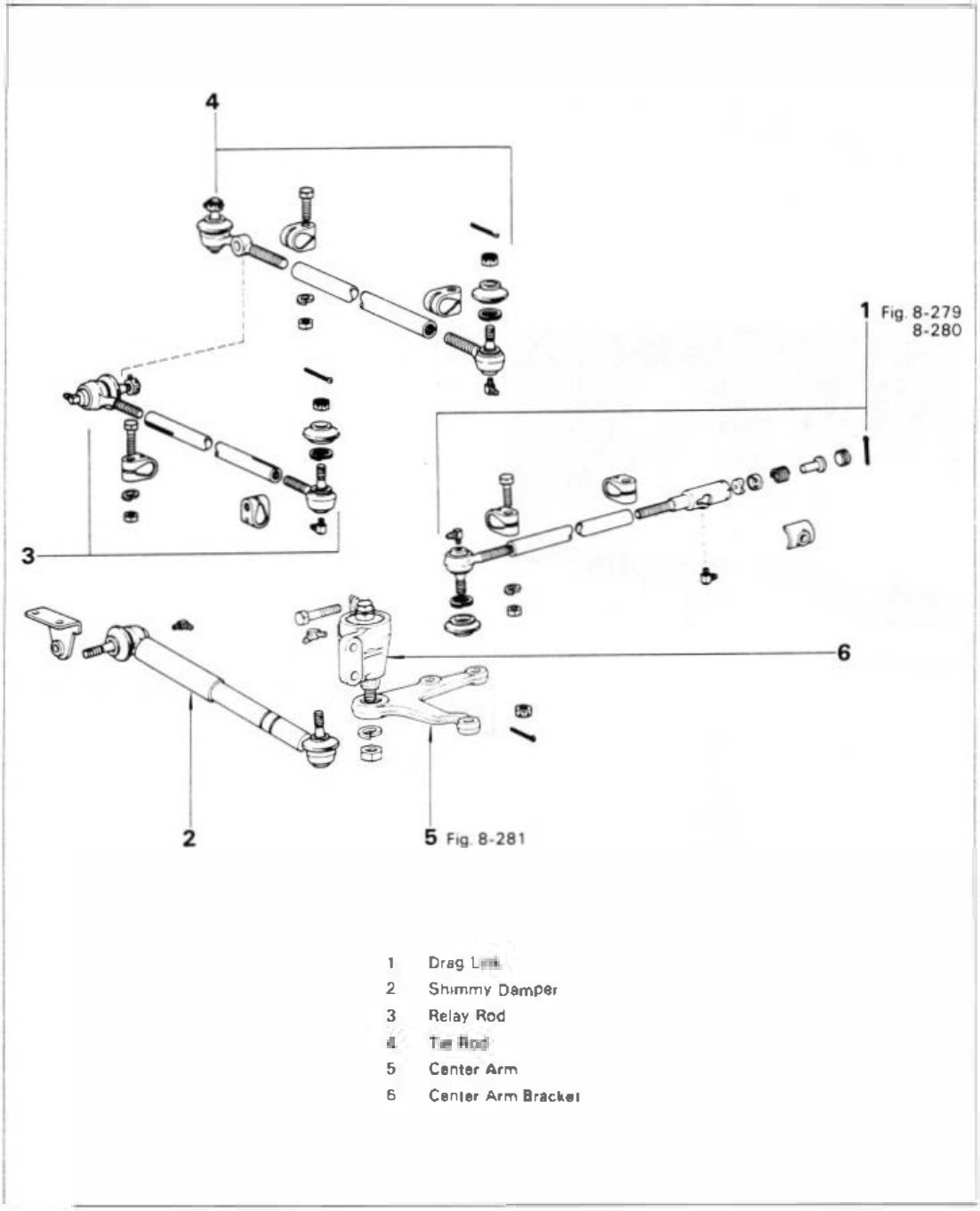
Tighten the nut
Tightening torque: 7.5 – 11.0 kg-m (55 – 79 ft-lb)

STEERING LINKAGE (FJ, BJ, HJ4 – SERIES)

REMOVAL & DISASSEMBLY

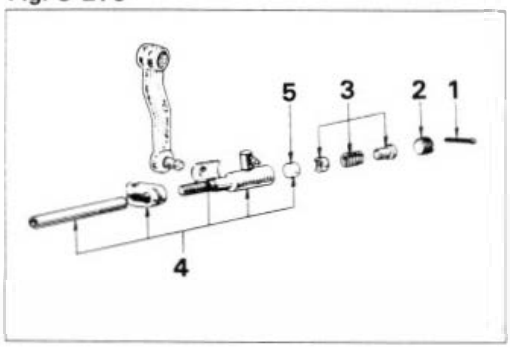
Remove and disassemble the parts in the numerical order shown in the figure

Fig. 8-278



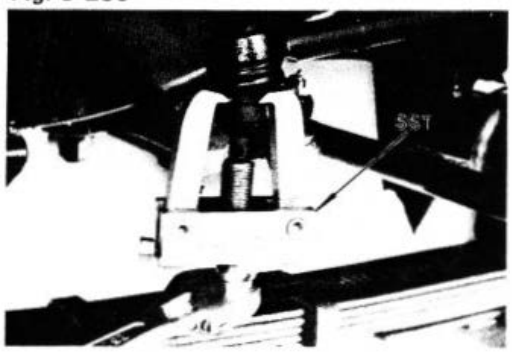
1 Drag Link
2 Shimmy Damper
3 Relay Rod
4 Tie Rod
5 Center Arm
6 Center Arm Bracket

Fig. 8-279



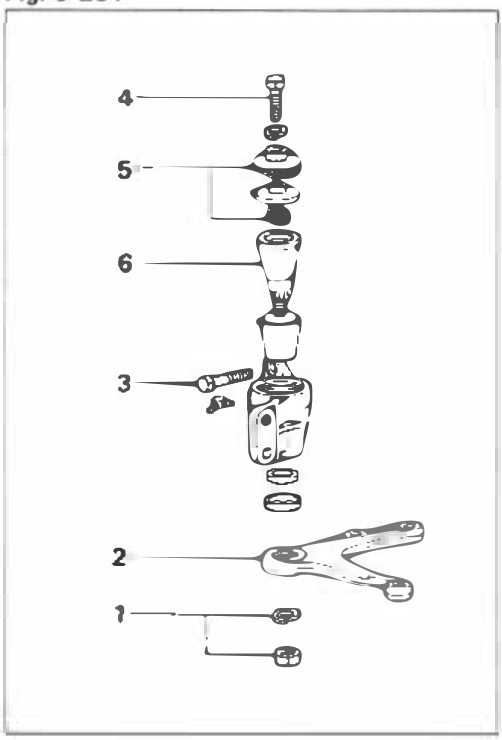
Disassemble the parts in the order shown by numbers

Fig. 8-280



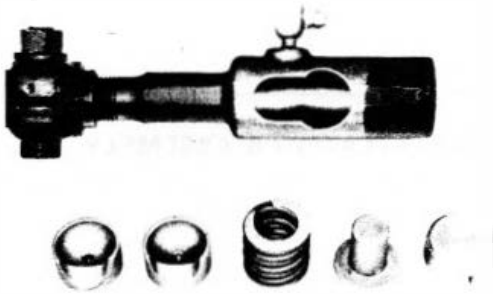
Disconnect the drag link with SST
SST [09628-62010]

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

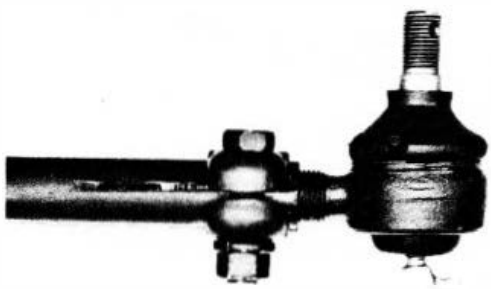
Inspect for wear or damage

Fig. 8-283

Shaft & Bushing

Inspect for wear or damage

Fig. 8-284



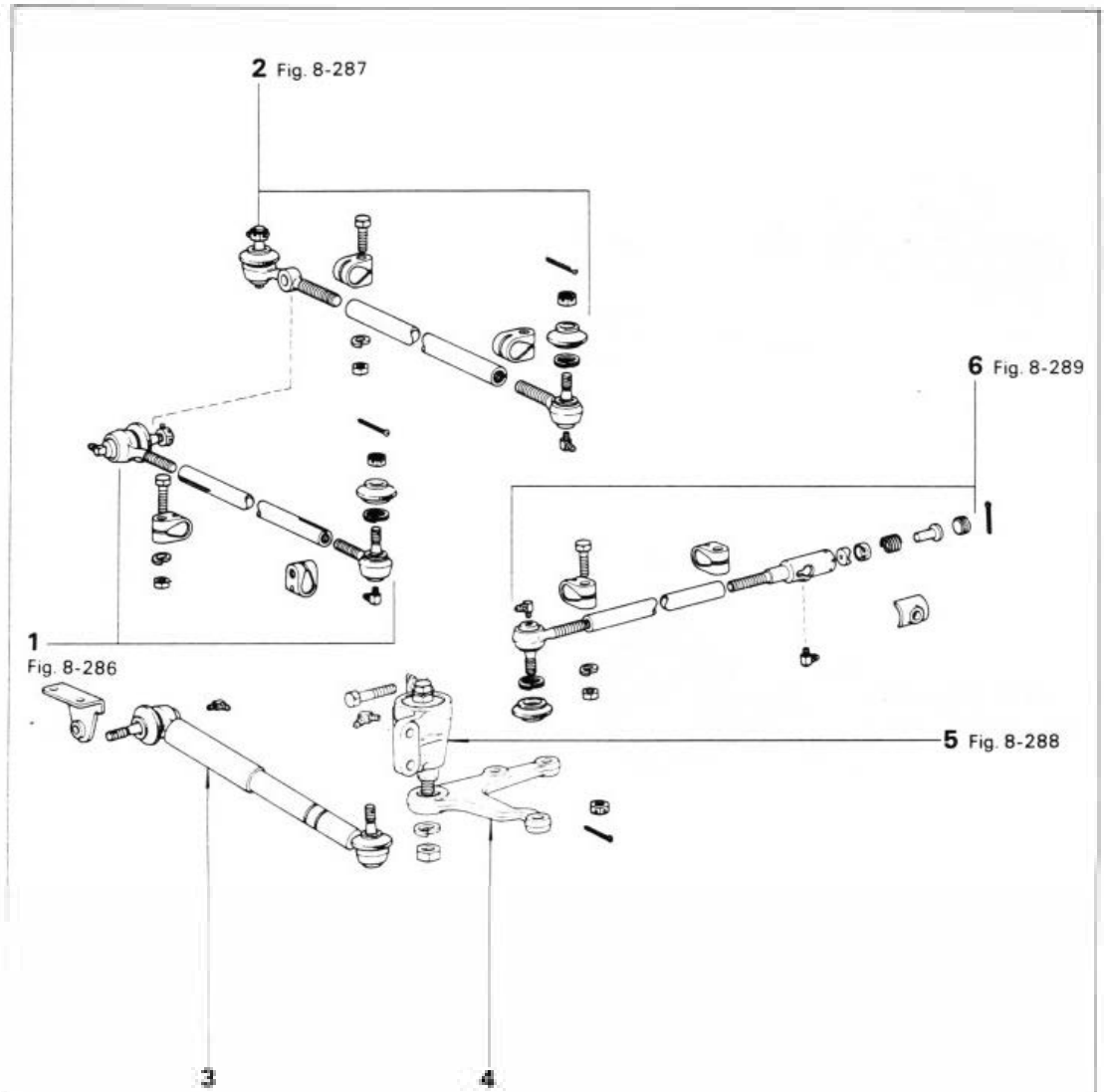
Drag Link, Tie Rod & Relay Rod

1. Inspect the link and rod for bending or cracks
2. Inspect the ball joint for wear

INSTALLATION & ASSEMBLY

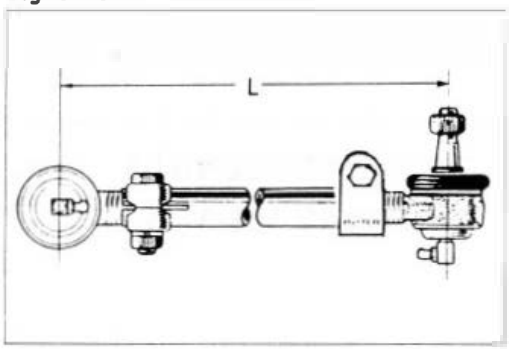
Install and assemble the parts in the numerical order shown in the figure.

Fig. 8-285



1. Relay Rod
2. Tie Rod
3. Shimmy Damper
4. Center Arm
5. Center Arm Bracket
6. Drag Link

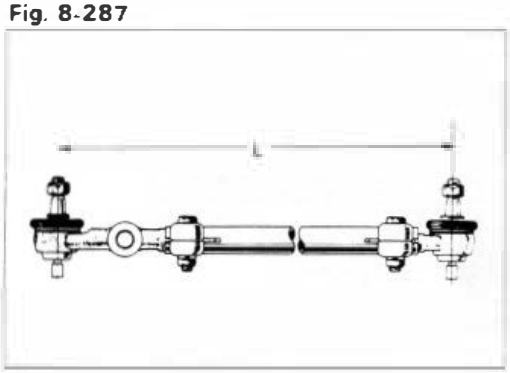
Fig. 8-286



Adjust the length L of relay rod to the standard value

Relay rod length:
STD 842 mm
(33.15 in.)

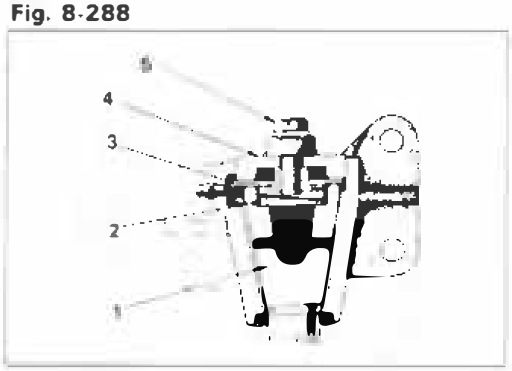
Fig. 8-287



Adjust the length L of tie rod to the standard value

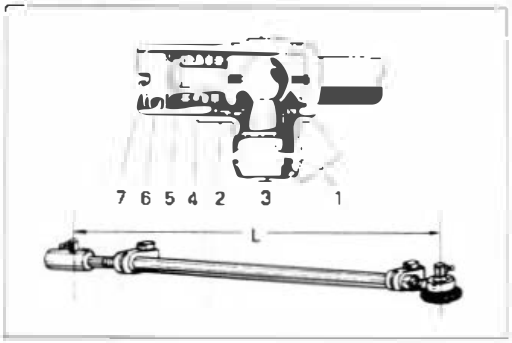
Tie rod length:
STD 1,205 mm
(47.44 in.)

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

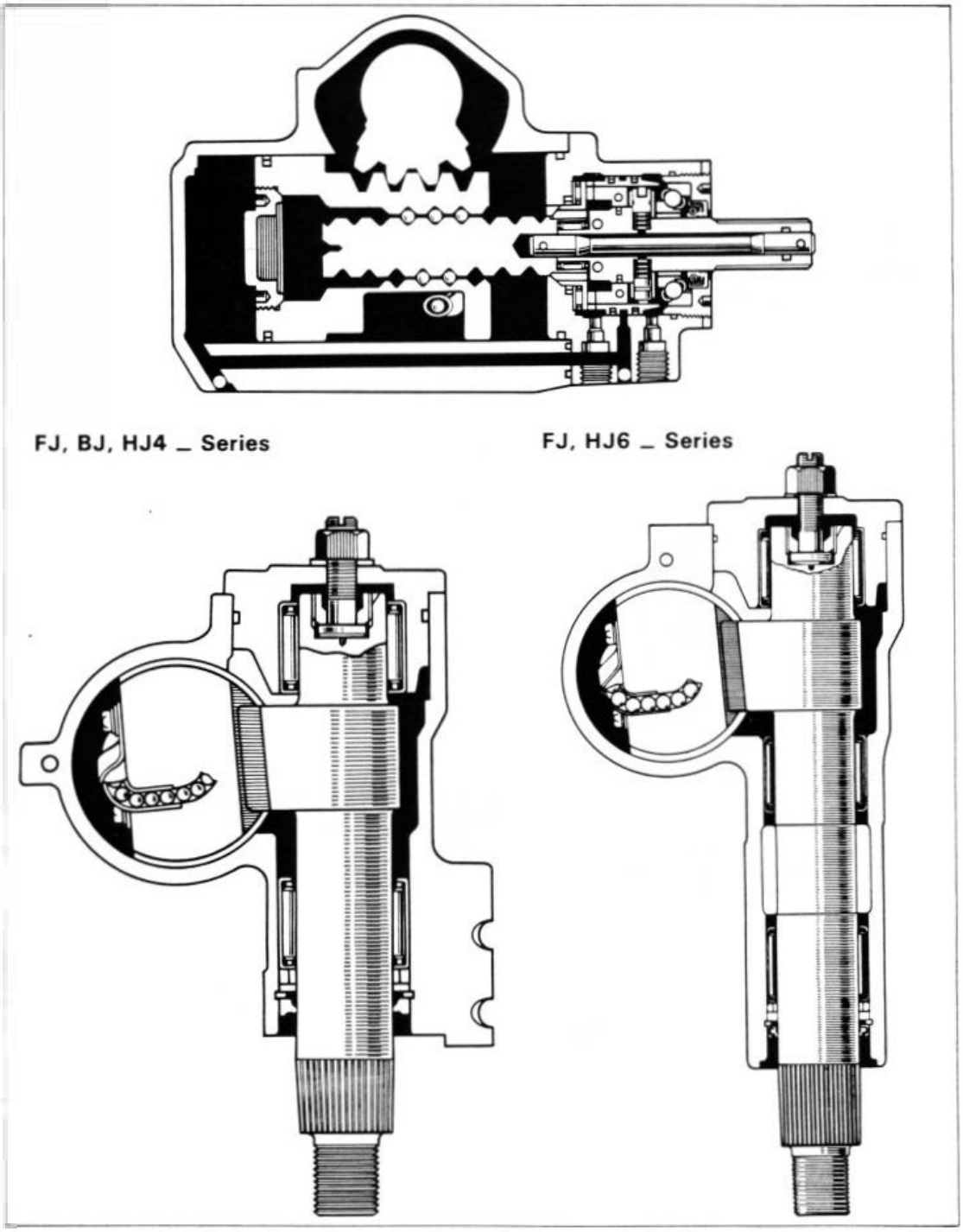


Fig. 8-291

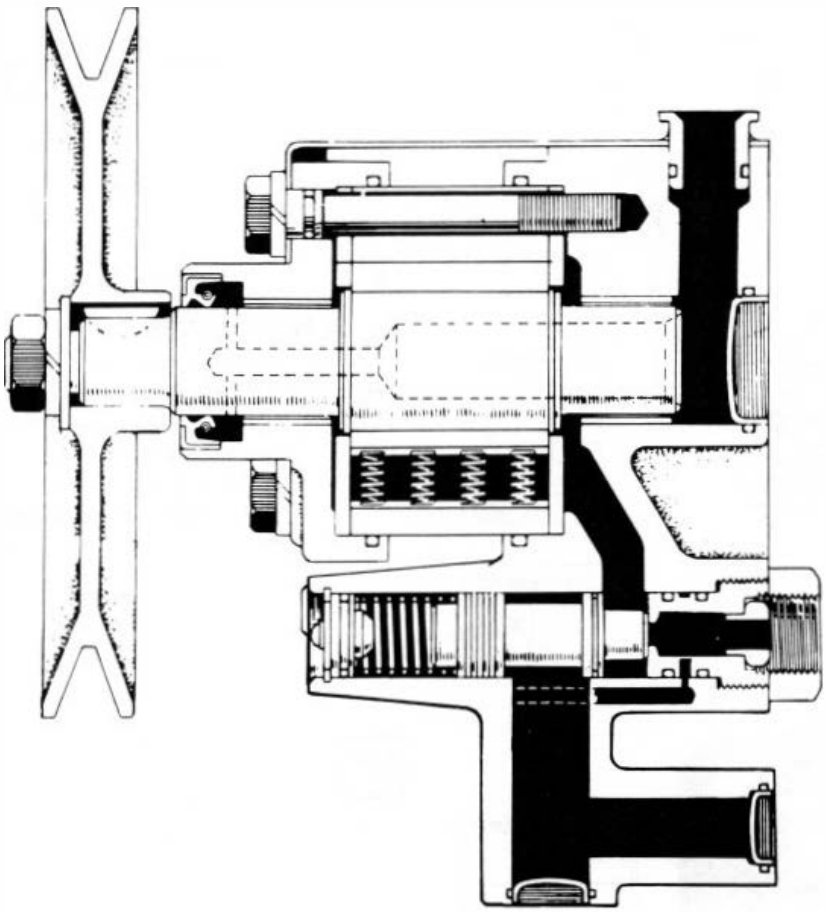
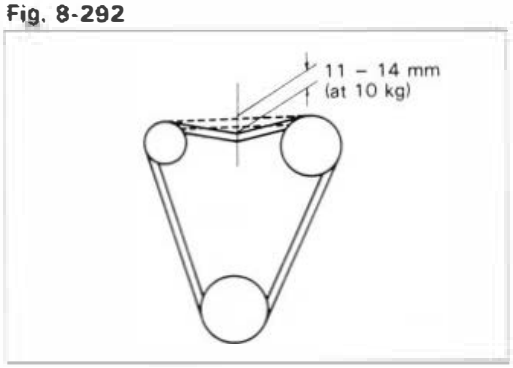


Fig. 8-292



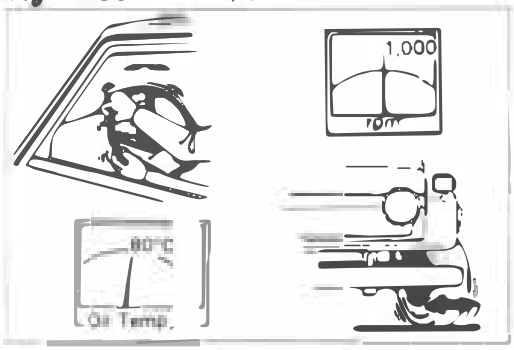
ON-VEHICLE INSPECTION

DRIVE BELT

Measure the belt tension between alternator pulley and vane pump pulley.

Tension: 11 – 15 mm/10 kg (0.43 – 0.59in./22 lb)

Fig 93 . 8-2

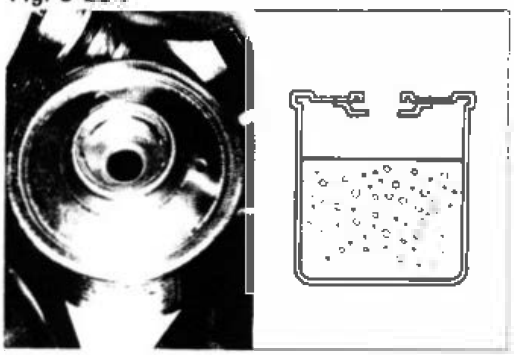


FLUID LEVEL

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

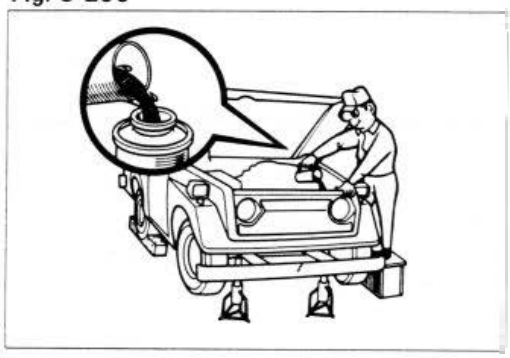


4. Inspect for foaming or emulsification. Note that foaming and emulsification indicate the existence of air in the system or that the fluid level is too low.

Fig. 8-295

5. Inspect the fluid level with a dip stick.
6. Inspect the complete system for fluid leakage.

Fig. 8-296



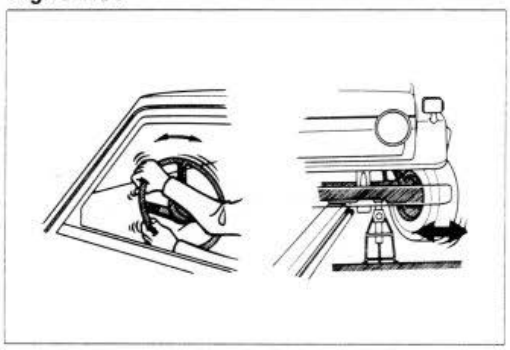
BLEEDING

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

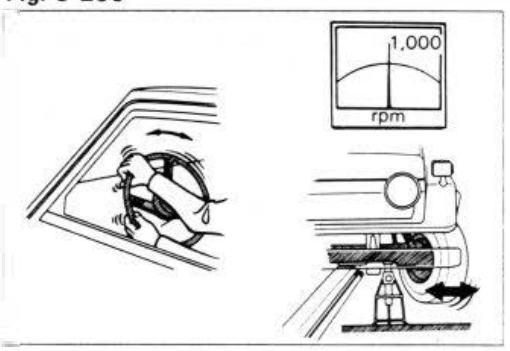


3. Turn the steering wheel from lock to lock two or three times

Fig. 8-298

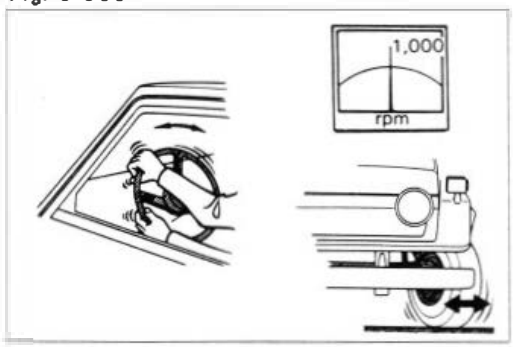
4. Recheck the fluid level

Fig. 8-299



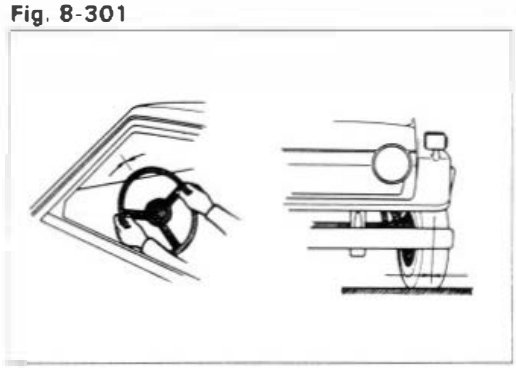
5. Start the engine and run it at 1,000 rpm
6. Turn the steering wheel from lock to lock two or three times

Fig. 8-300



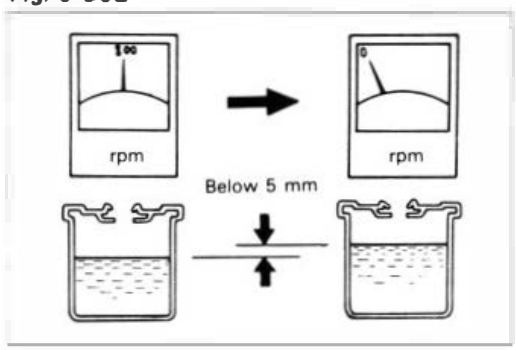
7. Lower the front of vehicle.
8. Run the engine at 1,000 rpm.
9. Turn the steering wheel from lock to lock several times.

Fig. 8-301



10. Center the steering wheel.

Fig. 8-302

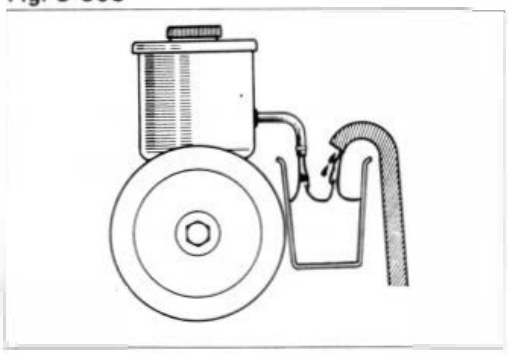


11. Bleeding is complete if the fluid level in the reservoir has not risen excessively and no foaming or emulsification is observed when the engine is stopped.

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.

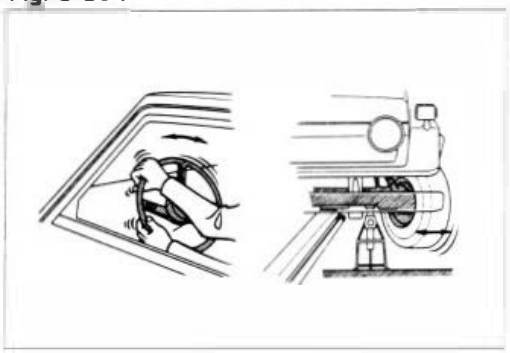
Fig. 8-303



FLUID REPLACEMENT

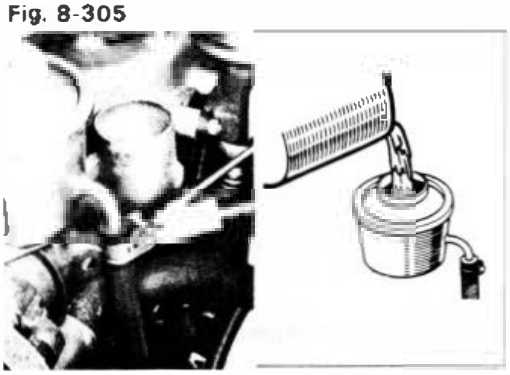
1 Jack up the front of the vehicle
2 Remove the return hose from the fluid reservoir and drain the fluid into a vessel

Fig. 8-304



3 Turn the steering wheel from lock to lock while draining the fluid

Fig. 8-305

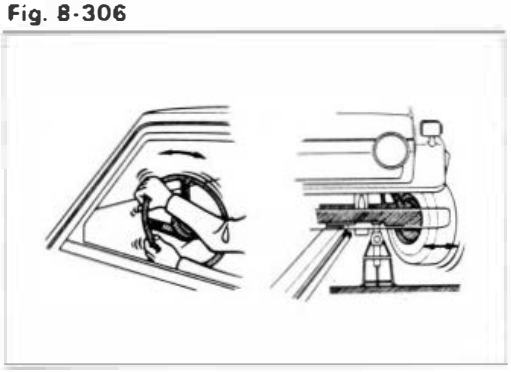


4 Connect the return hose to the fluid reservoir.
5 Add fresh fluid

Fluid: ATF type Dexron
Capacity:

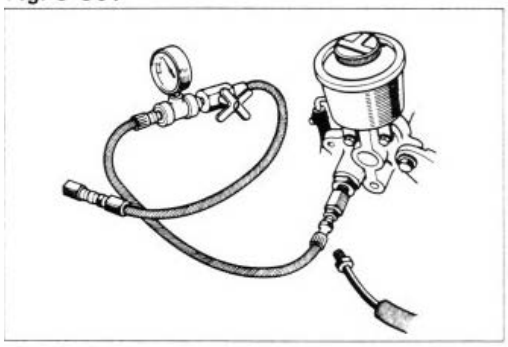
Vane pump	**300 cc (18.3 cu in.)**
Gear housing	**330 cc (20.1 cu in.)**

Fig. 8-306



6 Bleed the system

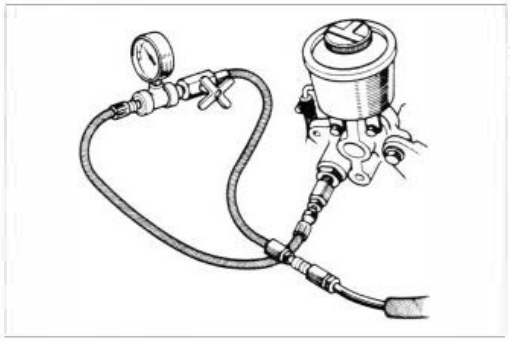
Fig. 8-307



FLUID PRESSURE INSPECTION

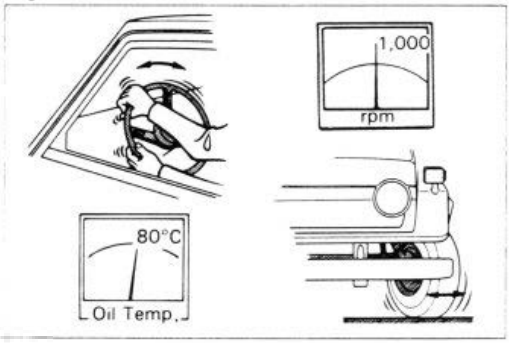
1 Attach a pressure gauge
   (1) Disconnect the pressure hose from the vane pump with SST
   SST [09631-22020]
   (2) Connect the gauge side of the pressure gauge to the vane pump

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



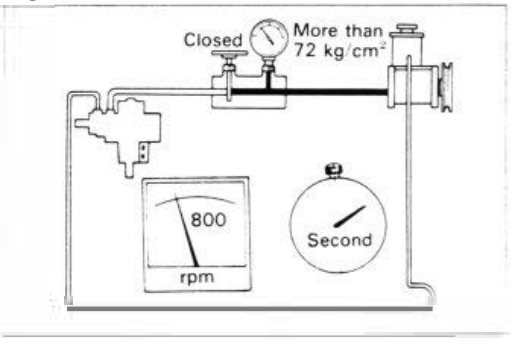
2. Boost the fluid temperature by turning the steering wheel from lock to lock several times with the engine running at 1,000 rpm

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)

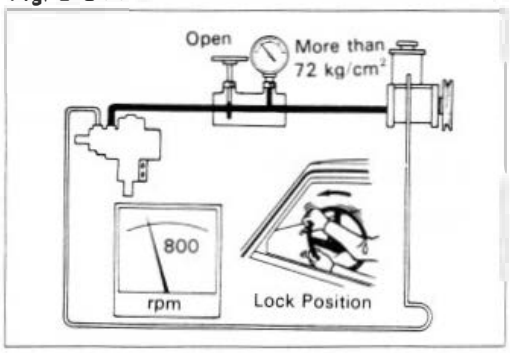
Fig. 8-310



– Note –
Do not keep the valve closed for more than 10 seconds.

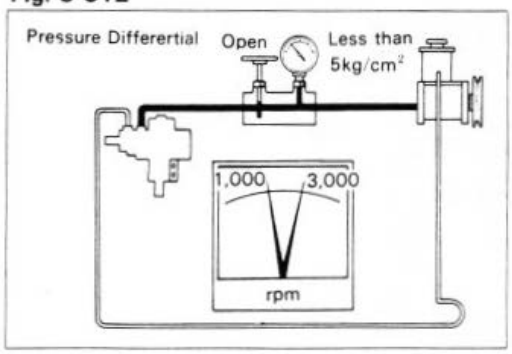
   (3) If the pressure does not reach 72 kg/cm² (1,022 psi) within 10 seconds there is a problem with the vane pump

Fig. 8-311



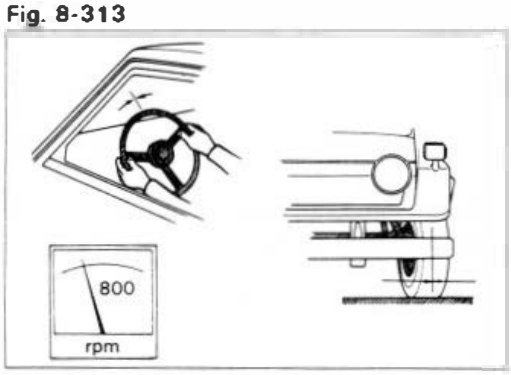
4 Measure the fluid pressure utilized in the gear housing
(1) Fully open the pressure valve
(2) Withthe steering wheel at fulllock measure the fluid pressure reading
Fluid presure:
More than 72 kg/cm² (1,022 psi)

Fig. 8-312



5 Measure the pressure differential under noload 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 differen tial:
Less than 5 kg/cm² (71 psi)
(4) If not within limit, check the flow control valve

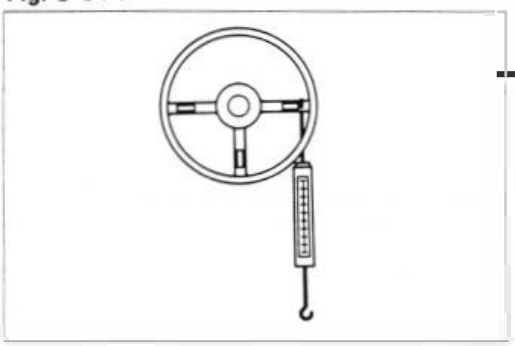
Fig. 8-313



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 effor t:
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

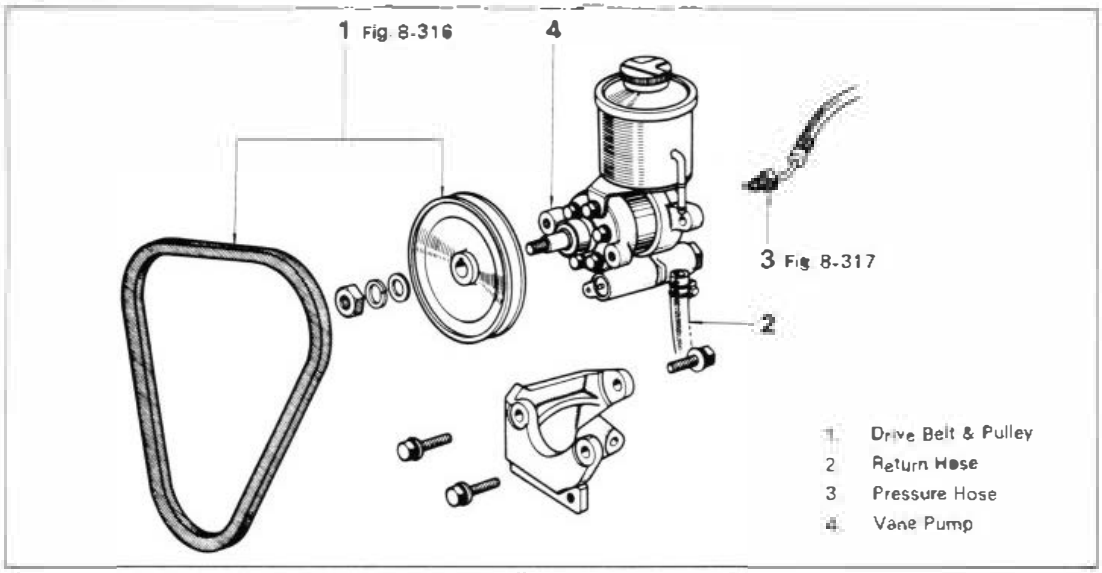
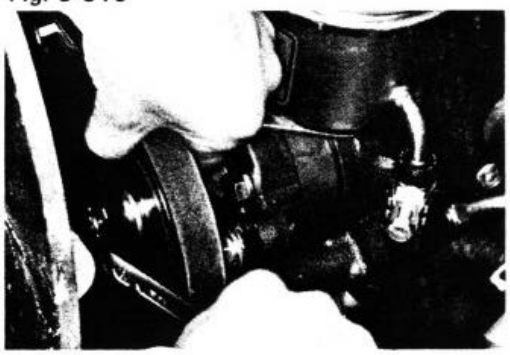


Fig. 8-316



Before releasing tension of the drive belt, loosen the pulley nut.

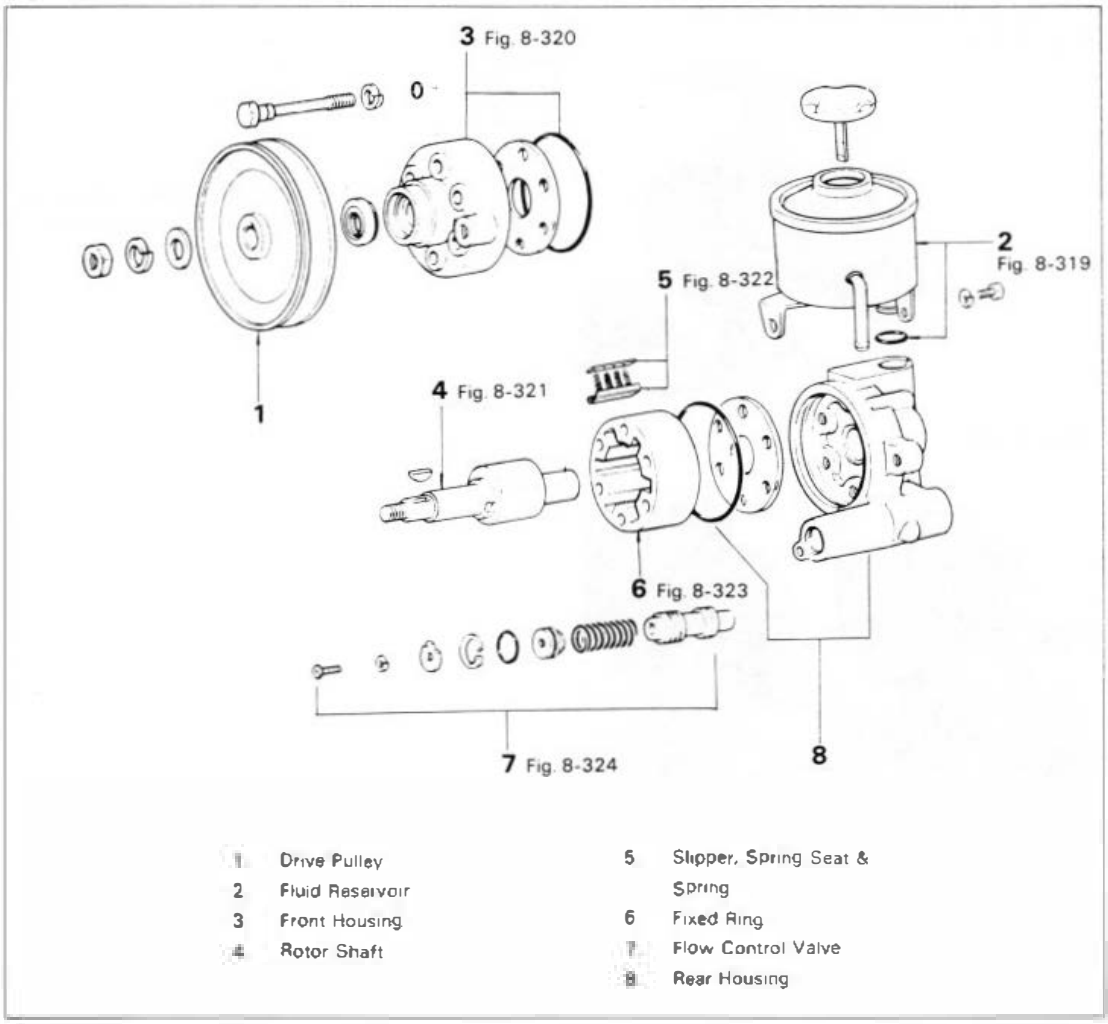
Fig. 8-317

Disconnect the pressure hose with SST.
SST [09631-22020]

DISASSEMBLY

Disassemble the parts in the numerical order shown in the figure

Fig. 8-318



1 Drive Pulley
2 Fluid Reservoir
3 Front Housing
4 Rotor Shaft
5 Slipper, Spring Seat & Spring
6 Fixed Ring
7 Flow Control Valve
8 Rear Housing

Fig. 8-319

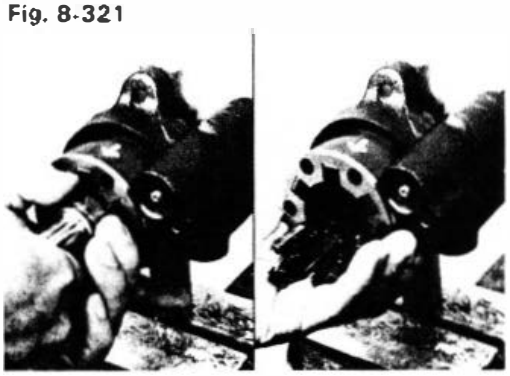
Attach SST to the vane pump and hold it in a vice
SST (09631-00030) of set (09630-00010)

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

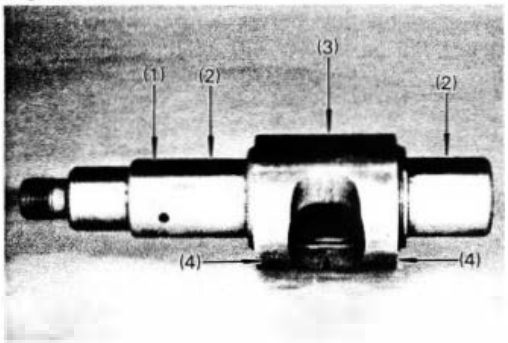
Fig. 8-323

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

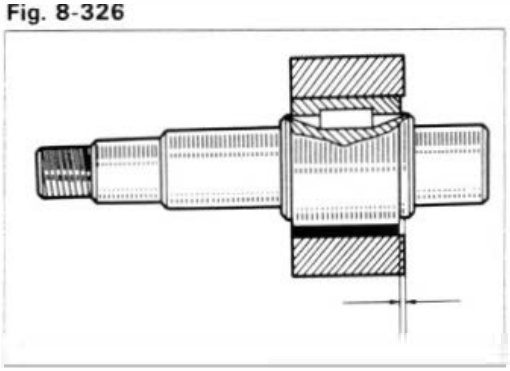


INSPECTION & REPAIR

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

Fig. 8-326

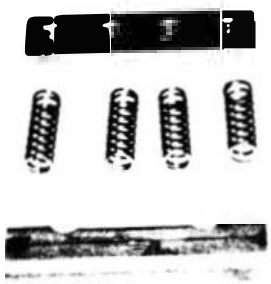


2. Measure overall length of the rotor and fixed ring

Fixed ring length – Rotor length:

STD	**0.03 mm (0.0012 in.)**
Limit	**0.06 mm (0.0024 in.)**

Fig. 8-327



Slipper & Spring

1. Inspect thesurface of the slipper forwear or damage

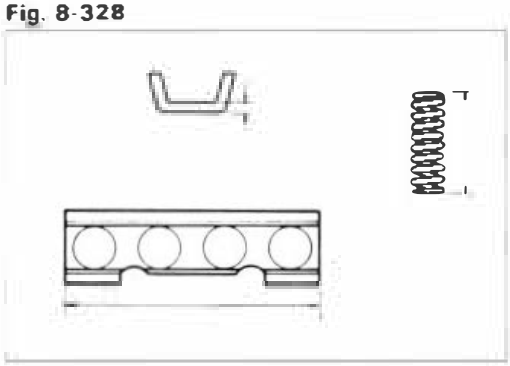
Thickness:

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.)**

Fig. 8-328

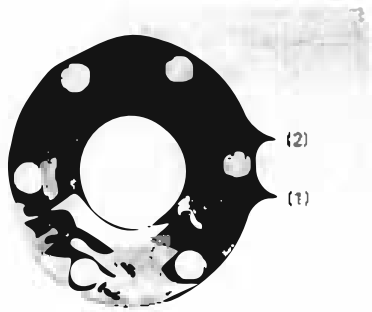


2. Measure the free height of the spring

Free height:

STD	**14 mm (0.55 in.)**
Limit	**13 mm (0.51 in.)**

Fig. 8-329

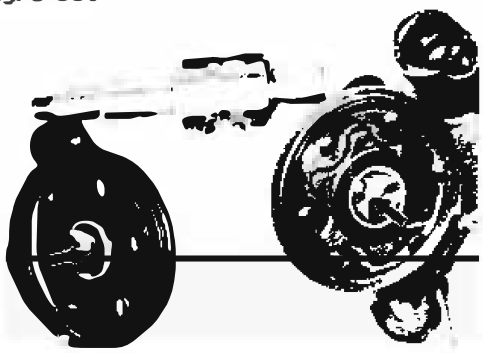


Side Plate

Inspect the following for wear or damage

1. Rotor contact surface
2. Slippers contact surface

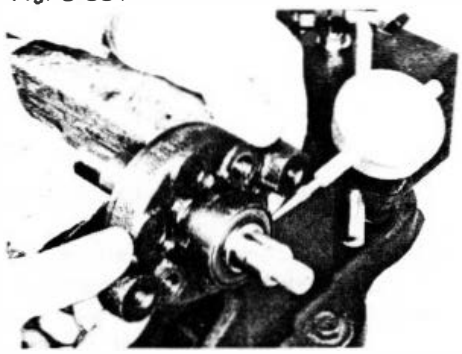
Fig. 8-330



Housing

1. Inspect the bushings for wear or damage

Fig. 8-331

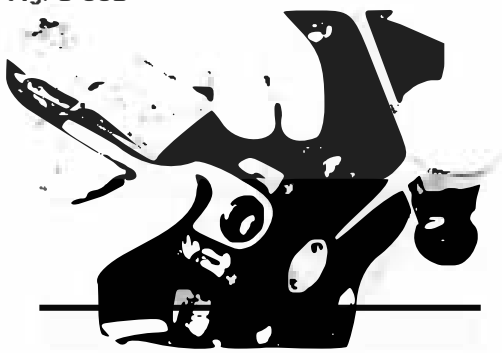


2. Measure the clearance between the rotor shaft and the front housing.

Clearance:

STD	**0.010—0.015 mm (0.0004—0.0006 in.)**
Limit	**0.03 mm (0.0012 in.)**

Fig. 8-332

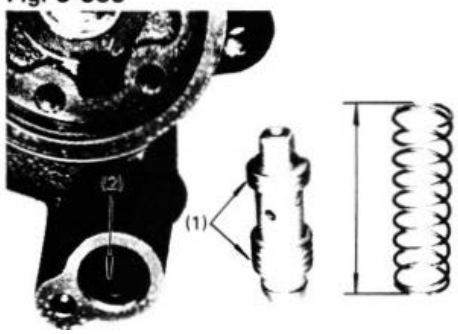


3. Measure the clearance between the rotor shaft and the rear housing.

Clearance:

STD	**0.010—0.015 mm (0.0004—0.0006 in.)**
Limit	**0.03 mm (0.0012 in.)**

Fig. 8-333



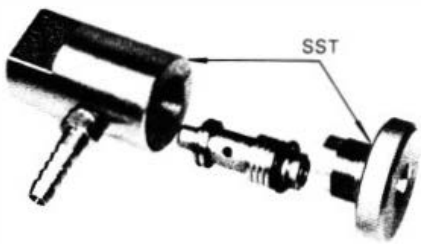
Flow Control Valve

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:

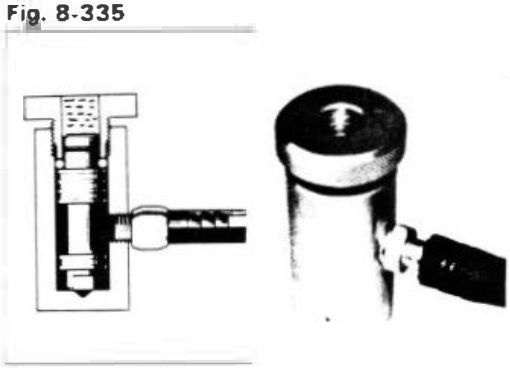
STD	**50mm (1.97 in.)**
Limit	**47 mm (1.85 in.)**

Fig. 8-334



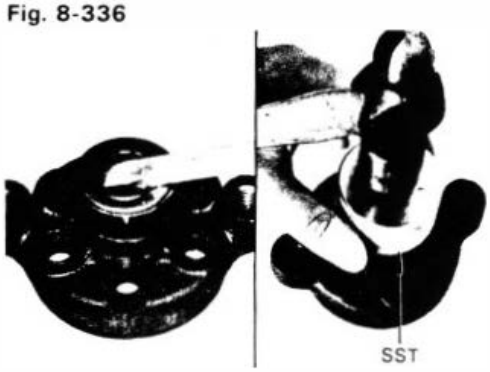
3 Pressure leakage test
   (1) Install the flow control valve to SST
   SST [09630-30030]

Fig. 8-335



   (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

Fig. 8-336



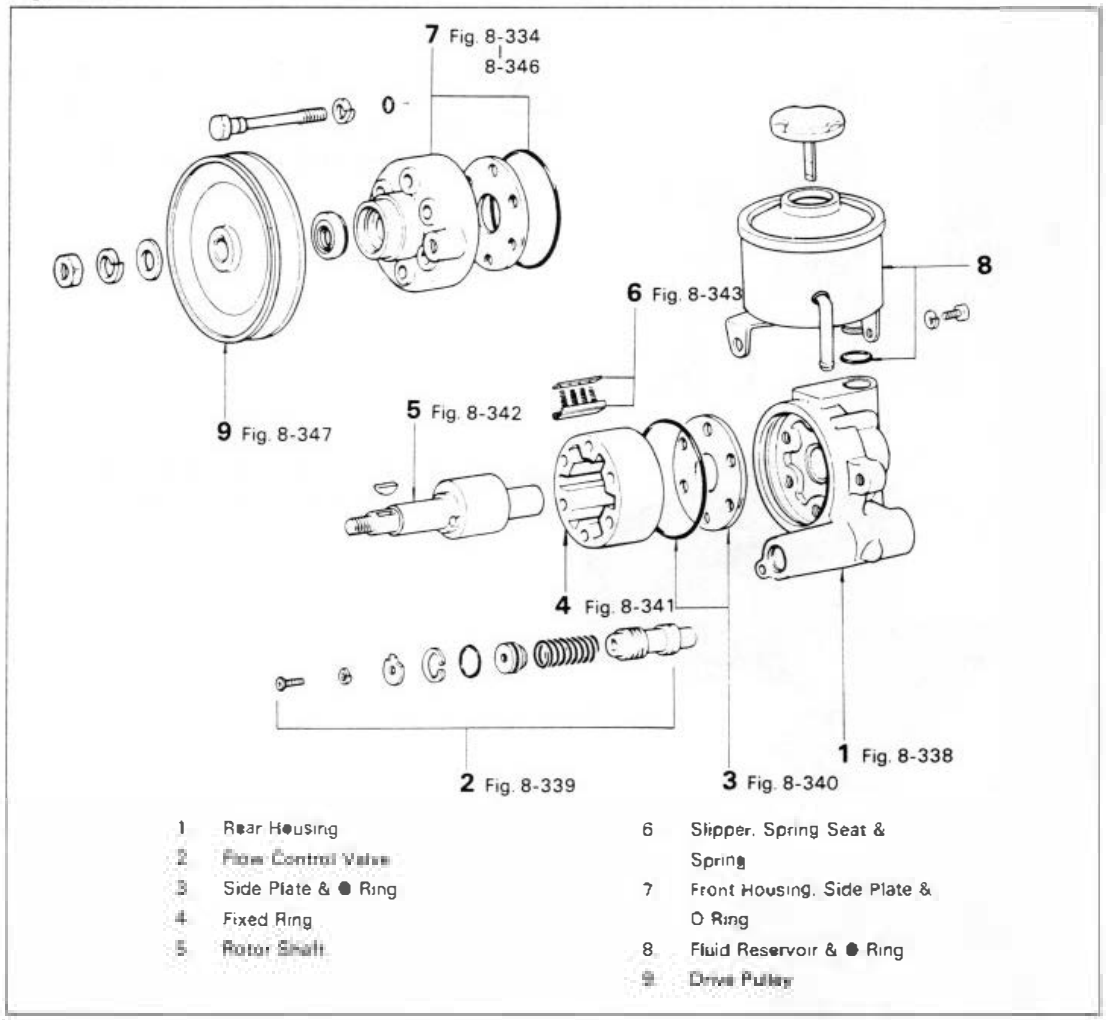
Replace The Front Housing Oil Seal

1 Remove the oil seal with a screwdriver
2 Install a new oil seal with SST
   SST (09632-00010) or set [09630-00010]

ASSEMBLY

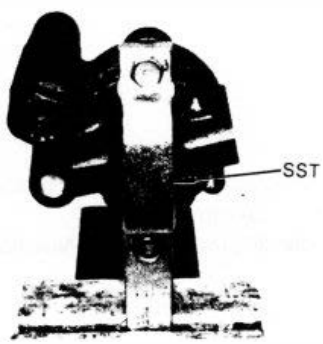
Assemble the parts in the numerical order shown in the figure

Fig. 8-337



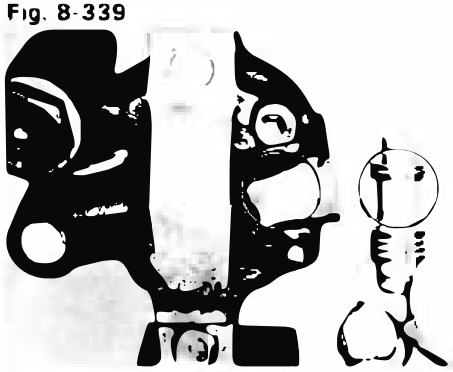
1 Rear Housing
2 Flow Control Valve
3 Side Plate & ● Ring
4 Fixed Ring
5 Rotor Shaft
6 Slipper, Spring Seat & Spring
7 Front Housing, Side Plate & O Ring
8 Fluid Reservoir & ● Ring
9 Drive Pulley

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

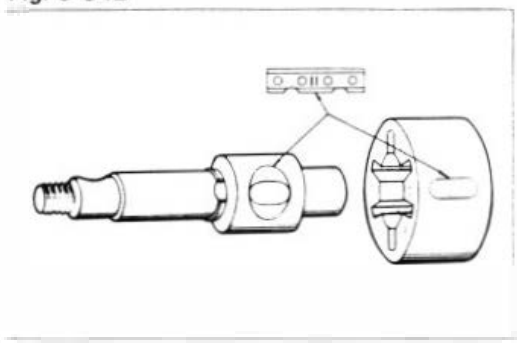
Fig. 8-340

⚠ 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.

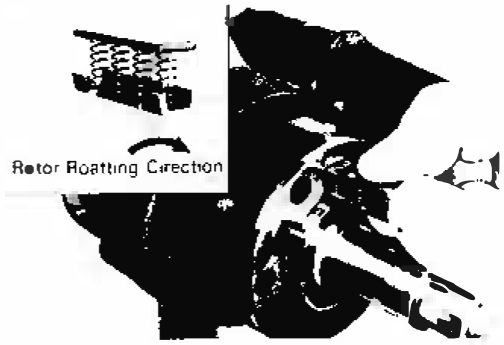
Fig. 8-342



⚠ Select a fixed ring, rotor shaft and slipper with matching identifying marks.

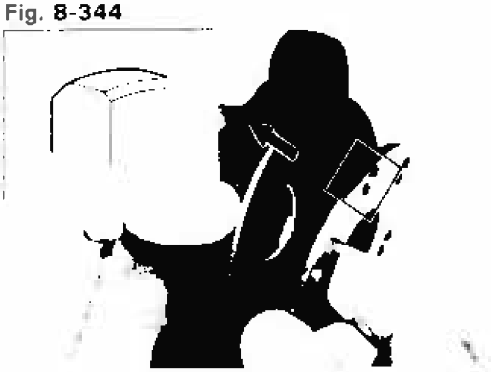
Identifying marks: Nothing or 2

Fig. 8-343



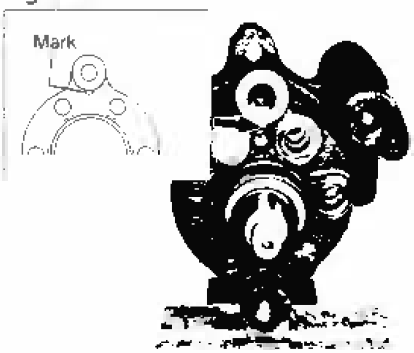
Compress the spring with the slipper and spring seat and install.
Position the slipper notch in the direction shown in the figure.

Fig. 8-344



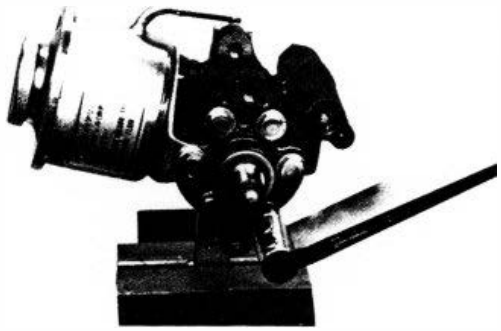
To assemble, place the side plate with the larger bevelled width facing towards the housing side.

Fig. 8-345



Fit the front housing and position the mark as is shown in the figure.

Fig. 8-346

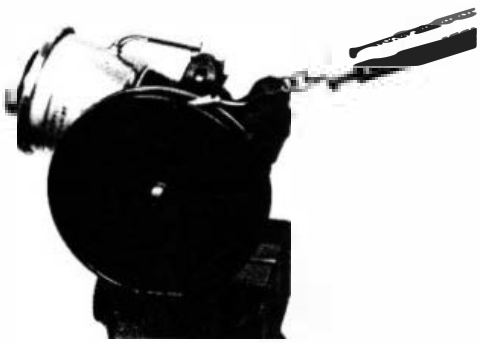


Tighten evenly in three or four rotations.

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

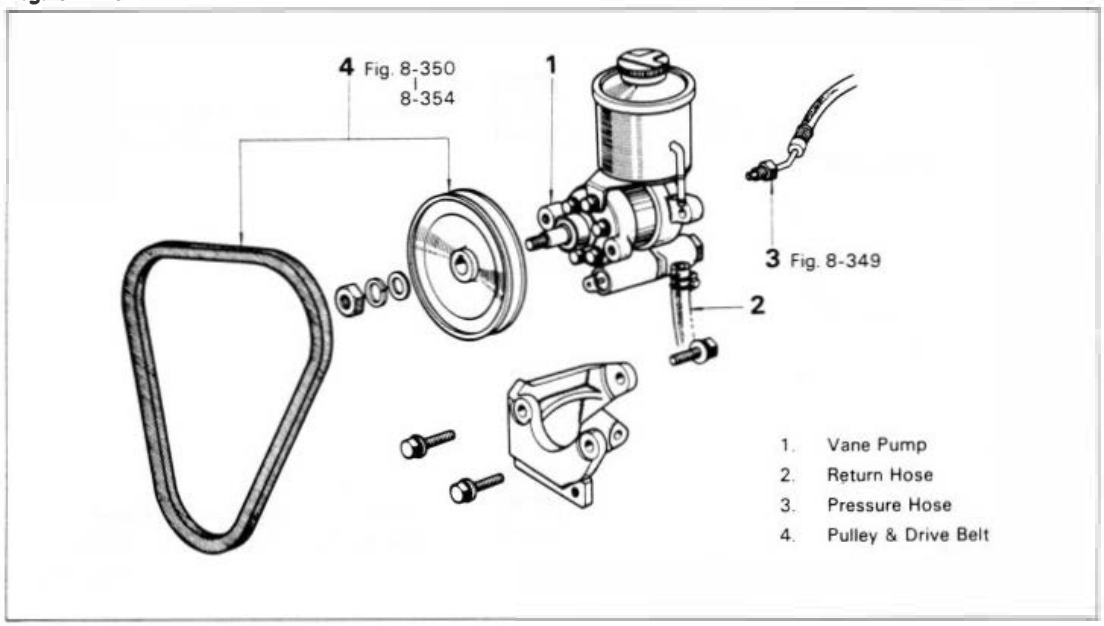
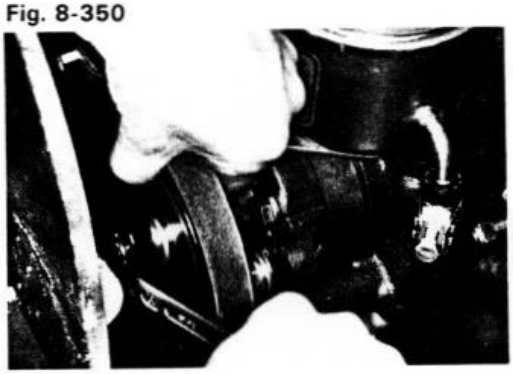


Fig. 8-349

Connect the pressure hose with SST
SST [09631-22020]

Tightening torque: 4.0–5.0 kg-m (29–36 ft-lb)

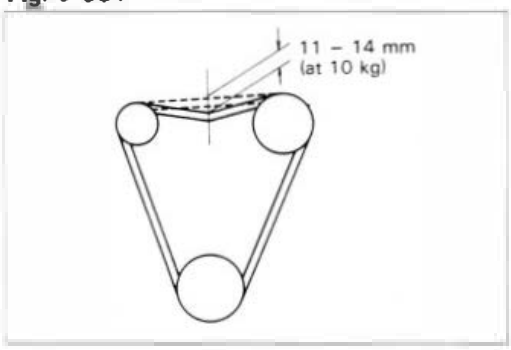
Fig. 8-350



Tighten the pulley set nut securely

Tightening torque: 3.5–5.4 kg-m (26–39 ft-lb)

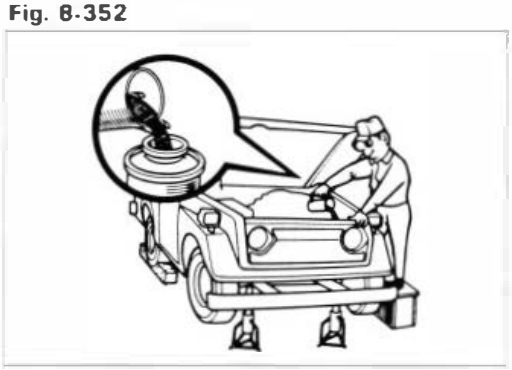
Fig. 8-351



Adjust the drive belt tension

Tension: 11–14 mm/10 kg (0.4–0.6 in./22 lb)

Fig. 8-352

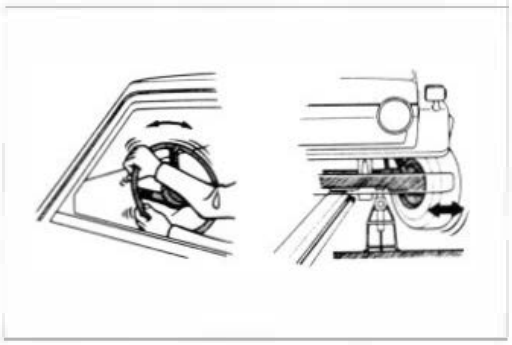


Fill with fluid

Fluid: ATF type Dexron

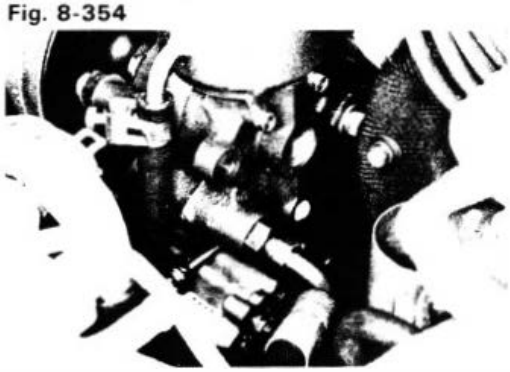
Capacity: Vane pump 300cc (18.3 cu in.)

Fig. 8-353



Bleed the system

Fig. 8-354



Boost the fluid pressure to check for fluid leakage.

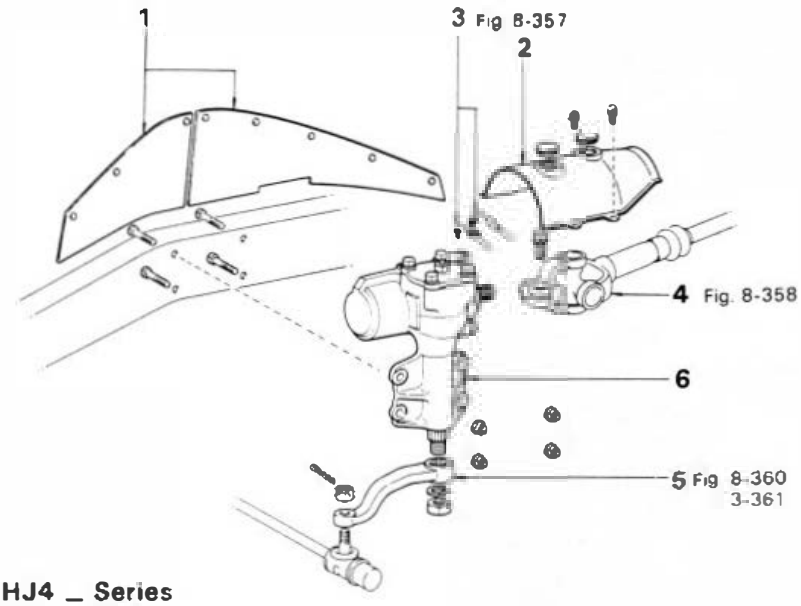
GEAR HOUSING

REMOVAL

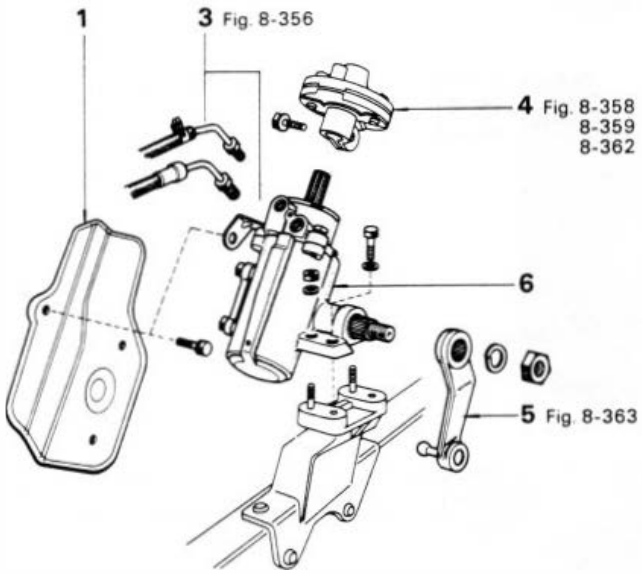
Remove the parts in the numerical order shown in the figure.

Fig. 8-355

FJ, HJ6 _ Series



FJ, BJ, HJ4 _ Series

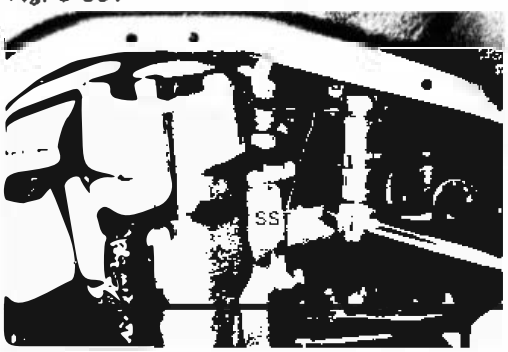


1. Dust Cover or Heat Insulator
2. Dust Cover
3. Fluid Return Hose & Fluid Pressure Hose
4. Intermediate Shaft Yoke or Main Shaft Coupling
5. Pitman Arm
6. Gear Housing

Fig. 8-356

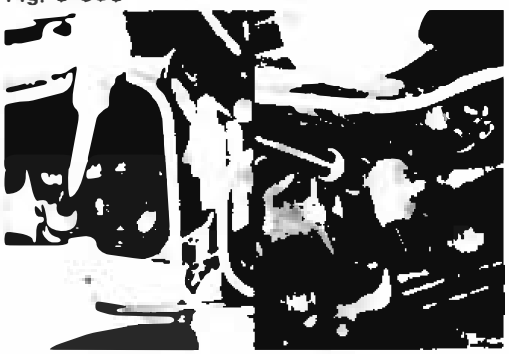
Disconnect the return hose with SST.
SST [09631-22020]

Fig. 8-357



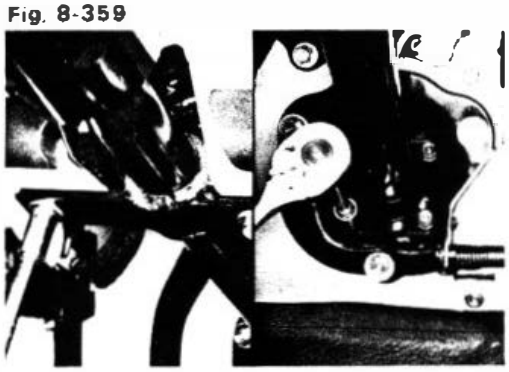
Disconnect the pressure hose with SST.
SST [09631-22020]

Fig. 8-358



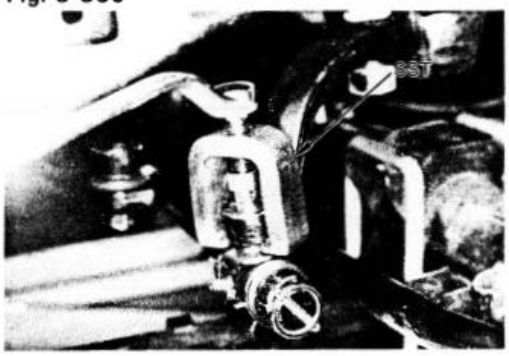
Remove the coupling set bolt

Fig. 8-359



Remove the steering column tube set bolts.
Loosen the upper bracket set bolts.

Fig. 8-360

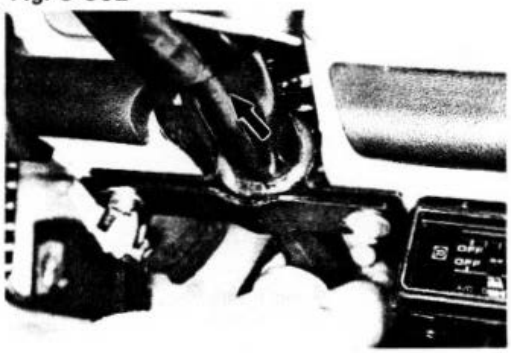


Disconnect the relay rod with SST
SST [09611-20014]

Fig. 8-361

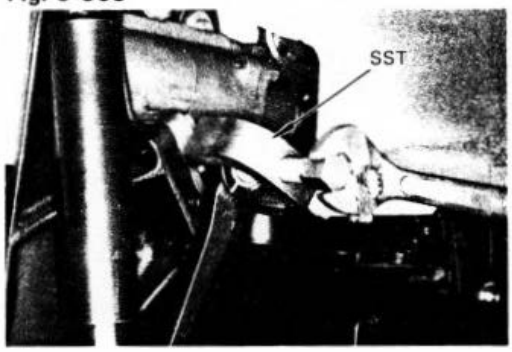
Remove the pitman arm with SST
SST [09610-55012]

Fig. 8-362



Remove the coupling from the steering gear housing

Fig. 8-363



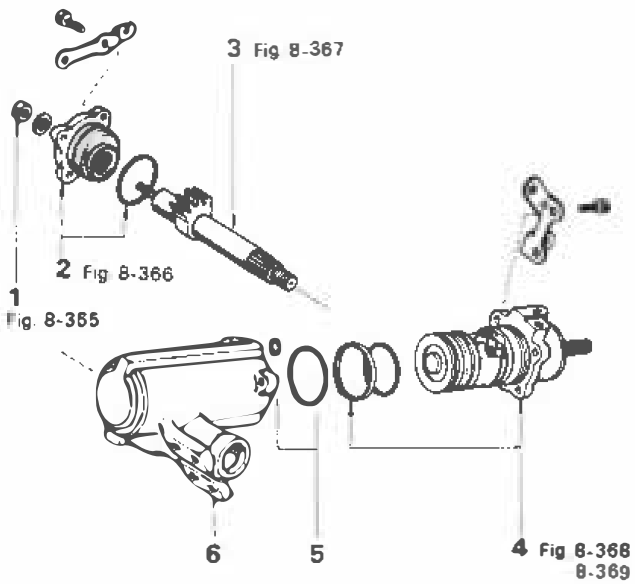
Remove the pitman arm with SST
SST [09610-55012]

DISASSEMBLY

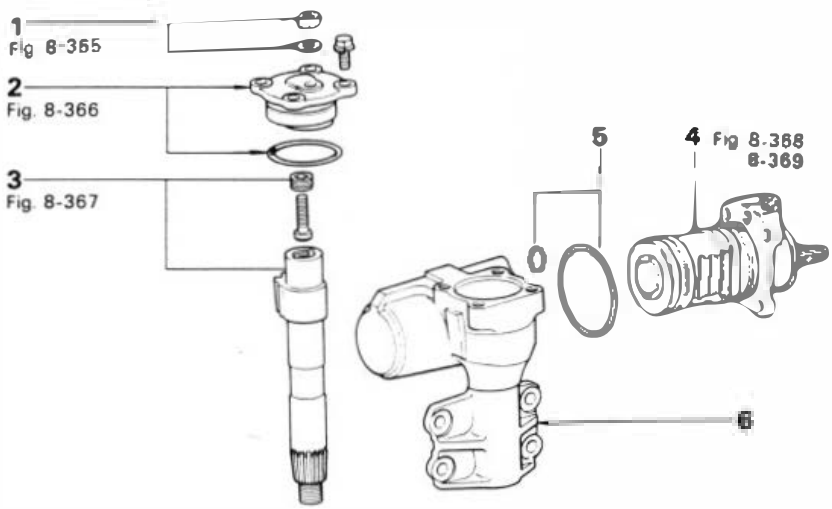
Disassemble the parts in the numerical order shown in the figure

Fig. 8-364

FJ, BJ, HJ4 _ Series

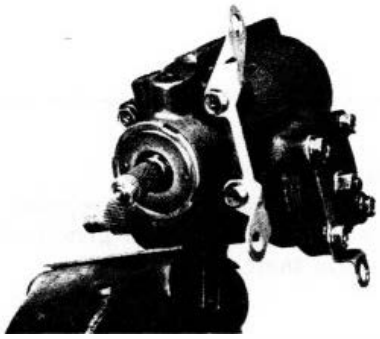


FJ, HJ6 _ Series



1. Lock Nut
2. End Cover & O Ring
3. Cross Shaft
4. Power Piston & Valve Body
5. O Ring
6. Housing

Fig. 8-365

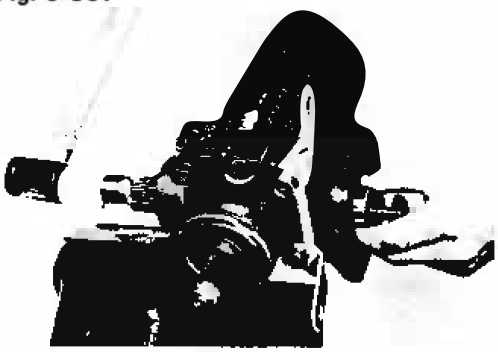


Clamp the gear housing in a vice.

Fig. 8-366

Tighten the adjusting screw until the end cover and O ring are removed from the housing.

Fig. 8-367

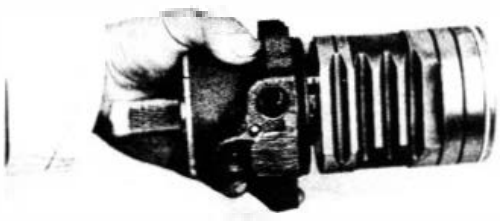


Remove the cross shaft by tapping the bottom end with a hammer.

Fig. 8-368

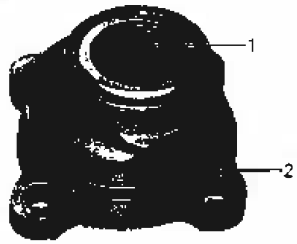
Hold the power piston with your finger and turn the worm shaft clockwise. Then pull out the valve body and power piston.

Fig. 8-369



– Note –
Do not disassemble the vatve body.
Do not remove the power piston nut from the worm shaft.

Fig. 8-370

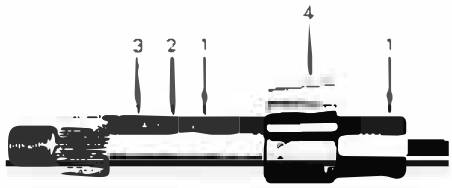


INSPECTION & REPAIR

End Cover

In spec tthe following for wear or damag e
1. Needle r ollerbear ing
2. ● r in gg roove

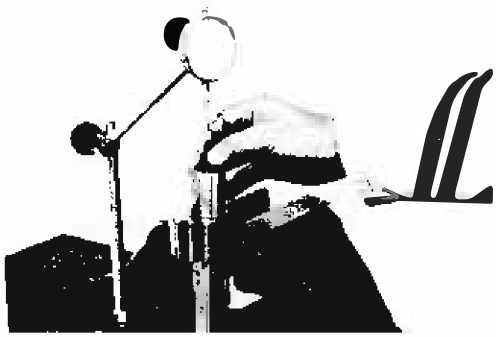
Fig. 8-371



Cross Shaft

Ins pec the following for wear or damag e
1. Needle r oller bear ing r unning s ur fac e
2. Tef lon ring c on tac t s urfac e
3. Dust s eal c on tacs u fac e
4. Power piston nut g ear toot hc on tac tsur face

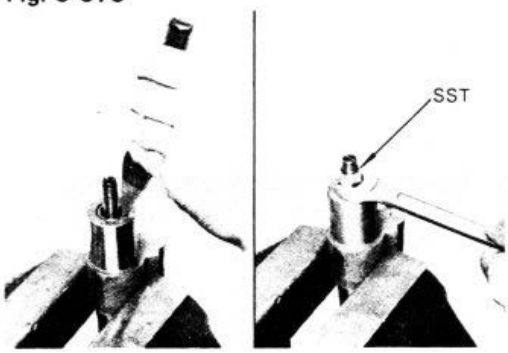
Fig. 8-372



Adjust The Cross Shaft Adjusting Screw

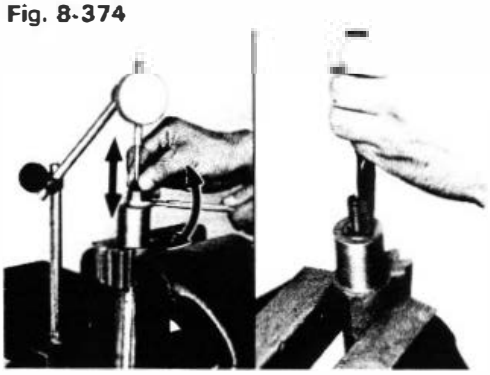
1. Meas u e the th us tc lear ance of the adjusting screw
   Clearance: 0.03–0.05 mm (0.0012–0.0020 in.)

Fig. 8-373



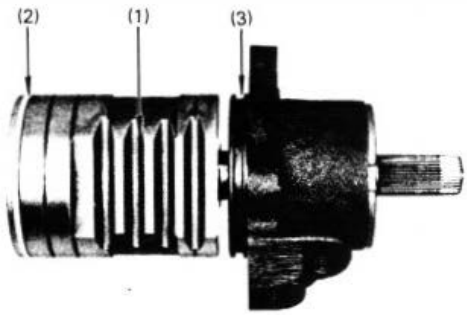
2. Unstak e thelock n ut
3. Loos enthe lock nut wi th SST
   SST (09632-00030) of s et[09630-00010]

Fig. 8-374



4 Adjust the clearance of the adjusting screw by turning the lock nut
5 Stake the lock nut

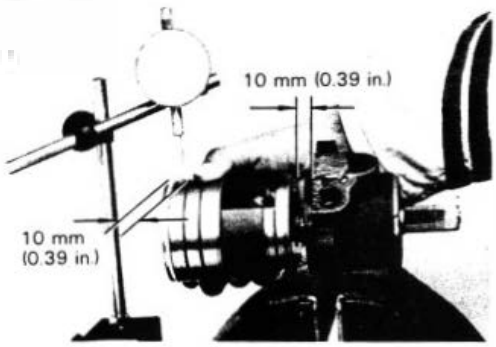
Fig. 8-375



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:

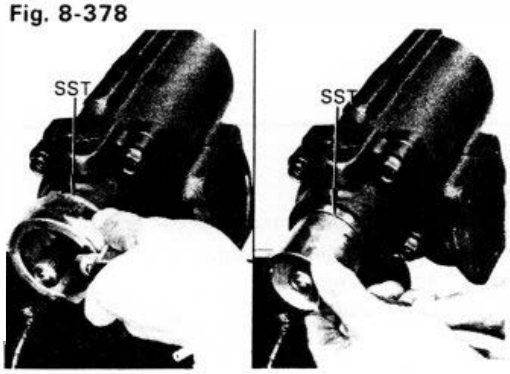
STD	**0.02–0.06 mm (0.0008–0.0024 in.)**
Limit	**0.15 mm (0.0059 in.)**

Fig. 8-377

Adjusting Plug & Worm Bearing

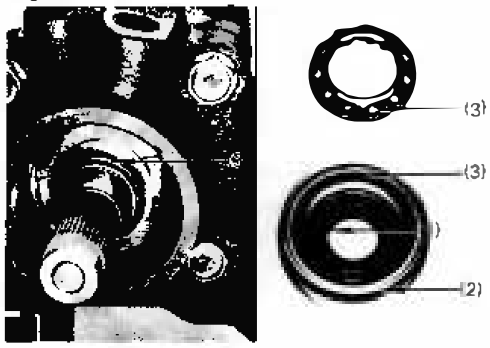
1 Support the valve body by installing it to the gear housing

Fig. 8-378



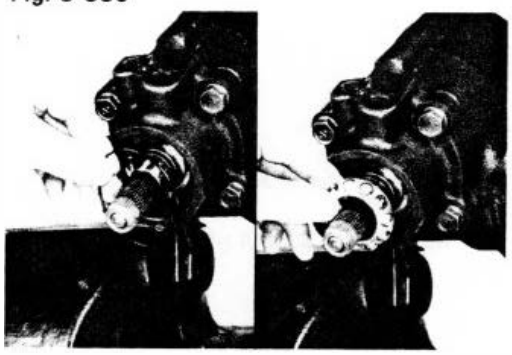
2. Remove the lock nut with SST
   SST (09631-00040) of set [09630-00010]
3. Remove the adjusting plug with SST
   SST (09631-00050) of set [09630-00010]

Fig. 8-379



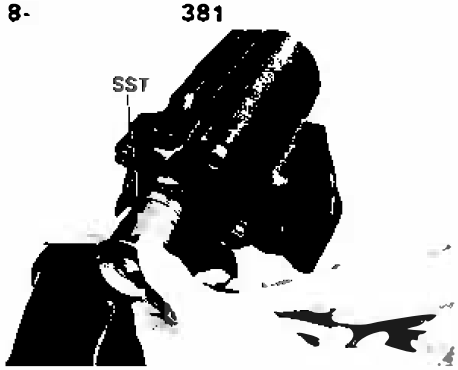
4. Inspect the following for wear or damage
   (1) Oil Seal
   (2) O ring contact surface
   (3) Bearing

Fig. 8-380



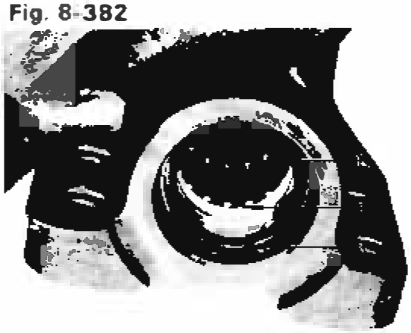
5. Install the adjusting plug provisionally
   (1) Use a new O ring
   (2) Install the bearing

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

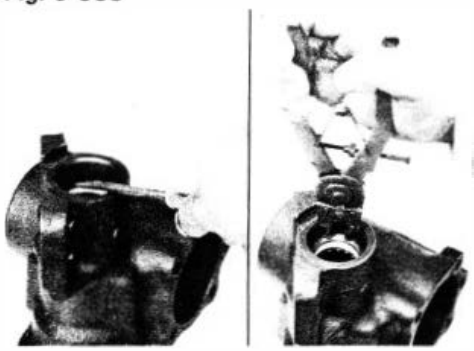


Gear Housing

Inspect the following for wear or damage

1. Needle roller bearing
2. Teflon ring
3. Dust seal

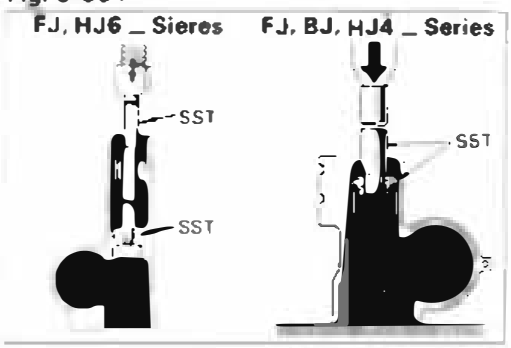
Fig. 8-383



Replace The Needle Roller Bearing

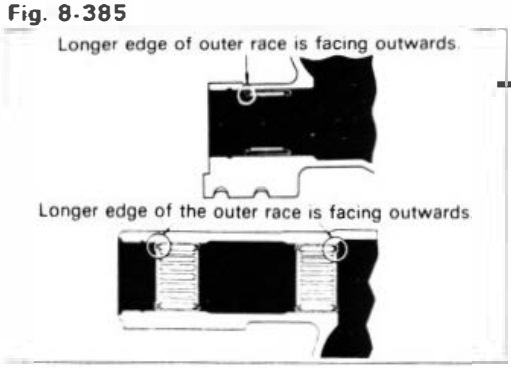
1. Remove the dust seal with a screwdriver
2. Remove the snap ring
3. Remove the teflon ring

Fig. 8-384



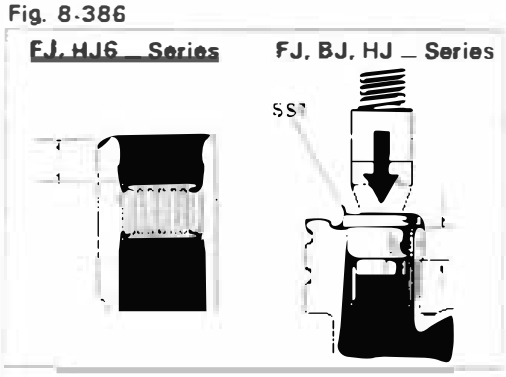
4. Remove the needle roller bearing with SST
   SST (09631-00080) of set [09630-00010]

Fig. 8-385



5. Install the needle roller bearing with the longer edge of the outer race facing outwards.

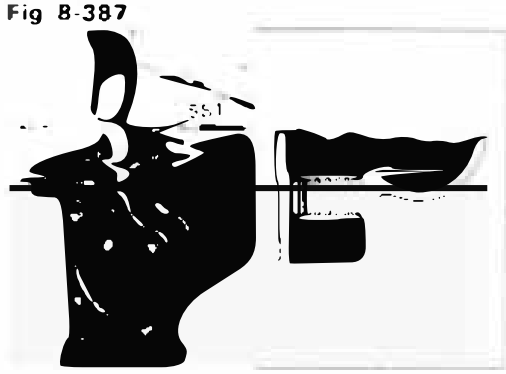
Fig. 8-386



6. Install the needle roller bearing with SST
SST (09631-00090) of set (09630-00010)
(09631-60010) FJ, HJ6 _ series
FJ, HJ4 _ series

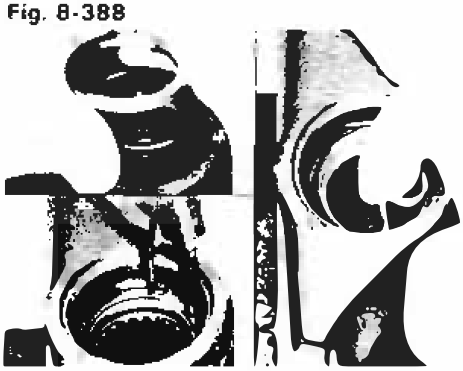
Installed position:
FJ, HJ6 _ Series
23.1 mm (0.909 in.)
FJ, HJ4 _ Series
23.6 mm (0.929 in.)

Fig 8-387



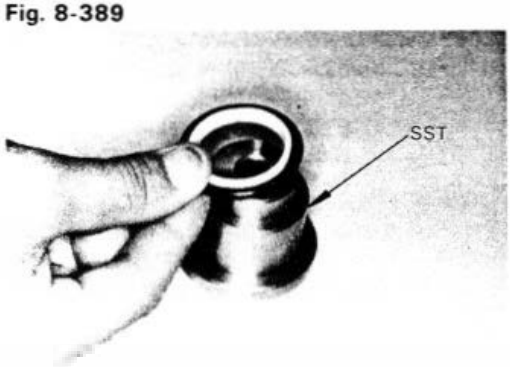
7. The bearing top end should be installed so that is aligns with the housing end surface.
SST (09631-00090) of set (09630-00010)

Fig. 8-388



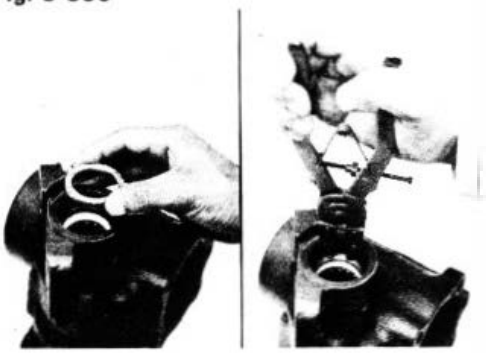
8. Install the teflon ring and O ring
FJ, HJ6 _ series
(1) Install the O ring, spacer and snap ring.
(2) Form the teflon ring into a heart shape and install with your finger.

Fig. 8-389



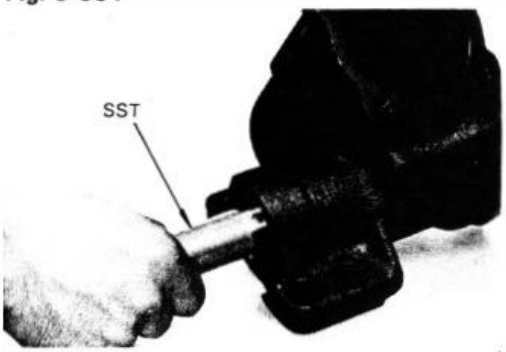
FJ, HJ4 _ Series
(1) Install the teflon ring together the O ring to SST
SST (09631-60010)
(2) Install SST together with the rings to the gear housing
SST (09631-60010)

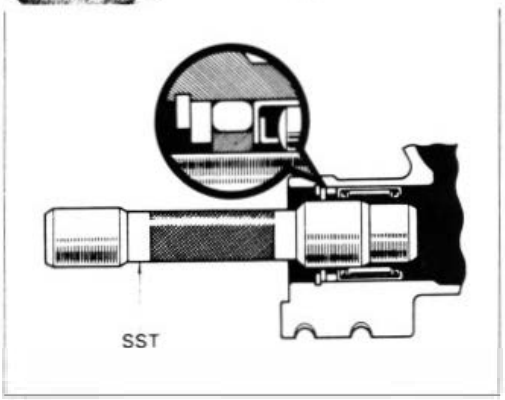
Fig. 8-390



(3) Install the steel ring and the snap ring
Comfirm that the steel ring can be turned by hand

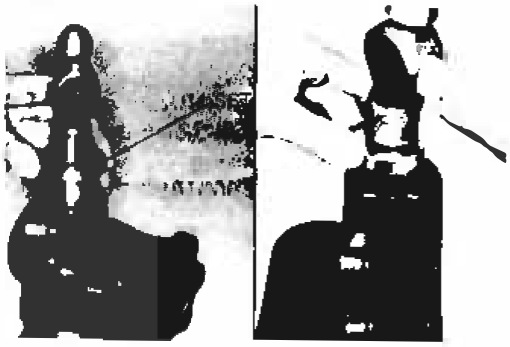
Fig. 8-391





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



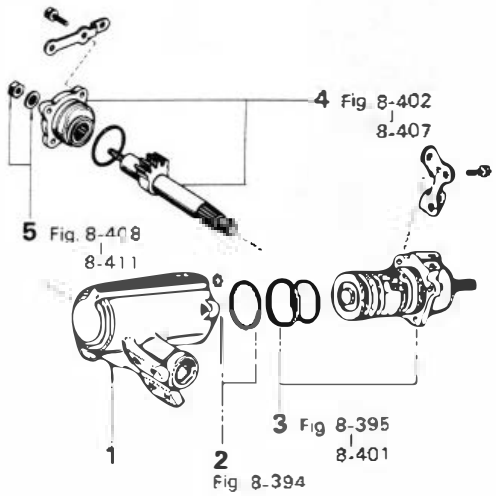
10. Install the dust seal with SST
SST (09631-00010) of set [09630-00010]
FJ, HJ6 _ series
[09631-60010] FJ, HJ4 _ series

ASSEMBLY

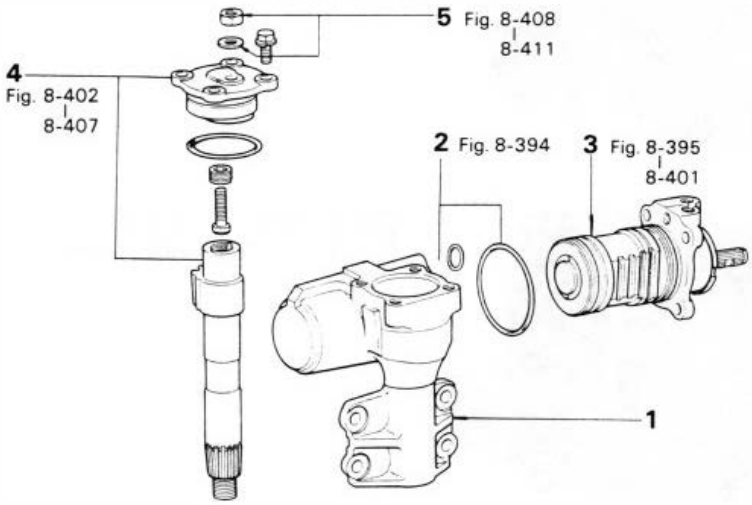
Assemble the parts in the numerical order shown in the figure.

Fig. 8-393

FJ, BJ, HJ4 _ Series



FJ, HJ6 _ Series

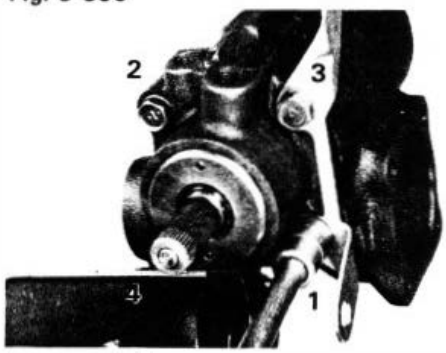


1. Housing
2. O Ring
3. Power Piston & Valve Body
4. End Cover, ● Ring & Cross Shaft
5. Lock Nut & Seal Washer

Fig. 8-394

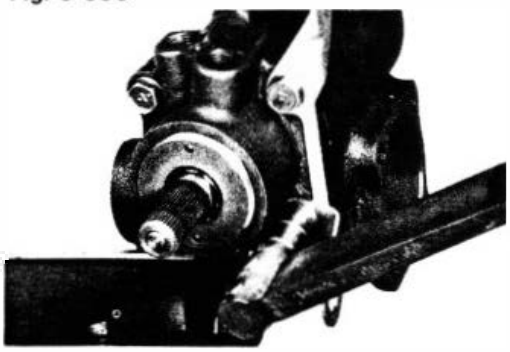
Fit the O ring accurately

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

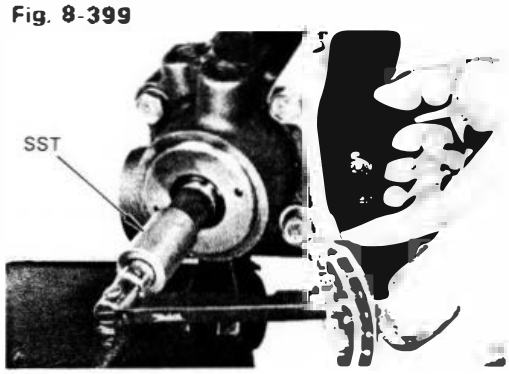
1 Tighten the adjusting plug with SST
SST (09631-00050) of set (09630-00010)

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]

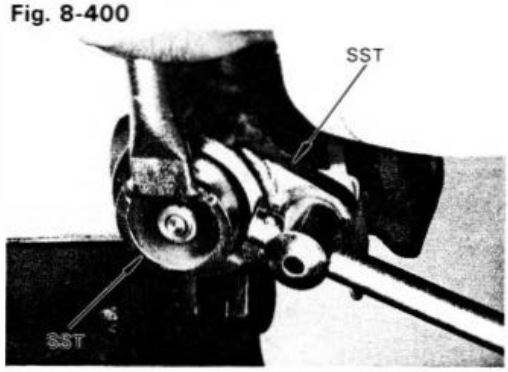
Fig. 8-399



4 Insert SST into the serrated section of the worm shaft, and measurethe preload with a torque meter
SST [09616-00010]
Preload (starting):
4.0 – 6.5 kg-cm
(3.5 – 5.6 in.-lb)

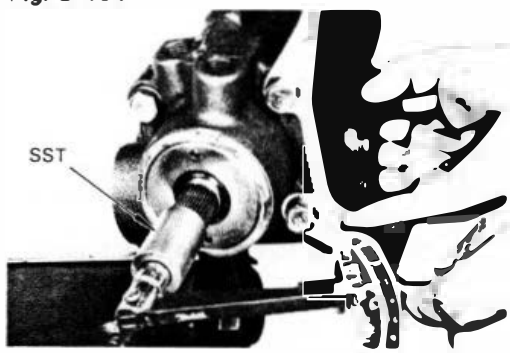
– Note –
Hold the power piston nutto prevent it from turning.

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

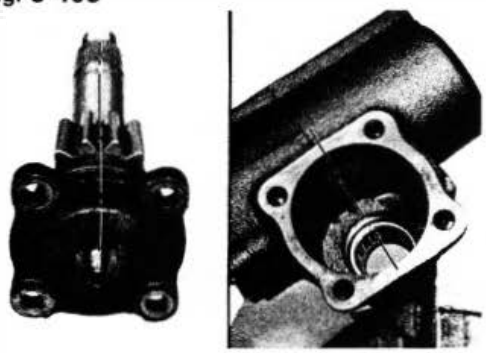


6 Recheck the preload
Check to see that both the right and left rotations are identical
SST [09616-00010]

Fig. 8-402

Wrap vinyl tape around the spline area of the cross shaft and loosen the adjusting screw fully.

Fig. 8-403

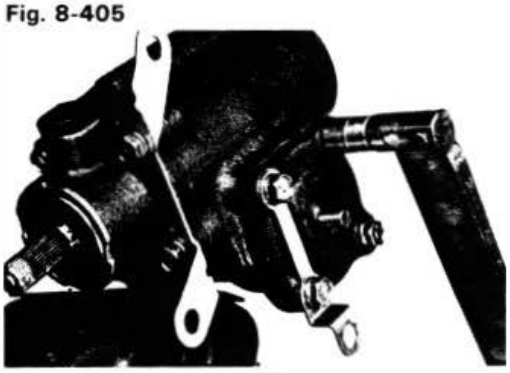


Align the cross shaft gear center with that of the power piston nut gear.

Fig. 8-404

Never turn the cross shaft, as this may cause O ring damage.

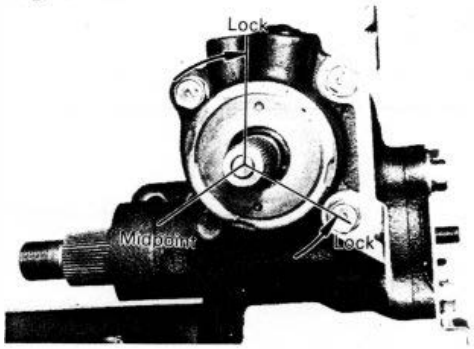
Fig. 8-405



Tighten the end cover diagonally and evenly in two or three rotations.

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

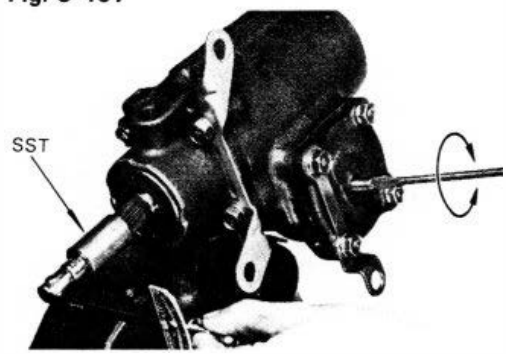
Fig. 8-406



Adjust the cross shaft preload.

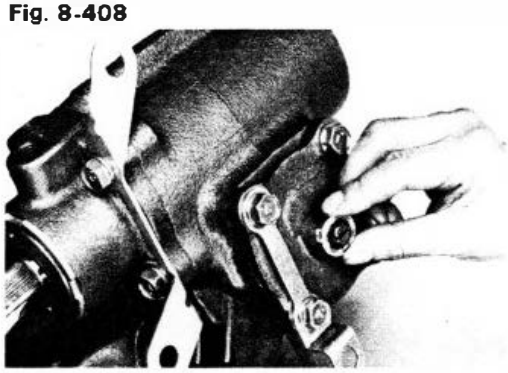
1. Set worm shaft to midpoint position.
   Determine total number of the worm shaft turns and return from full lock by half that number.

Fig. 8-407



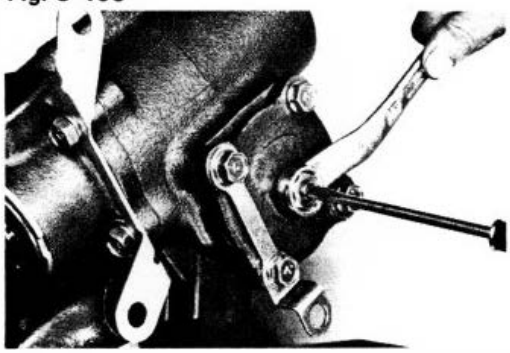
2. Insert SST into the serrated section of the worm shaft.
   Turn the adjusting screw, and measure preload with a torque meter.
   SST [09616-00010]
   Preload (starting):
   Worm shaft preload plus
   2 – 3 kg-cm
   (1.8 – 2.6 in.-lb)

Fig. 8-408



3. Use a new seal washer.

Fig. 8-409

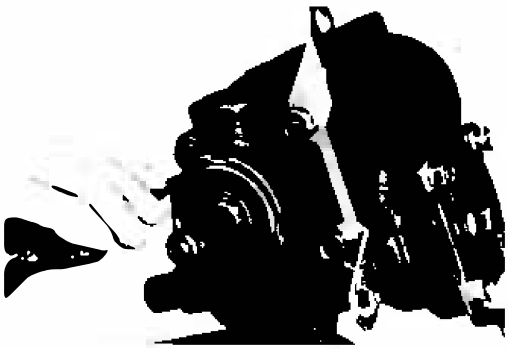


4. Tighten the lock nut.
   Tightening torque:
   4.0 – 5.5 kg-m
   (29 – 39 ft-lb)

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



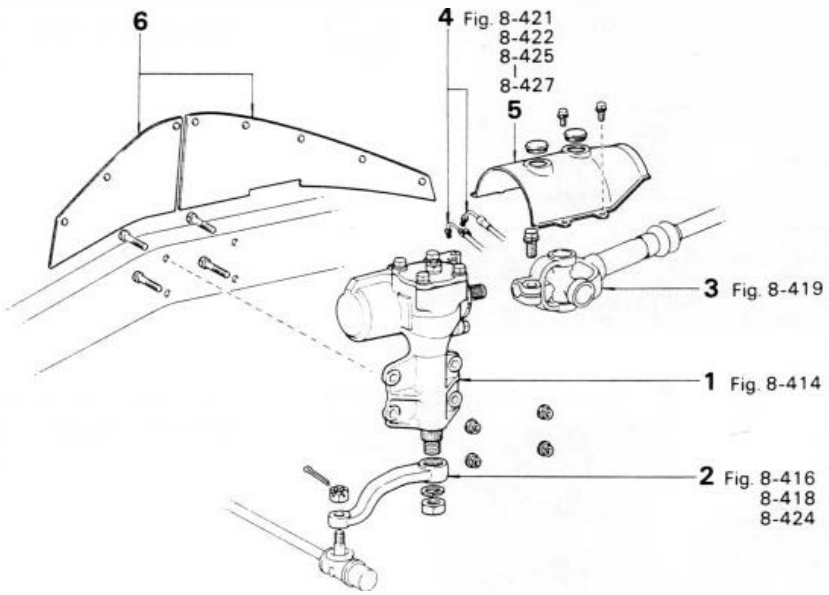
6. Stake at three points

INSTALLATION

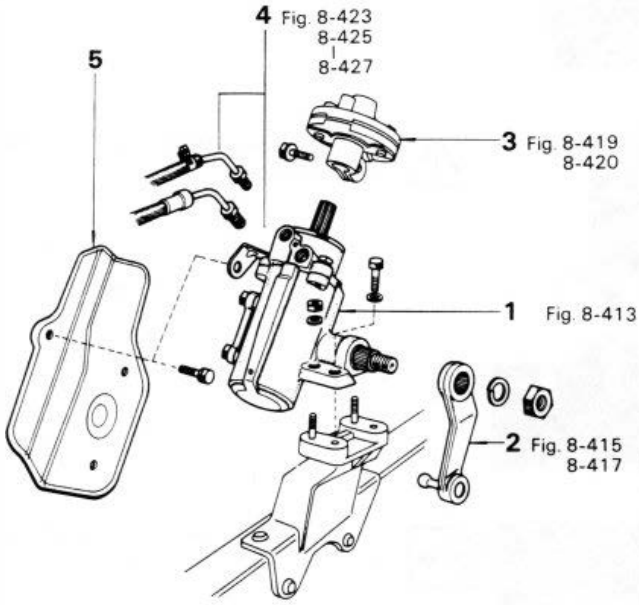
Install the parts in the numerical order shown in the figure.

Fig. 8-412

FJ, HJ6 _ Series

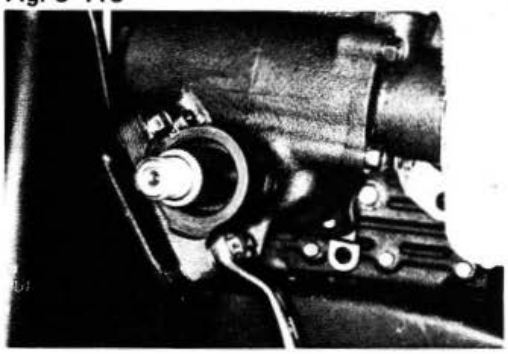


FJ, BJ, HJ4 _ Series



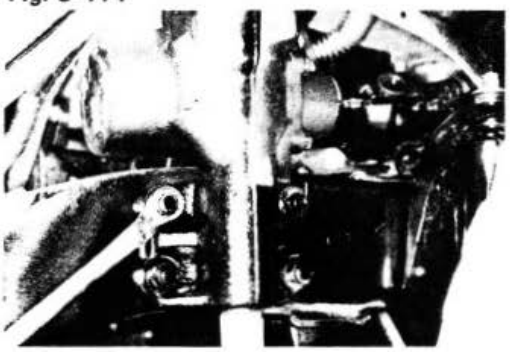
1. Gear Housing
2. Pitman Arm
3. Intermediate Shaft Yoke or Main Shaft Coupling
4. Fluid Pressure House & Fluid Return Hose
5. Dust Cover or Heat Insulator
6. Dust Cover

Fig. 8-413



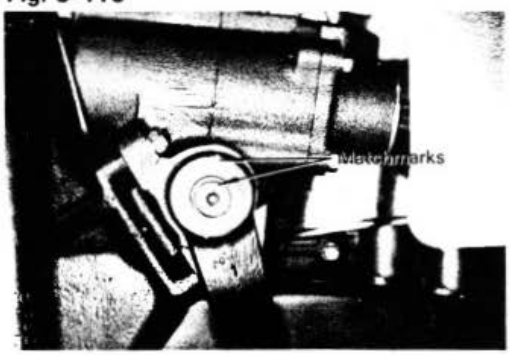
Tighten the gear housing set bolts and nuts.
Tightening torque: 5.5 – 8.8 kg-m (40 – 63 ft-lb)

Fig. 8-414



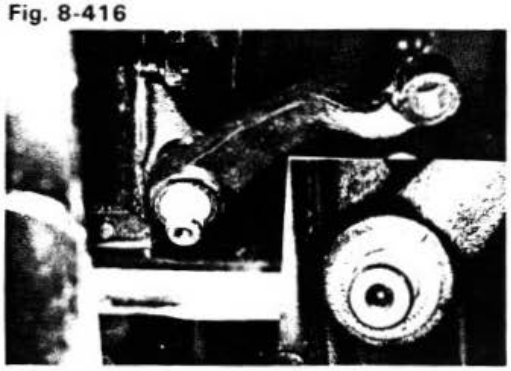
Tighten the gear housing set bolts and nuts.
Tightening torque: 5.5 – 8.8 kg-m (40 – 63 ft-lb)

Fig. 8-415



Align the matchmarks on the pitman arm and the cross shaft.

Fig. 8-416

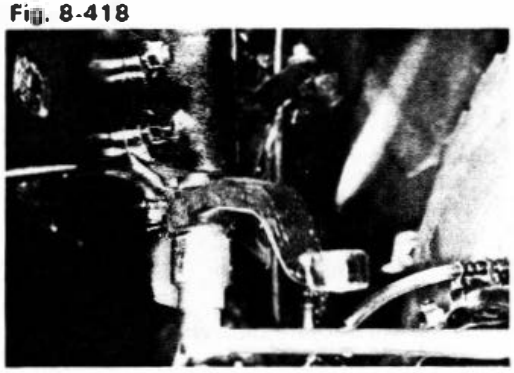


Align the matchmarks on the pitman arm and the cross shaft.

Fig. 8-417

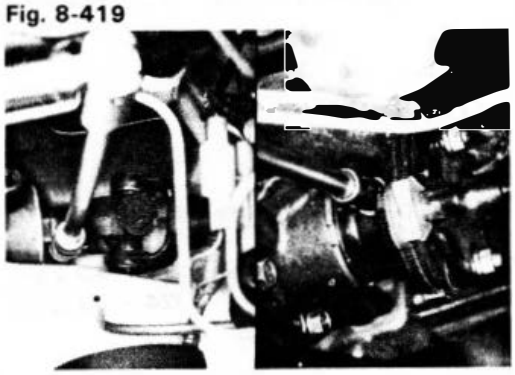
Tighten the pitman arm set nut.
Tightening torque:
16.5 – 19.5 kg-m
(120 – 141 ft-lb)

Fig. 8-418



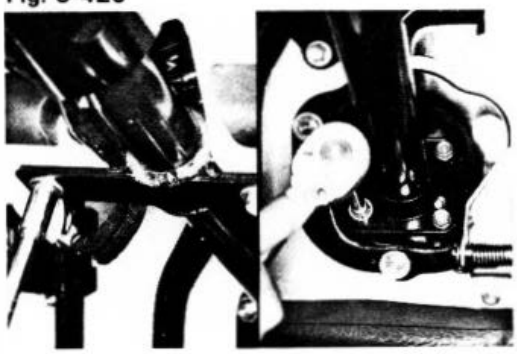
Tighten the pitman arm set nut.
Tightening torque:
16.5 – 19.5 kg-m
(120 – 141 ft-lb)

Fig. 8-419



Tighten the coupling set bolt.
Tightening torque: 3.0 – 4.5 kg-m
(22 – 32 ft-lb)

Fig. 8-420

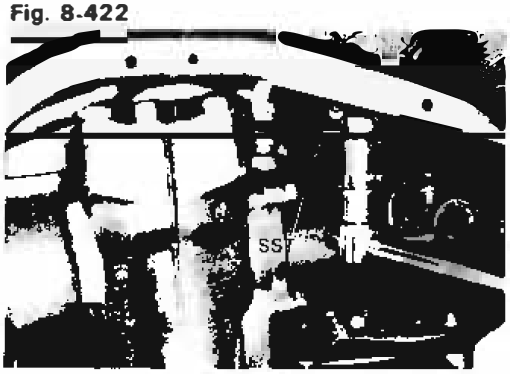


Install the steering column tube.

Fig. 8-421

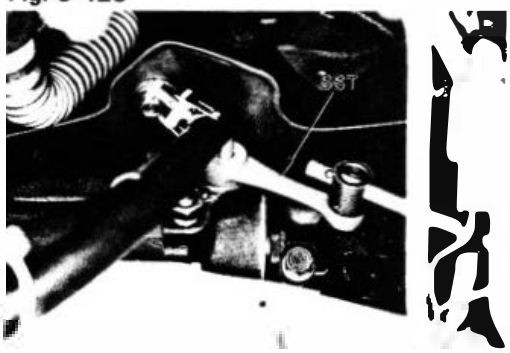
Connect the pressure hose with SST
SST [09631-22020]
Tightening torque: 4.0 – 5.0 kg-m (29 – 36 ft-lb)

Fig. 8-422



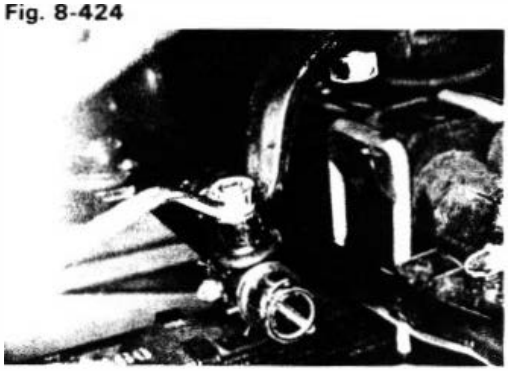
Connect the pressure hose with SST
SST [09631-22020]
Tightening torque: 4.0 – 5.0 kg-m (29 – 36 ft-lb)
Connect the return pipe with SST
SST [09631-22020]
Tightening torque: 3.2 – 4.2 kg-m (24 – 30 ft-lb)

Fig. 8-423



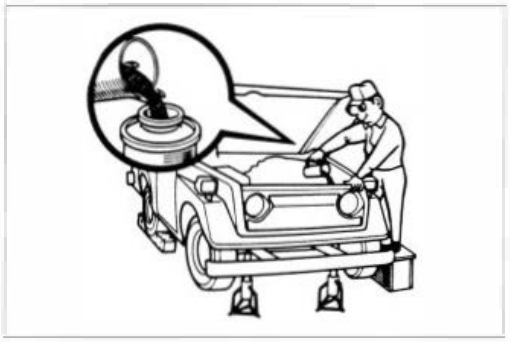
Connect the return hose with SST
SST [09631-22020]
Tightening torque: 3.2 – 4.2 kg-m (24 – 30 ft-lb)

Fig. 8-424



Connect the relay rod

Fig. 8-425

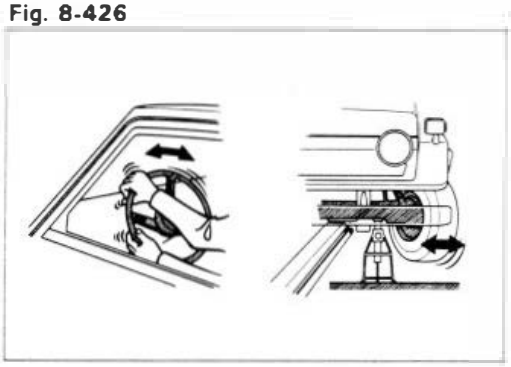


Fill with fluid

Fluid: **ATF type Dexron**

Capacity: **Gear housing 330 cc (20.1 cu in.)**

Fig. 8-426



Bleed the system

Fig. 8-427

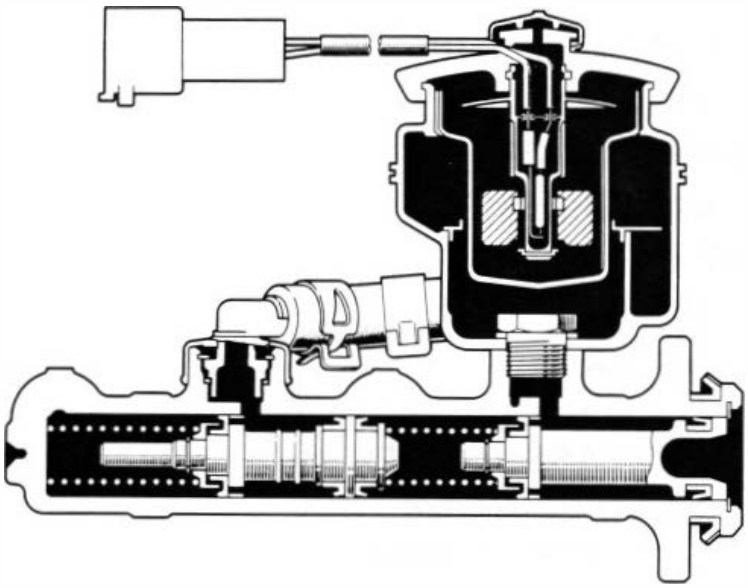
Boost the fluid pressure to check for fluid leakage

BRAKE

CUTAWAY VIEW

Fig. 9-1

TANDEM MASTER CYLINDER
(For Disc Brake)



TANDEM MASTER CYLINDER
(For Drum Brake)

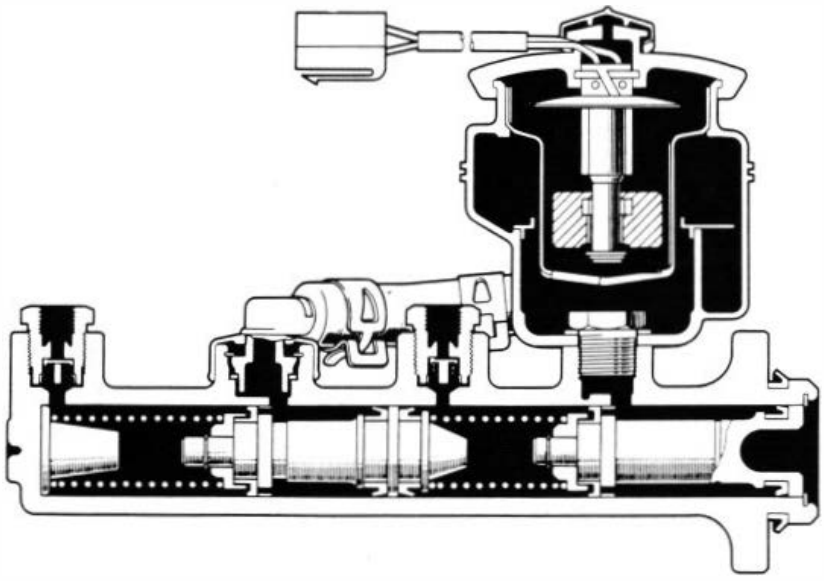
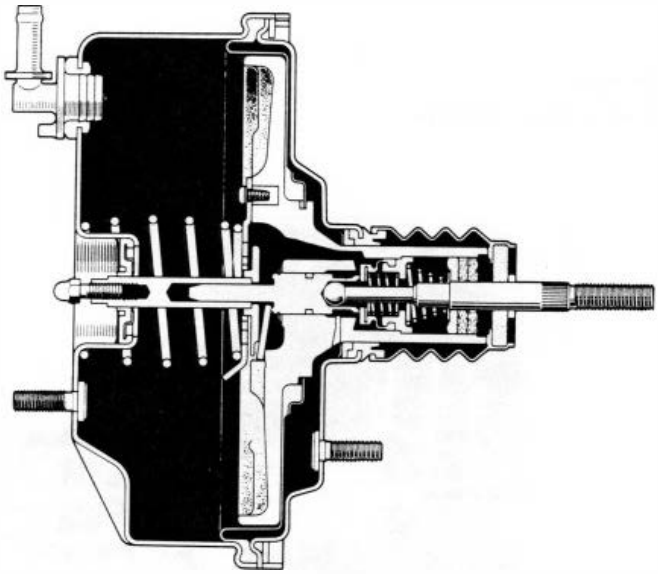


Fig. 9-2

BRAKE BOOSTER
(7.5 in. For Drum Brake)



BRAKE BOOSTER
(9.0 in. For Drum & Disc Brake)

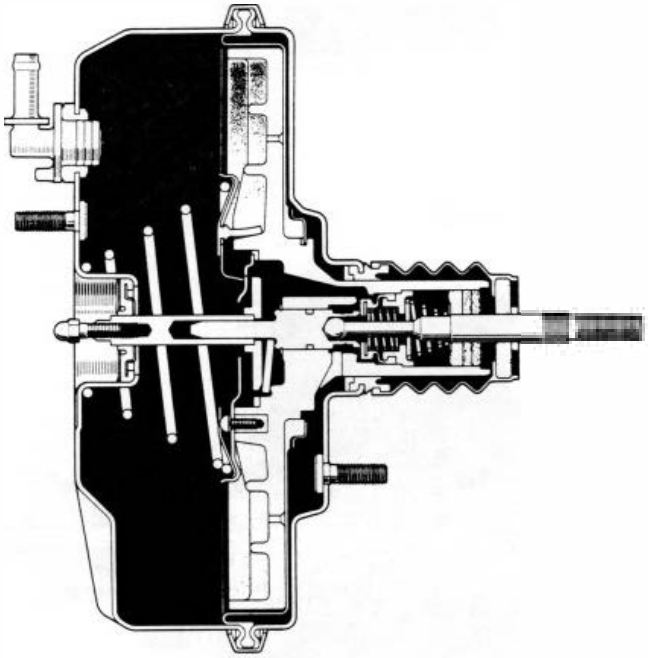
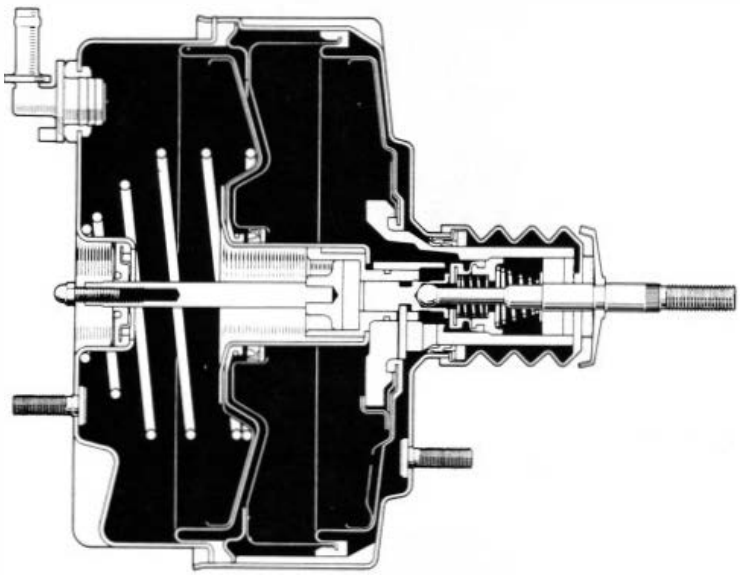


Fig. 9-3

BRAKE BOOSTER
(7.5 in. Tandem Type : AISIN)



BRAKE BOOSTER
(7.5 in. Tandem Type : JKC)

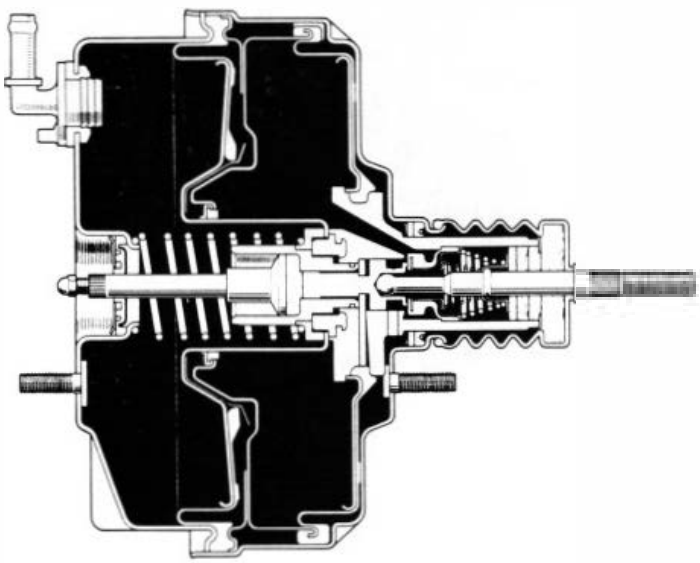
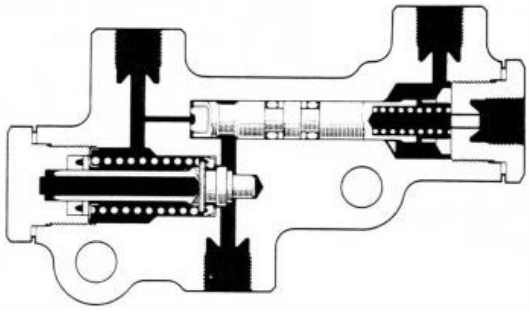


Fig. 9-4

P & B VALVE



LSPV

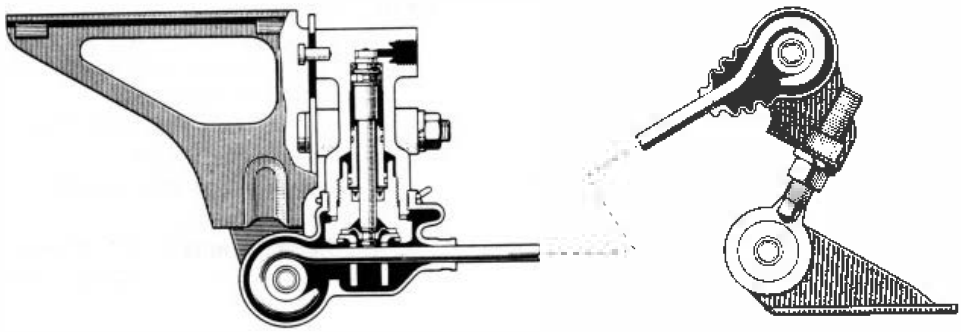
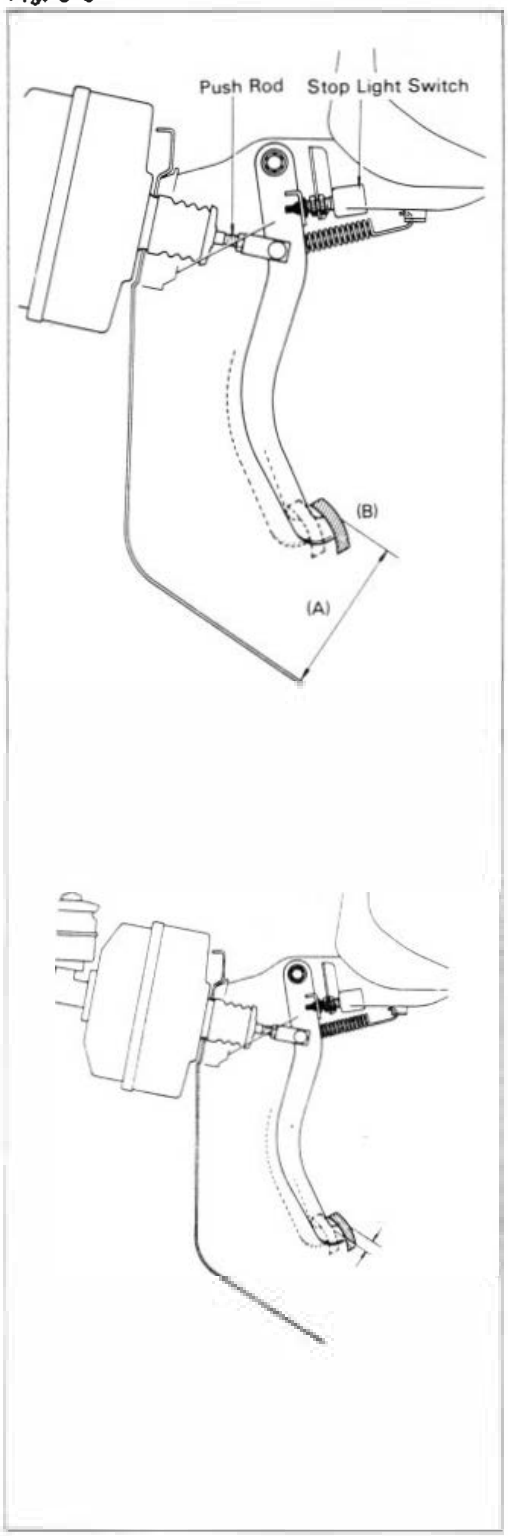


Fig. 9-5



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) Sufficently 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

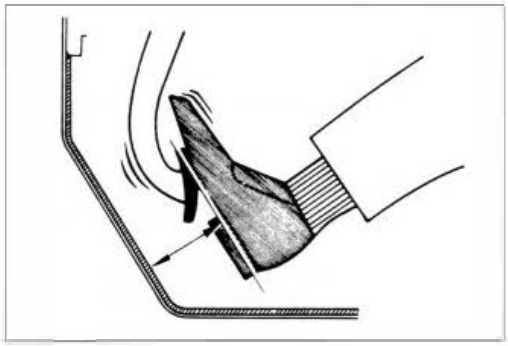


Fig. 9-7

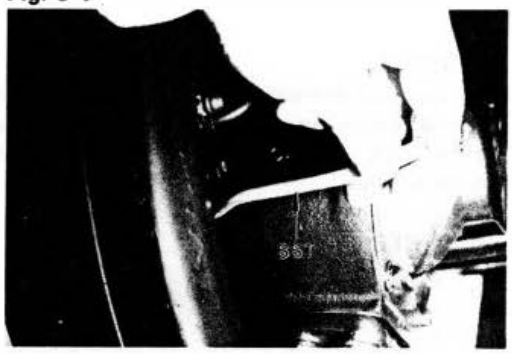
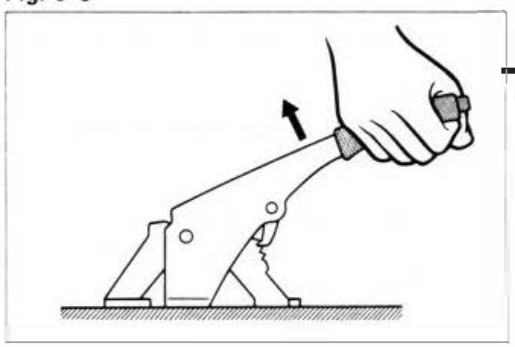


Fig. 9-8

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

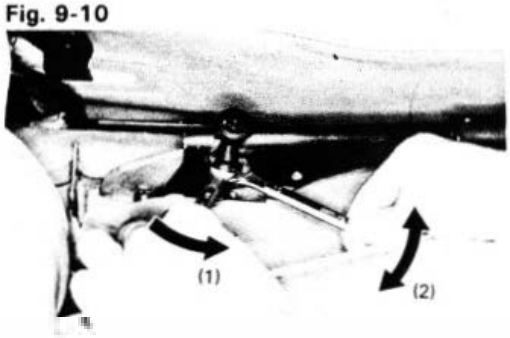


Fig. 9-11

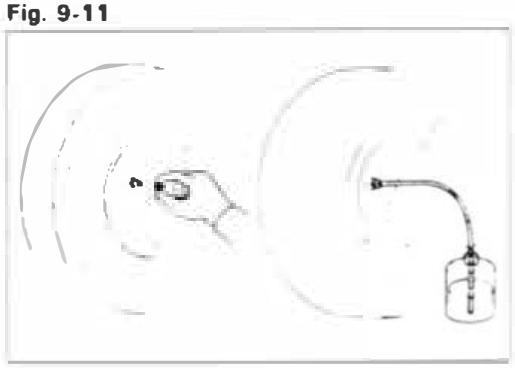


Fig. 9-12

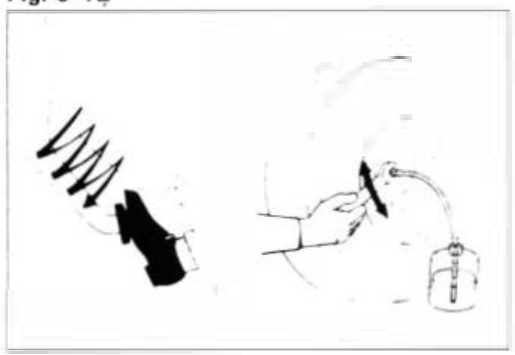
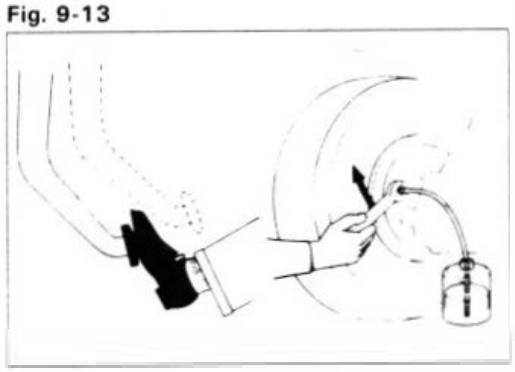


Fig. 9-13



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.

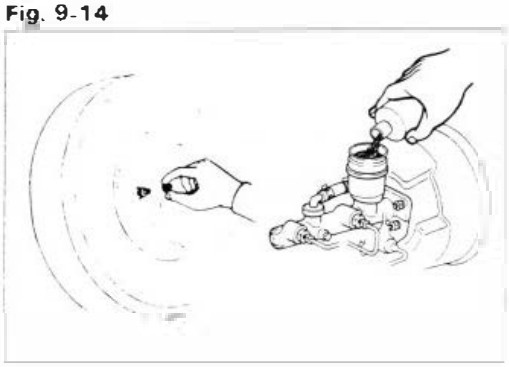
— Caution —

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

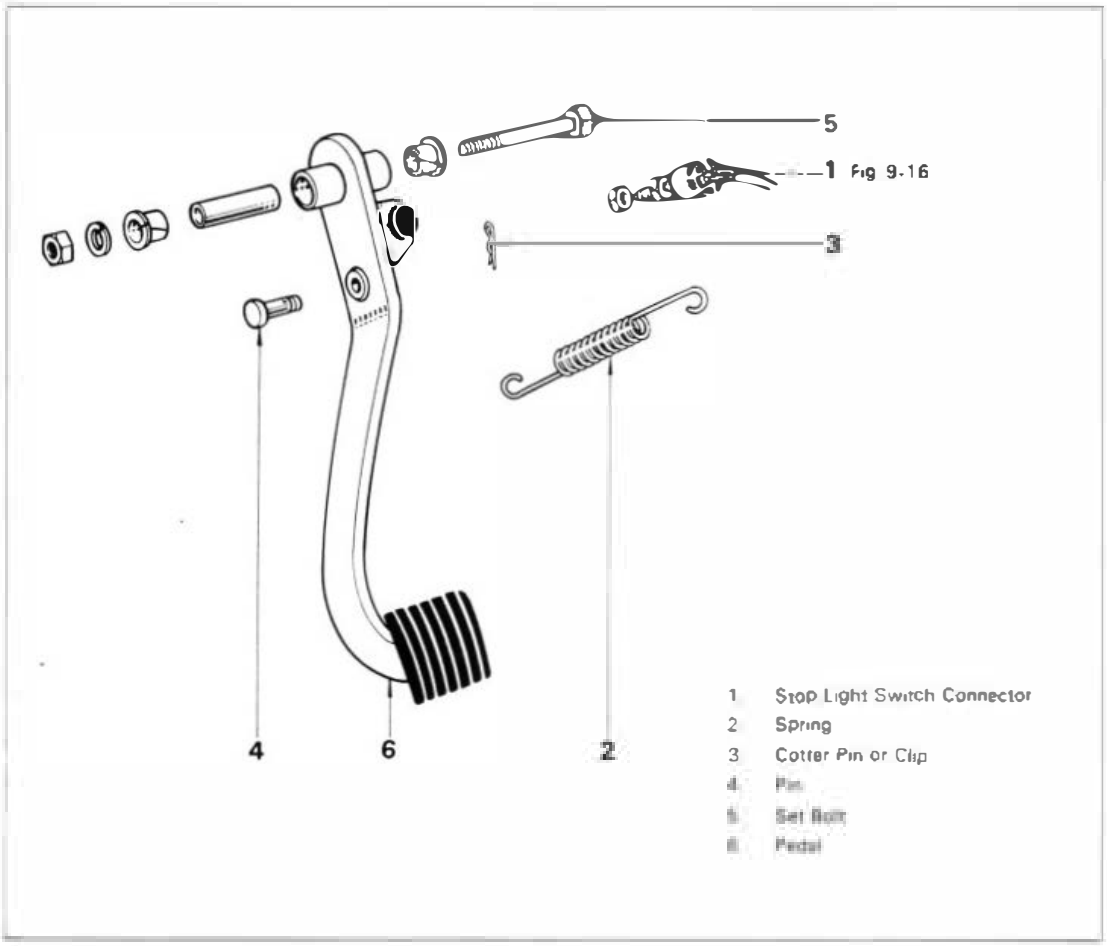
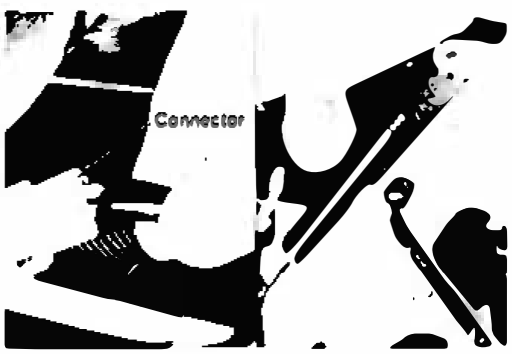
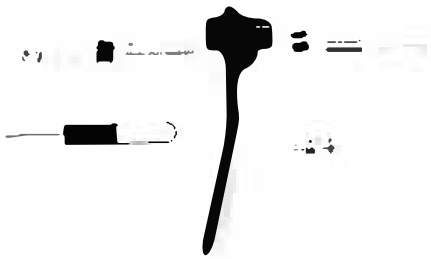


Fig. 9-16



Disconnect the stop light switch connector and remove the pedal

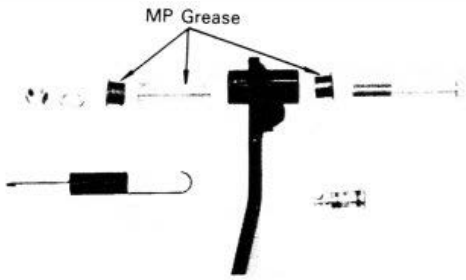
Fig. 9-17



INSPECTION

Inspect the removed parts for wear or damage and replace parts if necessary

Fig. 9-18



INSTALLATION

1. Install in reverse sequence of removal

– Note –

Coat the bushings with MP grease.

Fig. 9-19

2. Install the bolt

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

Fig. 9-20

3. Adjust the pedal height and play

SEE
BRAKE PEDAL
ADJUSTMENT
SECTION
Fig. 9-5

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

— Note —
Care must be taken not to spill fluid on the tube and painted surfaces.

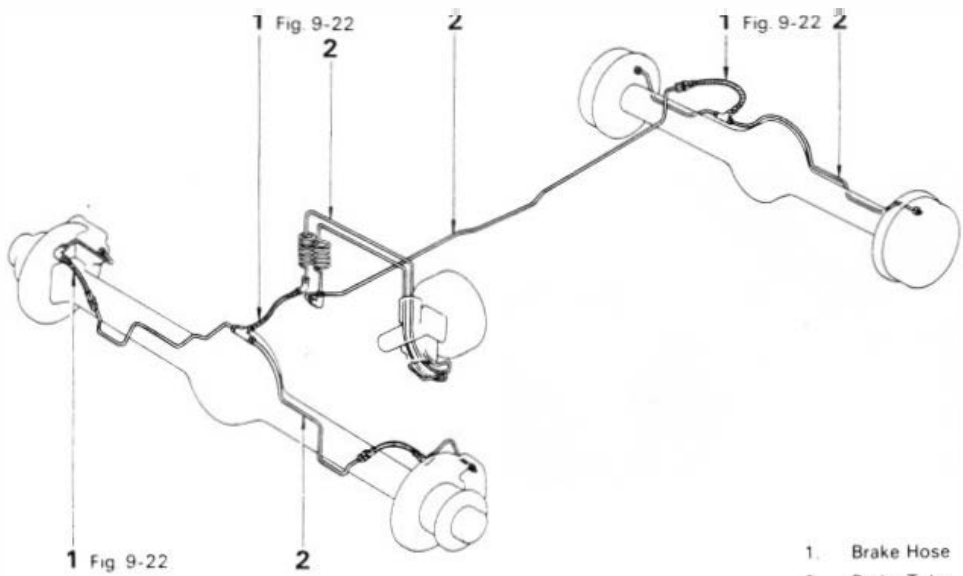
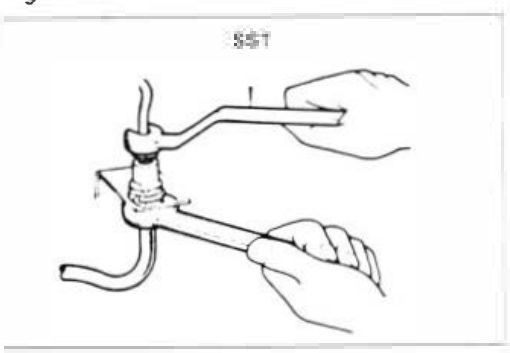
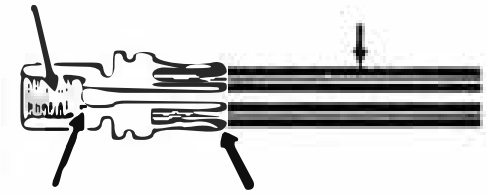


Fig. 9-22



Disconnect the hose and tube with a wrench and SST
SST [09751-36011]

Fig. 9-23

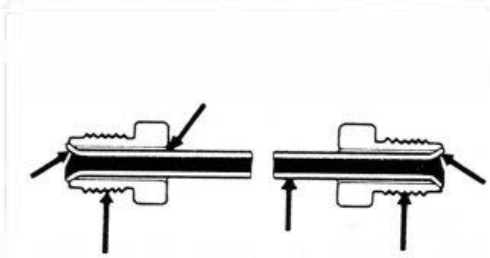


INSPECTION

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

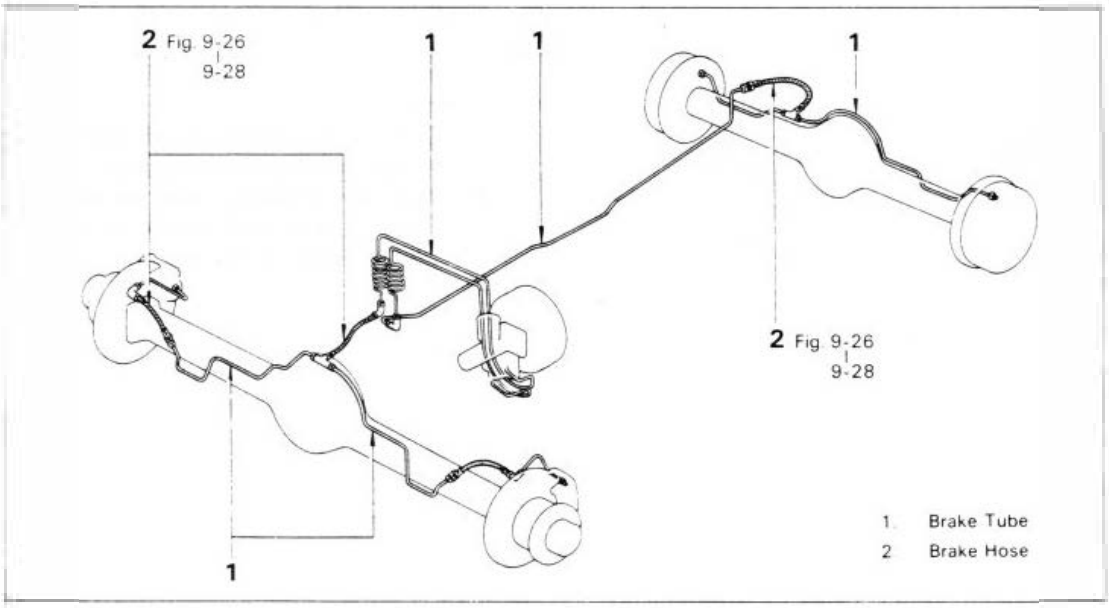
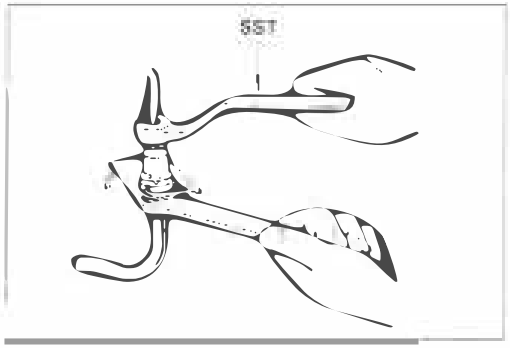


Fig. 9-26



Connect the tubes to the proper places with a wrench and SST
SST [09751-36011]

— Note —

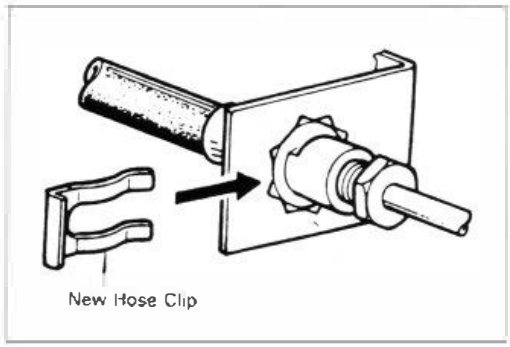
All hoses should be free from excessive bending twisting or pulling.

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

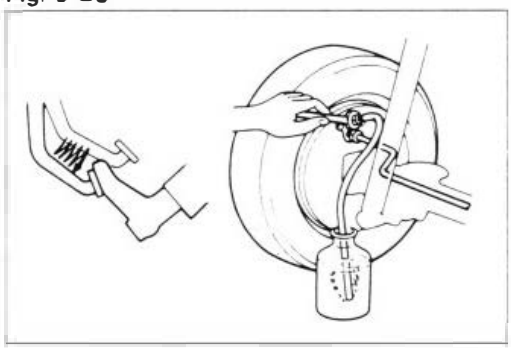


Install a new hose clip

— Note —

After installation, check to see that all hoses and tubes have sufficient clearance to prevent contacting any sharp edges, moving components or the exhaustpipe.

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

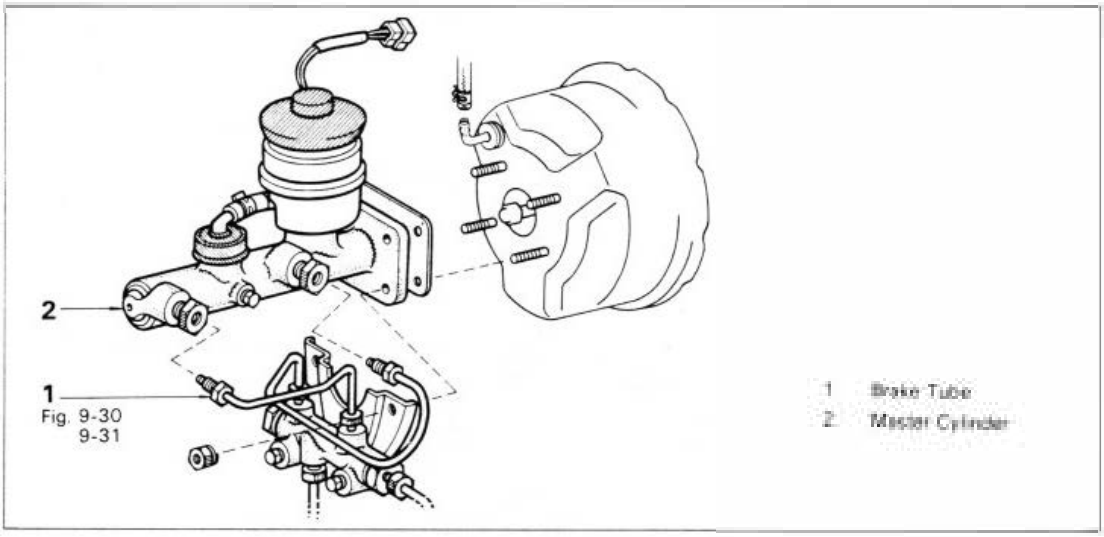
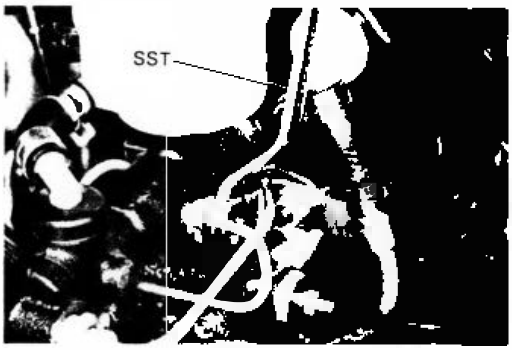


Fig. 9-30

Take out fluid with a syringe or such

Fig. 9-31



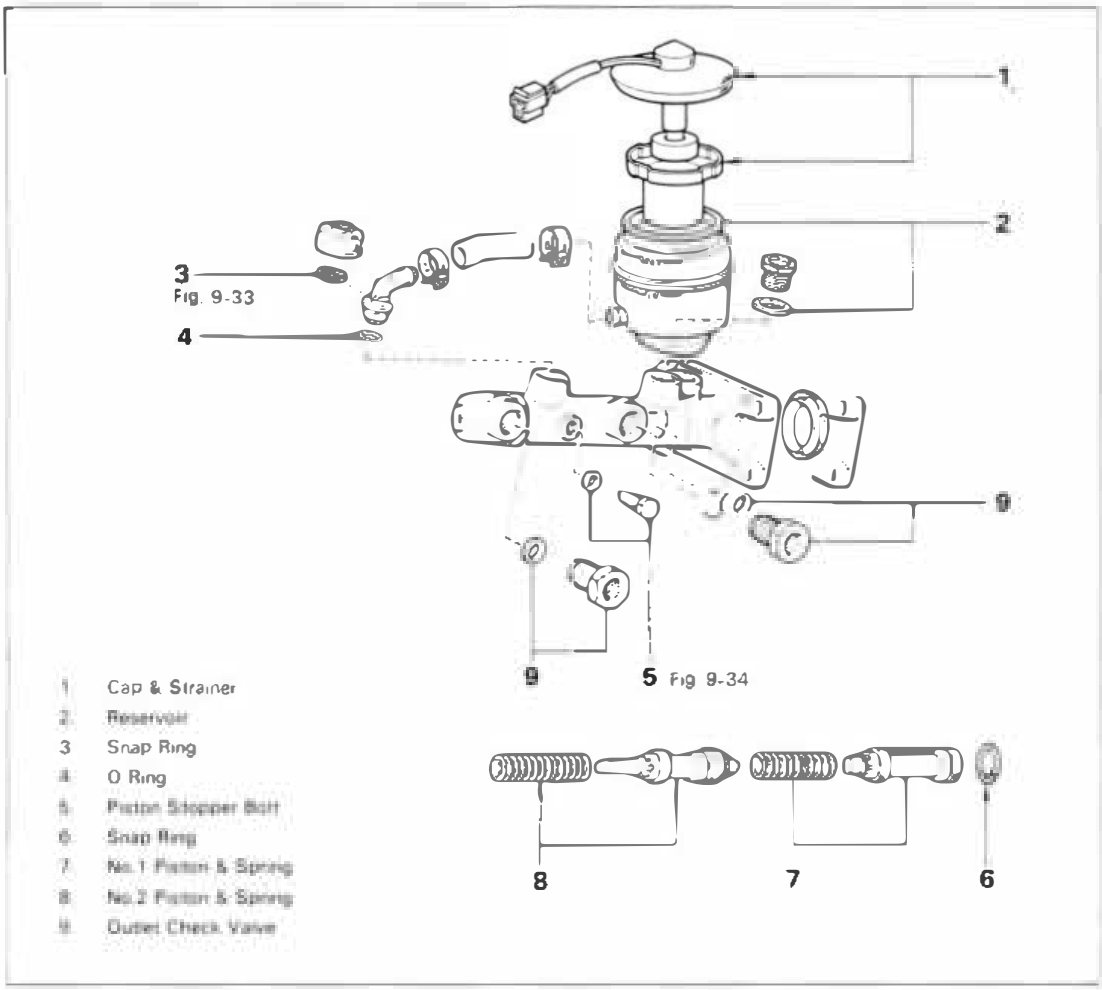
Disconnect the brake tube from the master cylinder with SST
SST [09751-36011]

– Note –
Do not allow brake fluid together painted surfaces.

DISASSEMBLY

Disassemble the parts in the numerical order shown in the figure

Fig. 9-32



1. Cap & Strainer
2. Reservoir
3. Snap Ring
4. O Ring
5. Piston Stopper Bolt
6. Snap Ring
7. No.1 Piston & Spring
8. No.2 Piston & Spring
9. Outlet Check Valve

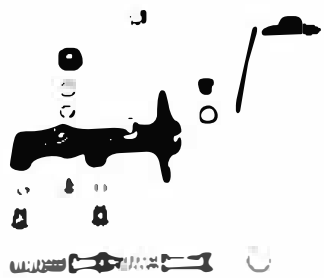
Fig. 9-33

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

MESTER CYLINDER INNER WALL CLEANING

1 Use a thin wooden stick having soft white cloth wound on its tip and sook in thenew brake fluid.

2 Insert the stick into the cylinder halfway and rotate to clean the innerwall.

– 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

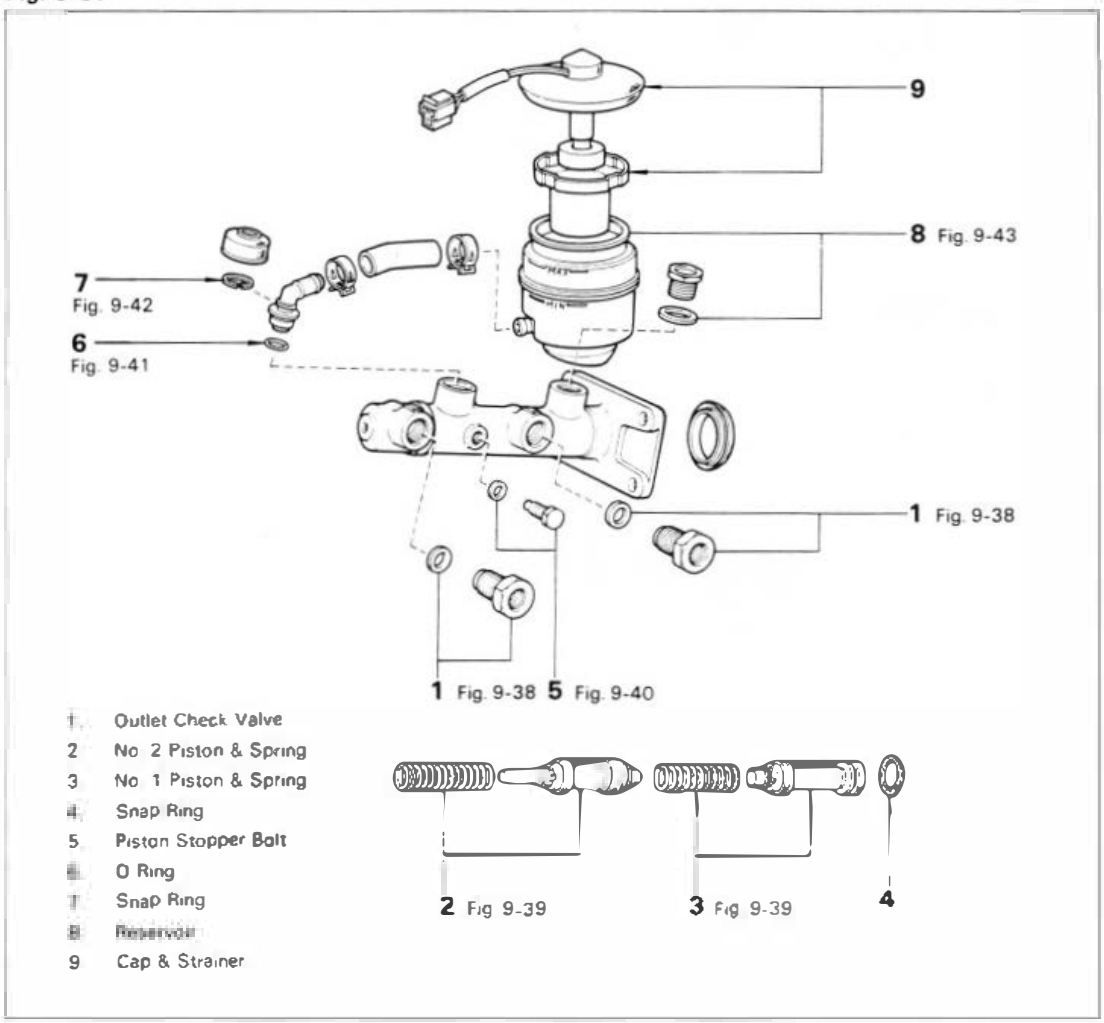
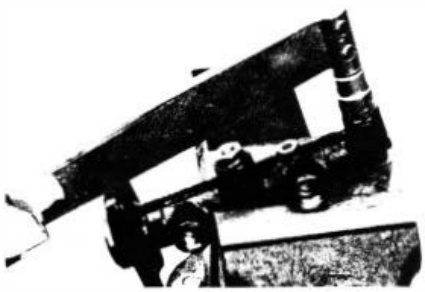


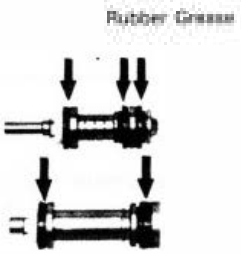
Fig. 9-38



Install the outlet check valve

Tightening torque: 3.5 – 5.5 kg-m (26 – 39 ft-lb)

Fig. 9-39



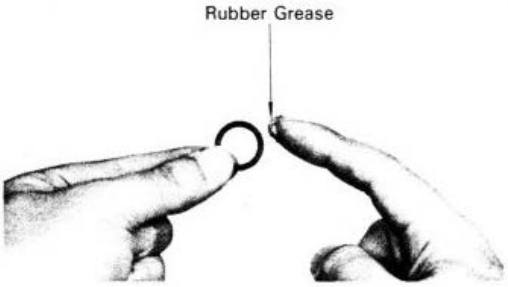
– Note –
Before assembly, coat rubber grease on the parts indicated by arrows.

Fig. 9-40

Install the piston stopper bolt with pistons pushed in all the way.

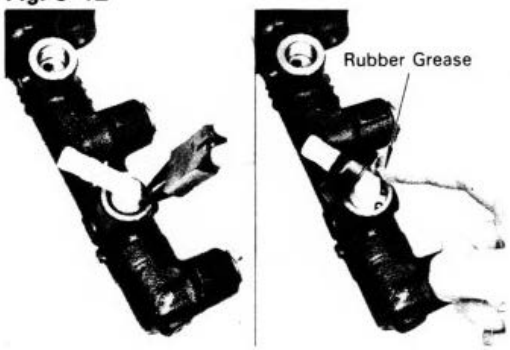
Tightening torque: 0.8 – 1.5 kg-m (70 – 130 in.-lb)

Fig. 9-41



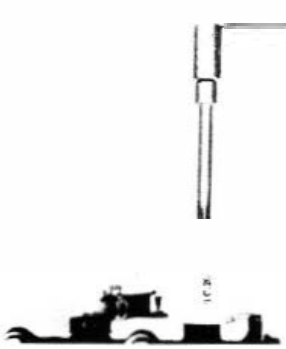
Apply rubber grease to the O ring and install the O ring to the elbow.

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

For Drum Brake

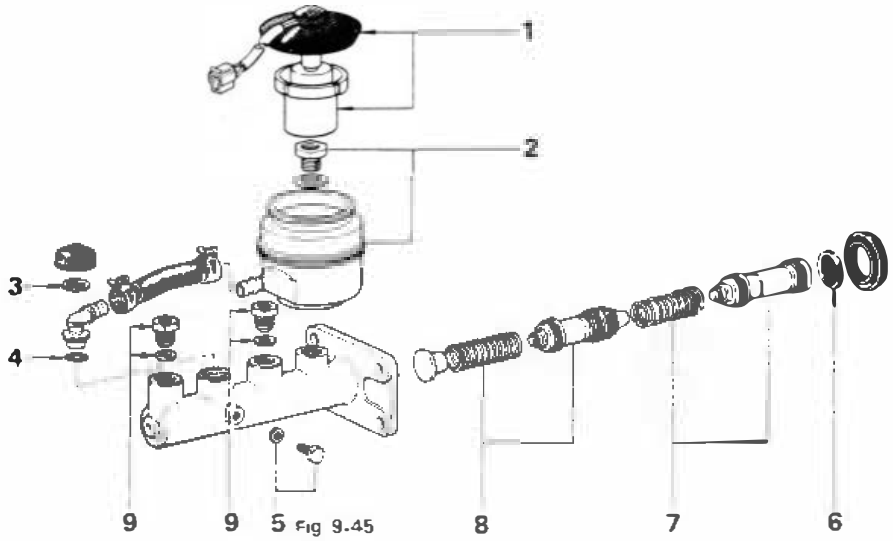


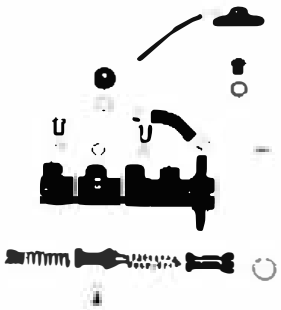
Fig. 9-45

1 Cap & Strainer
2 Reservoir
3 Snap Ring
4 O Ring
5 Piston Stopper Bolt
6 Snap Ring
7 No 1 Piston & Spring
8 No 2 Piston & Spring
9 Outlet Check Valve

Fig. 9-45

Remove the piston stopper bolt with the pistons pushed in all the way

Fig. 9-46



INSPECTION

Inspect the all disassembled parts forwearor damage and replace parts if necessary

– Note –

1. Wash the disassembled parts with brake fluid.
2. Do not reuse the piston cap.

Fig. 9-47

MASTER CYLINDER INNER WALL CLEANING

1 Use a thin wooden stick having soft white clothwound 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 inthe 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 scrotch on the inner wall

ASSEMBLY

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

Fig. 9-48

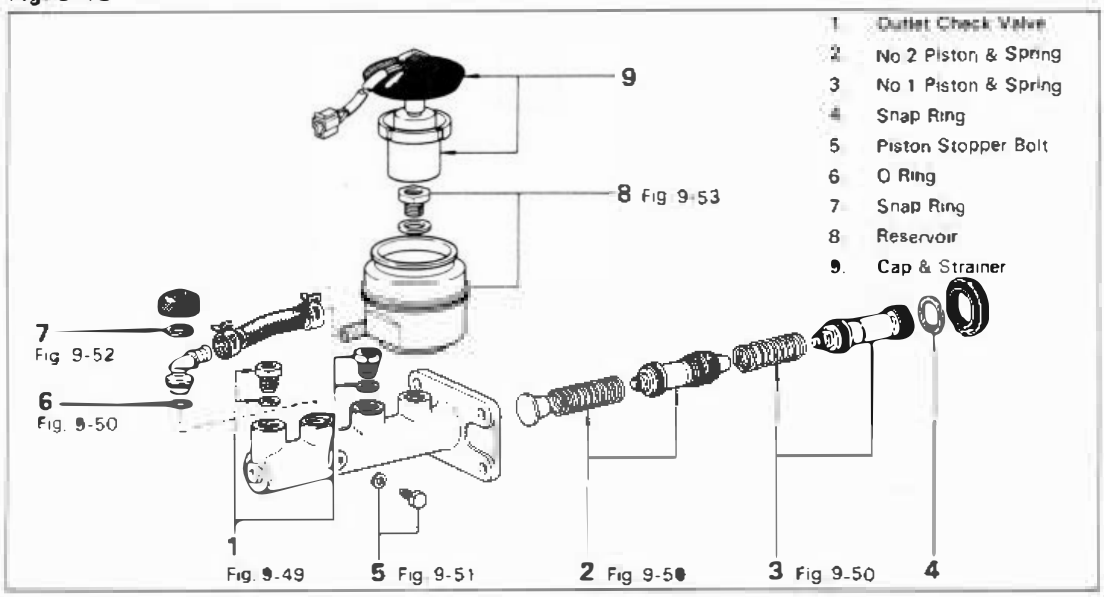
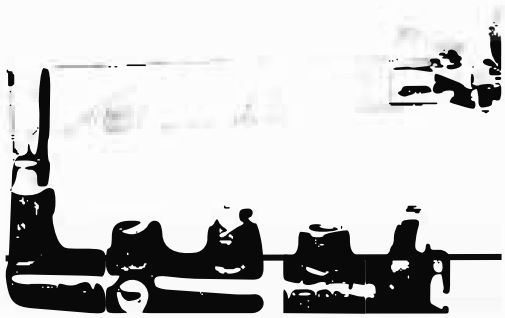


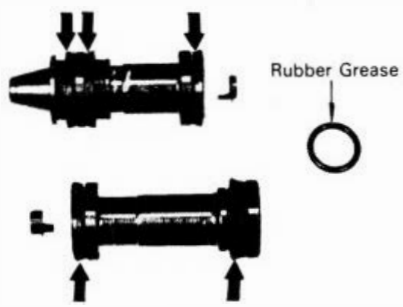
Fig. 9-49



Install the outlet check valve

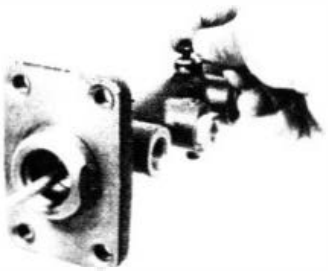
Tightening torque: 3.5 — 5.5 kg-m (26 — 39 ft-lb)

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)

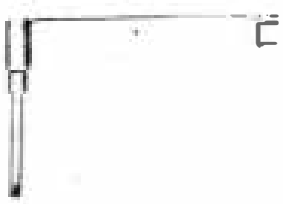
Fig. 9-52

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

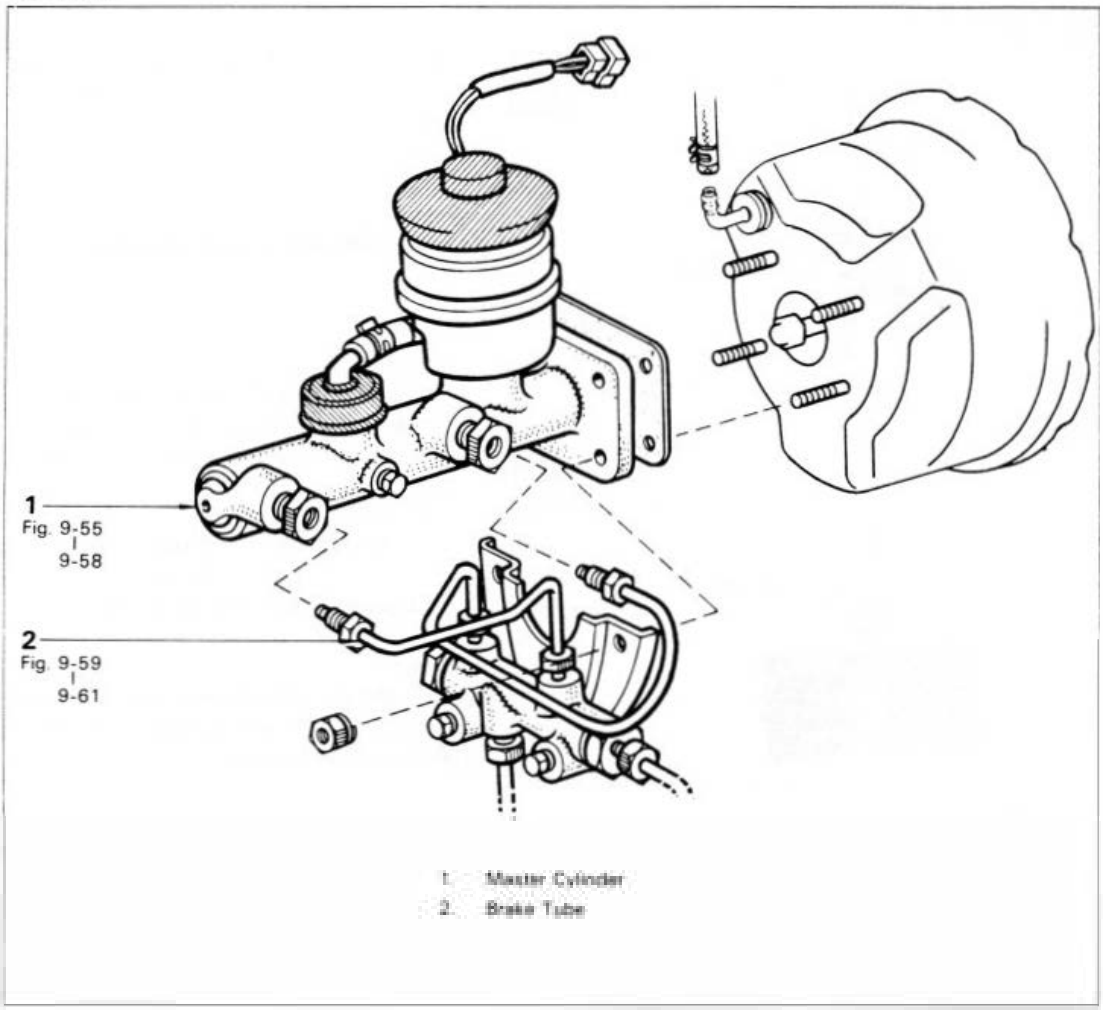
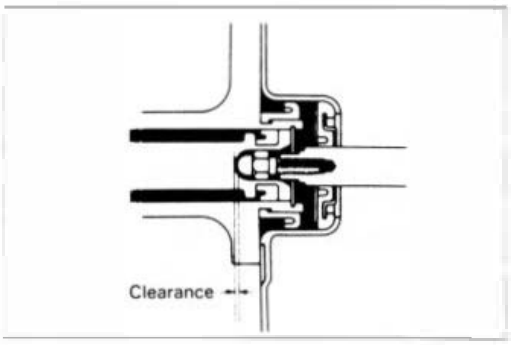


Fig. 9-55



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.

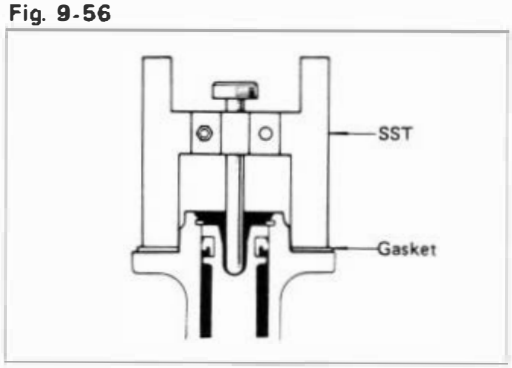
Clearance:

STD at Idling vacuum

0.1 – 0.5 mm

(0.004 – 0.020 in.)

Fig. 9-56

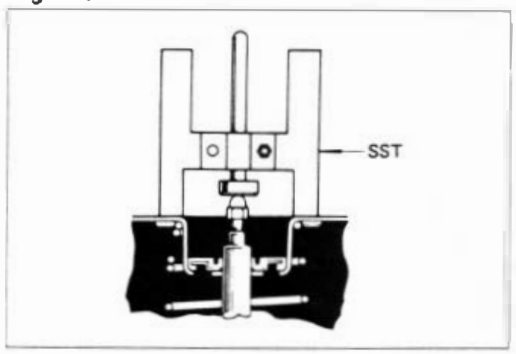


1. With the SST set as shown in the figure, push the pin until it contacts the piston rod
   SST [09737-00010]

– 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

Fig. 9-57

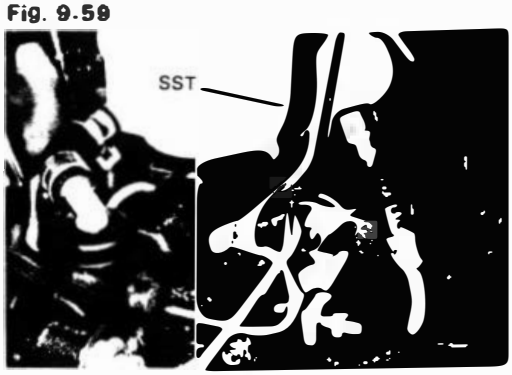


– Note –
By the above adjustment, the clearance will be 0.1 – 0.5 mm (0.004 – 0.020 in.) under the idling vacuum.

Fig. 9-58

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

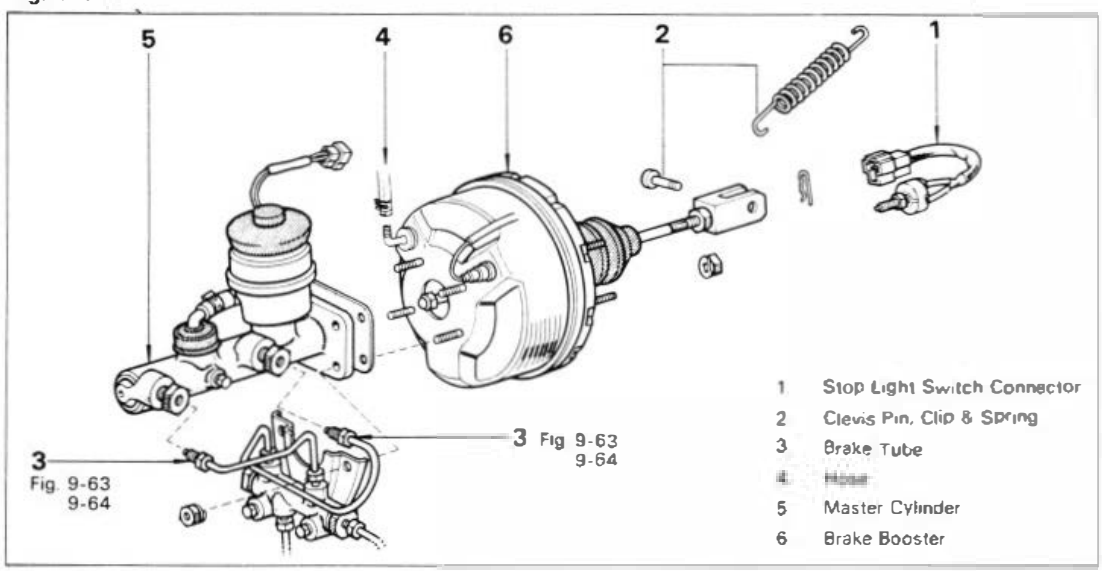
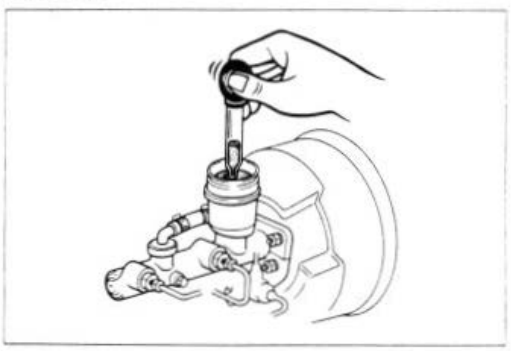
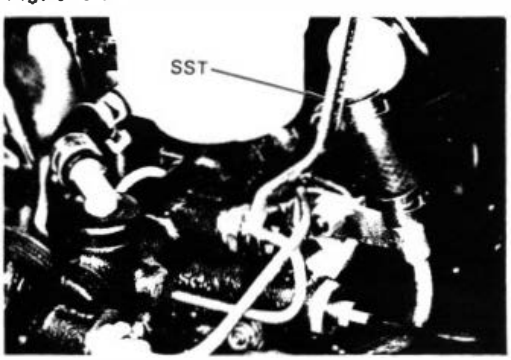


Fig. 9-63



Take out the fluid with a syrige or such

Fig. 9-64



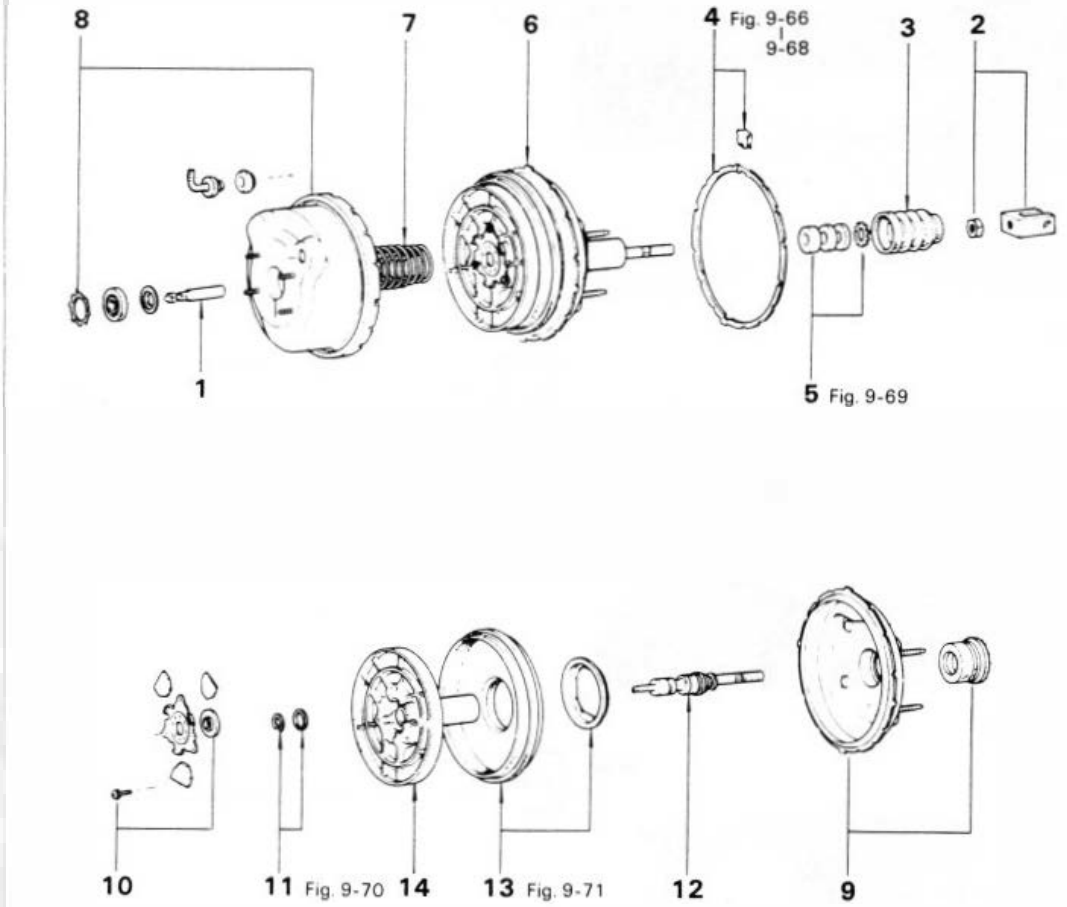
Disconnect the brake tube with SST
SST [09751-36011]

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

DISASSEMBLY
(7.5 in. SINGLE TYPE: AISIN)

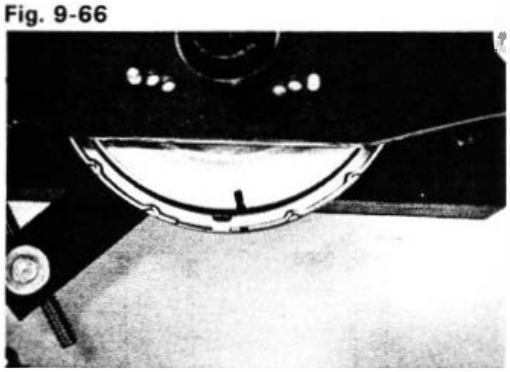
Disassemble the parts in the numerical order shown in the figure.

Fig. 9-65



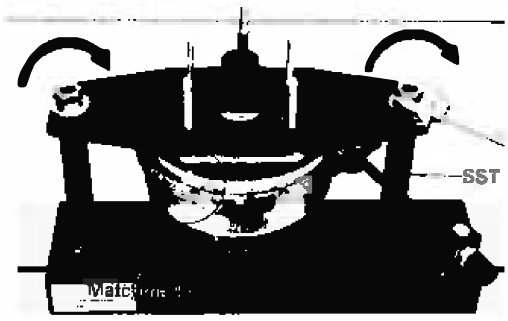
1	Push Rod	8	Front Body
2	Clevis	9	Rear Body
3	Boot	10	Reaction Retainer, Lever & Plate
4	Lock & Body Connecter	11	Snap Ring & Plate
5	Air Filter Element	12	Operating Rod
6	Rear Body w/ Diaphragm Plate	13	Diaphragm & Retainer
7	Spring	14	Diaphragm Plate

Fig. 9-66



1. Place matchmarks on the front body and rear body
2. Pry out the lock with a screwdriver

Fig. 9-67

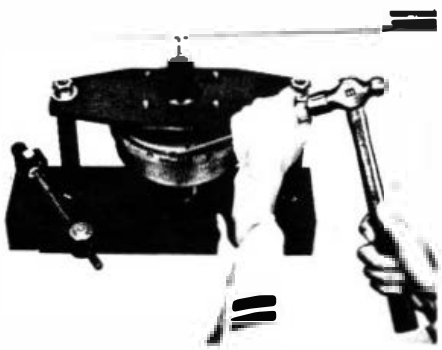


Set the booster to the SST.
SST (09753-00010) of set [09738-00020]

Tightening torque: 1.1 — 1.3 kg-m (8 — 9 ft-lb)

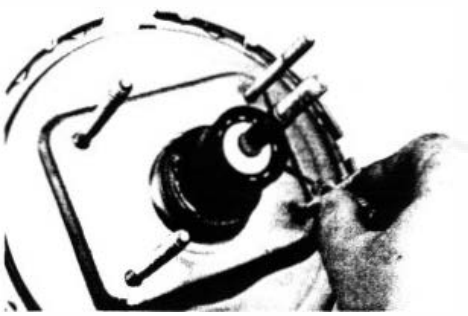
— Note —
Tighten the left and right nuts uniformly.

Fig. 9-68



Remove the body connector by turning it counterclockwise with a screwdriver

Fig. 9-69

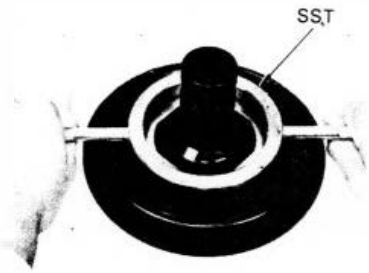


Remove the snap ring and plate with snap ring pliers

Fig. 9-70

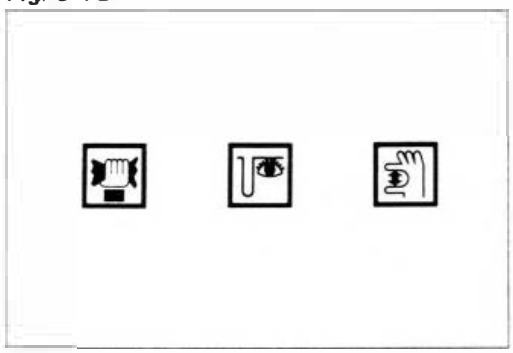
Prv out the circular ring with a screw driver and pull out the air valve together with the air filter elements.

Fig. 9-71



Remove the diaphragm retainer with SST.
SST [09736-30020]

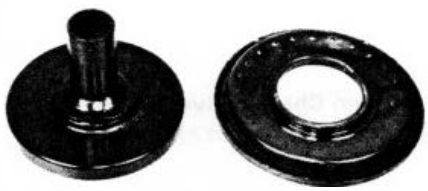
Fig. 9-72



INSPECTION & REPAIR

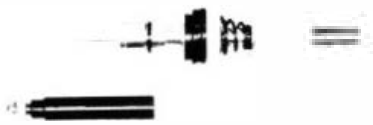
Inspect the disassembled parts on the following points and repair or replace if necessary.

Fig. 9-73



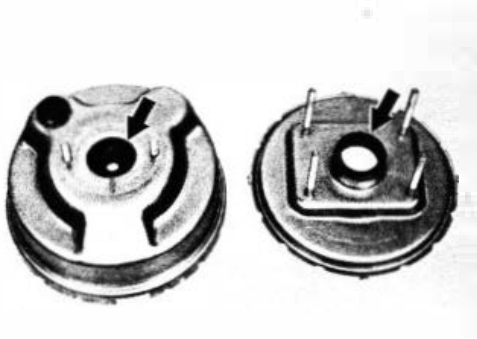
Diaphragm & Booster Piston
Inspect the diaphragm and booster piston for wear, damage or cracks.

Fig. 9-74



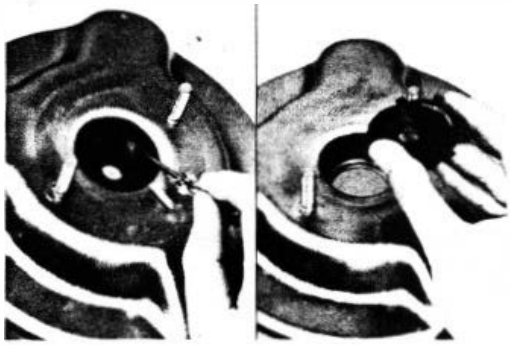
Booster Air Valve & Piston Rod
Inspect for wear, damage or bending

Fig. 9-75



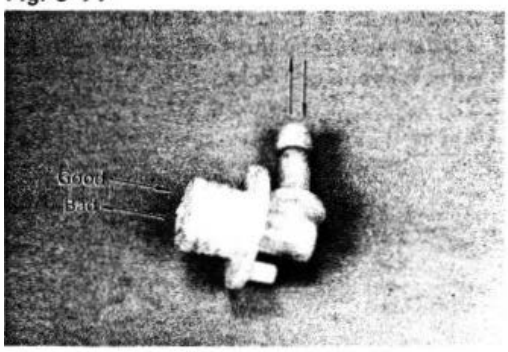
Booster Body, Seal & Bearing
Inspect the booster bodies, seal and bearing for wear or damage

Fig. 9-76



Replace The Seal
1. Remove the seal from the shell by prying
2. Install a new seal

Fig. 9-77

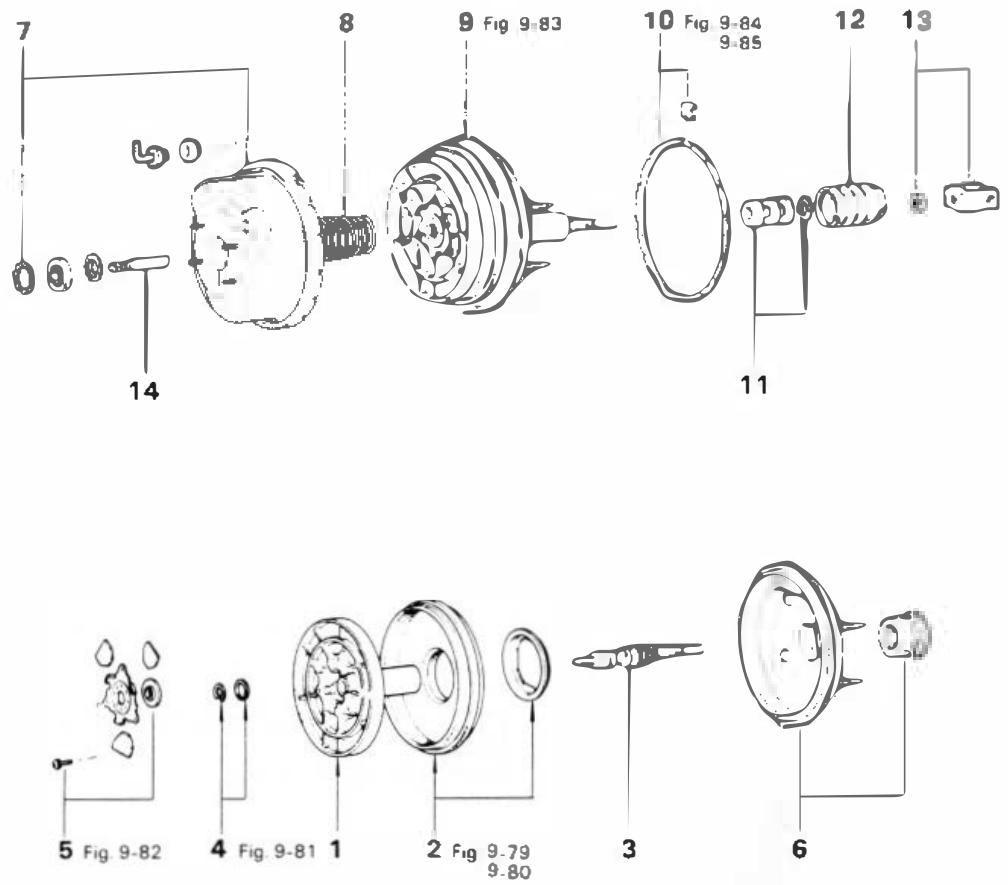


Vacuum Check Valve
Check the operation of the valve

ASSEMBLY

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

Fig. 9-78



1. Diaphragm Plate
2. Diaphragm & Retainer
3. Operating Rod
4. Snap Ring & Plate
5. Reaction Retainer, Lever & Plate
6. Rear Body
7. Front Body
8. Spring
9. Rear Body with Diaphragm Plate
10. Lock & Body Connector
11. Air Filter Element
12. Boot
13. Clevis
14. Push Rod

Fig. 9-79

— Note —
Before assembly, coat the parts shown below with silicon grease (furnished in repair kit).

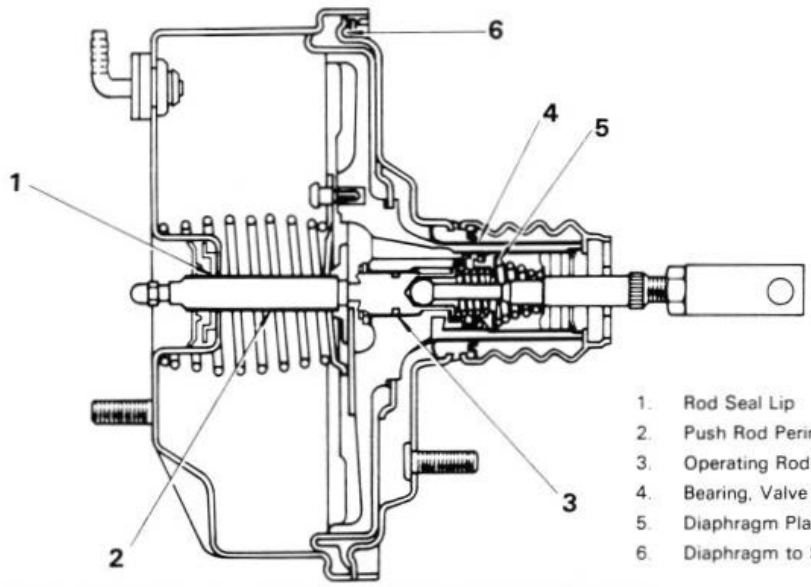
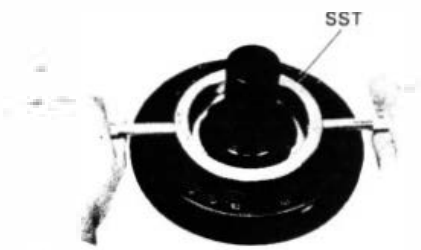


Fig. 9-80



Install the retainer by turning the SST about 45°
SST [09736-30020]

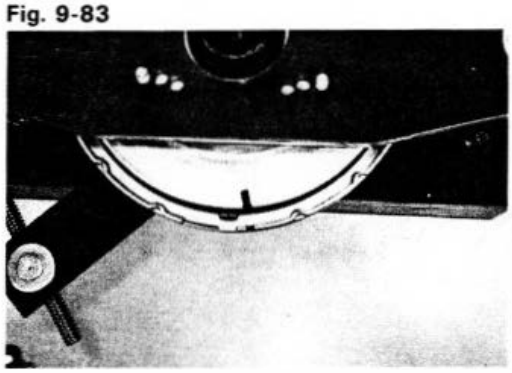
Fig. 9-81

Install the snap ring onto the air valve

Fig. 9-82

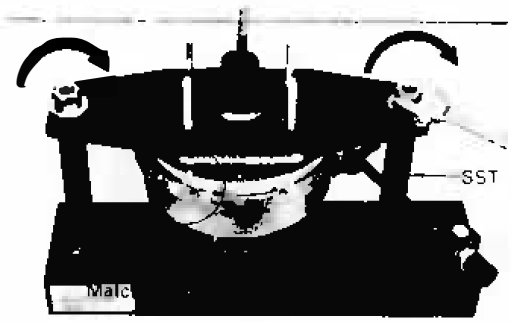
Install the reaction levers and plate with its protrusion directed upward

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

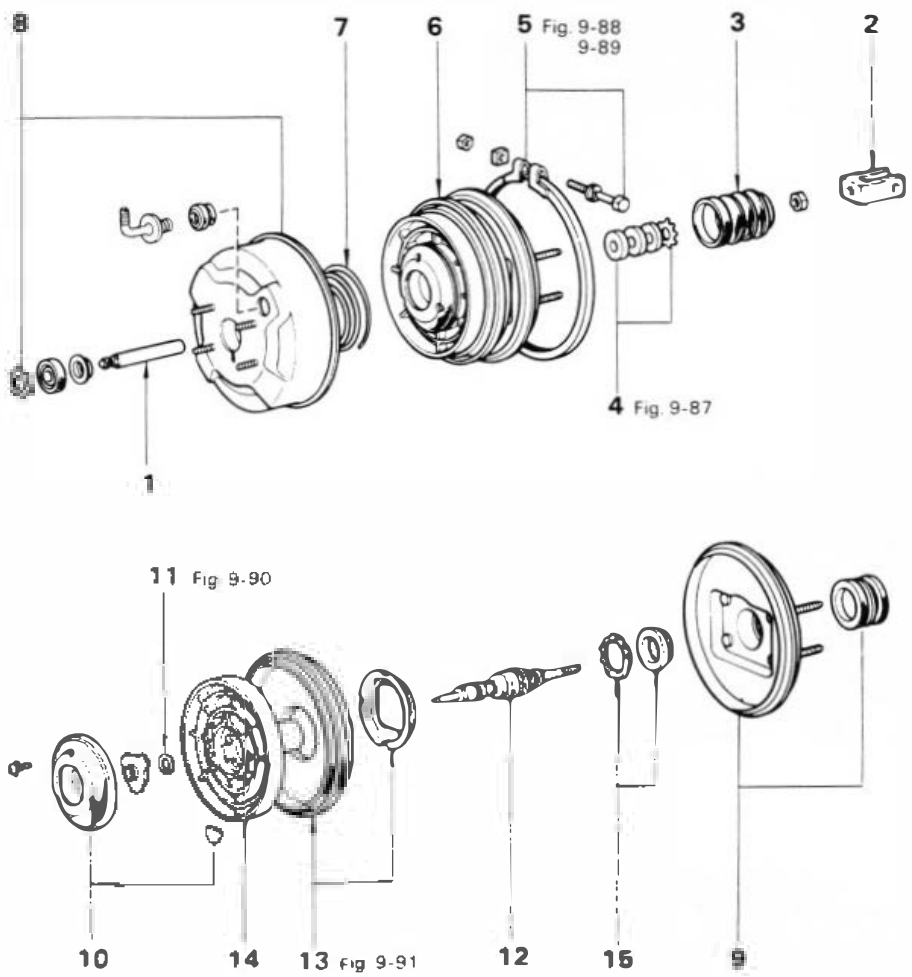
Turn the body connector clockwise with a screwdriver

DISASSEMBLY

(9.0 in. SINGLE TYPE : AISIN)

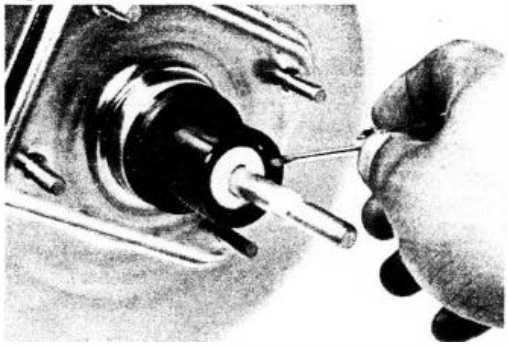
Disassemble the parts in the numerical order shown in the figure.

Fig. 9-86



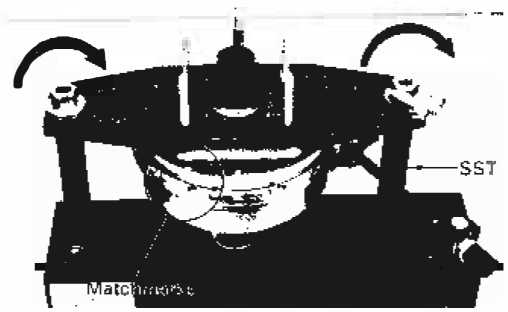
1. Push Rod
2. Clevis
3. Bolt
4. Air Filter Element
5. Booster Band
6. Rear Body with Diaphragm Plate
7. Spring
8. Front Body
9. Rear Body
10. No.2 Reaction, No. 1 Retainer, Plate & Lever
11. Snap Ring
12. Operating Rod
13. Diaphragm & Retainer
14. Diaphragm Plate
15. Piston Bearing & Circular Internal Ring

Fig. 9-87



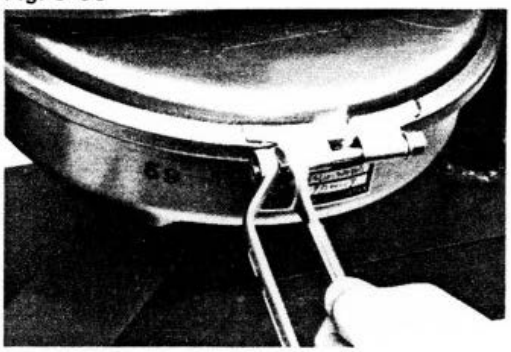
Remove the retainer and filter elements with a screwdriver

Fig. 9-88



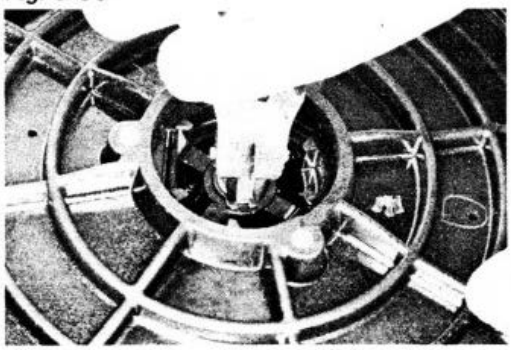
Place matchmarks on the front and rear body, and fix to the SST
SST (09753-00010) of set [09738-00020]

Fig. 9-89



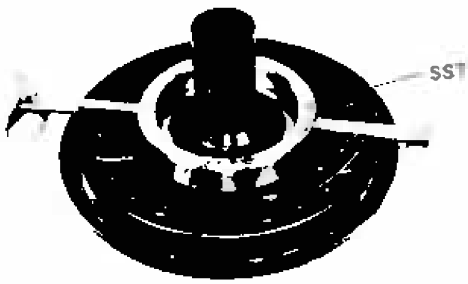
1 Remove the booster band lock nut
2 Remove the booster band

Fig. 9-90



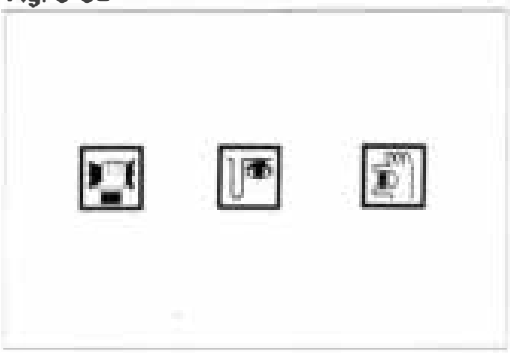
Remove the snap ring

Fig. 9-91



Remove the diaphragm and the diaphragm plate with SST
SST [09736-30020]

Fig. 9-92



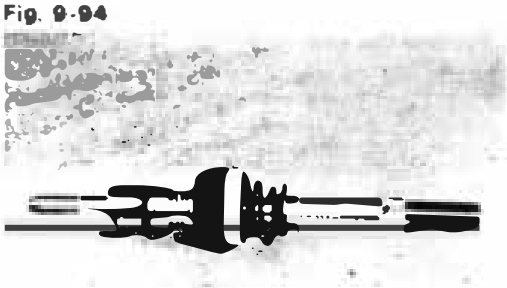
INSPECTION & REPAIR

Inspect the disassembled parts on the following points, and repair or replace parts if necessary

Fig. 9-93

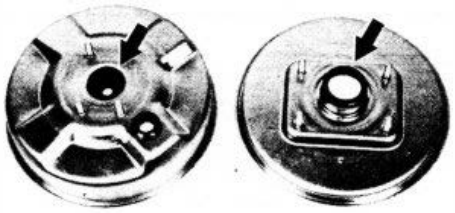
Diaphragm & Diaphragm Plate
Inspect the diaphragm and diaphragm plate for wear, damage or cracks

Fig. 9-94



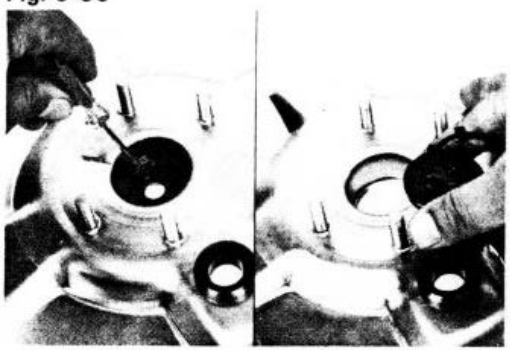
Valve Operating Rod
Inspect the valve operating rod for wear or damage

Fig. 9-95



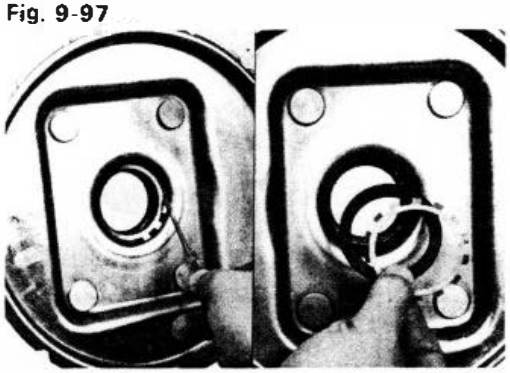
Body & Body Seal
Inspect the seals for wear or damage

Fig. 9-96



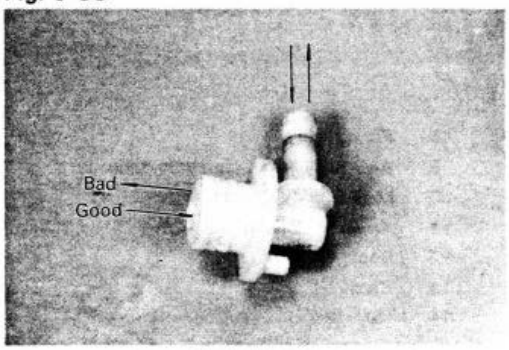
Replace The Seal
Remove the seal from the shell.
Install the new seal.

Fig. 9-97



Replace The Bearing
Remove the bearing from the shell and install a new bearing.

Fig. 9-98

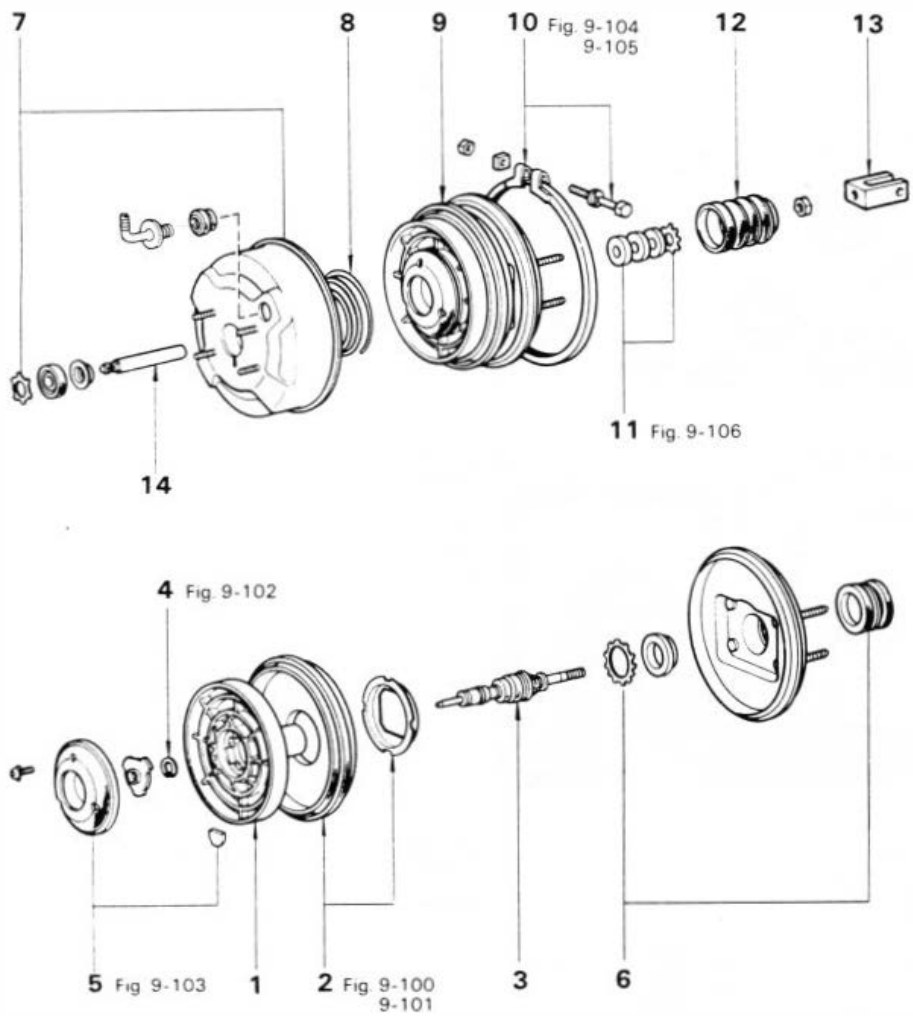


Vacuum Check Valve
Check the operation of the valve

ASSEMBLY

Assemble the parts in numerical order shown in the figure.

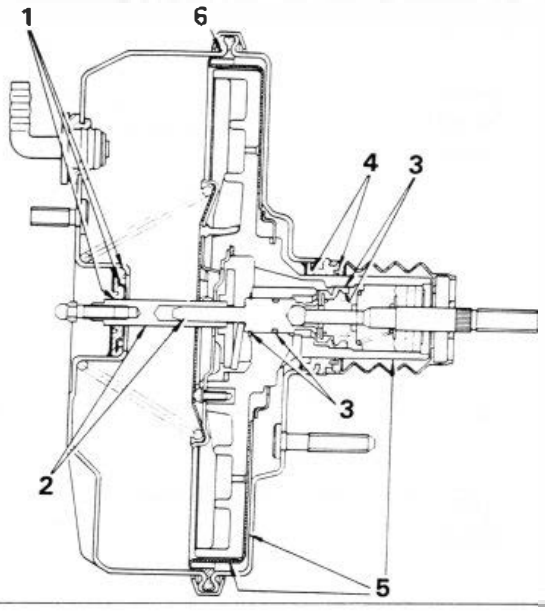
Fig. 9-99



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).

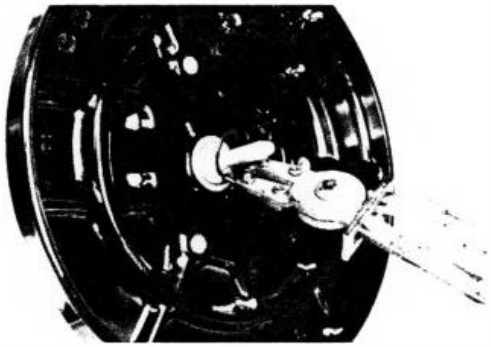


1. Rod Seal Lip & Perimeter
2. Push Rod
3. Operating Rod & Seal
4. Bearing, Valve Body Seal Lip
5. Diaphragm Plate Inside & Outside
6. Diaphragm to Shell Contacting Surface & to Retainer Contacting Surface

Fig. 9-101

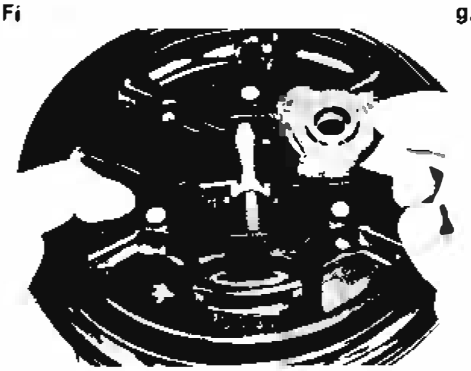
Install the retainer by turning about 45° with SST
SST [09736-30020]

Fig. 9-102



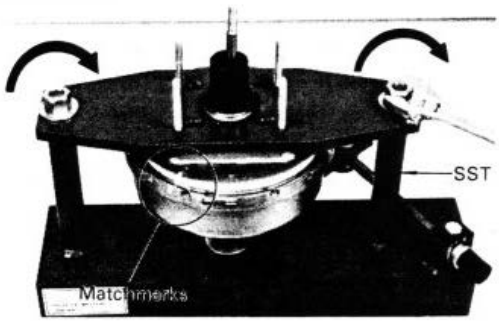
Install the plate and snap ring onto the valve operating rod.

Fig. 9-103



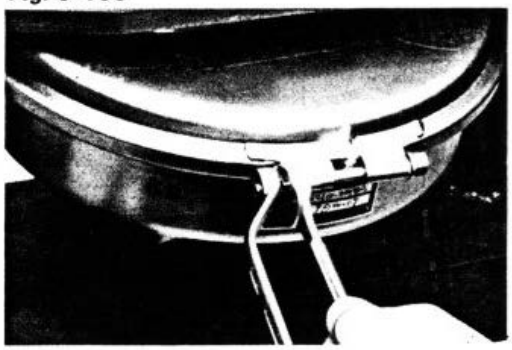
Install the reaction levers and plate with its protrusion directed upward

Fig. 9-104



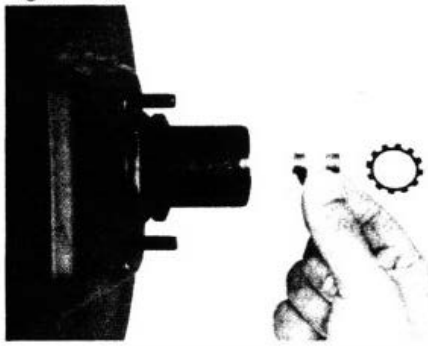
Align the matchmarks and fix to the SST.
SST (09753-00010) of set [09738-00020]

Fig. 9-105



Install the booster band with SST
SST (09753-00010) of set [09738-00020]

Fig. 9-106



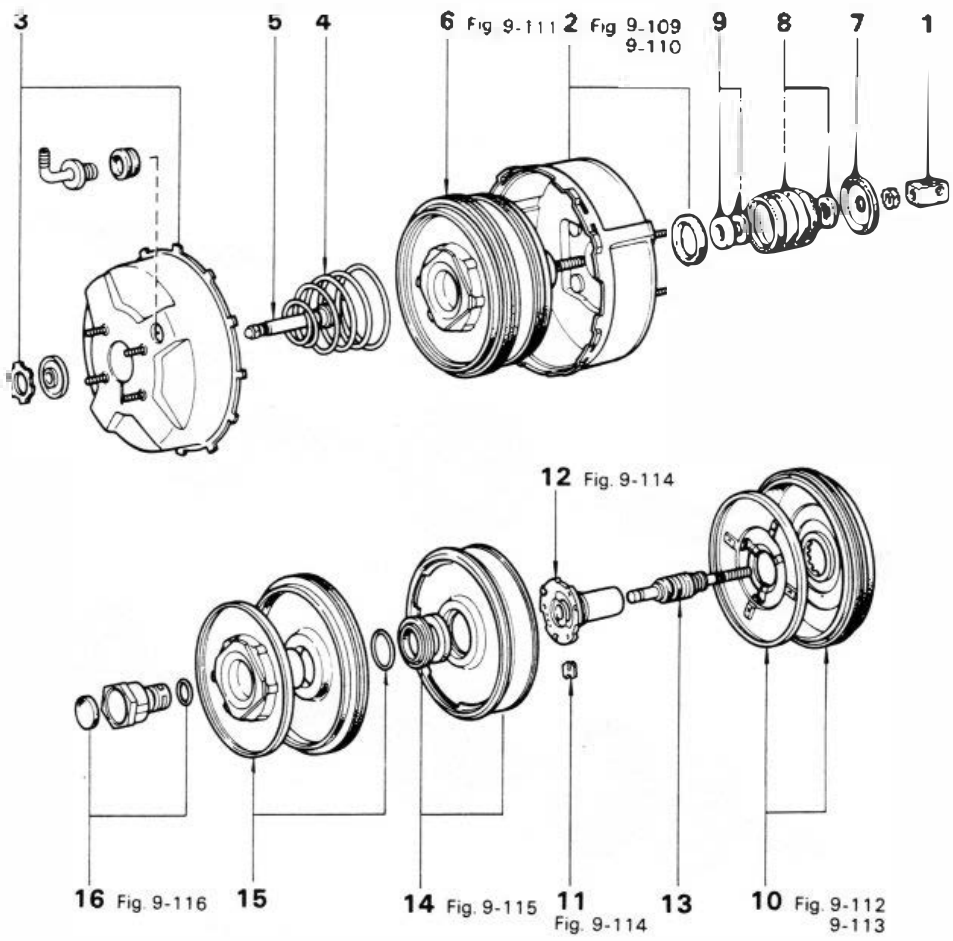
Install the air filter elements and retainer

DISASSEMBLY

(7.5 in. TANDEM TYPE : AISIN)

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

Fig. 9-107

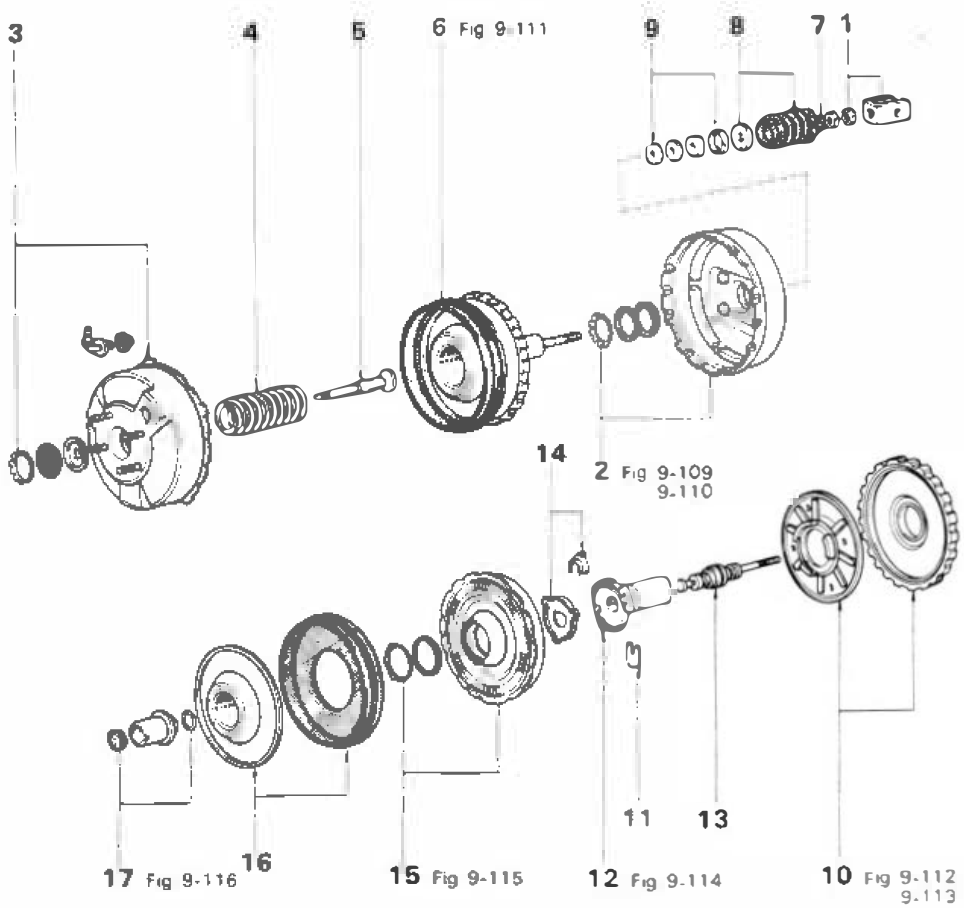


1	Clevis	9	Air Cleaner Element & Separater
2	No. 2 Body	10	Rear Diaphragm & Piston Plate
3	No. 1 Body	11	Valve Stopper Key
4	Piston Return Spring	12	No. 1 Piston
5	Piston Rod	13	Air Vlave Operating Rod
6	No. 3 Body	14	No. 3 Body
7	Deflector	15	No. 2 Piston & Front Diaphragm
8	Air Cleaner Element & Boot	16	Reaction Disc, Case & Oil Seal

(7.5 in. TANDEM TYPE : JKC)

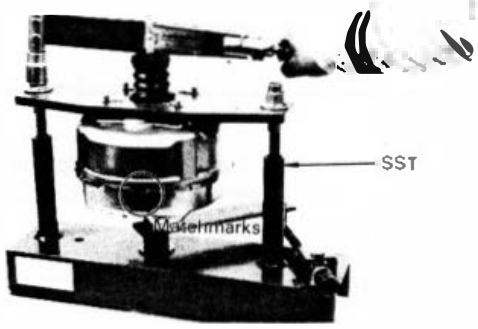
Disassemble the parts in the numerical order shown in the figure.

Fig. 9-108



1. Clevis
2. No.2 Body
3. No.1 Body
4. Piston Return Spring
5. Piston Rod
6. No.3 Body
7. E Ring
8. Air Cleaner & Boot
9. Air Cleaner Element & Separater
10. Rear Diaphragm & Piston Plate
11. Valve Stopper Key
12. No.1 Piston
13. Air Valve Operating Rod
14. Clip & Retainer
15. No.3 Body
16. No.2 Piston & Front Diaphragm
17. Reaction Disc, Case & Oil Seal

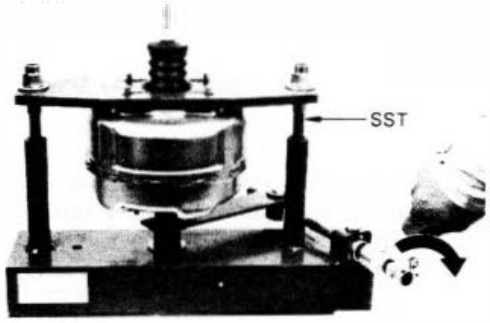
Fig. 9-109



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)

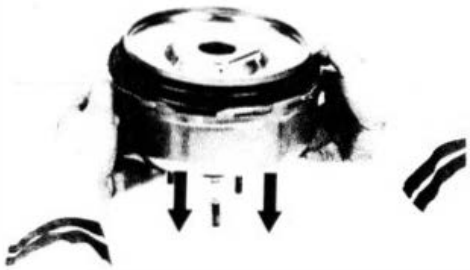
– Note –
Tighten the right and left nuts evenly.

Fig. 9-110



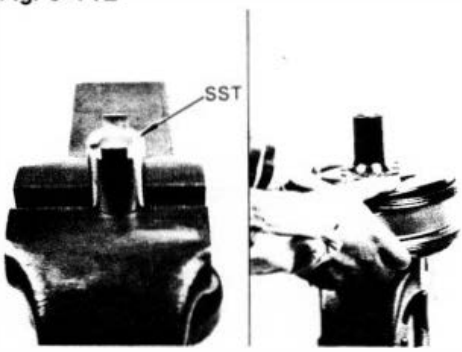
3. Turn the joint handle of the SST to separate No.1 body and No.2 body
   SST [09738-00020]

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 4ribs, push in two diagonal ones with your finger and turn the piston plate counterclockwise.
Then remove the diaphragm and piston plate.

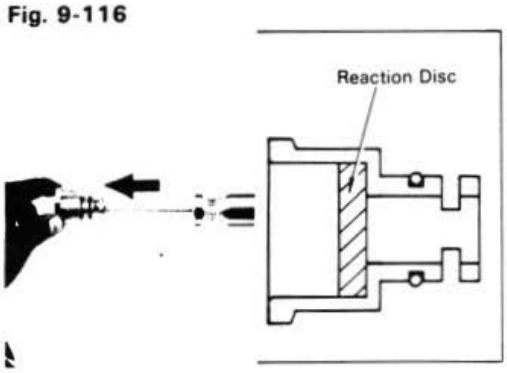
Fig. 9-114

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.

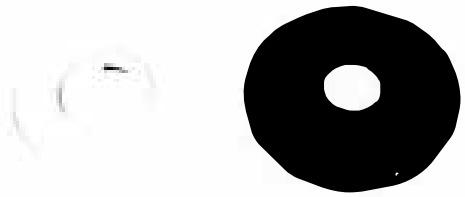
Fig. 9-116



Remove the reaction disc from the case.

Fig. 9-117
AISIN TYPE

JKC TYPE

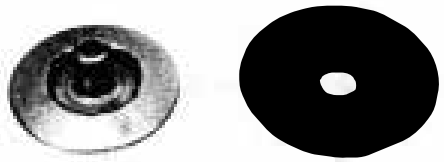


INSPECTION & REPAIR

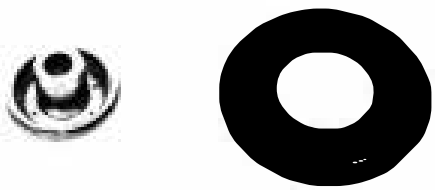
Rear Diaphragm & Plate

Inspect for wear, damage or cracks.

Fig. 9-118
AISIN TYPE



JKC TYPE



Front Diaphragm & No.2 Piston

Inspect the diaphragm No.2 piston and oil seal for wear, damage or cracks.

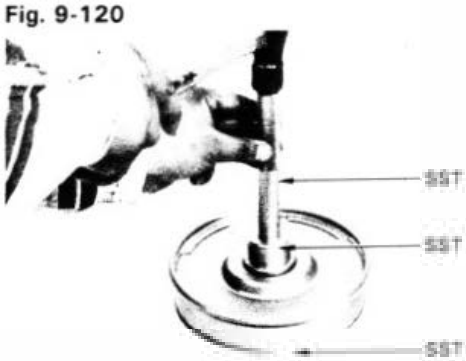
Fig. 9-119

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

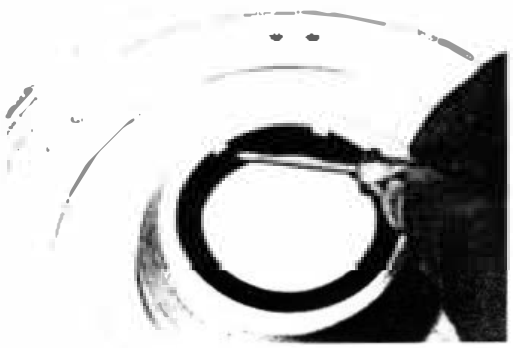


2 Install the seal and bearing to the No 3 body with SST
SST [09726-35010] No 1
[09753-30020]

– 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

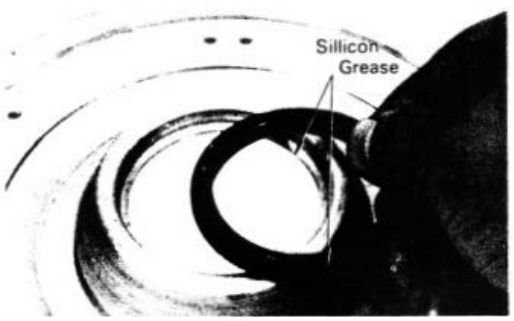


Replace The Seal & Bearing

JKC TYPE

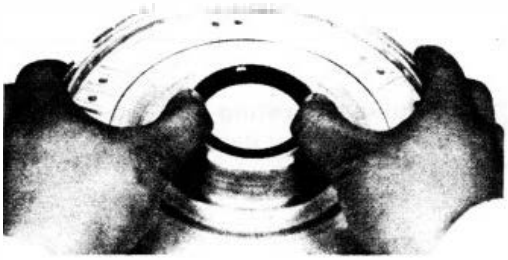
1 Remove the circular ring and seal from the No 3 body

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.

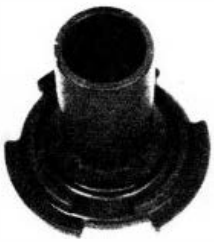
Fig. 9-124

AISIN TYPE

Piston Rod
Inspect for wear, damage or bend.

JKC TYPE

Fig. 9-125



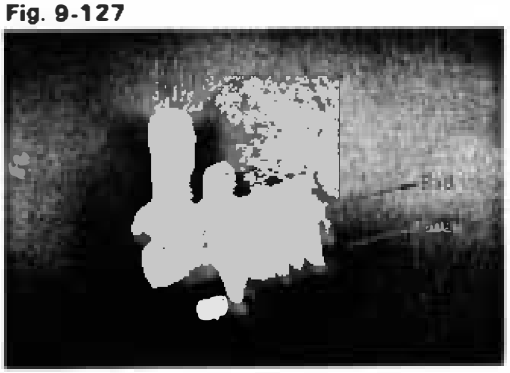
Booster Piston
Inspect for scratches, cracks or deformation.

Fig. 9-126
AISIN TYPE

JKC TYPE

Air Valve Operating Rod
Inspect for wear or damage

Fig. 9-127



Vacuum Check Valve
Check the operation of the valve

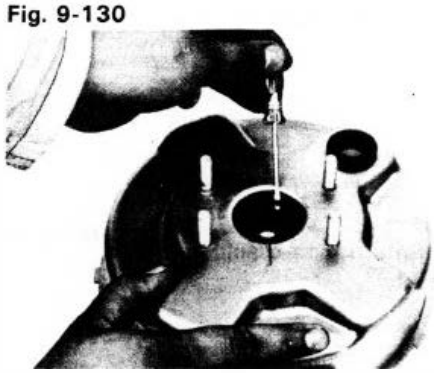
Fig. 9-128
AISIN TYPE

Booster Body, Seal & Bearing
Inspect the booster bodies, seals and bearing for wear or damage

Fig. 9-129
JKC TYPE

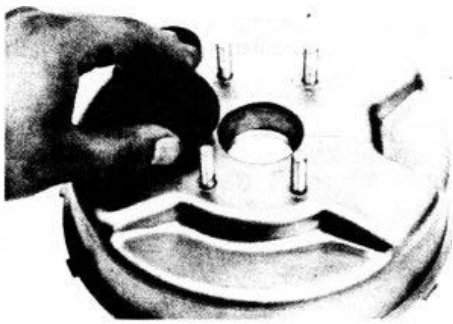
Booster Body, Seal & Bearing
Inspect the booster bodies, seals and bearing for wear or damper

Fig. 9-130



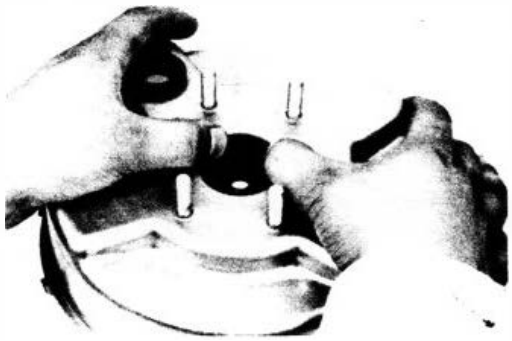
Replace The No.1 Body Seal
AISIN TYPE
1. Remove the circular ring andseal from the No.1 body seal

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

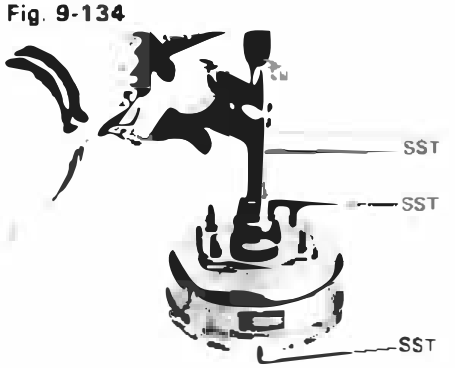
Fig. 9-133

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

Fig. 9-134

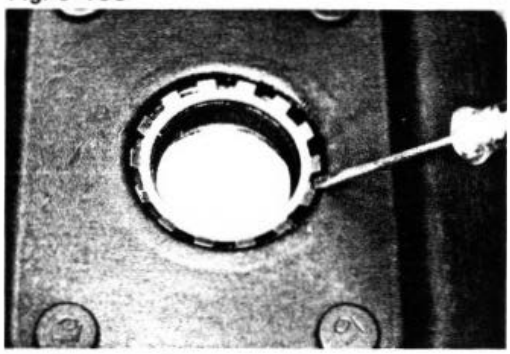


2. Install a new seal to the No.2 body seal with SST.
   SST [09726-35010] No.1
   [09608-35010]
   [09753-30020]
   [09608-20011] No.2

— Note —

Be careful not to crack the bearing during assembly.

Fig. 9-135

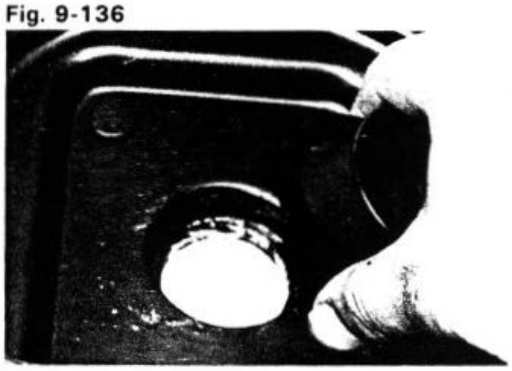


Replace The No.2 Body Seal

JKC TYPE

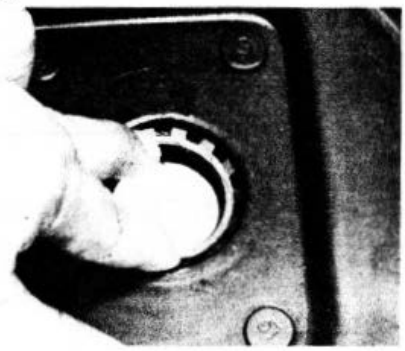
1. Remove the circular ring and seal from the No.2 body seal.

Fig. 9-136



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

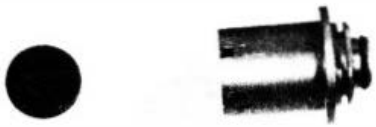
Fig. 9-138

AISIN TYPE

Reaction Disc & Case

Inspect for wear, damage, cracks or corrosion

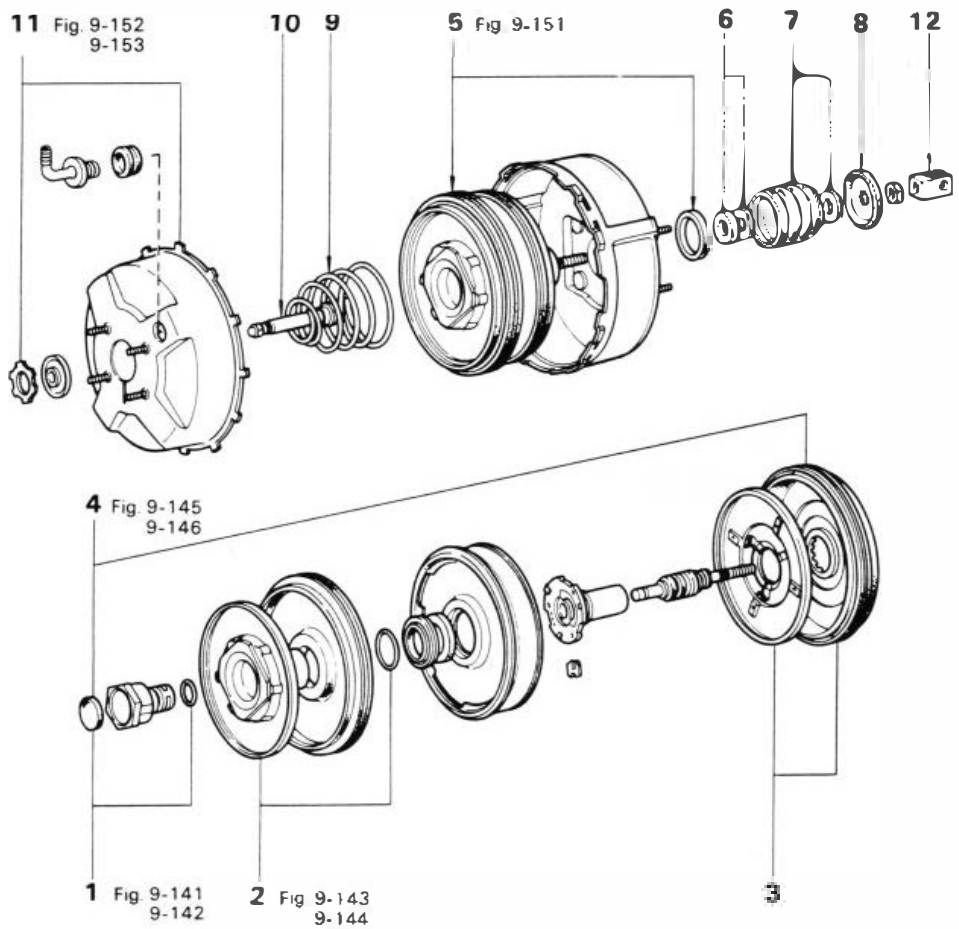
JKC TYPE



ASSEMBLY
(7.5 in. TANDEM TYPE : AISIN)

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

Fig. 9-139

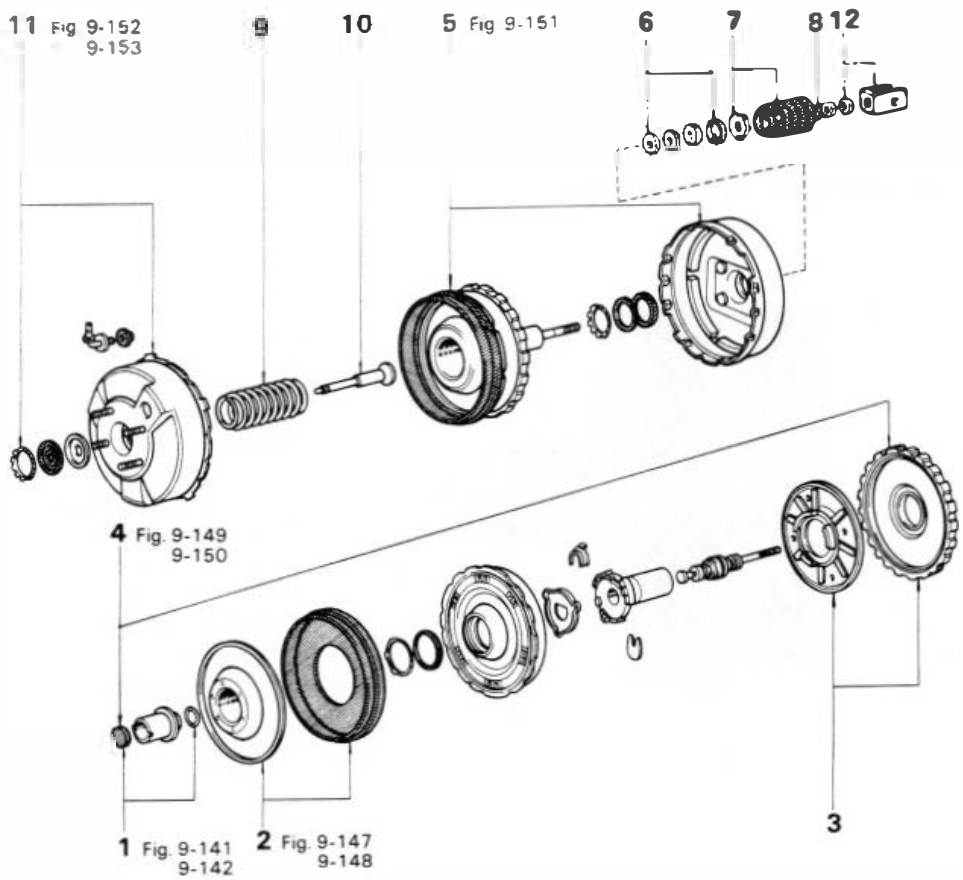


1. Reaction Disc, Case & Oil Seal
2. Front Diaphragm, Retainer & No.2 Piston
3. Piston Plate & Rear Diaphragm
4. No.3 Body
5. No.3 Body & No.2 Body
6. Air Cleaner Separater & Element
7. Boot & Air Cleaner Element
8. Deflector
9. Piston Return Spring
10. Piston Rod
11. No.1 Body
12. Clevis

(7.5 in. TANDEM TYPE : JKC)

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

Fig. 9-140

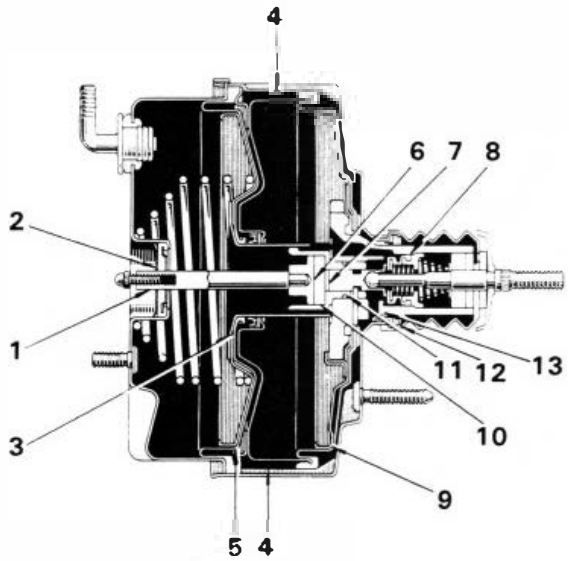


1. Reaction Disc, Case & Oil Seal
2. Front Diaphragm, Retainer & No.2 Piston
3. Piston Plate & Rear Diaphragm
4. No.3 Body
5. No.3 Body & No.2 Body
6. Air Cleaner Separater & Element
7. Boot & Air Cleaner Element
8. E Ring
9. Piston Return Spring
10. Piston Rod
11. No.1 Body
12. Clevis

– 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 Ssurface 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)

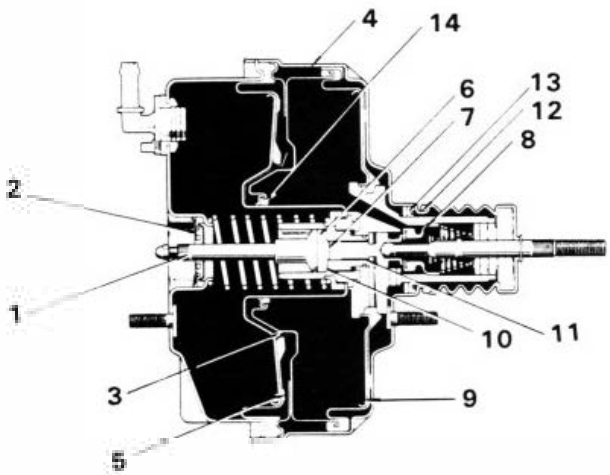
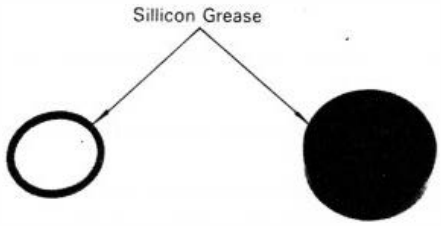
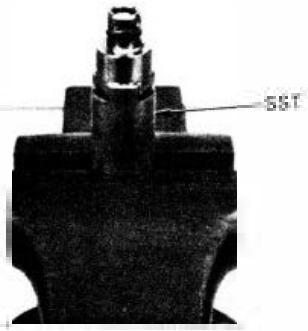


Fig. 9-142



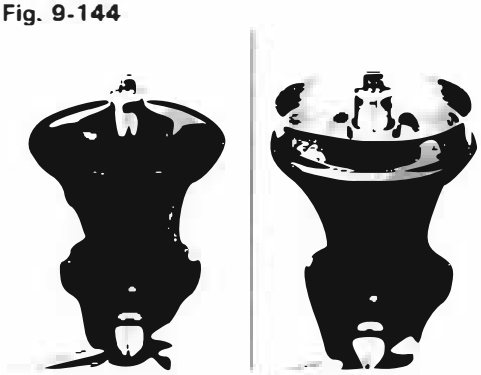
⚠ Coat the outer surface of the reaction disc and O ring with silicon grease.

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

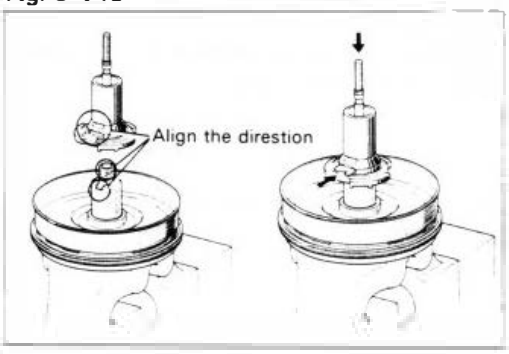


2 Install the front diaphragm and No.2 piston to the reaction disc case.
3 Install the No.3 body to the No.2 piston

– 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

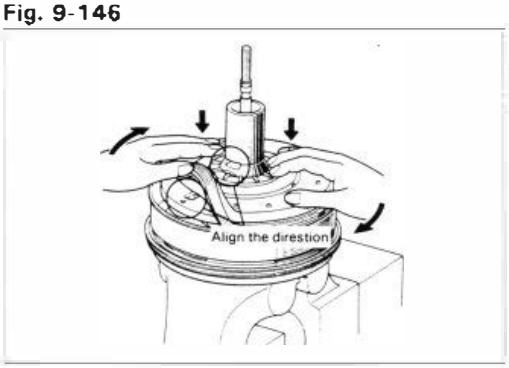


4 Push in the valve operating rod and valve stop key, and install the No.1 piston and No.2 piston

– Note –

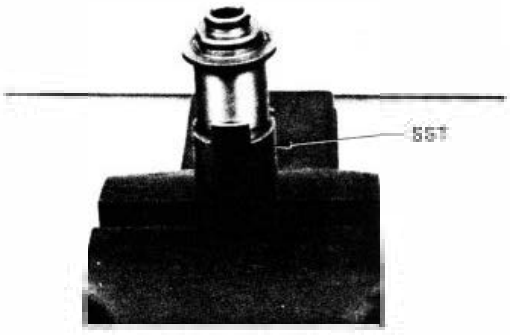
Align the reaction disc case, No.1 piston and No.2 piston in the same direction.

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 digonal 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 thereaction 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 crip as shown in the figure

Fig. 9-150

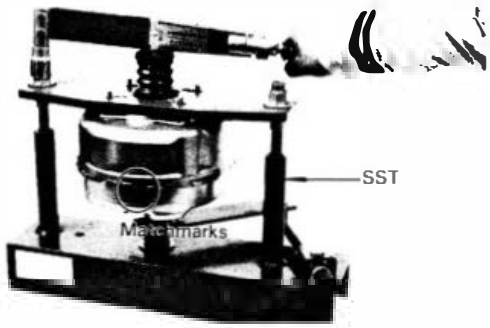
Match the hole and crip

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

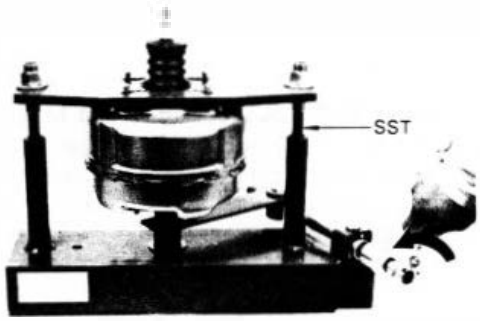


Install the No.1 body return spring, piston rod and No.2 body to SST and tighten the nut
SST [09738-00020]

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

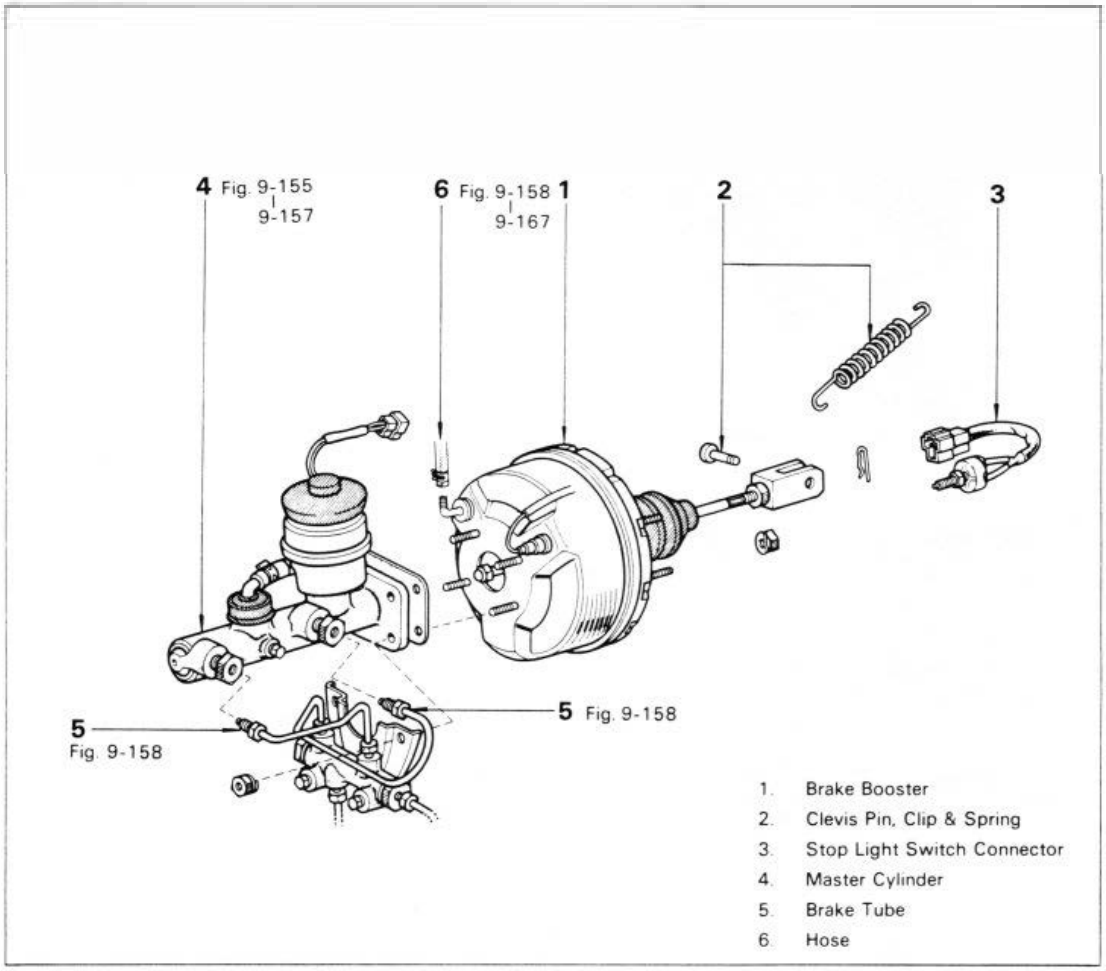
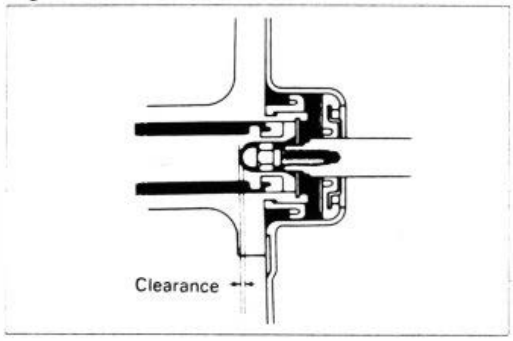


Fig. 9-155



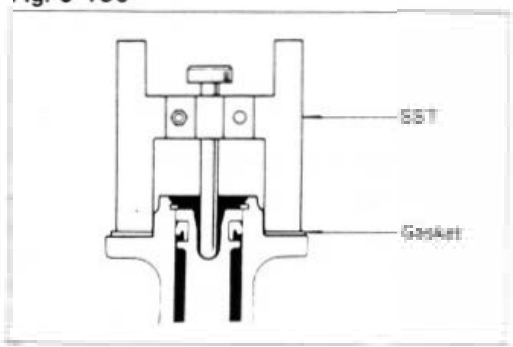
Adjust The Booster Push Rod Length

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 vaccum
0.1 – 0.5 mm
(0.004 – 0.020 in.)

Fig. 9-156

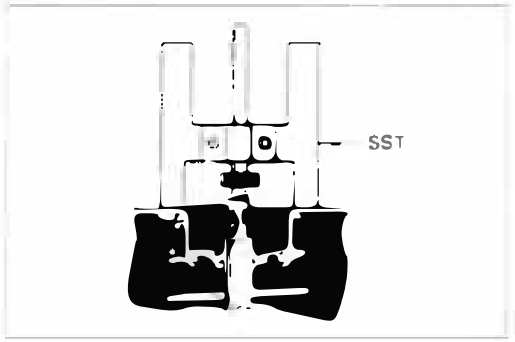


1 Set the SST on the master cylinder and push the pin until it contacts the piston
SST [09737-00010]

Note

Measure the master cylinder together with the gasket.

Fig. 9-157



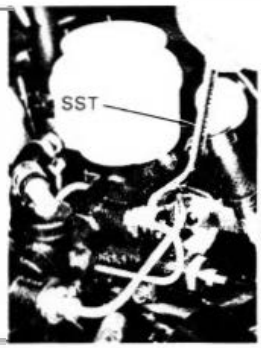
2 Turn the SST upside down and place it on the booster. Adjust the booster push rod length until the rod end contacts the pin head.
SST [09737-00010]

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

SEE MASTER CYLINDER INSTALLATION SECTION
Fig. 9-54 to 9-69



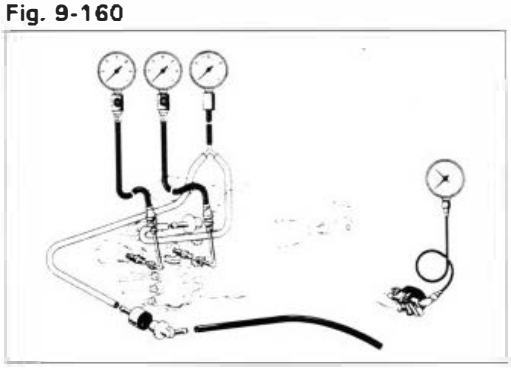
Install the master cylinder and connect the brake tube with SST.
SST [09751-36011]

Fig. 9-159

SEE BRAKE PEDAL ADJUSTMENT & AIR BLEEDING SECTION
Fig. 9-5, 9-11 to 9-14

After installing, adjust the pedal height and play, and bleed air from the system.

Fig. 9-160

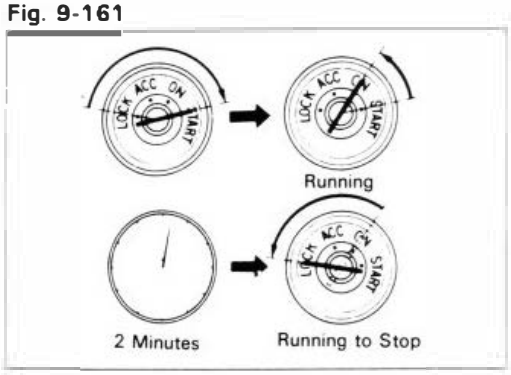


ON-VEHICLE INSPECTION

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



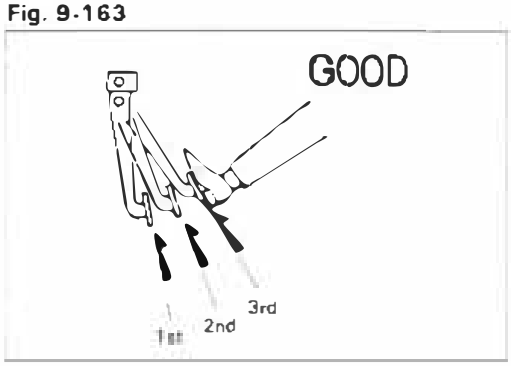
Check The Air Tighteness

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.

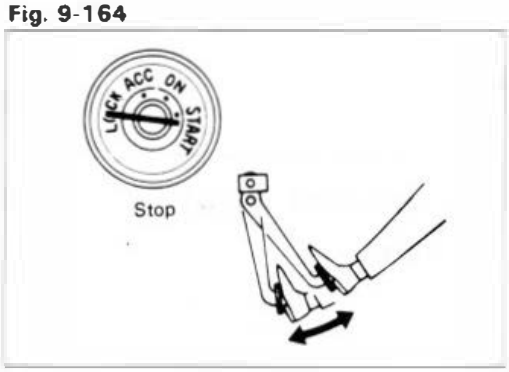
Fig. 9-163



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!

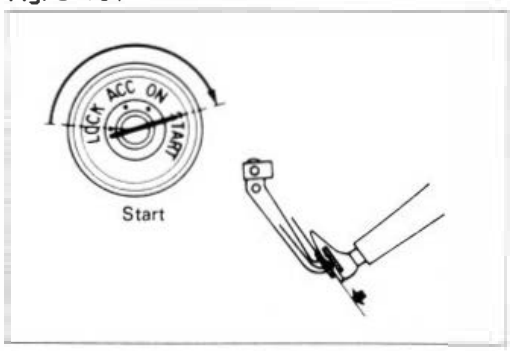
Fig. 9-164



Check The Operation

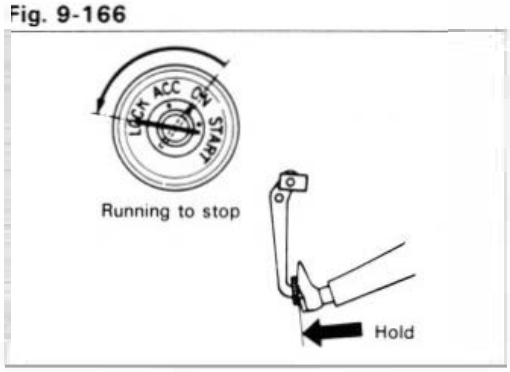
1 With the engine stopped pump the brake pedal several times with the same pressure Insure that the pedal height does not change

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

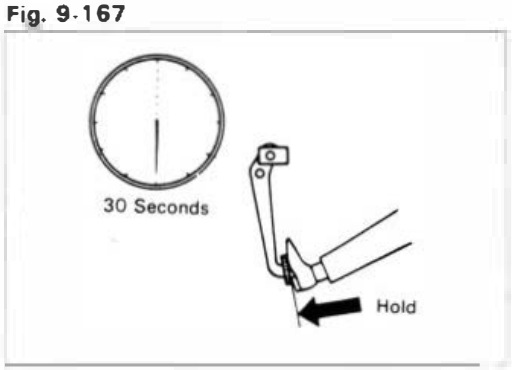
Fig. 9-166



Check The Air Tighteness 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

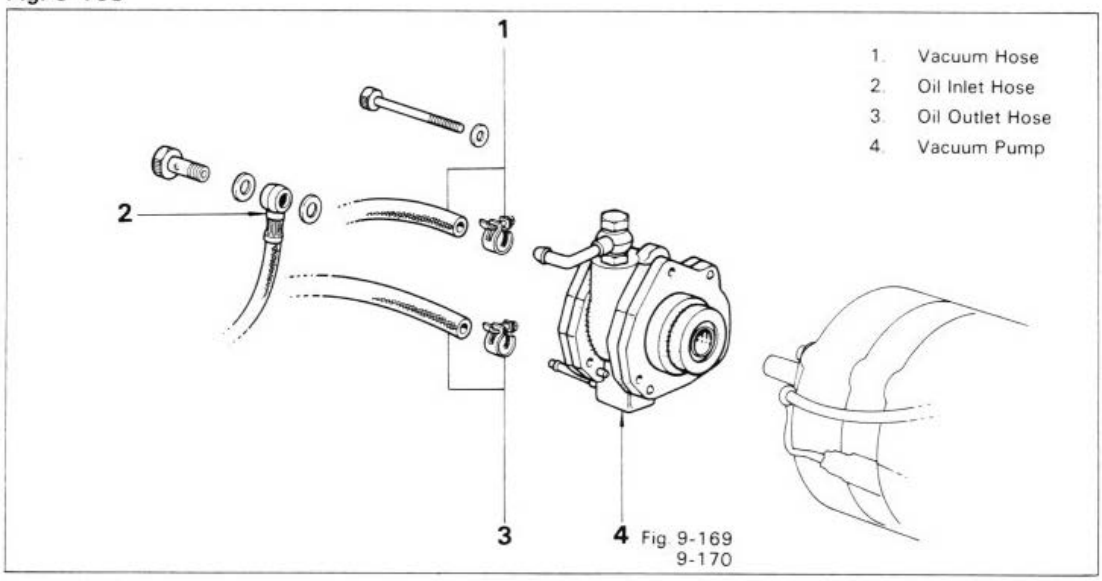
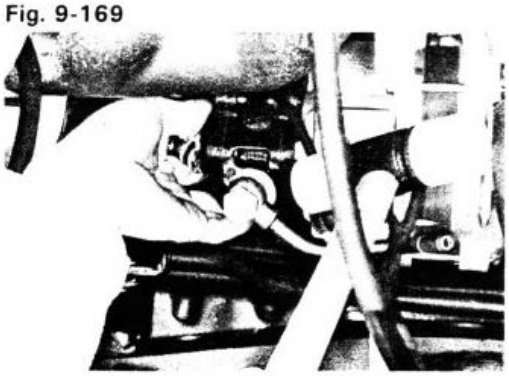


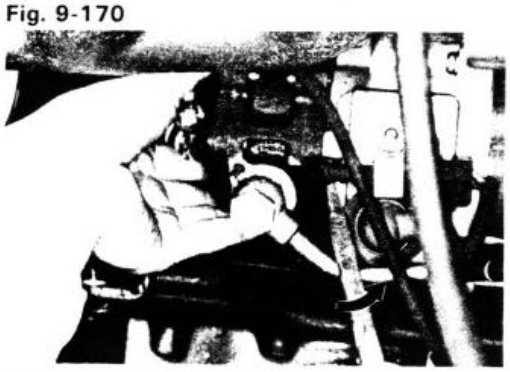
Fig. 9-169
9-170

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

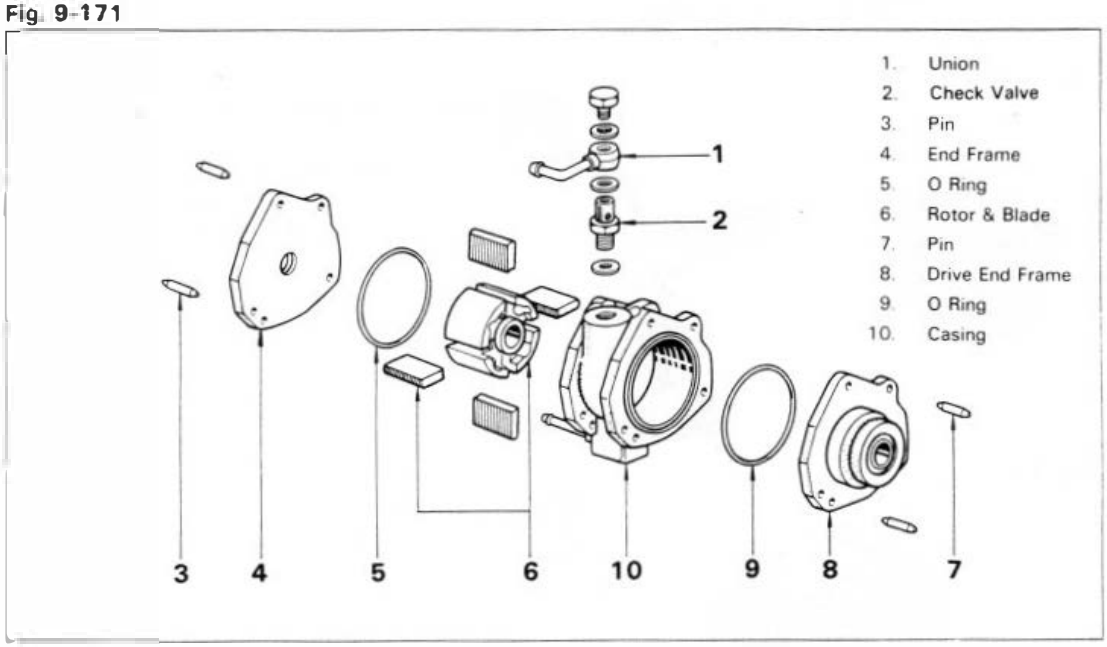


Fig. 9-172

INSPECTION & REPAIR

Casing

Inspect for wear or damage.

Fig. 9-173

End Frame

Inspect for wear or damage.

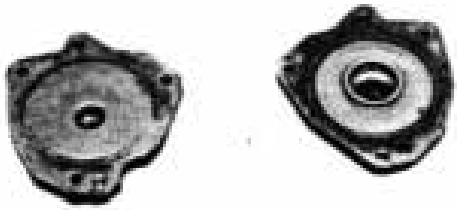
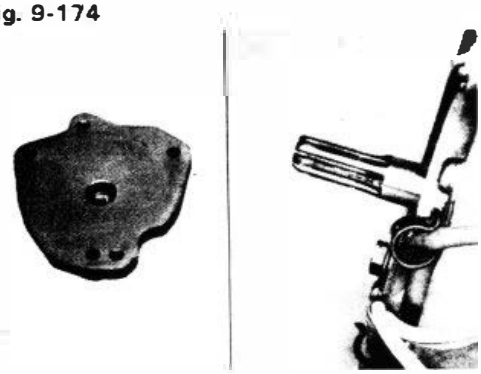


Fig. 9-174



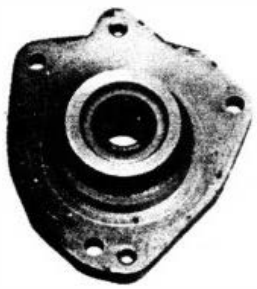
Bushing & Shaft

Inspect for wear or damage

Bushing bore diameter:

Limit 16.14 mm (0.6354 in.)

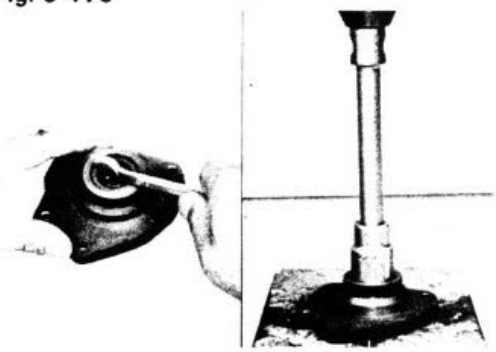
Fig. 9-175



Oil Seal

Inspect for wear or damage

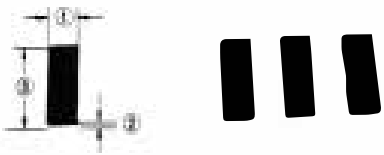
Fig. 9-176



Replace The Oil Seal

1. Remove the oil seal.
2. Drive in the oil seal with a socket wrench.

Fig. 9-177



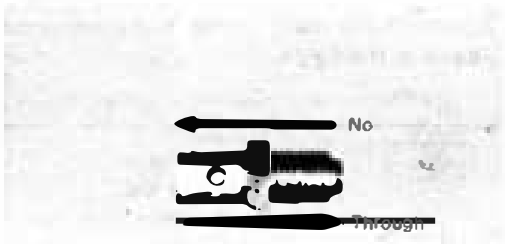
Blade

Inspect for wear or damage

mm (in.)

Item \ Series	2H, B
① Height limit	11.6 (0.457)
② Width limit	6.9 (0.272)
③ Length limit	34.9 (1.374)

Fig. 9-178

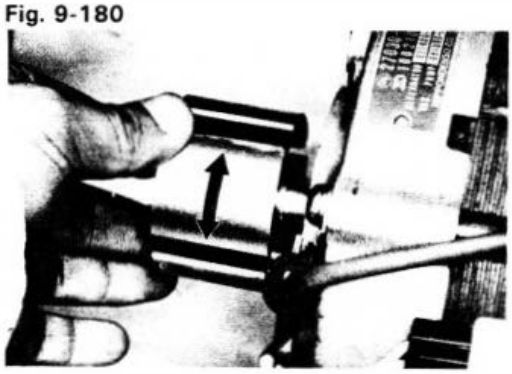


Check Valve
Check to see that the lead is in the direction shown in the figure.

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

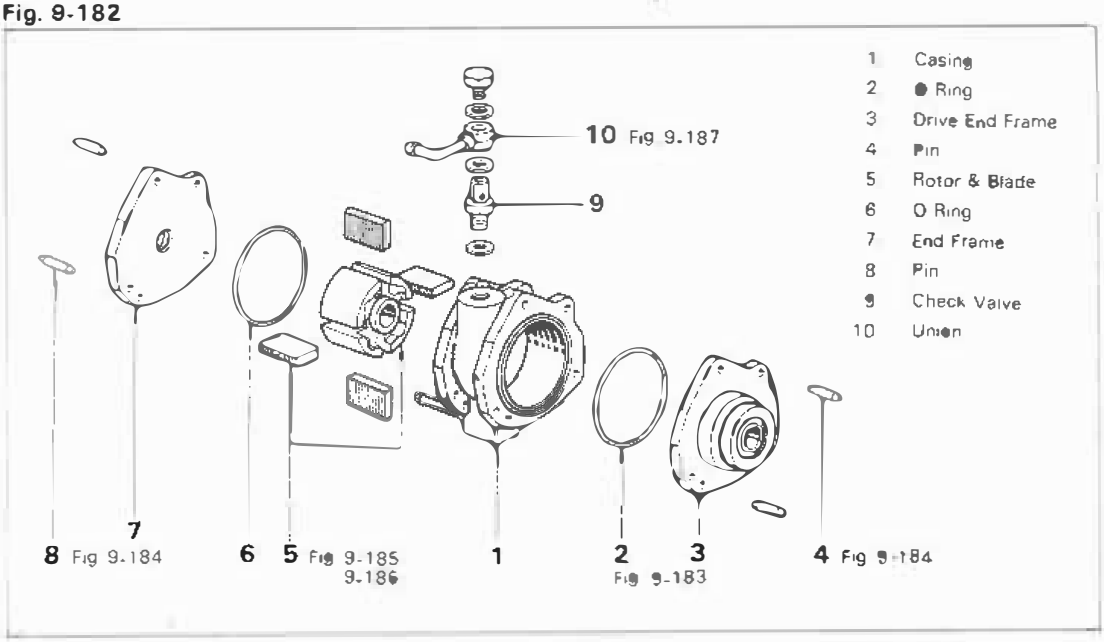


Fig. 9-183

Use new O ring

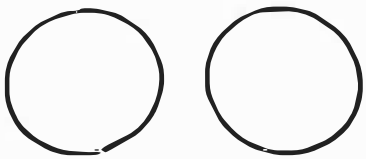


Fig. 9-184

[redacted]

Strike out 5 mm (0.20 in.)

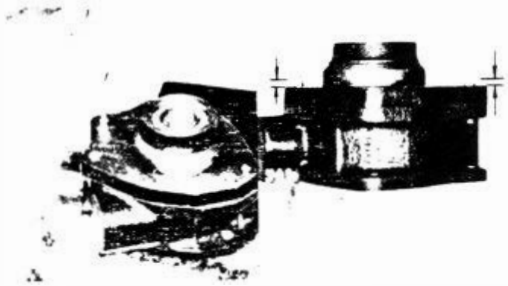
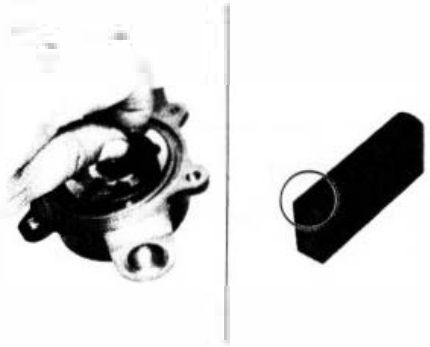


Fig. 9-185

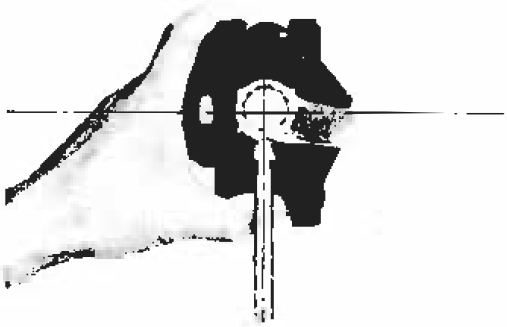


Face the rounded side toward the outside

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

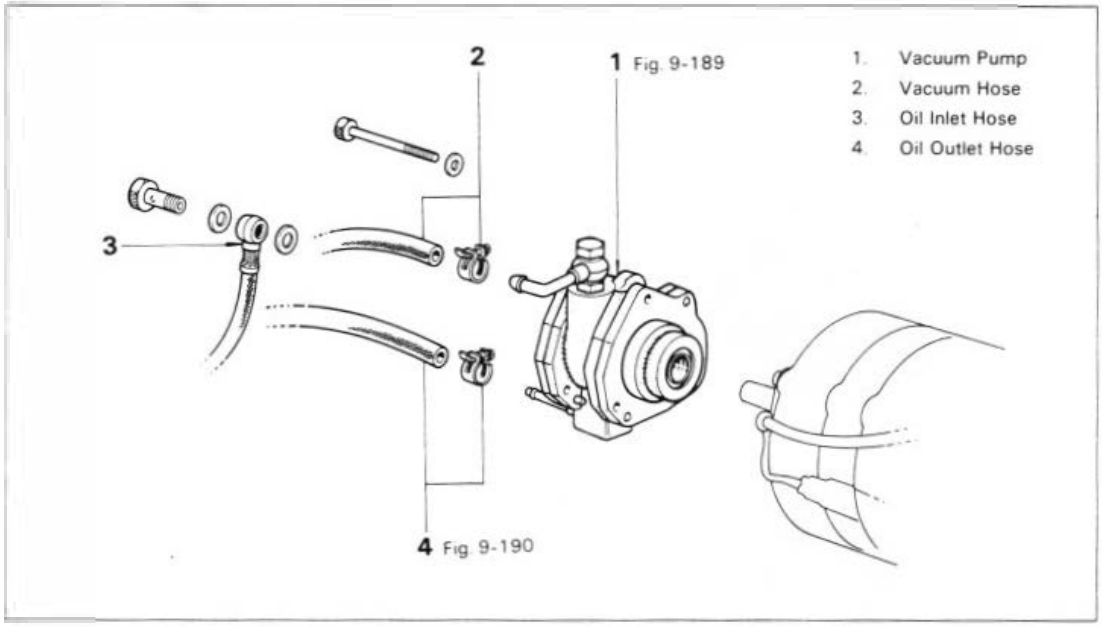
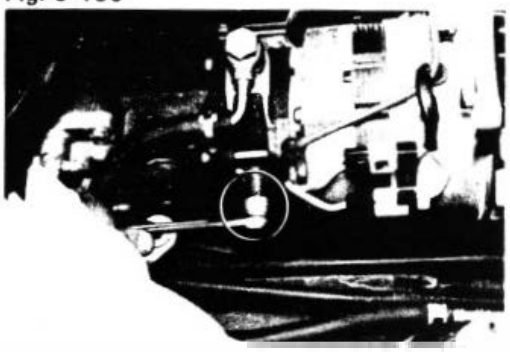


Fig. 9-189

⚠ Apply MP grease to the oil seal lip.

Fig. 9-190



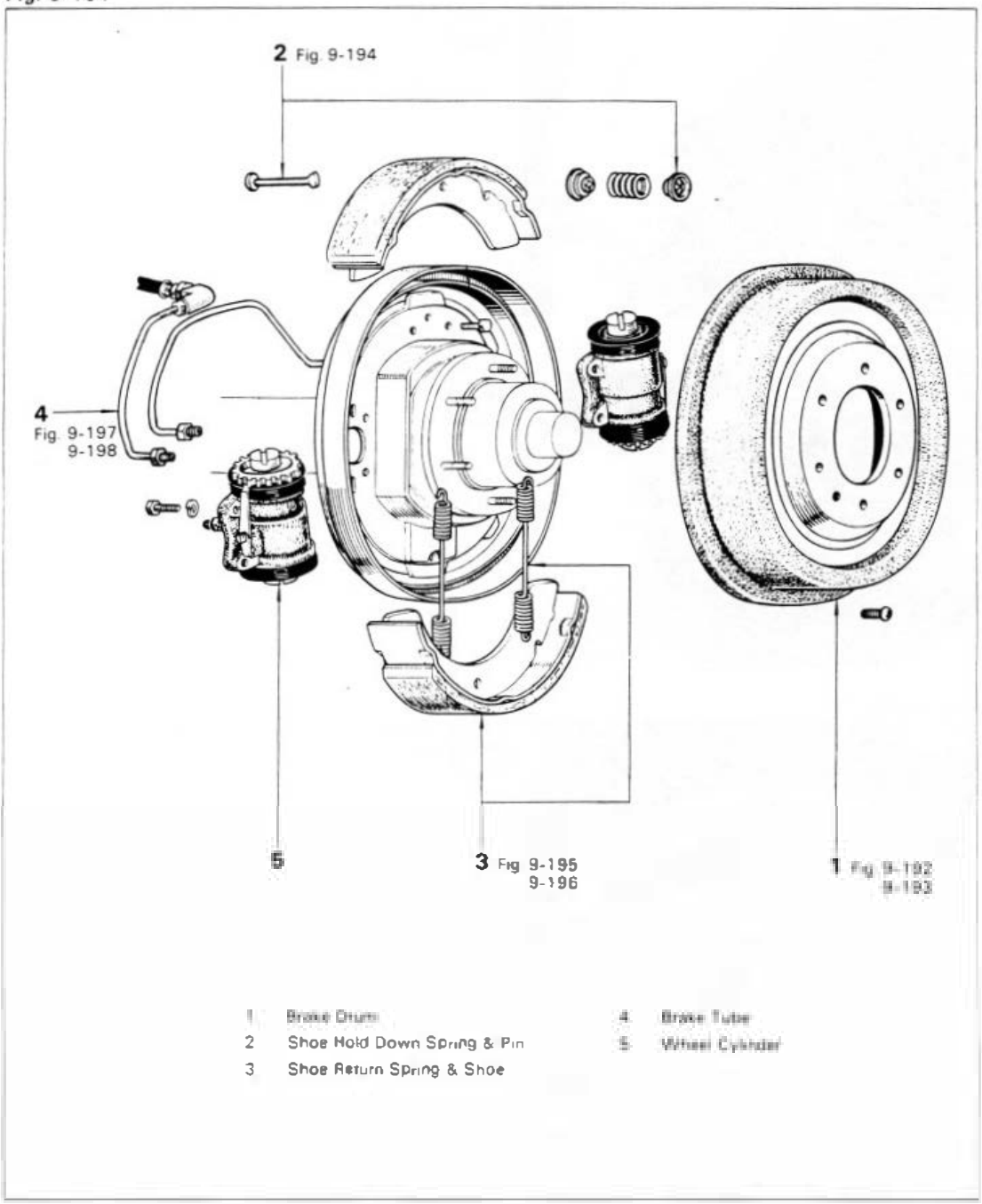
⚠ While the engine is idling, loosen the outlet union bolt and confirm that oil leaks out.

FRONT BRAKE (DRUM TYPE)

REMOVAL

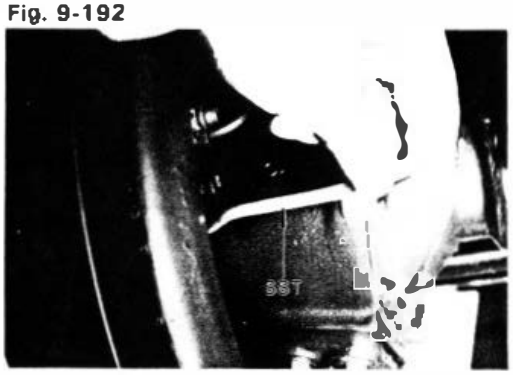
Remove the parts in the numerical order shown in the figure.

Fig. 9-191



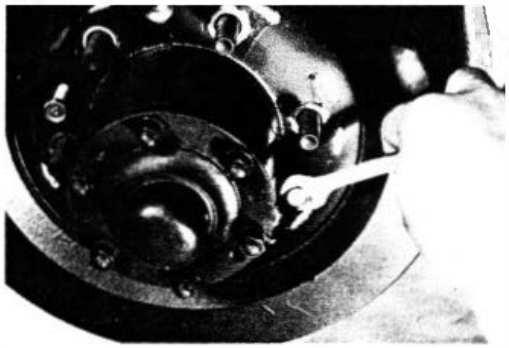
1 Brake Drum
2 Shoe Hold Down Spring & Pin
3 Shoe Return Spring & Shoe
4 Brake Tube
5 Wheel Cylinder

Fig. 9-192



Return the wheel cylinder adjusting nut with SST
SST [09704-10010]

Fig. 9-193

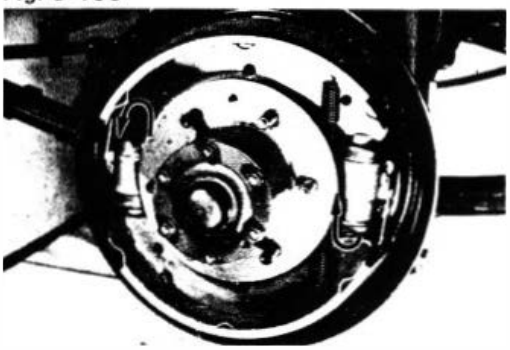


Remove the drum by screwing service bolt

Fig. 9-194

Remove the snap ring with SST
SST [09718-00010]

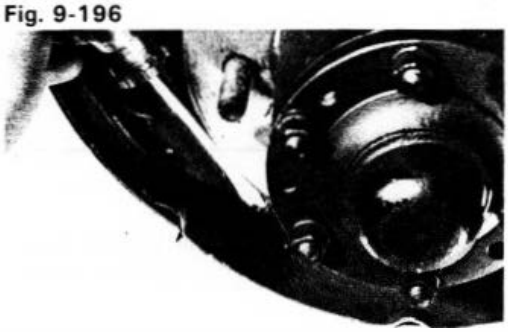
Fig. 9-195



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

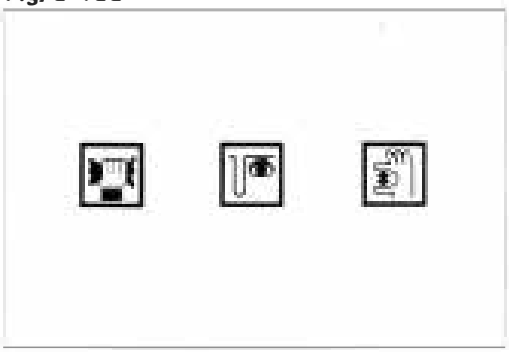
Fig. 9-197

Loosen the union nut with SST
SST [09751-36011]

Fig. 9-198

Assemble the bleeder plug cap to the brake tube

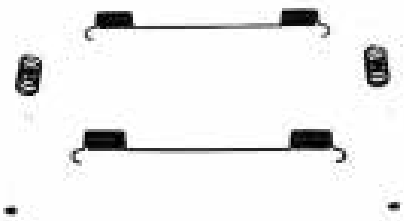
Fig. 9-199



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

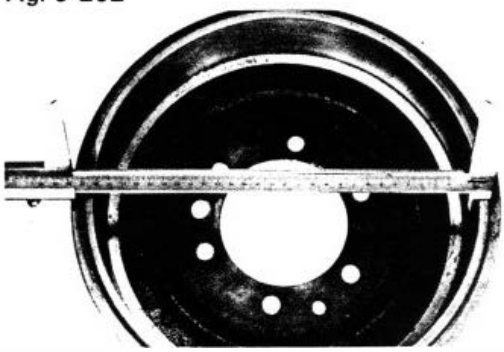
Shoe & Lining

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:

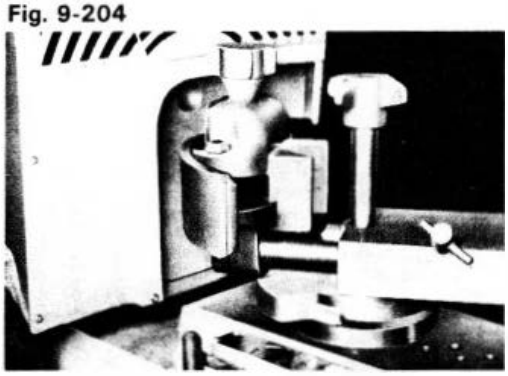
STD 295 mm (11.61 in.)

Limit 297 mm (11.69 in.)

Fig. 9-203

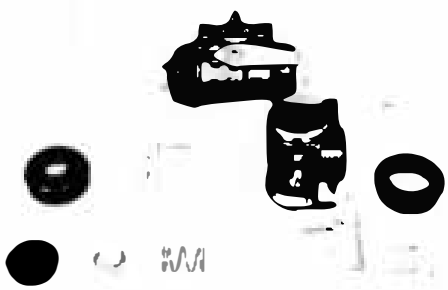
Inspect the brake lining and drum for proper contact

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

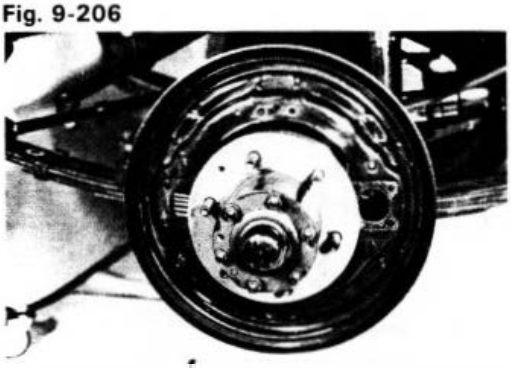
Fig. 9-205



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



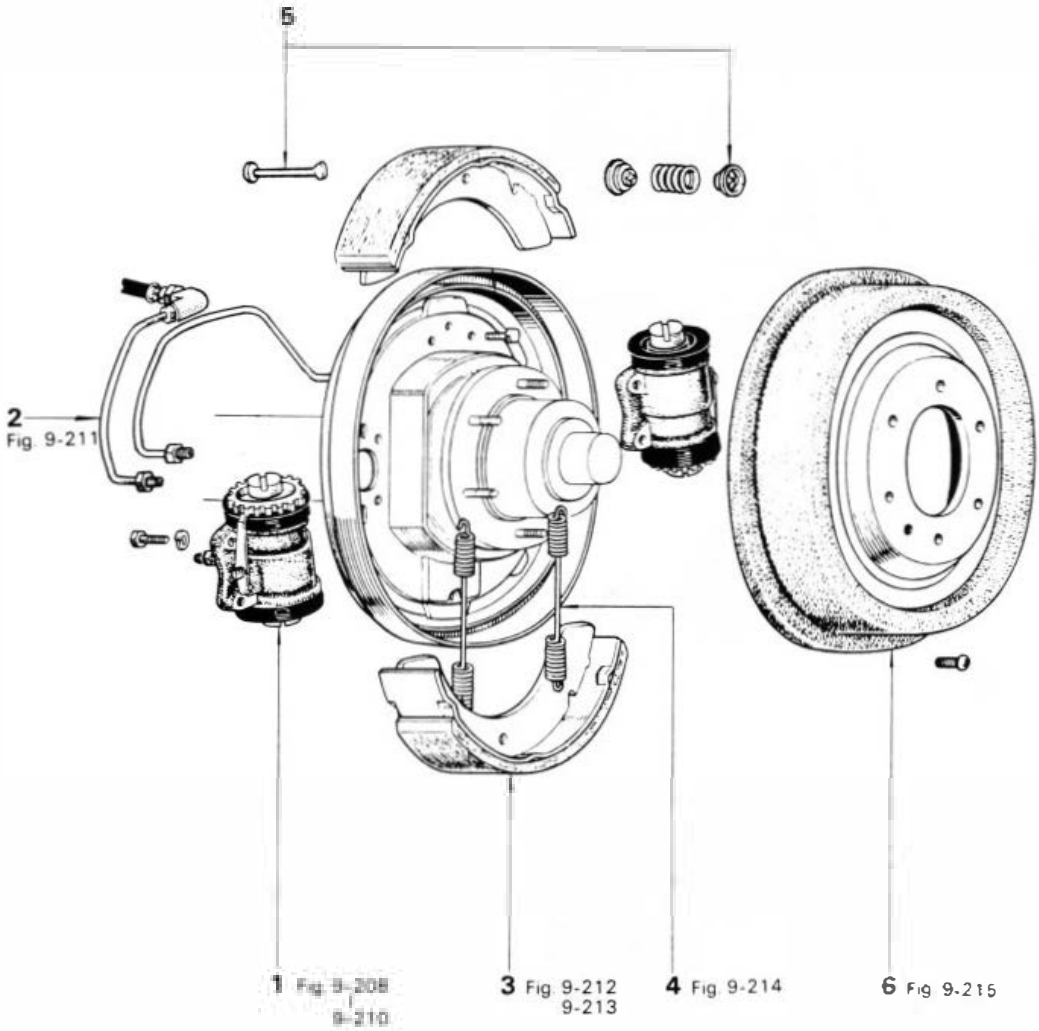
Backing Plate

Inspect for damage, cracks, or deformation
For removal and installation, refer to the Front Axle section installation

INSTALLATION

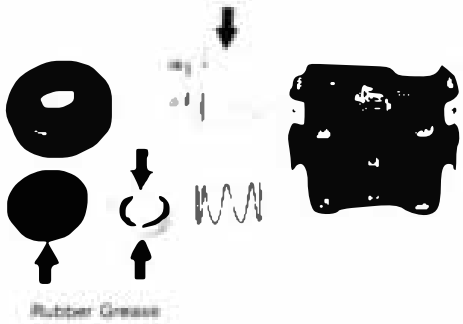
Install the parts in the numerical order shown in the figure

Fig. 9-207



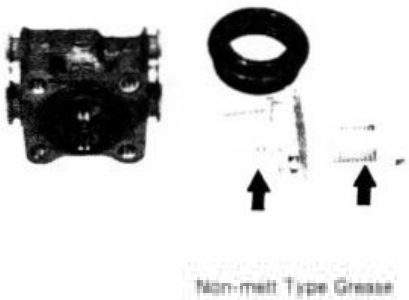
1. Wheel Cylinder
2. Brake Tube
3. Brake Shoe
4. Shoe Return Spring
5. Shoe Hold Down Spring & Pin
6. Brake Drum

Fig. 9-208



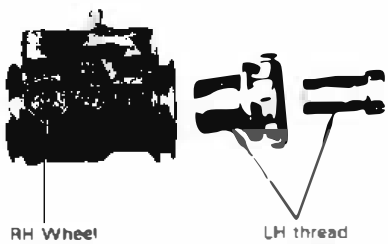
⚠ Coat the piston and cup with rubber grease

Fig. 9-209



⚠ Coat the adjusting nut and bolt with non-melt type grease.

Fig. 9-210



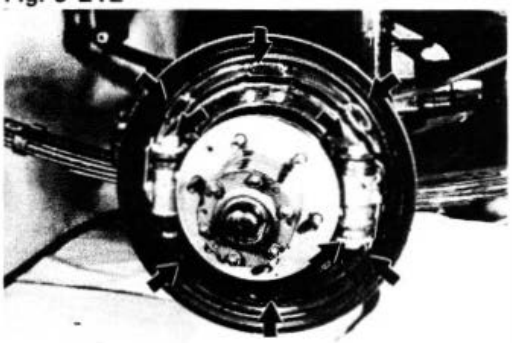
⚠ Install the left hand thread adjusting nut and bolt at the RH wheel brake.

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

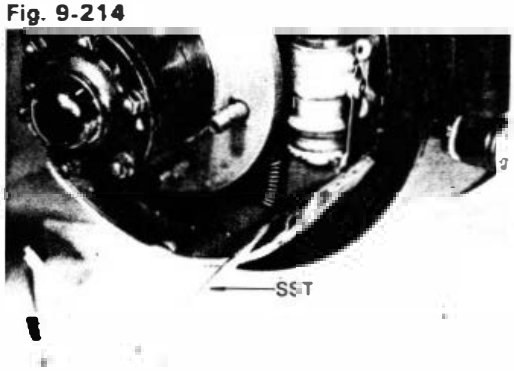


Apply non-melt type grease to the place indicated by the arrow

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

Bleed the air from the system
Adjust the brake shoe clearance with SST
SST [09704-10010]

SEE
AIR BLEEDING & BRAKE
SHOE CLEARANCE
ADJUSTMENT SECTIONT
Fig. 9-5, 9-11 to 9-14

FRONT BRAKE (DISC TYPE)

BRAKE PAD

REMOVAL

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

Fig. 9-216

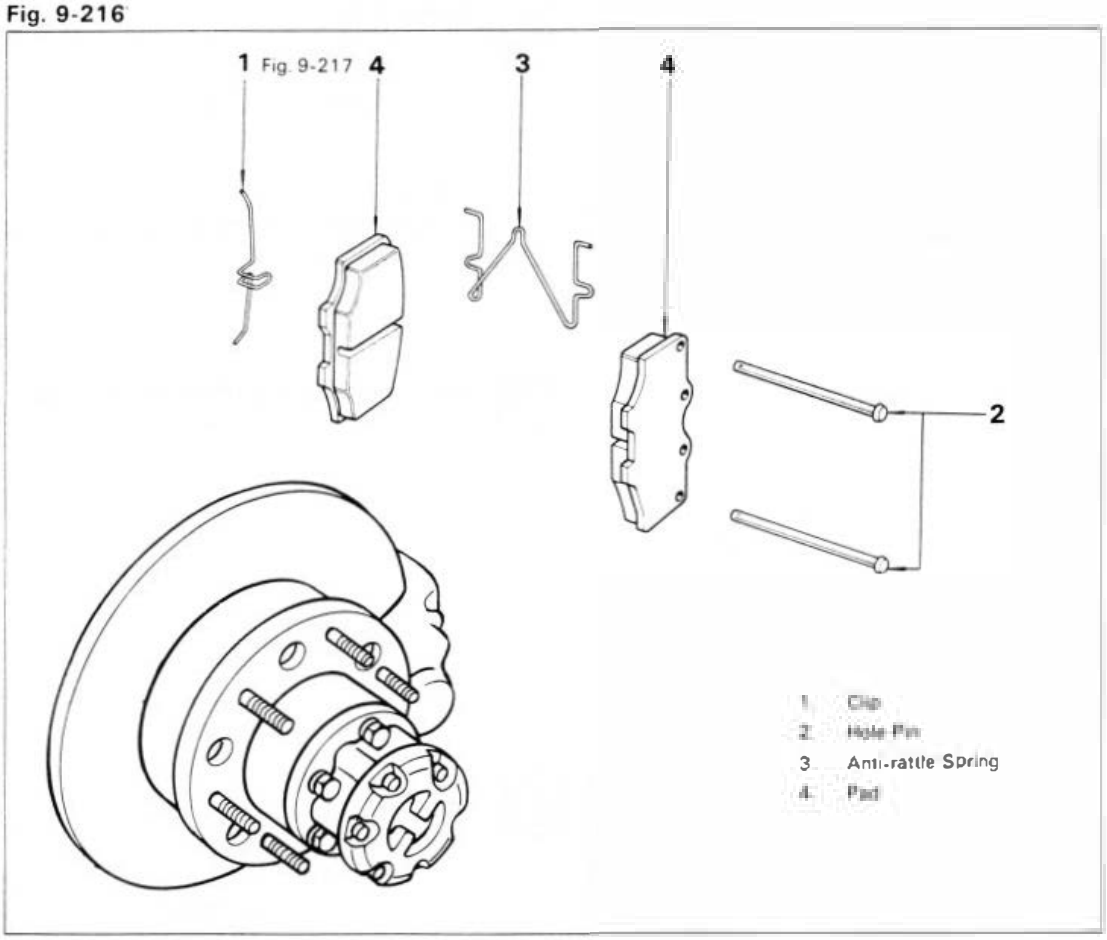


Fig. 2-217

Check the brake pad thickness

Brake pad lining thickness:

Limit 1.0 mm (0.039 in.)

Fig. 9-218

INSPECTION

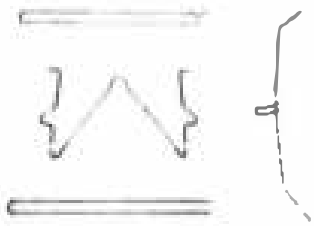
Brake Pad

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

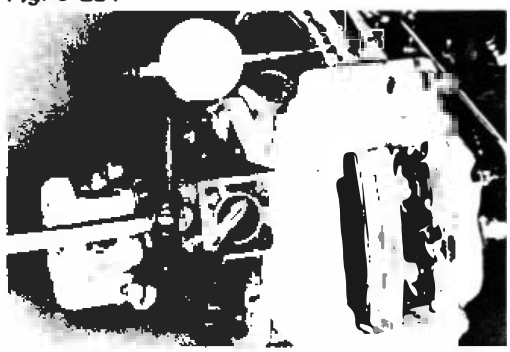
Disc

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

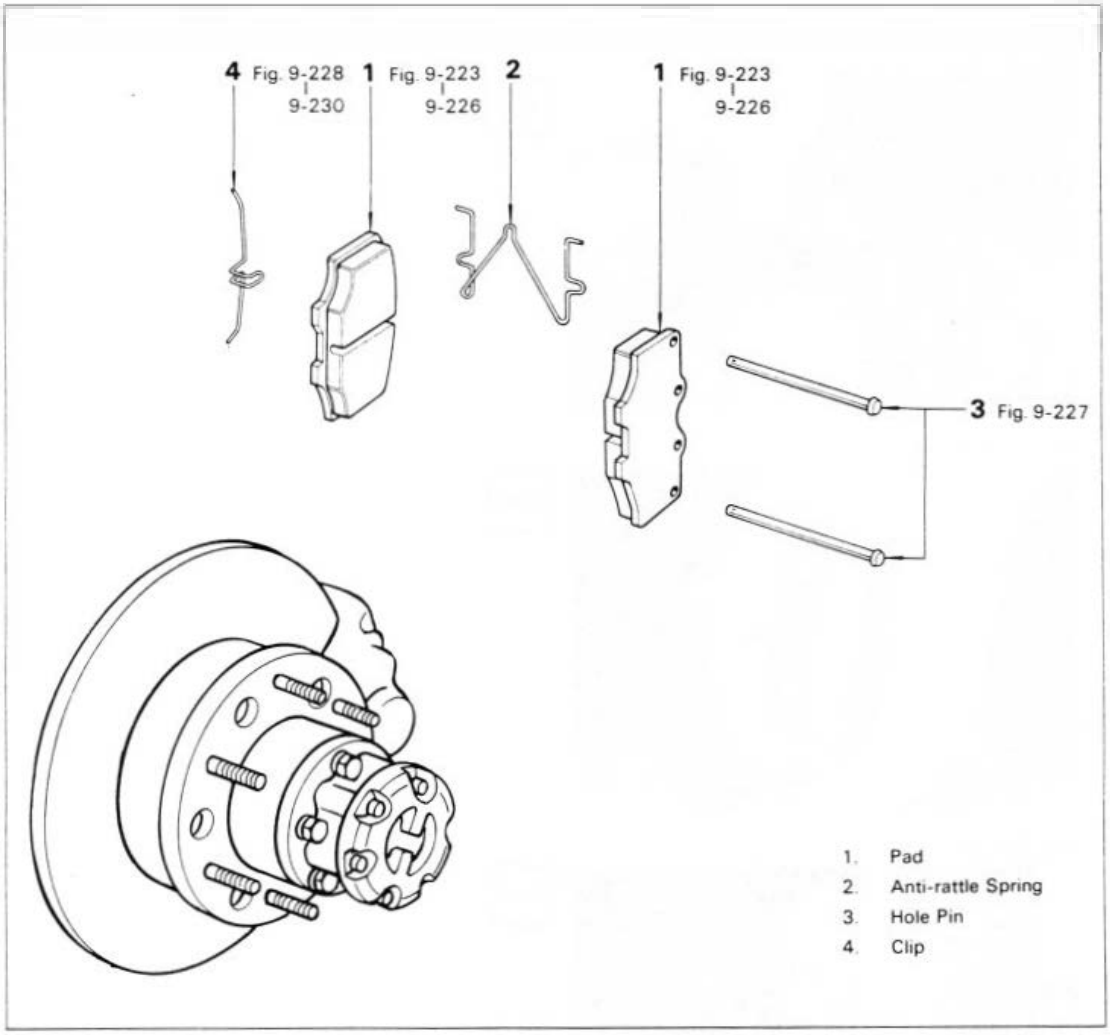
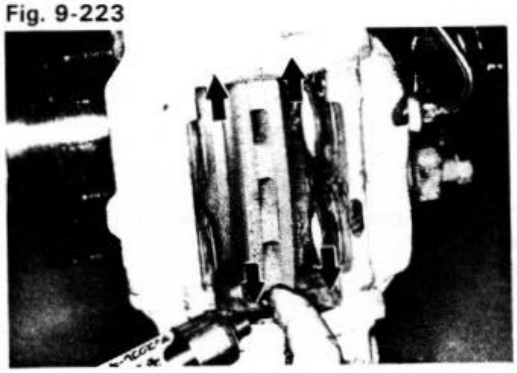
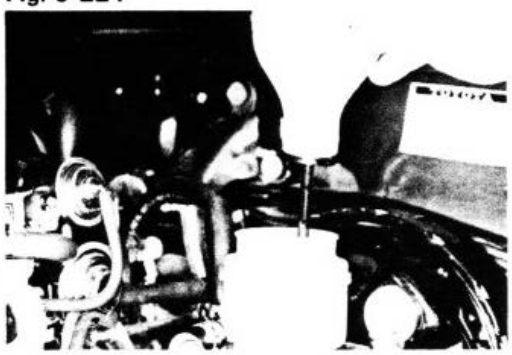


Fig. 9-223



⚠ Coat disc brake grease on the disc brake cylinder that the pads slide on.

Fig. 9-224

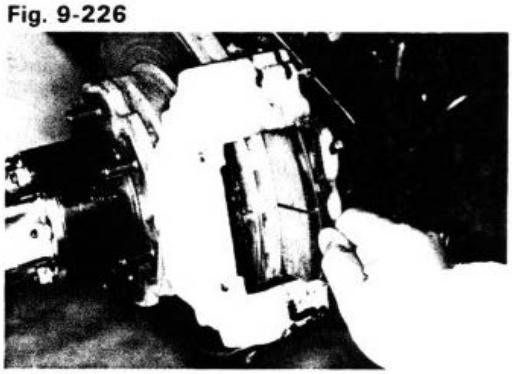


Draw out a small amount of brake fluid from the reservoir

Fig. 9-225

Push both pistons into the cylinder

Fig. 9-226

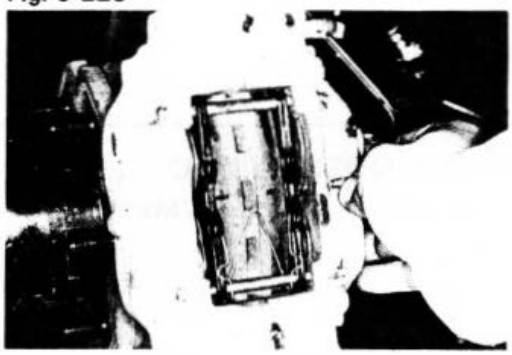


Install the pads

Fig. 9-227

Install the pins through the anti-rattle spring

Fig. 9-228

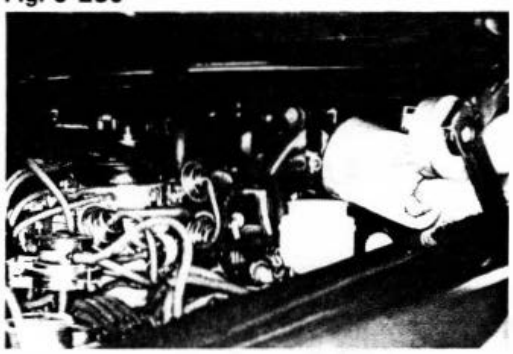


Install the clip.

Fig. 9-229

Depress the brake pedal.

Fig. 9-230



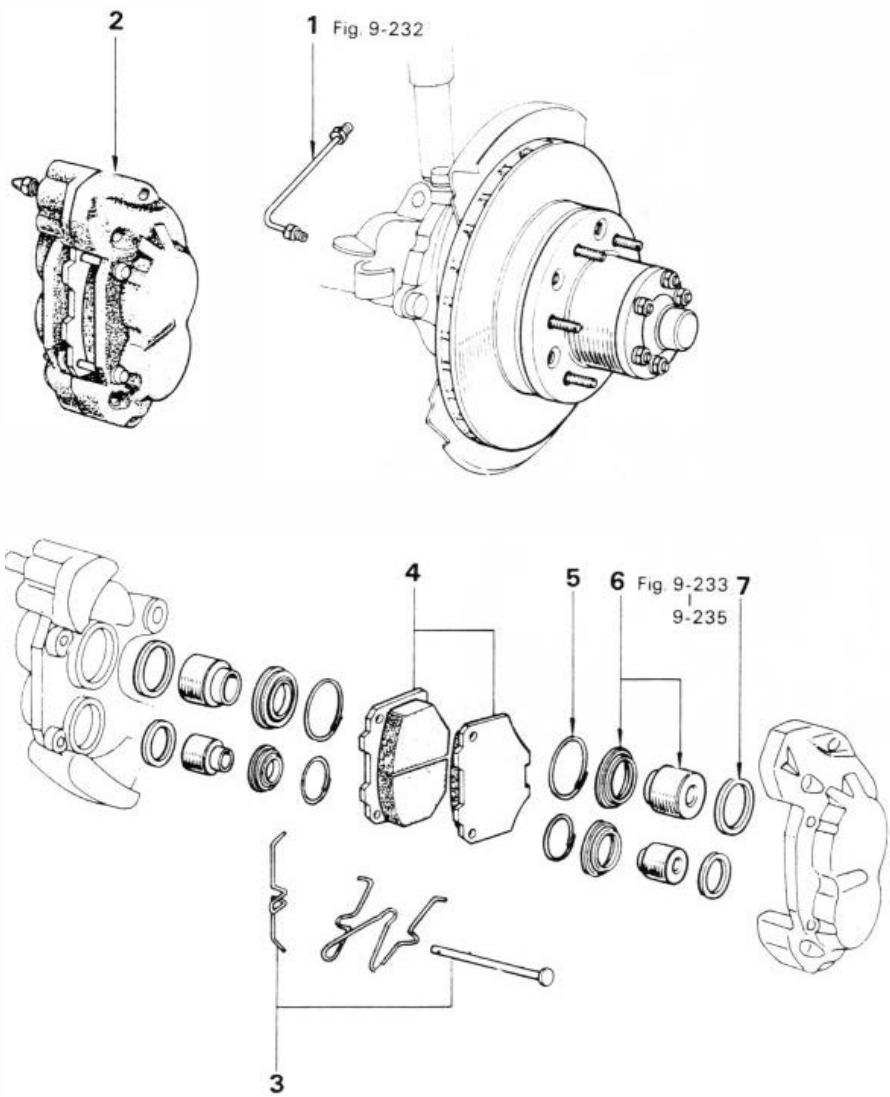
Replenish the brake fluid to the MAX line.

CYLINDER & DISC

REMOVAL & DISASSEMBLY

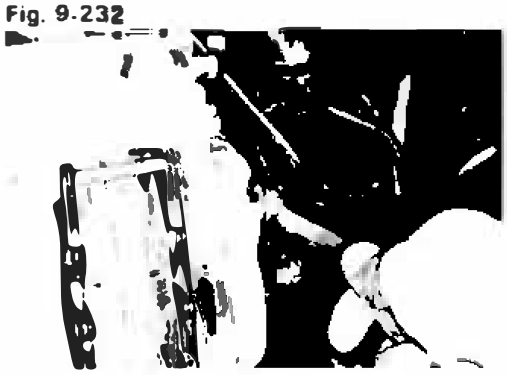
Remove and disassemble the parts in the numerical order shown in the figure

Fig. 9-231



1 Brake Tube
2 Disc Brake Caliper
3 Clip, Hole Pin & Anti-rattle Spring
4 Disc Brake Pad
5 Set Ring
6 Cylinder Boot & Disc Brake Piston
7 Seal Ring

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.

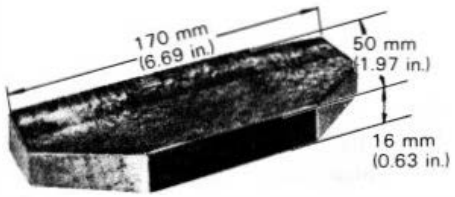


Fig. 9-234

Remove the pistons on at a time by compressed air.

Fig. 9-235

–Caution–
1. **Do not loosen the caliper bolts.**
2. **Do not separate the caliper.**

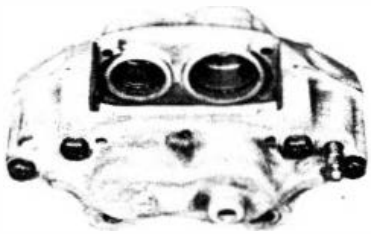


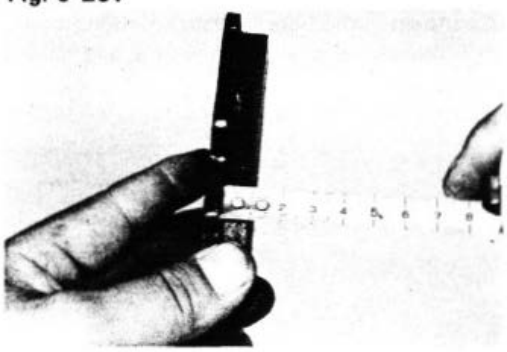
Fig. 9-236

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



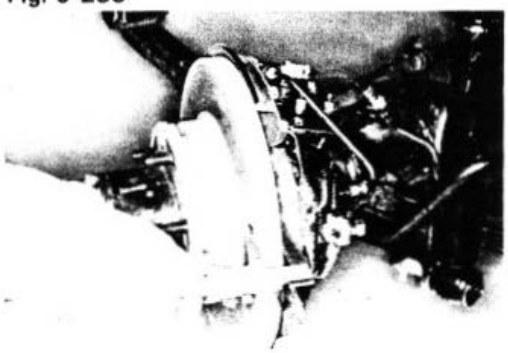
Pad

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



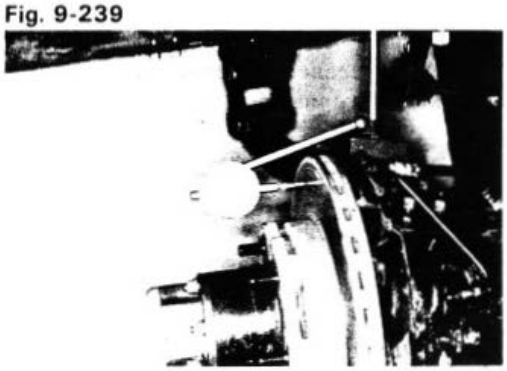
Disc

1 Inspect for thickness and runout.

Thickness:

STD	20 mm (0.79 in.)
Limit	19 mm (0.75 in.)

Fig. 9-239



Runout:

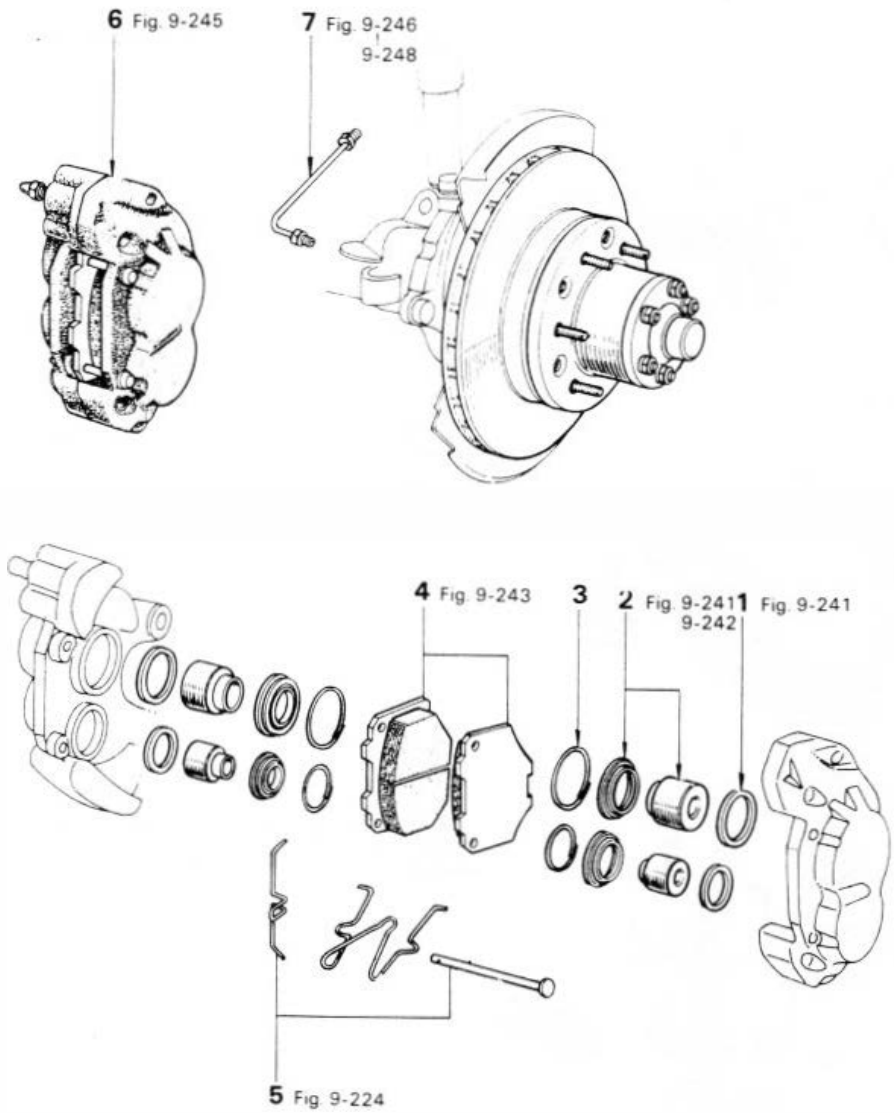
Limit	0.12 mm (0.0047 in.)

—Note—
There must not beany excessive looseness in the front wheel bearings when the runout is measured.

INSTALLATION

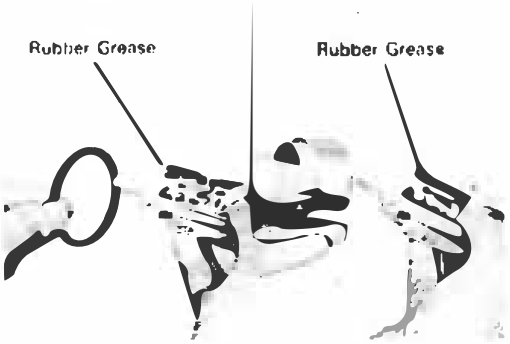
Install the parts in the numerical order shown in the figure

Fig. 9-240



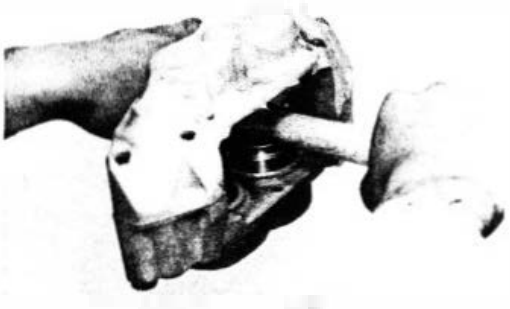
1 Seal Ring
2 Disc Brake Piston & Cylinder Boot
3 Set Ring
4 Disc Brake Pad
5 Anti-rattle Spring, Hole Pin & Clip
6 Disc Brake Caliper
7 Brake Tube

Fig. 9-241



Apply rubber grease to the new seal and the piston.

Fig. 9-242



Do not pry the piston into the cylinder.

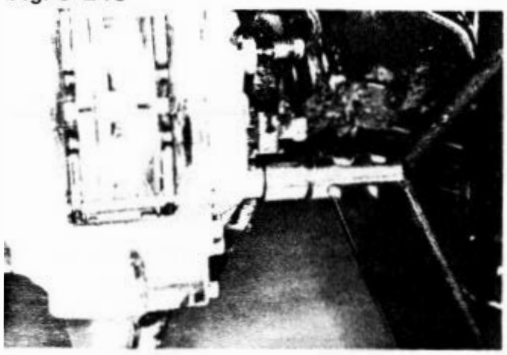
Fig. 9-243

Coat disc brake grease on the disc cylinder that the pads slide on.

Fig. 9-244

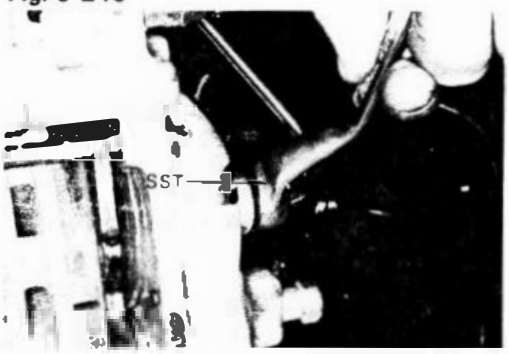
Install the clip.

Fig. 9-245



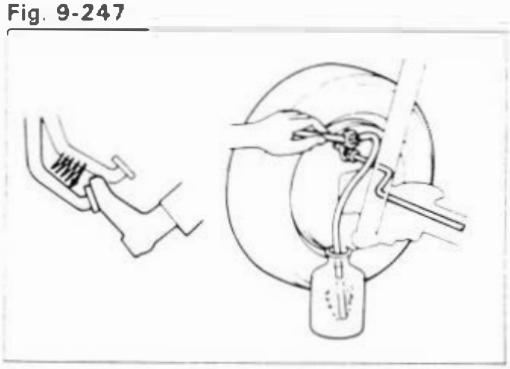
Tighten the caliper mounting bolts
Tightening torque: 10.0–15.0 kg-m (73–108 ft-lb)

Fig. 9-246



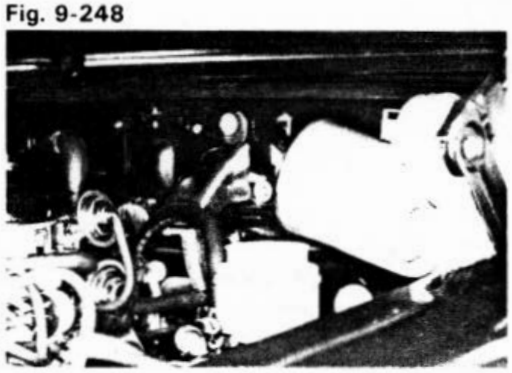
1 Connect the brake tube to the caliper with SST
SST [09751-36011]
Tightening torque:
1.3 – 1.8 kg-m (10 – 13 ft-lb)

Fig. 9-247



2 Bleed the air from the system

Fig. 9-248



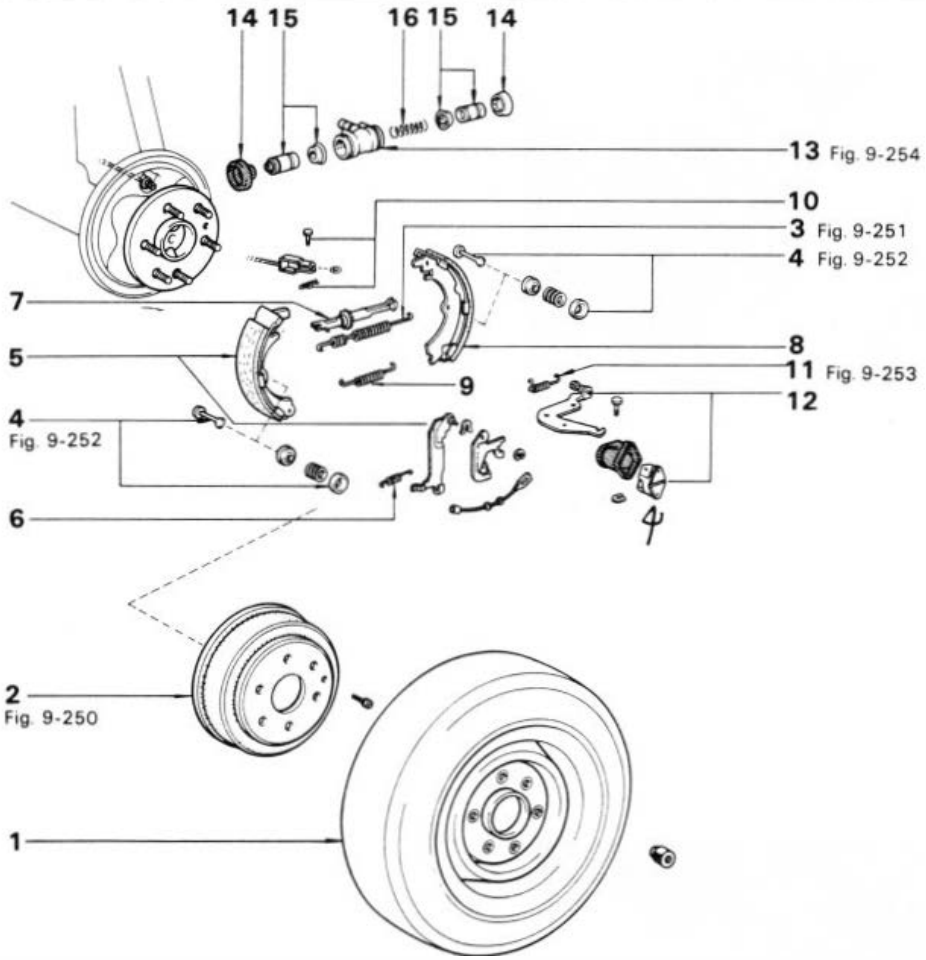
3. Replenish the brake fluid to the MAX line

REAR BRAKE

REMOVAL & DISASSEMBLY

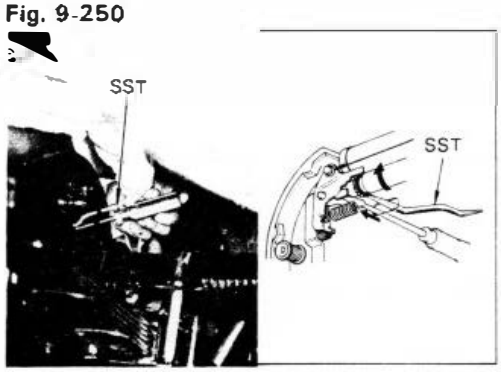
Remove and disassemble the parts in the numerical order shown in the figure

Fig. 9-249



1	Wheel	9	Spring
2	Brake Drum	10	No.2 Parking Brake Cable
3	Tension Spring		Pin & Cotter Pin
4	Shoe hold Down Spring & Pin	11	Tension spring
5	Brake Shoe with Lever	12	Bell Crank
6	Spring	13	Wheel Cylinder
7	Parking Brake Shoe Strut Set	14	Boot
8	Brake Shoe	15	Piston & Piston Cup
		16	Spring

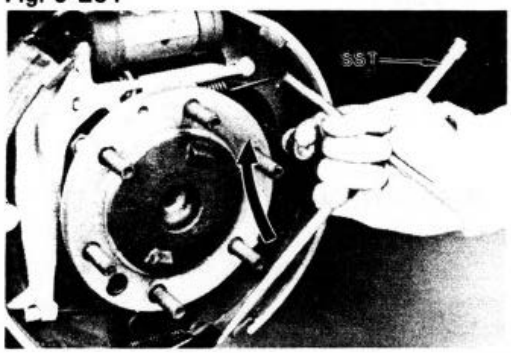
Fig. 9-250



The drum may be difficult to remove because of little clearance between it and the shoe. Always allow sufficient clearance before drum removal.

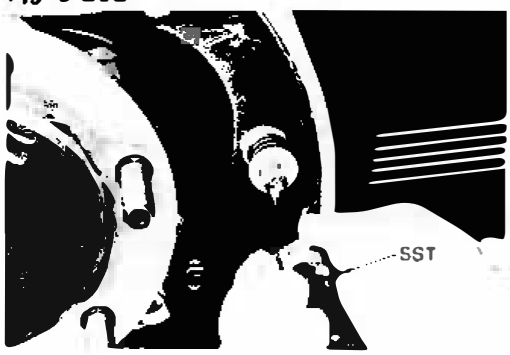
1. Push back the automatic adjuster lever with a screwdriver.
2. Shorten the adjuster with SST.
   SST [09704-10010]

Fig. 9-251



Remove the tension spring with SST.
SST [09703-30010]

Fig. 9-252

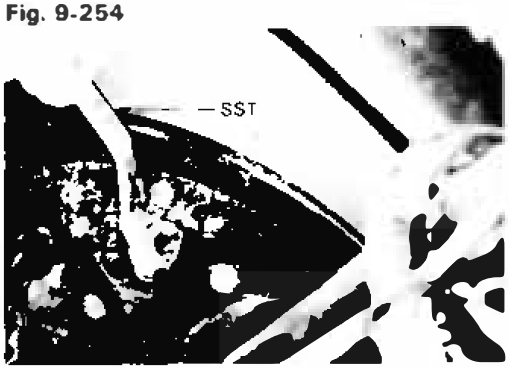


Remove the shoe hold down spring with SST.
SST [09718-00010]

Fig. 9-253

Remove the tesion spring from the bell crank.

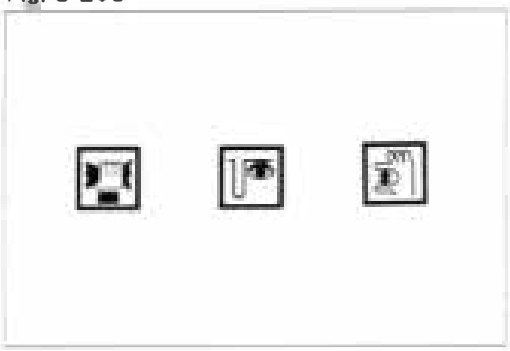
Fig. 9-254



Disconnect the brake tube and remove the wheel cylinder with SST
SST [09751-36011]

—Note—
Do not remove the wheel cylinder unless necessary.

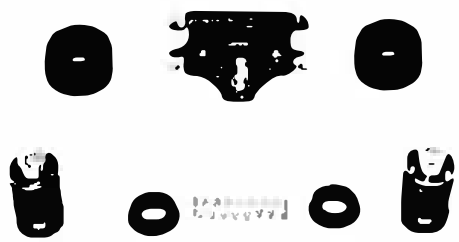
Fig. 9-255



INSPECTION & REPAIR

Inspect the disassembled parts on the following points and repair or replace parts if necessary

Fig. 9-256

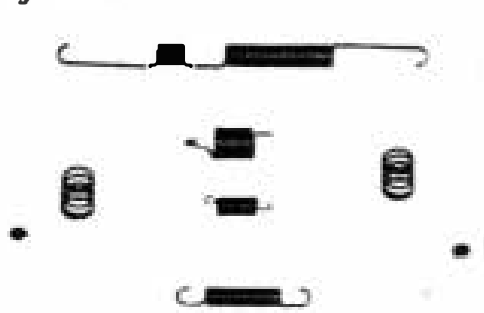


Wheel Cylinder

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.**

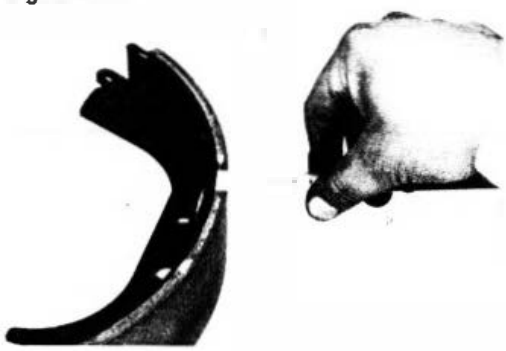
Fig. 9-257



Spring

Inspect for damage or weakening

Fig. 9-258



Brake Shoe & Lining

1. Inspect for wear, damage or deformation.

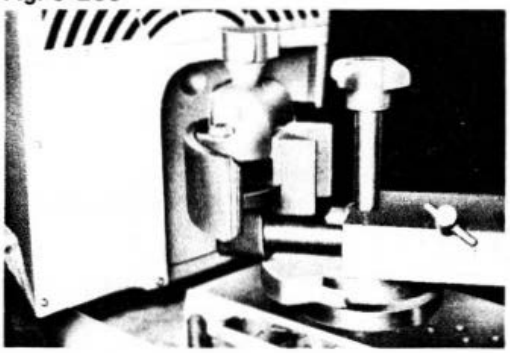
Lining thickness:
Limit 1.5 mm
(0.059 in.)

—Note—
When any lining requires replacement, it should be replaced as a set for both rear wheels to maintain effective brakes.

Fig. 9-259

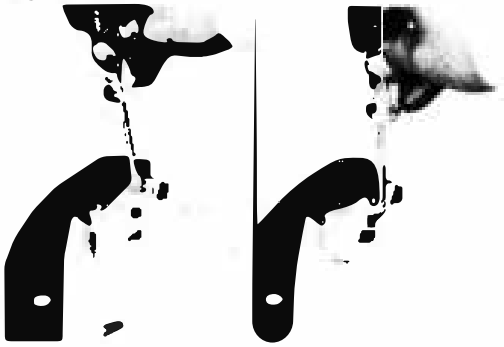
2. Inspect the brake lining and drum for proper contact

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.

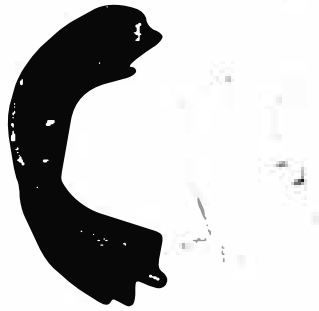
Fig. 9-261



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

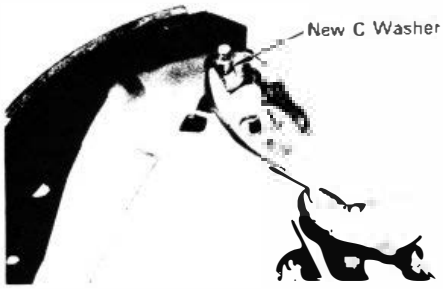


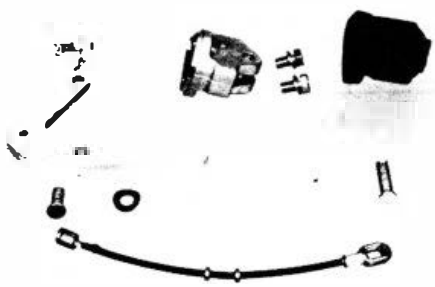
Fig. 9-264

4 Make sure that the lever moves smoothly

Fig. 9-265

Parking Brake Shoe Strut Set
Inspect the strut set for wear or damage

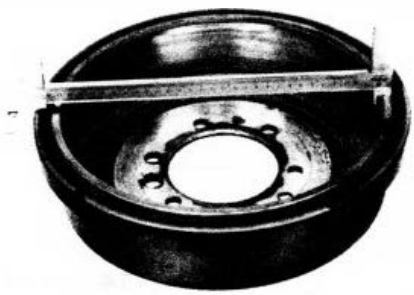
Fig. 9-266



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



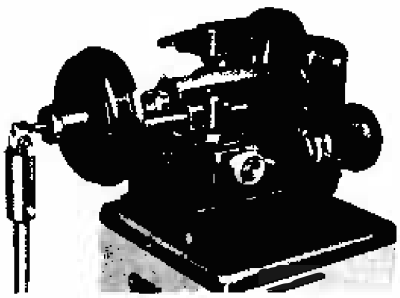
Brake Drum

1. Inspect the brake drum for wear, scoring or cracks.
2. Measure the brake drum inner diameter.

Drum inner diameter:

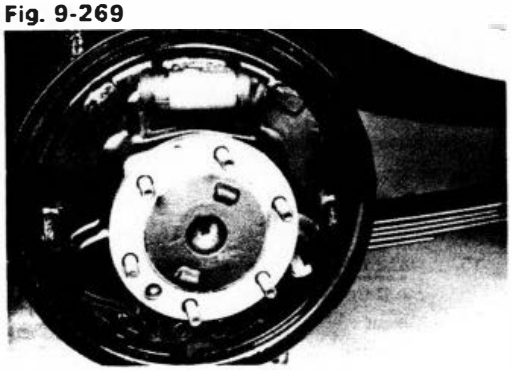
STD	295 mm (11.61 in.)
Limit	297 mm (11.69 in.)

Fig. 9-268



3. Using a drum lathe, rebore the brake drum if necessary.

Fig. 9-269



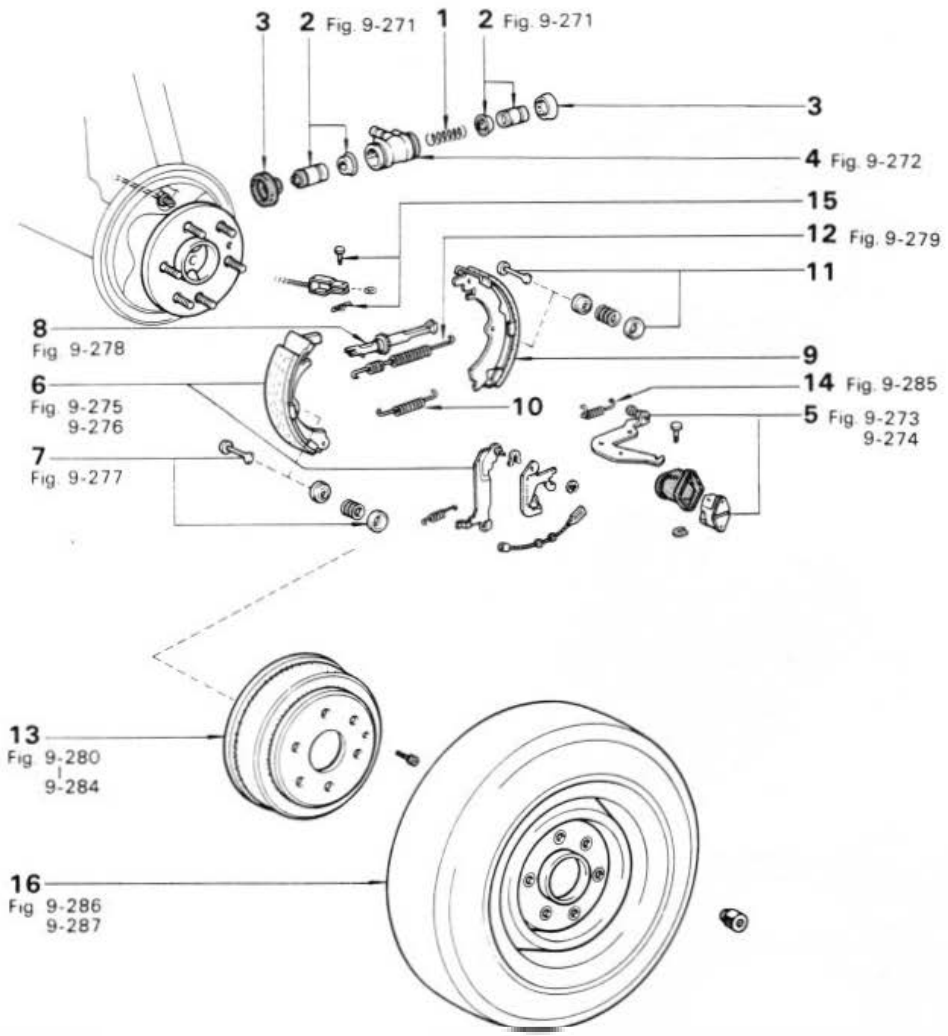
Backing Plate

Inspect for damage or weakening.

ASSEMBLY & INSTALLATION

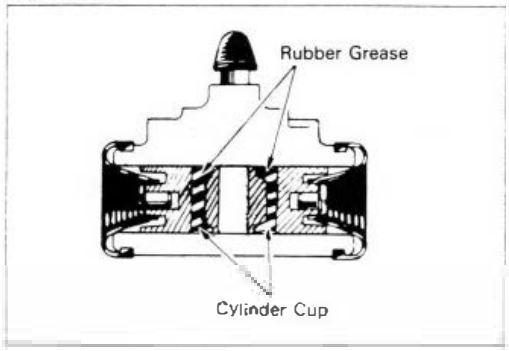
Assemble and install the parts in the numerical order shown in the figure.

Fig. 9-270



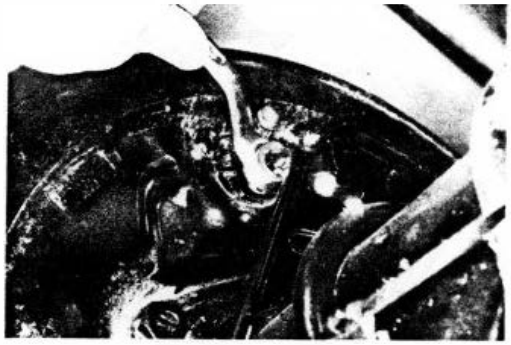
1	Spring	9	Brake Shoe
2	Piston & Piston Cup	10	Spring
3	Boot	11	Shoe Hold Down Spring & Pin
4	Wheel Cylinder	12	Tension Spring
5	Bell Crank	13	Brake Drum
6	Brake Shoe with Lever	14	Tension Spring
7	Shoe Hold Down Spring & Pin	15	No. 2 Parking Brake Cable, Pin & Cotter Pin
8	Parking Brake Shoe Strut Set	16	Wheel

Fig. 9-271



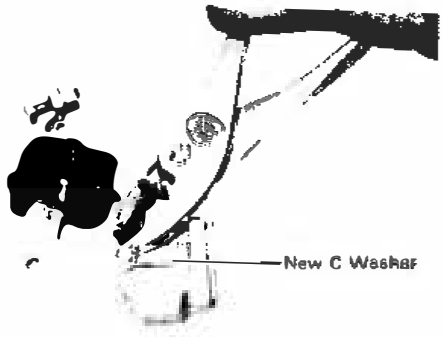
Coat the cylinder cups with rubber grease. Be sure to install the cylinder cups in the correct direction.

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.
   SST [09751-36011]
   Tightening torque:
   1.3 – 1.8 kg-m
   (10 – 13 ft-lb)

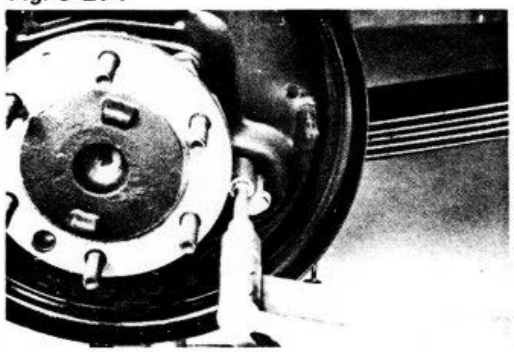
Fig. 9-273



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

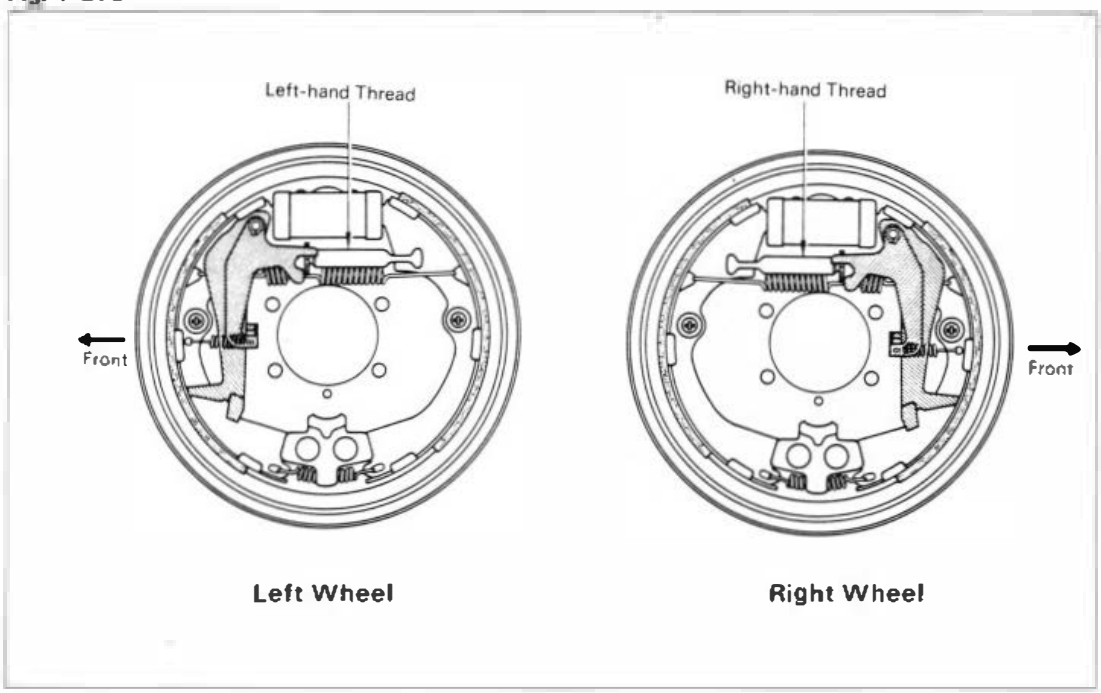
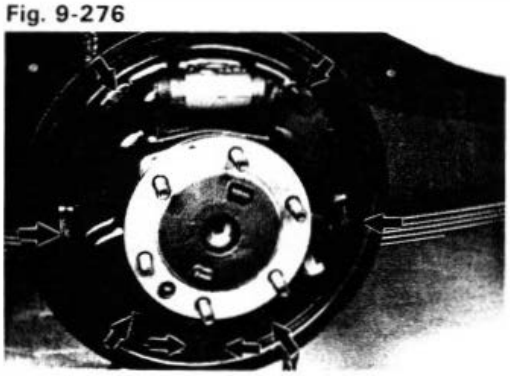


Fig. 9-276

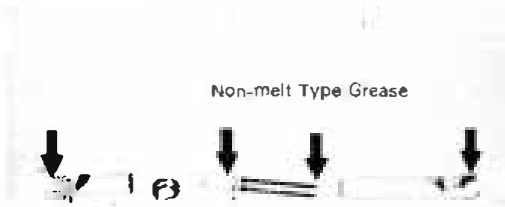


Coat non-melt type grease on the backing plate at surfaces contacting the shoes.

Fig. 9-277

Install the shoe hold down spring with SST
SST [09718-00010]

Fig. 9-278

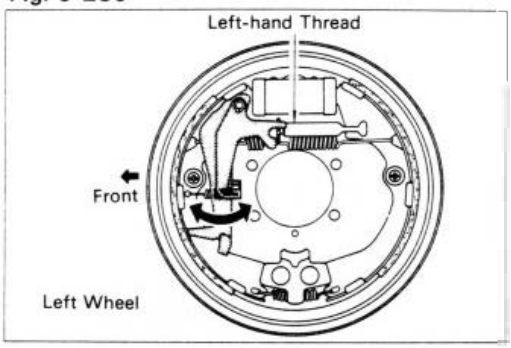


Coat on non-melt type grease to the adjuster bolt threads and insertion end

Fig. 9-279

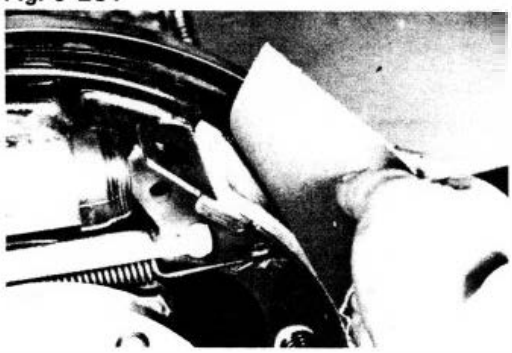
Install the spring to the shoe with SST
SST [09703-30010]

Fig. 9-280



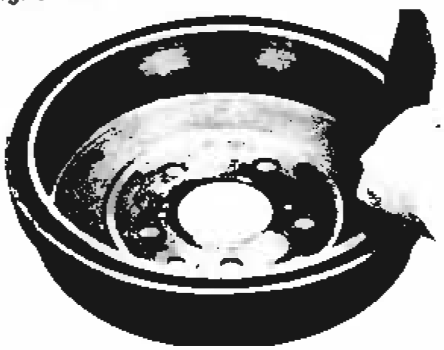
Check the operation of the automatic adjuster mechanism

Fig. 9-281



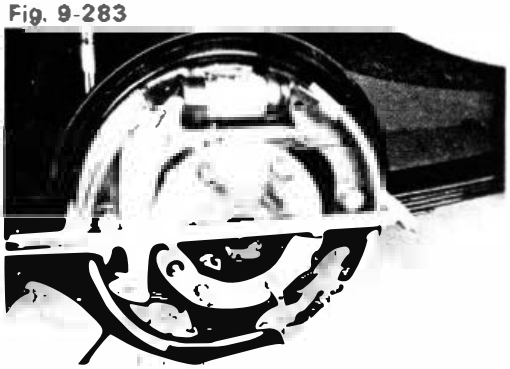
Polish the drum and shoe surfaces with sandpaper

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.)

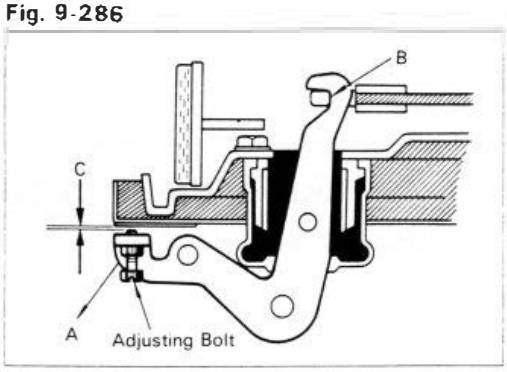
Fig. 9-285

Bleed the air from the system.

SEE AIR BLEEDING SECTION

Fig. 9-11 to 9-14

Fig. 9-286



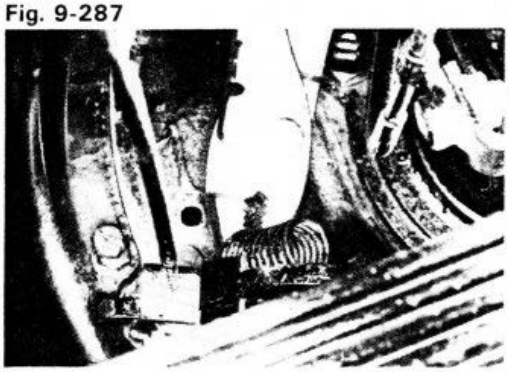
Adjust the bell crank.

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



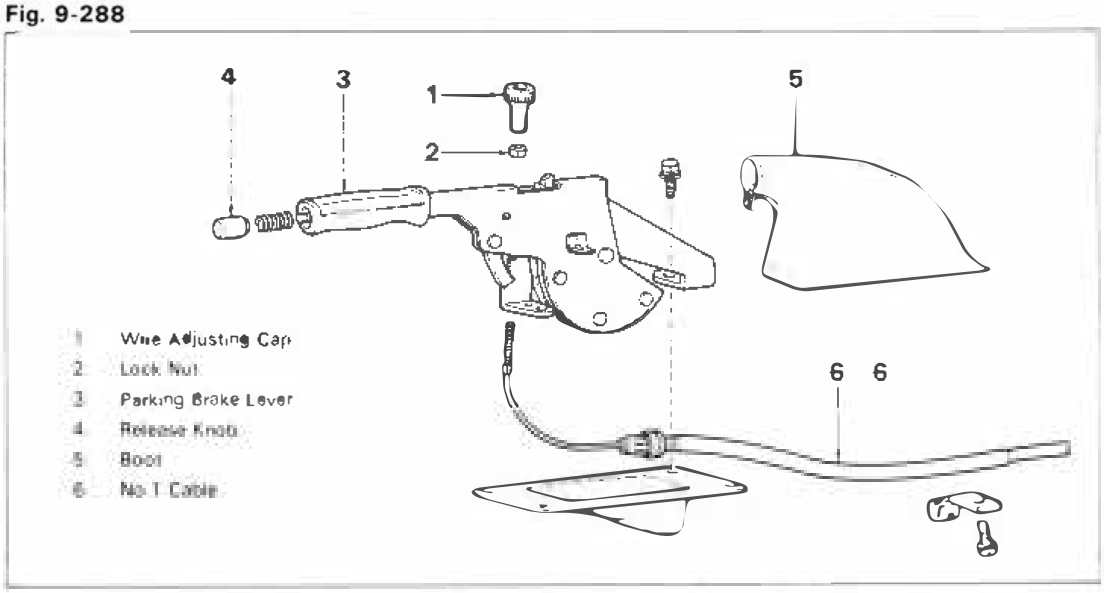
3 Install the tension spring.

PARKING BRAKE

PARKING BRAKE LEVER

COMPONENTS

Fig. 9-288



NO. 2 PARKING BRAKE CABLE

COMPONENTS

Fig. 9-289

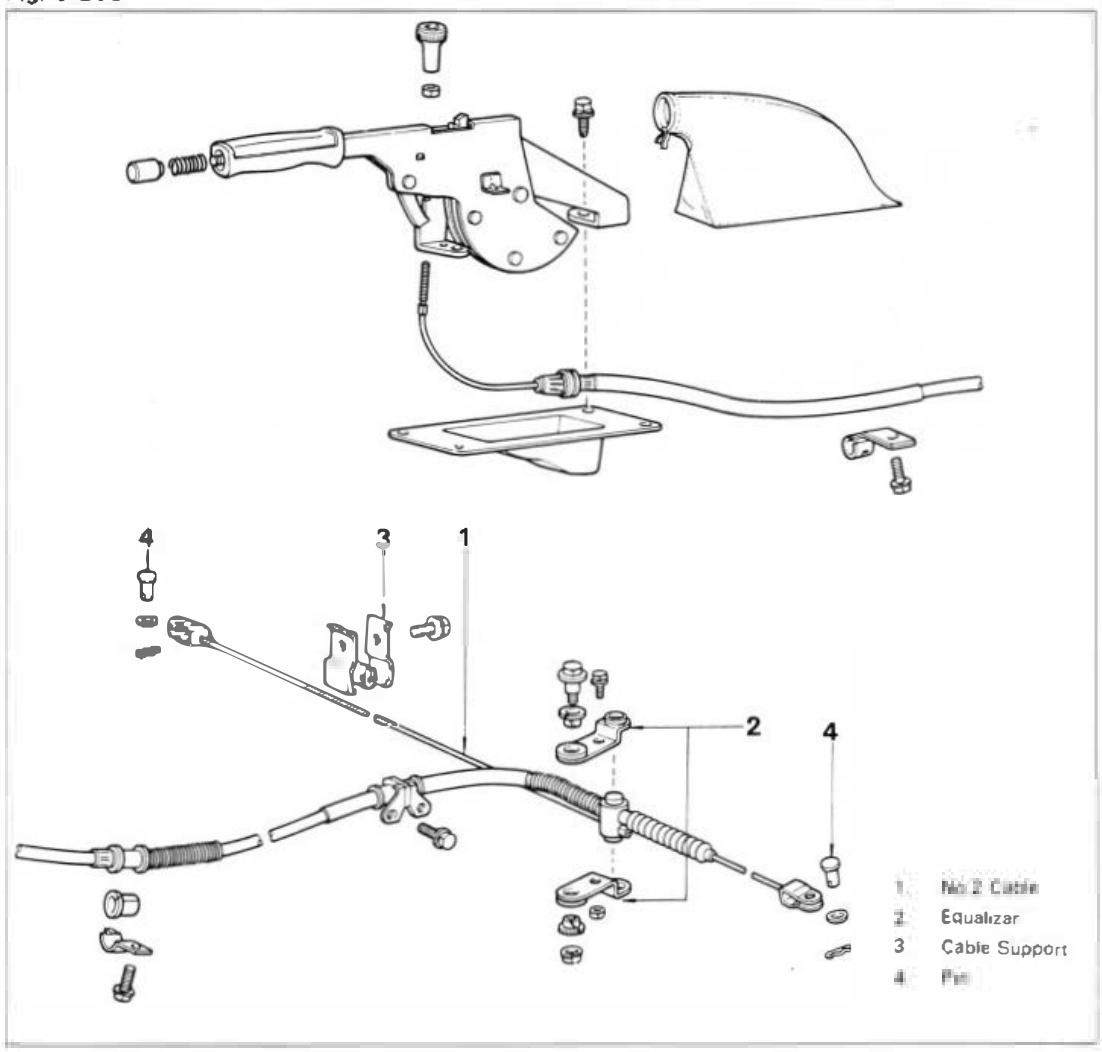
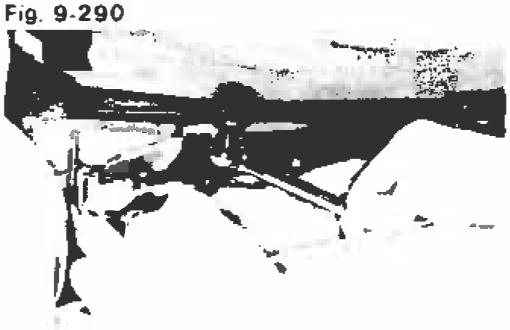


Fig. 9-290



REMOVAL

If the wire adjusting cap is light and difficult to get loose, loosen in the manner shown in the figure

Fig. 9-291

Remove the equalizer (1) and support lever (2)

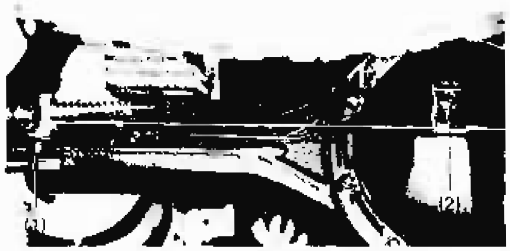


Fig. 9-292

Disconnect the bell crank (1) and parking brake cable No. 2 (2)

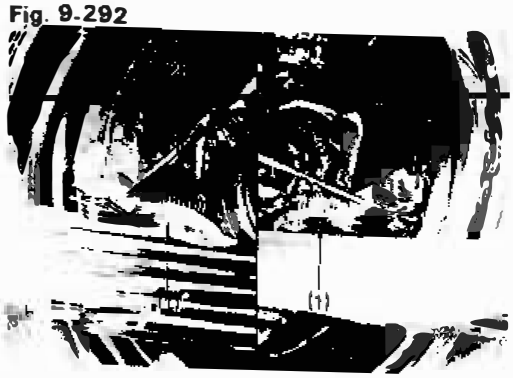


Fig. 9-293

INSTALLATION

1. Connect the bell crank (1) and parking brake cable No. 2 (2).

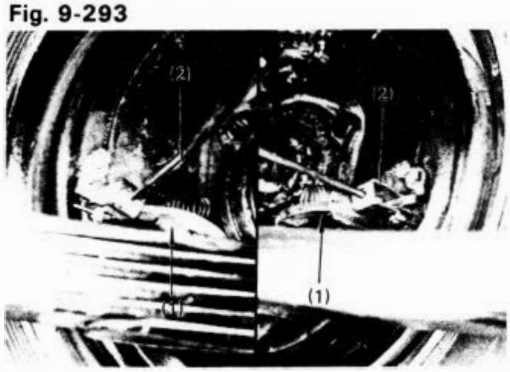
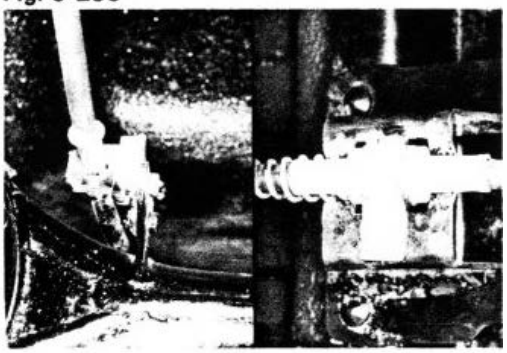


Fig. 9-29 94

2 Install the equalizer and support lever

Fig. 9-295



3 Install the cable bracket and clip

Fig. 9-296

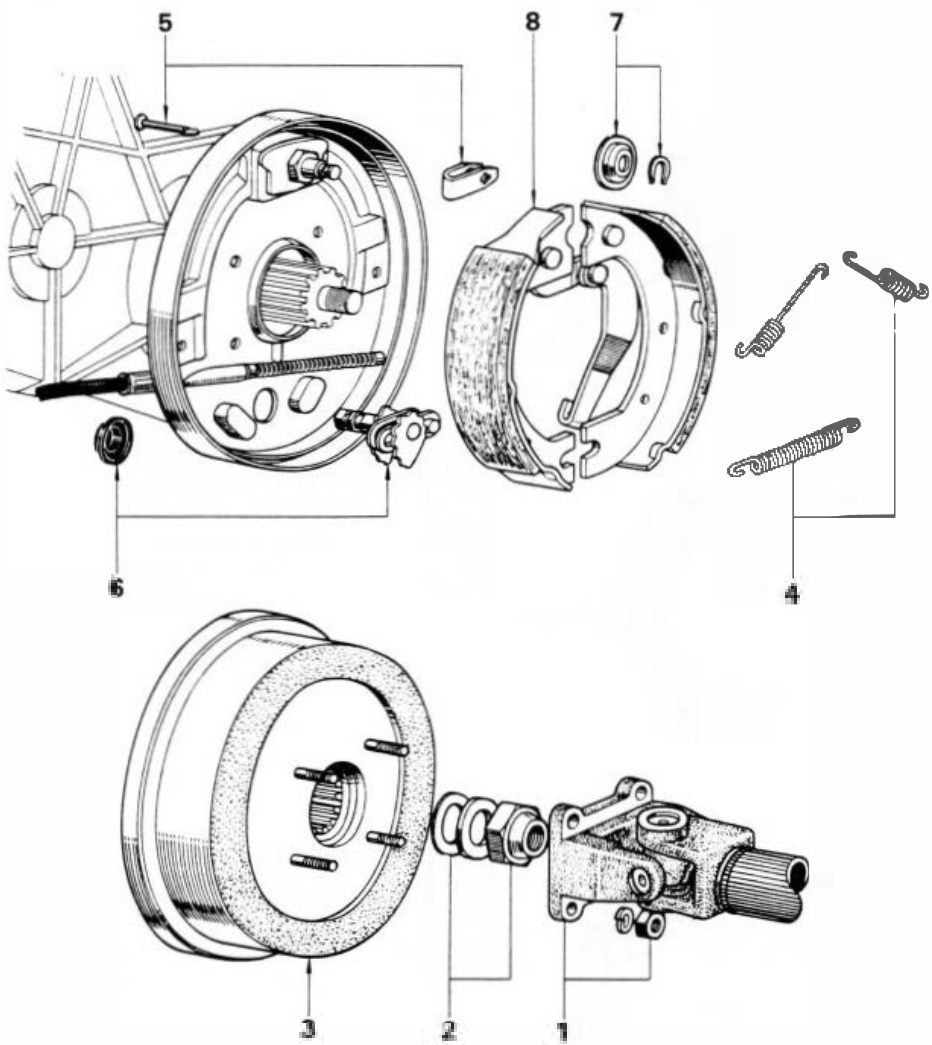
SEE
PARKING BRAKE
ADJUSTMENT
SECTION
Fig. 9-8 to 9-10

4 Adjust the parking brake control handle travel after installation

CENTER BRAKE

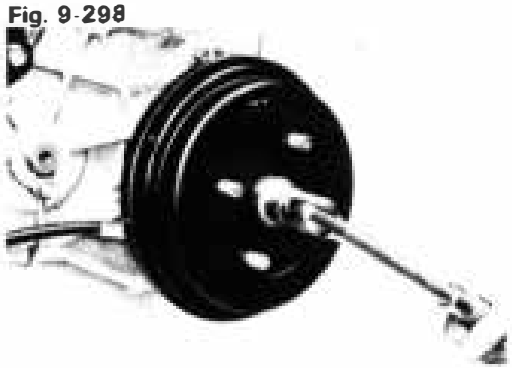
COMPONENTS

Fig. 2-297



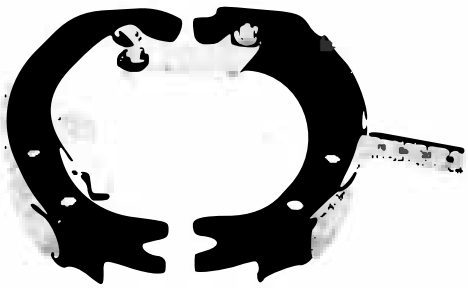
1. Propeller Shaft
2. Nut, Washer & Shim
3. Brake Drum
4. Tension Spring
5. Hold Down Spring & Pin
6. Cover & Shoe Adjuster
7. C Washer & Washer
8. Shoe & Lever

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.)

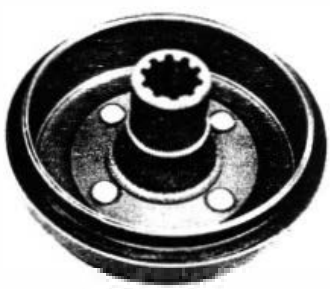
Fig. 9-300

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

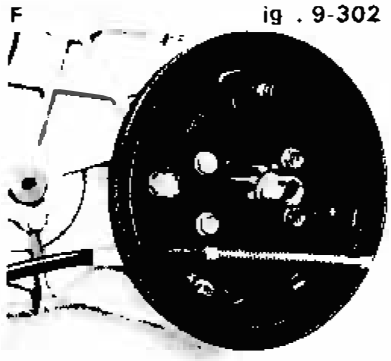


Brake Drum

Inspect the inner surface for wear or damage.

Drum inner diameter:
Limit 161 mm (6.34 in.)

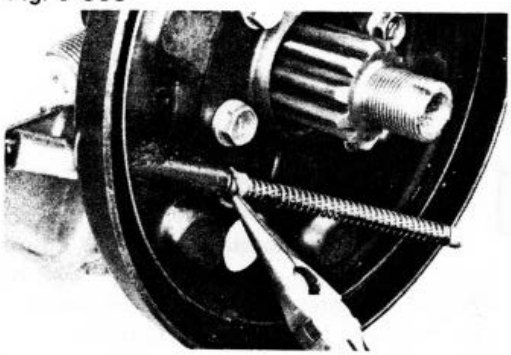
F ig . 9-302



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.

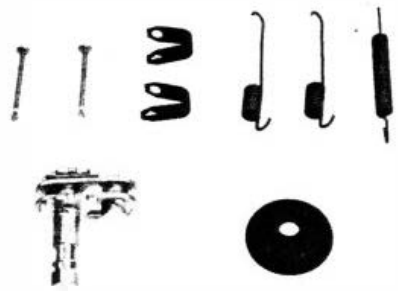
Fig. 9-303



Replace The Parking Brake Cable

1. At the backing plate, remove and reinstall the C washer.
2 At the parking brakelever, refer to theprocedures described in Transmission Removal and Installa tion.

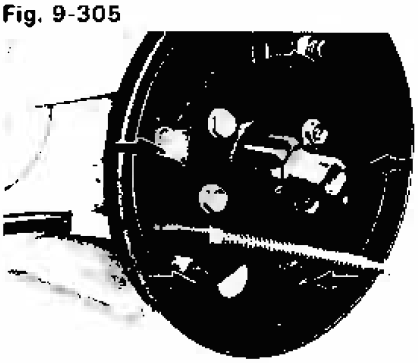
Fig. 9-304



Adjuster, Spring & Pin

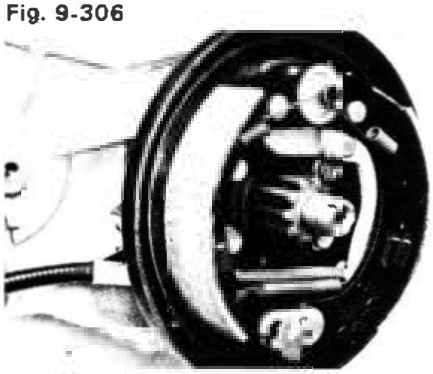
Inspect for wear or damage.

Fig. 9-305



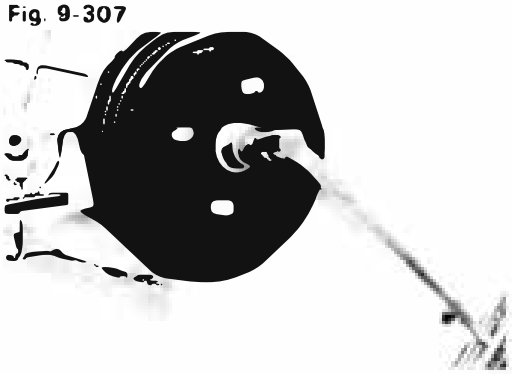
Apply non-melt type grease to the place indicated by arrow.

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 adjustthe 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

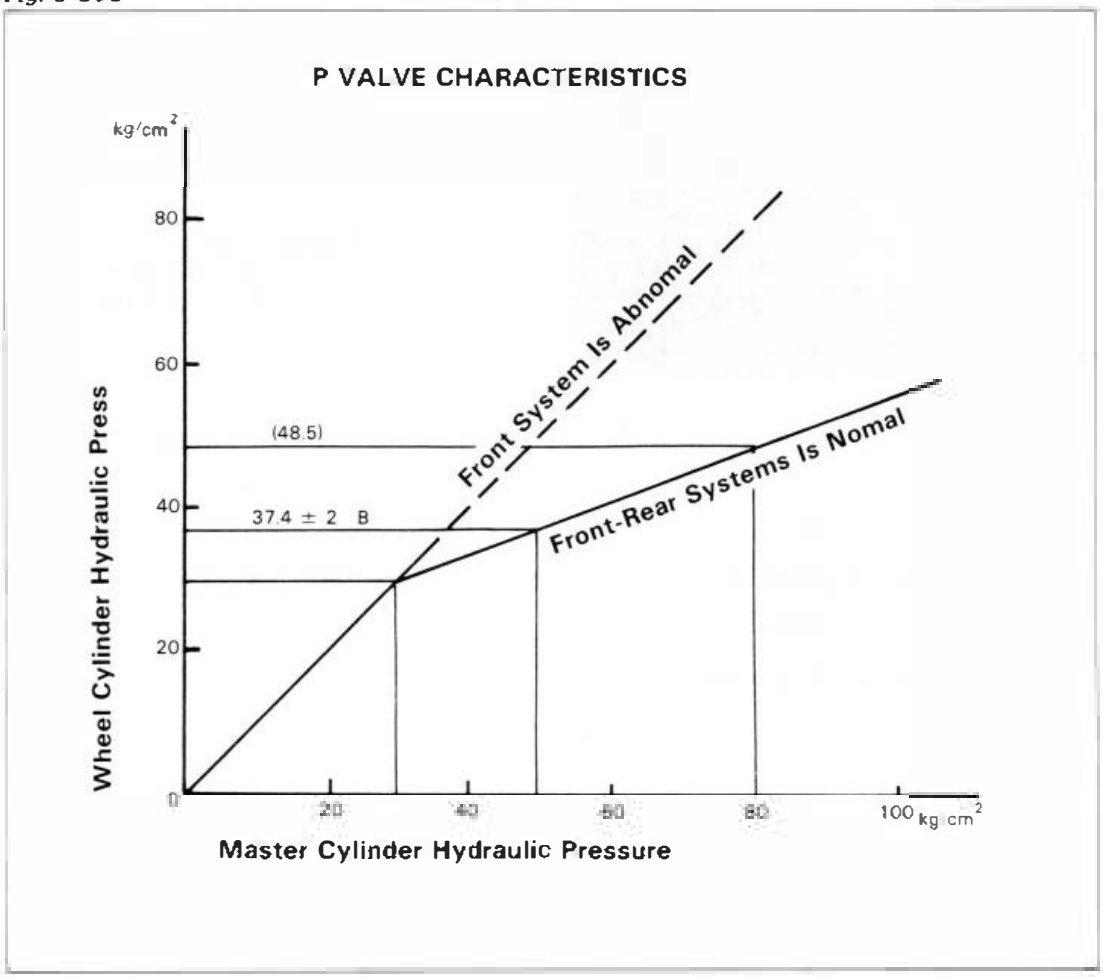
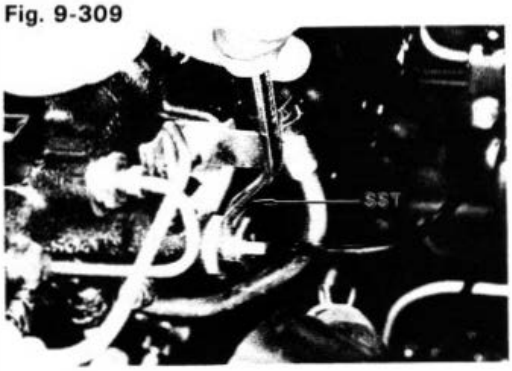


Fig. 9-309



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

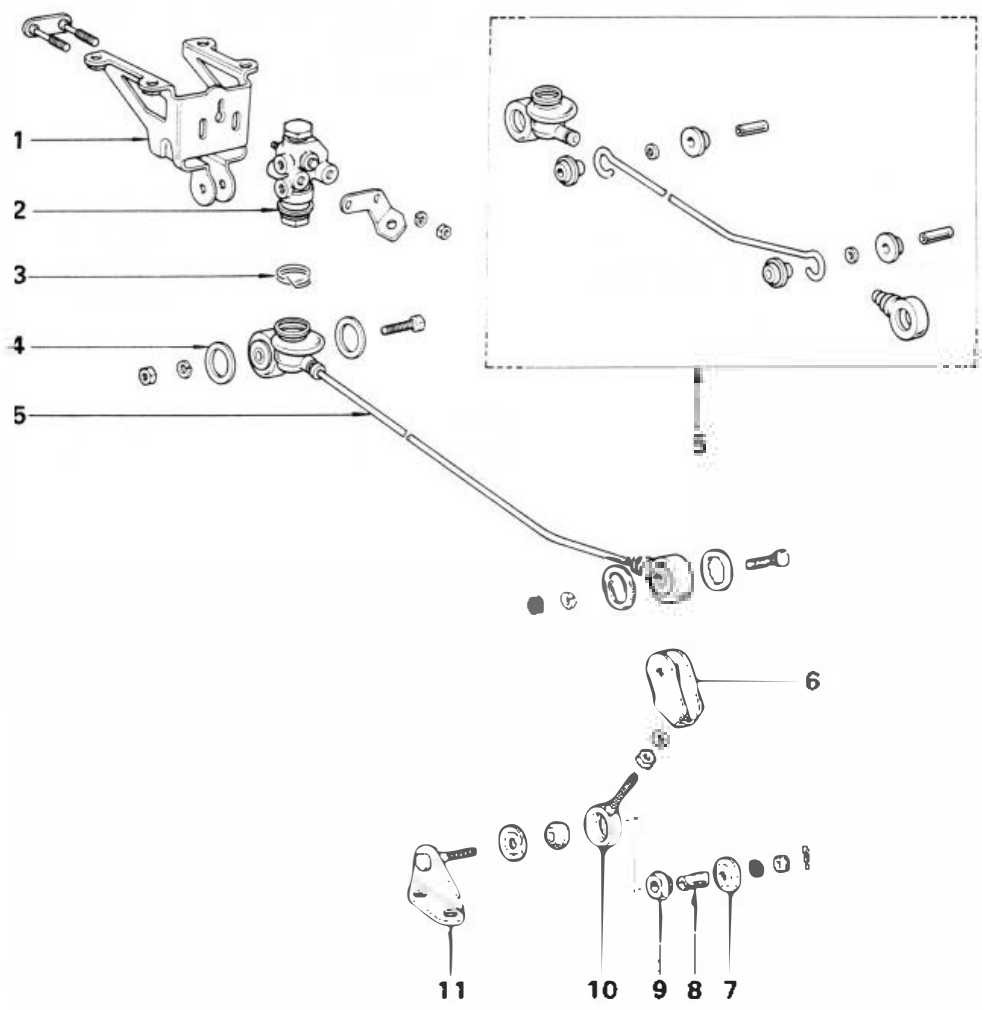
3. Bleed the air from the system

SEE
AIR BLEEDING
SECTION
Fig. 9-11 to 9-14

LSPV (LOAD SENSING PROPORTIONING VALVE)

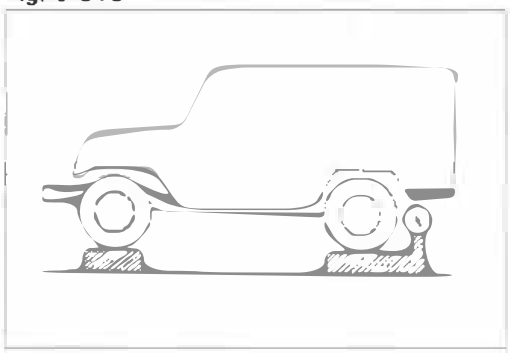
COMPONENTS

Fig. 9-312



1. Bracket
2. Load Sensing Valve
3. Clip
4. Plate Washer
5. Load Sensing Spring
6. No.1 Shackle
7. Cushion Retainer
8. Collar
9. Bushing
10. No.2 Shackle
11. No.1 Shackle Bracket

Fig. 9-313



FLUID PRESSURE INSPECTION & REPAIR

Inspect The Fluid Pressure

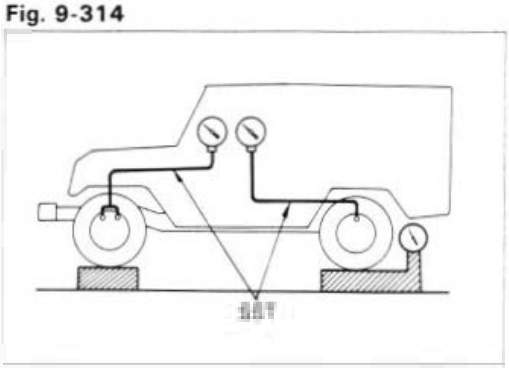
1 Set the rear axle load

Rear axial load (include vehicle weight):

6_series 1,200 kg (2,646 lb)

4_series 1,150 kg (2,535 lb)

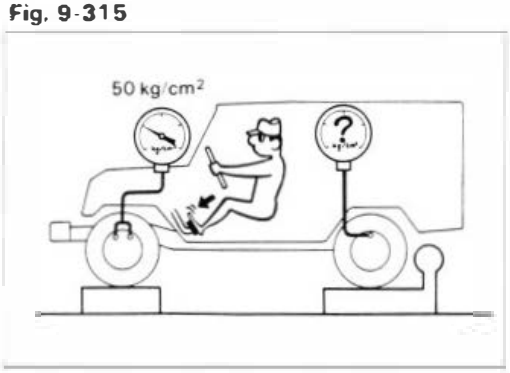
Fig. 9-314



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

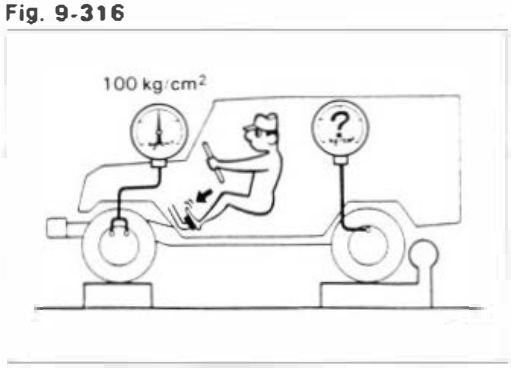
Rear brake pressure:

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

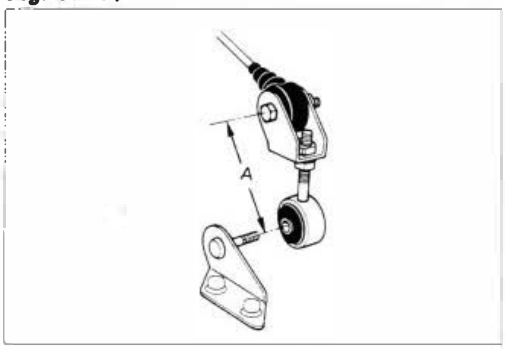


Fig. 9-318

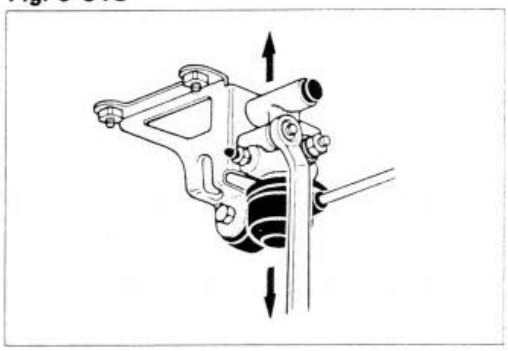


Fig. 9-319

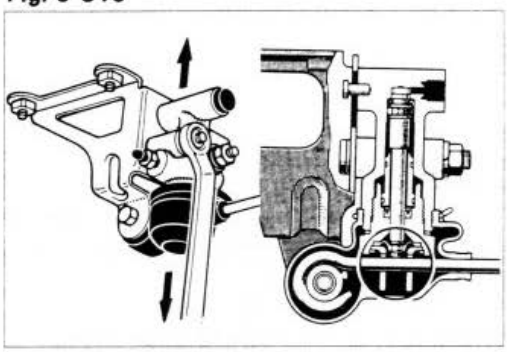
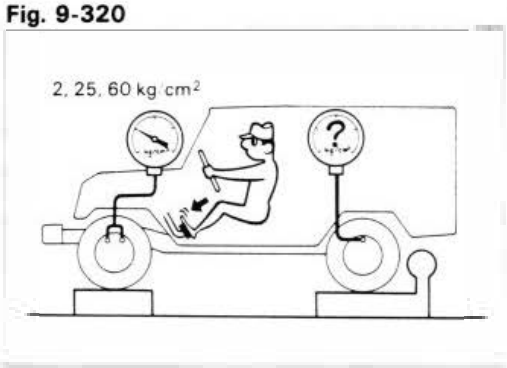


Fig. 9-320



Adjust The Fluid Pressure

1. Adjust the length of the No. 2 shackle
   Low pressure —— Lengthen A
   High pressure —— Shorten A

Model	Initial set	Adjusting range
FJ,BJ,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.)
FJ,BJ,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).

2. 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)
3. 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.

1. 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.

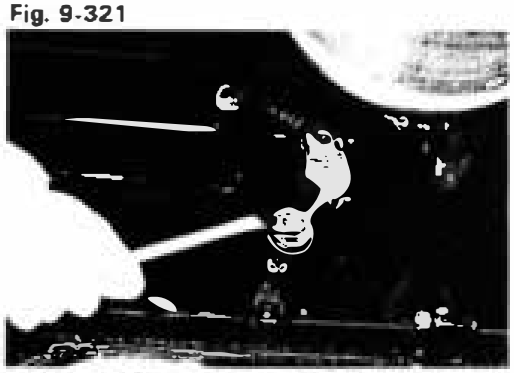
2. In this position, check the rear wheel cylinder pressure

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)

3. If the measured value is not within standard, replace LSPV assembly.

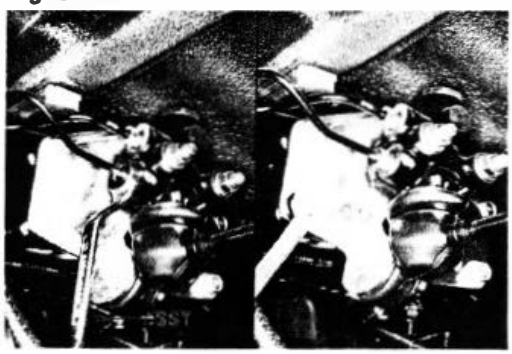
Fig. 9-321



REMOVAL

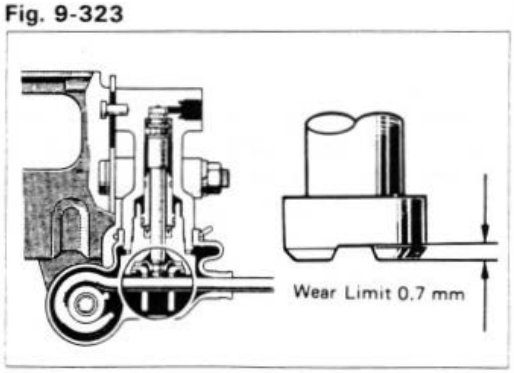
1. Disconnect the No. 2 shackle from the bracket

Fig. 9-322



2. Disconnect the brake tube unions with SST
   SST [09751-36011]
3. Remove the load sensing valve bracket

Fig. 9-323



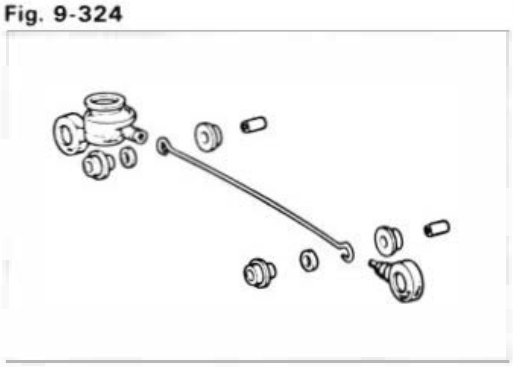
INSPECTION

1. Inspect the valve piston pin and load sensing spring contact surfaces for wear

   Wear:

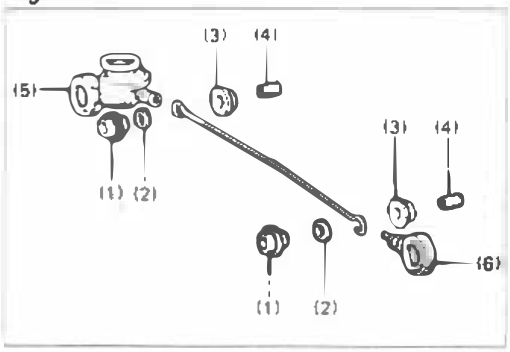
   Limit 0.7 mm (0.028 in.)

Fig. 9-324



2. Inspect the load sensing spring, shackle bracket, etc. for any noticeable rust or damage

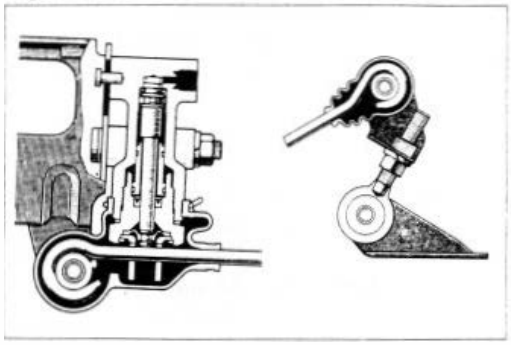
Fig. 9-325



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.

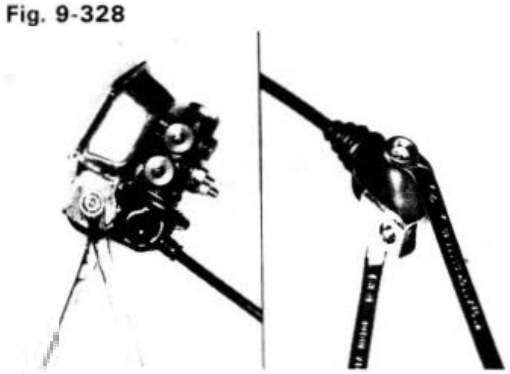
Fig. 9-327

2. Assemble the LSPV to the bracket.

—Note—

Fingertighten the LSPV mounting bolts.

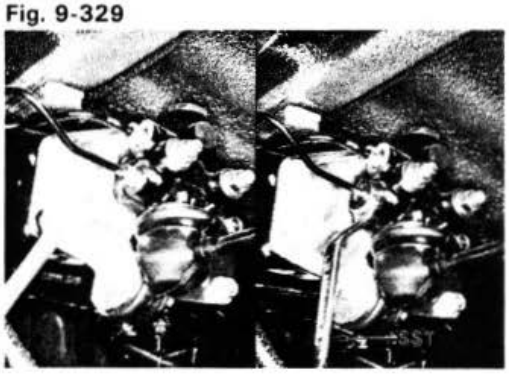
Fig. 9-328



3. Connect the LSPV and No. 1 shackle to the load sensing spring.

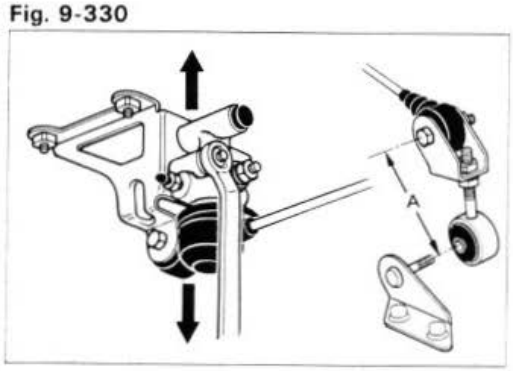
Tightening torque:
1.5 – 2.2 kg-m
(11 – 15 ft-lb)

Fig. 9-329



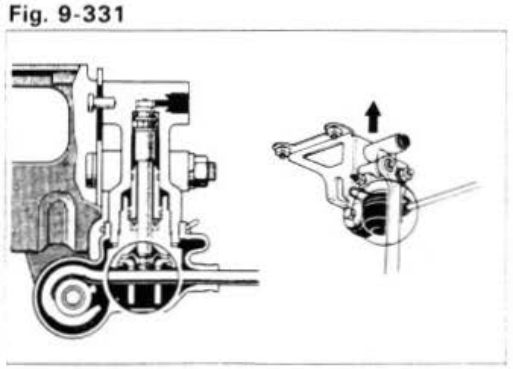
4. Install the LSPV to the frame
   Tightening torque:
   1.5 – 2.2 kg-m
   (11 – 15 ft-lb)
5. Connect the brake tube to the LSPV with SST
   SST [09751-36011]
   Tightening torque:
   1.3 – 1.8 kg-m
   (10 – 13 ft-lb)

Fig. 9-330



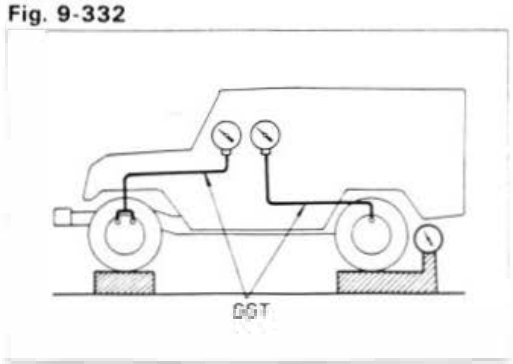
6. Assemble the No. 2 shackle to the No. 1 shackle and set the length of the No. 2 shackle
   Initial set: 78 mm
   (3.07 in.)
7. Connect the No. 2 shackle to the bracket
8. Bleed the brake line (Refer to AIR BLEEDING See Fig. 9-11 to 9-14)

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

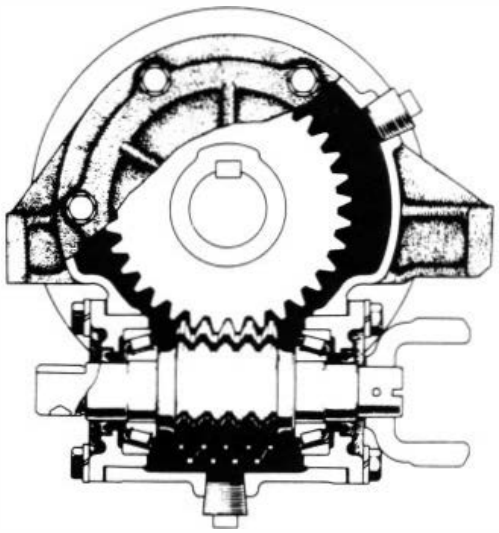
CUTAWAY VIEW

Fig. 10-1

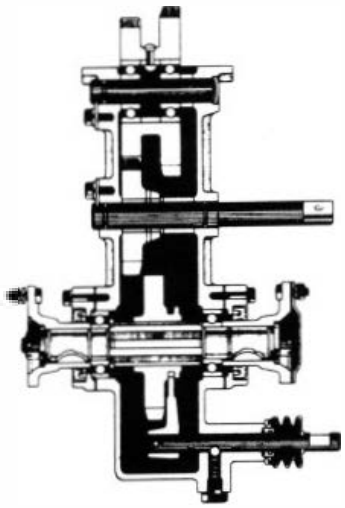
[MECHANICAL WINCH]

POWER TRAIN

WINCH GEAR CASE



POWER TAKE OFF



WINCH

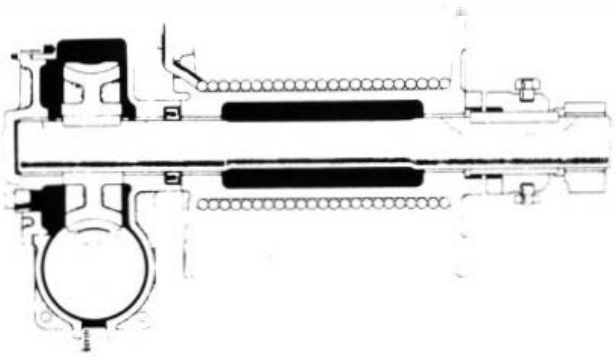
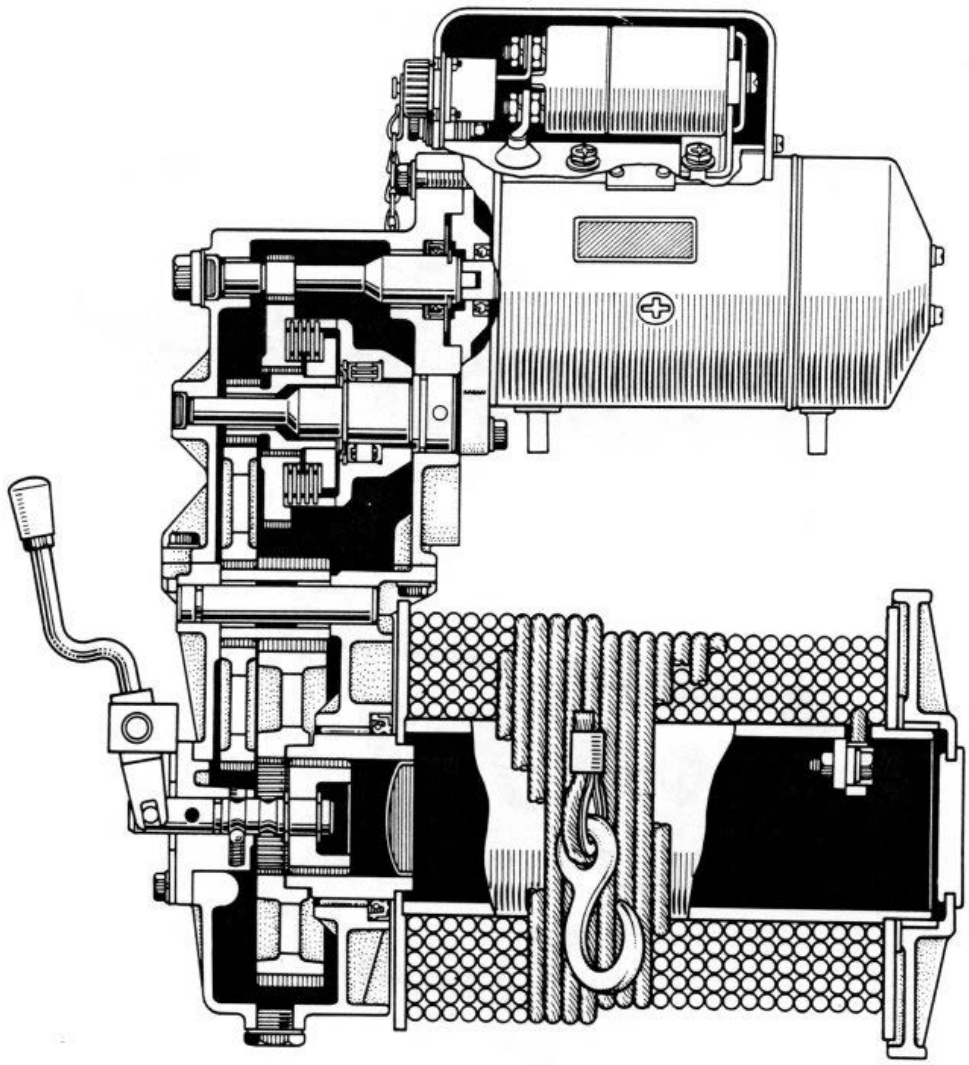


Fig. 10-2

[ELECTRIC WINCH]

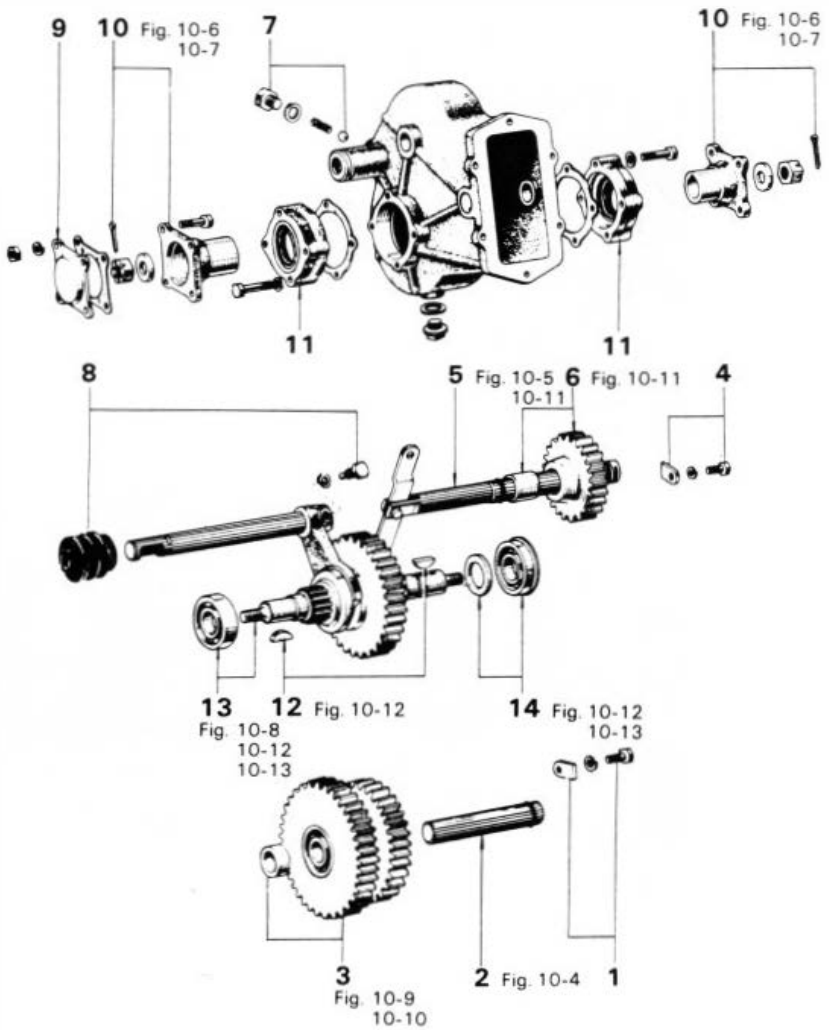


POWER TAKE OFF

DISASSEMBLY

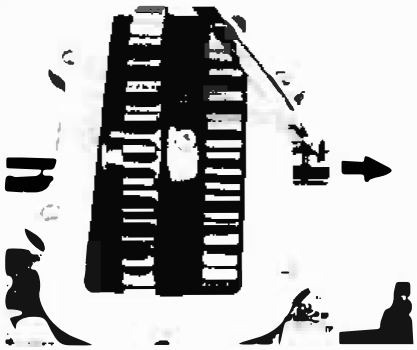
Disassemble the parts in the numerical order shown in the figure

Fig. 10-3



1 Lock Plate
2 Input Gear Shaft
3 Spacer, Input Gear & Bearing
4 Lock Plate
5 Reverse Idler Shaft
6 Reverse Idler Gear & Spacer
7 Lock Ball & Spring
8 Lock Bolt, Fork Shaft, Boot & Shift Fork
9 Retainer Cap
10 Nut, Plate & Joint Flange
11 Bearing Retainer
12 Woodruff Key
13 Output Shaft & Bearing
14 Spacer & Bearing

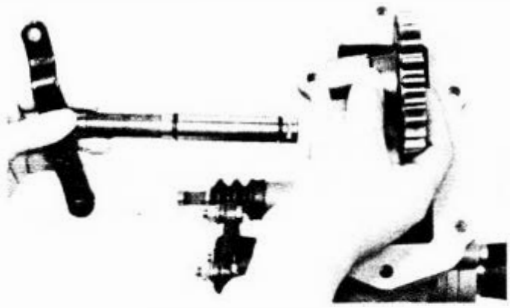
Fig. 10-4



Remove the input gear shaft

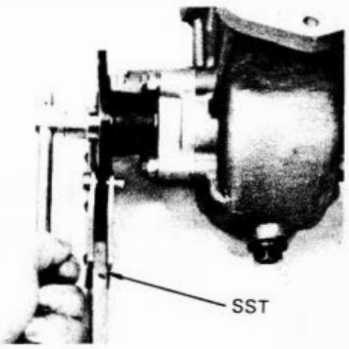
– Note –
If difficult to remove the shaft, first tap the shaft lightly towards the front, and remove the expansion plug.

Fig. 10-5



Remove the reverse idler shaft assembly.

Fig. 10-6

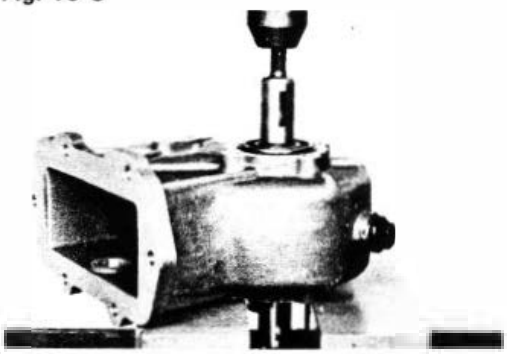


Remove the joint flange with SST.
SST [09330-00020]

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

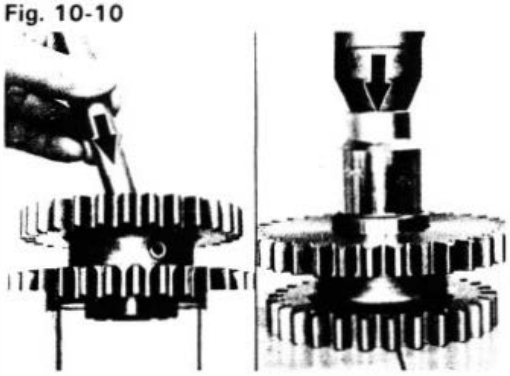
Fig. 10-9

INSPECTION

Input Gear & Bearing

1. Inspect the gears for teeth wear or damage
2. Inspect the bearings for wear or damage

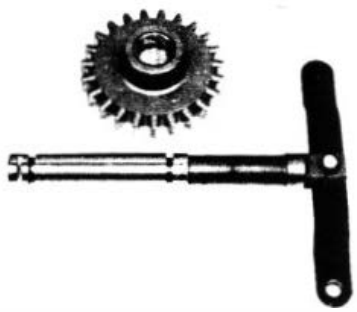
Fig. 10-10



Replace The Input Gear Bearing

1. Remove the bearings with drift pin
2. Install the bearings with socket wrench

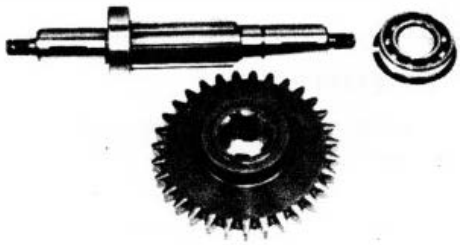
Fig. 10-11



Reverse Idler Gear & Shaft

Inspect for wear or damage

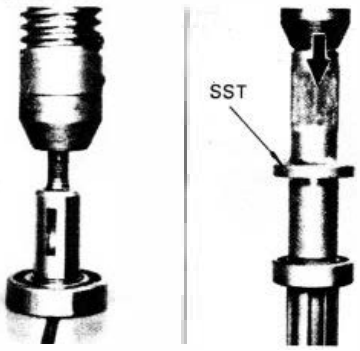
Fig. 10-12



Output Gear, Shaft & Bearing

1. Inspect for wear or damage.

Fig. 10-13



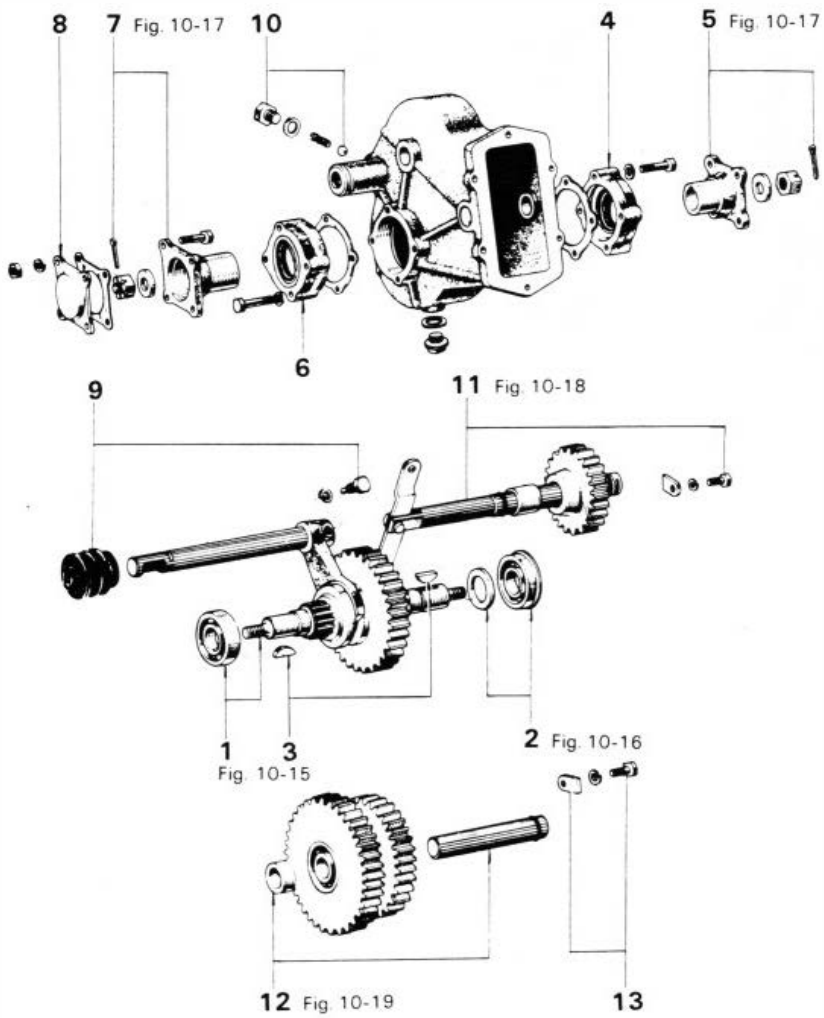
Replace The Output Gear Bearing

1. Remove the bearing with a press
2. Install the bearing with a press and SST
   SST [09325-12010]

ASSEMBLY

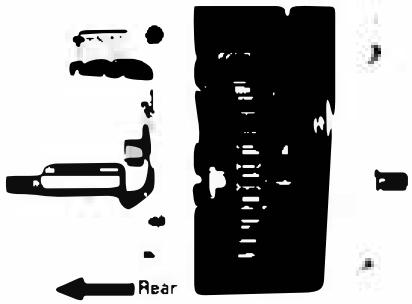
Assemble the parts in the numerical order shown in the figure.

Fig. 10-14



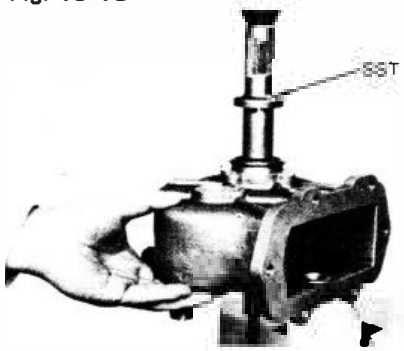
1	Output Shaft & Bearing	8	Retainer Cap
2	Spacer & Bearing	9	Shift Fork, Shaft & Boot
3	Woodruff Key	10	Lock Ball & Spring
4	Bearing Retainer	11	Reverse Idler Gear, Spacer & Shaft
5	Joint Flange	12	Input Gear & Shaft
6	Bearing Retainer	13	Lock Plate
7	Joint Flange		

Fig. 10-15



Position the output gear into the case with the shift fork groove towards the rear.

Fig. 10-16



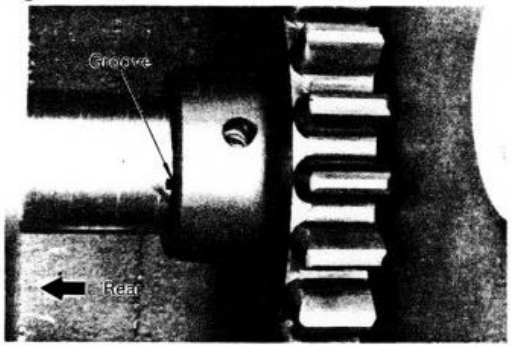
Install the bearing with a press and SST
SST [09325-12010]

Fig. 1 0-17

Tighten the nut with SST
SST [09330-00020]

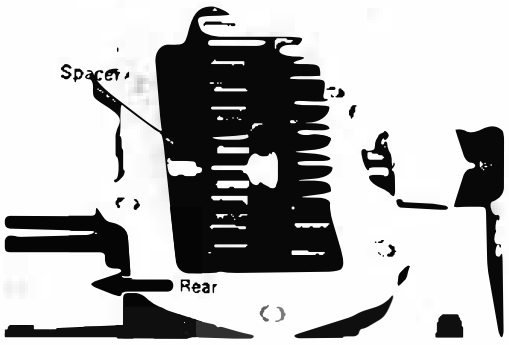
Tightening torque: 3.5 – 5.5 kg-m (26 – 39 ft-lb)

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



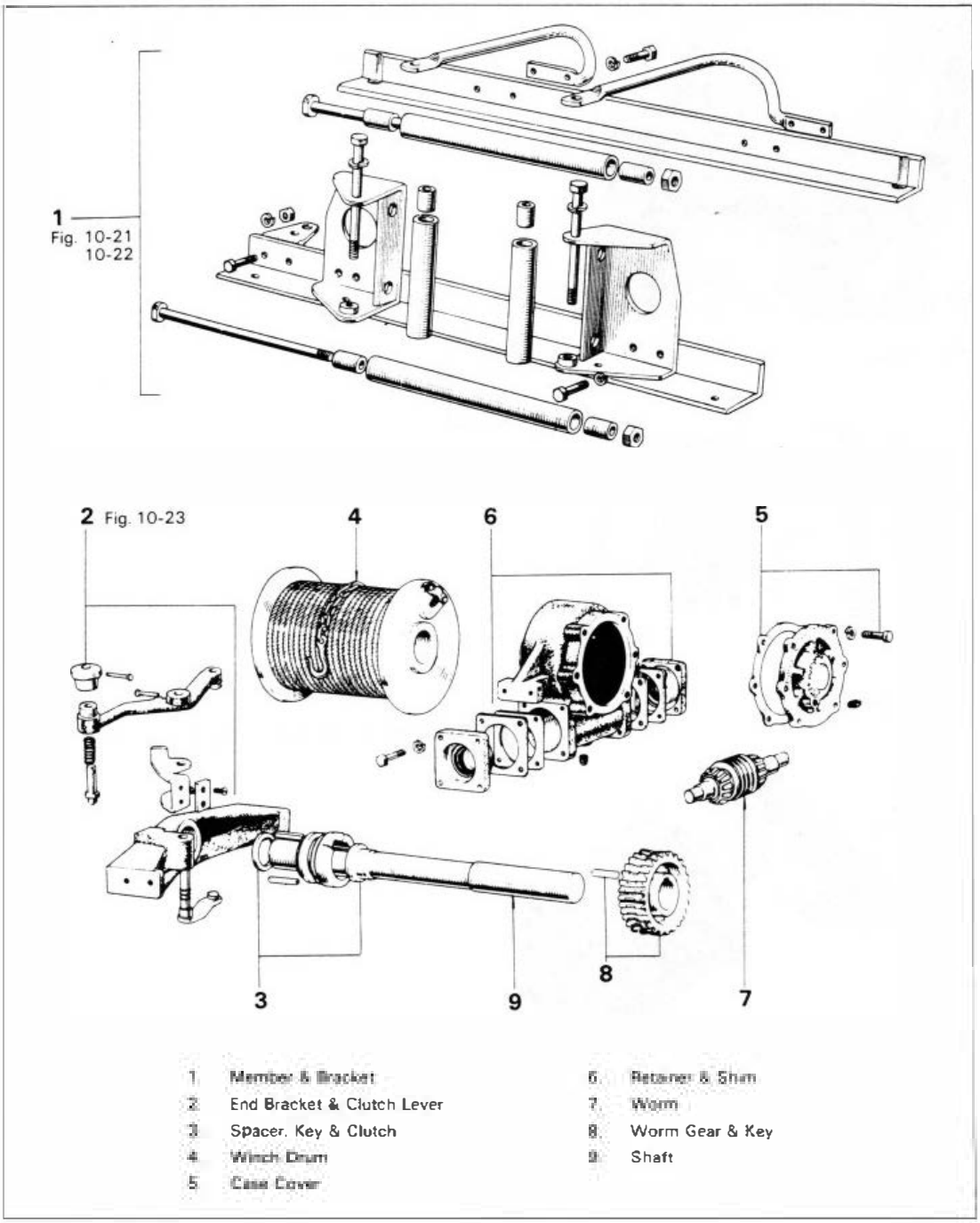
Install the input gear with the larger gear towards the rear.

MECHANICAL WINCH

DISASSEMBLY

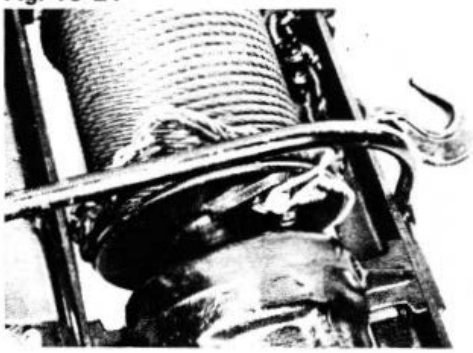
Disassemble the parts in the numerical order shown in the figure.

Fig. 10-20



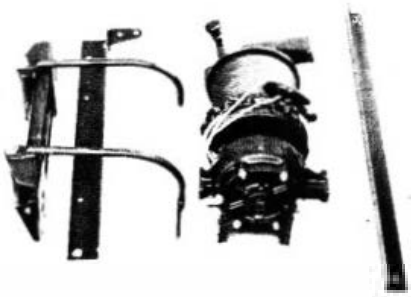
1. Member & Bracket
2. End Bracket & Clutch Lever
3. Spacer, Key & Clutch
4. Winch Drum
5. Case Cover
6. Retainer & Shim
7. Worm
8. Worm Gear & Key
9. Shaft

Fig. 10-21



Keep the wire rope end tied together with a wire as shown in the figure.

Fig. 10-22

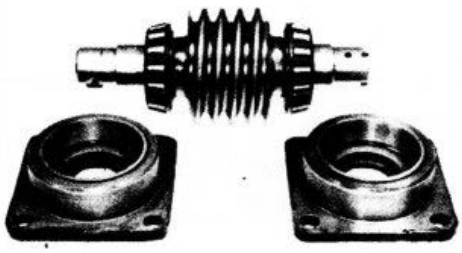


Remove the front and rear base members, and the roller bracket supports.

Fig. 10-23

Remove the winch end bracket assembly.

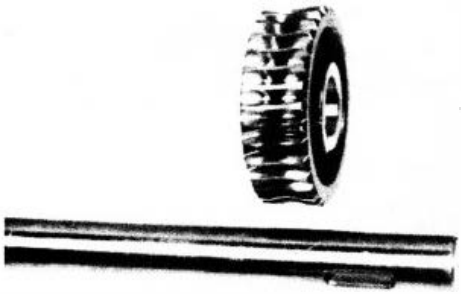
Fig. 10-24



INSPECTION

Worm & Bearing
Inspect for wear or damage

Fig. 10-25

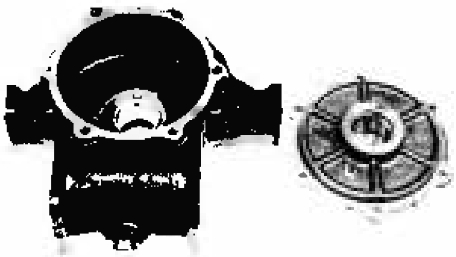


Worm Gear & Shaft
Inspect for wear or damage

Fig. 10-26

Clutch & Spacer
Inspect for wear or damage

Fig. 10-27

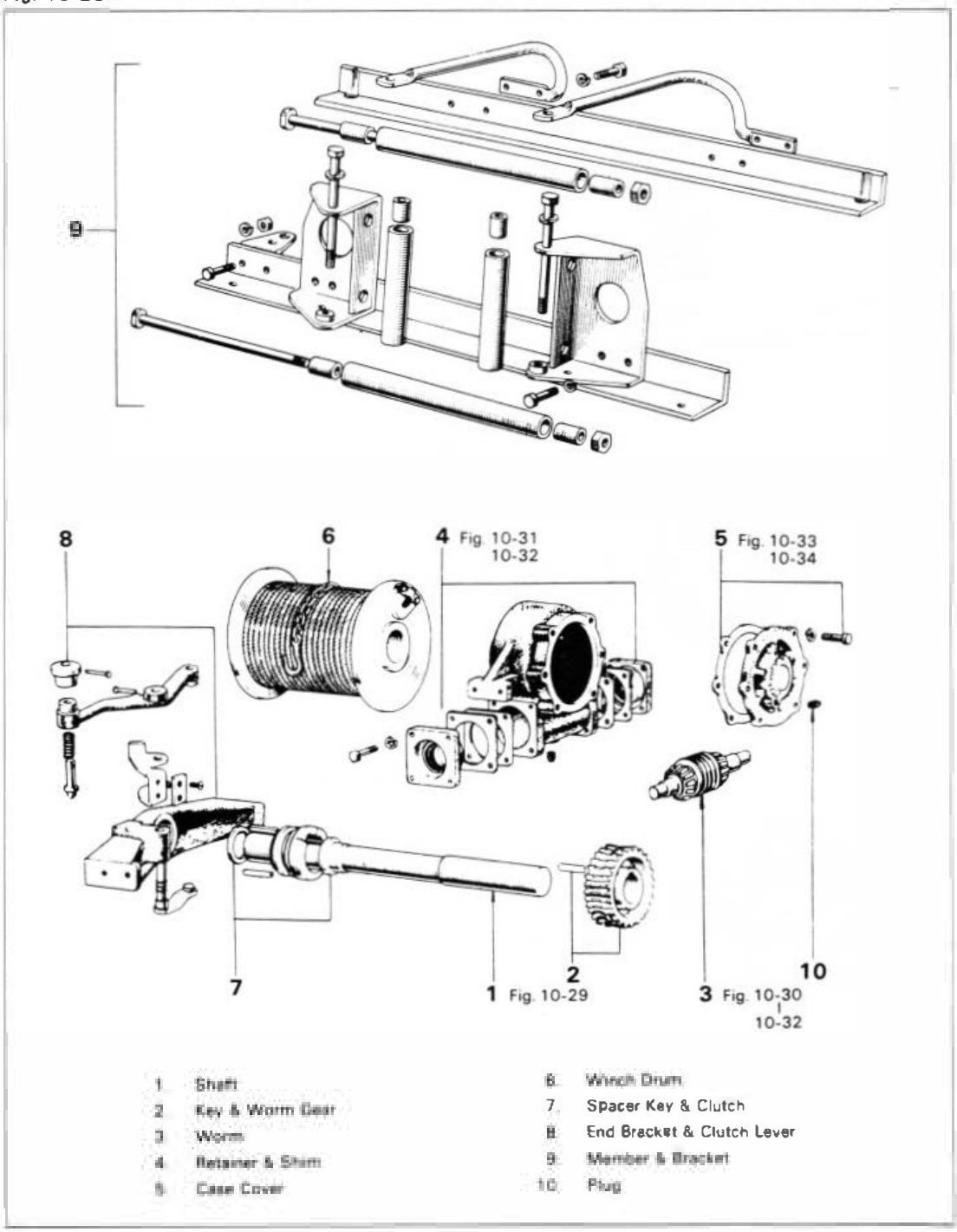


Gear Case & Cover
Inspect for cracks or wear

ASSEMBLY

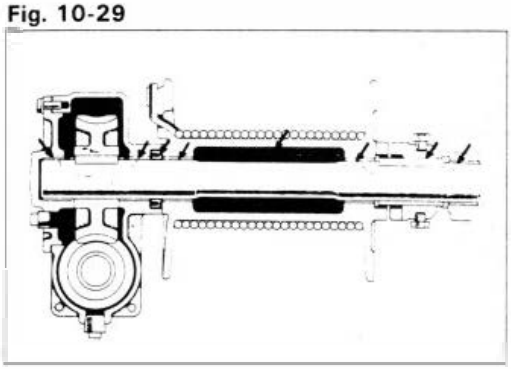
Assemble the parts in the numerical order shown in the figure.

Fig. 10-28



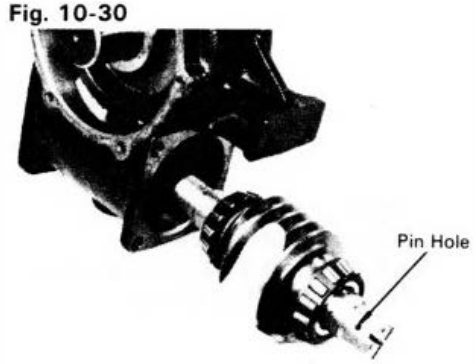
1. Shaft
2. Key & Worm Gear
3. Worm
4. Retainer & Shim
5. Case Cover
6. Winch Drum
7. Spacer Key & Clutch
8. End Bracket & Clutch Lever
9. Member & Bracket
10. Plug

Fig. 10-29



Apply MP grease on all bushings, shaft and the clutch mechnism when assembling, and pack MP grease into the drum to about three-fourth of the drum volume

Fig. 10-30



Place the worm into thecase withthe 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

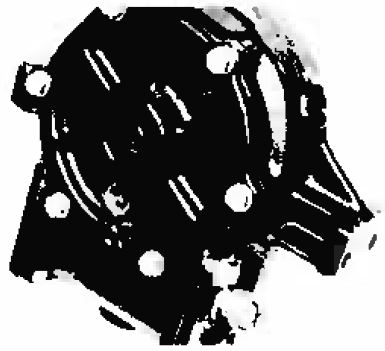
Rotatethe worm, and check the condition for looseness or tightness, and also rock the worm to-and-fro, and check the worm end play

The worm end play should be zero and it should rotate smoothly

Adjusting shim thickness

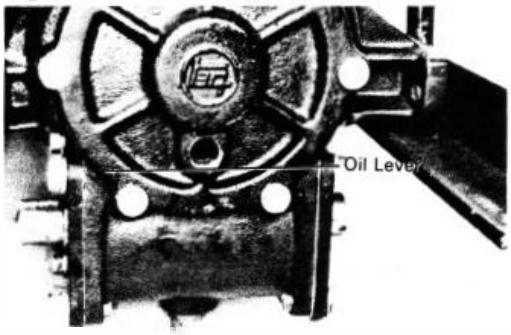
Part No.	Thickness mm (in.)
38123-60010	0.228 (0.0090)
38124-60010	0.5 (0.020)

Fig. 10-33



Install the case cover with its filler hole positioned downward

Fig. 10-34



Fill the gear case with gear oil

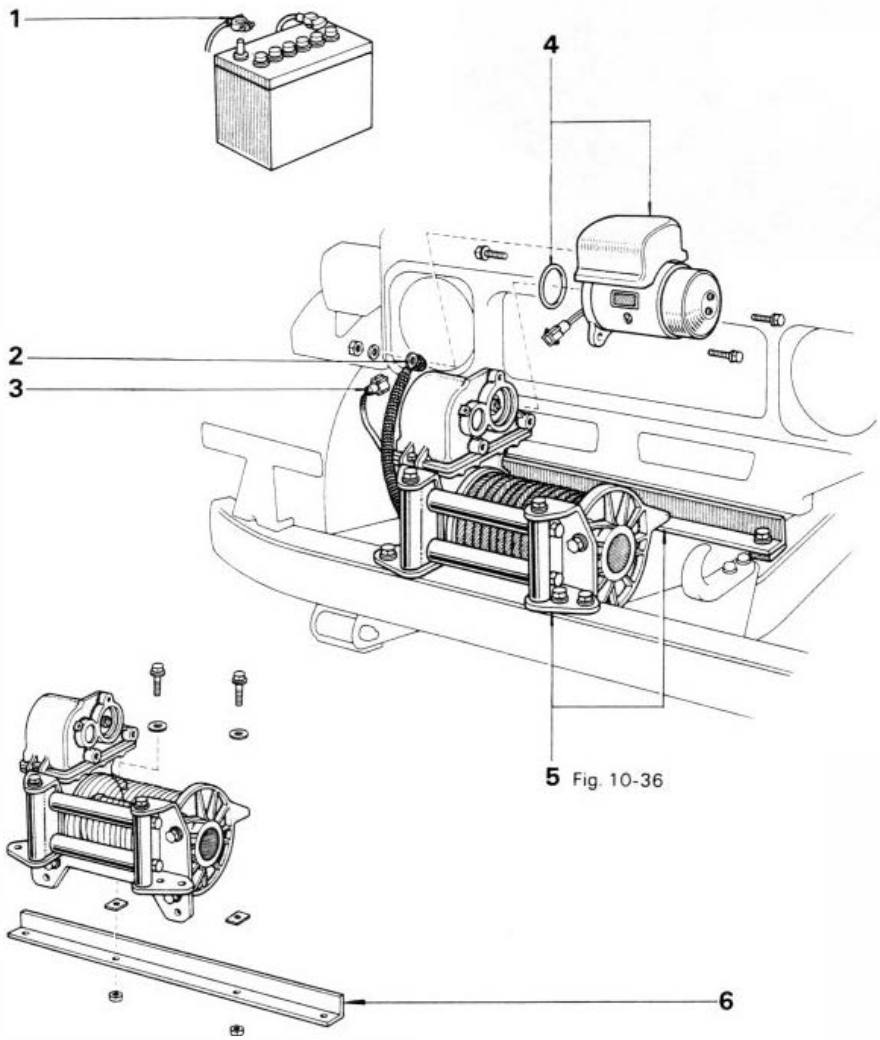
Gear case oil capacity:
0.6 liter (0.6 US qt., 0.5 Imp.qt.)
Type: SAE 90, API GL-4

ELECTRIC WINCH

REMOVAL

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

Fig. 10-35



1. Negative Battery Terminal
2. Wiring Harness
3. Connector
4. Motor & O Ring
5. Winch with Rear Base Member
6. Rear Base Member

5 Fig. 10-36

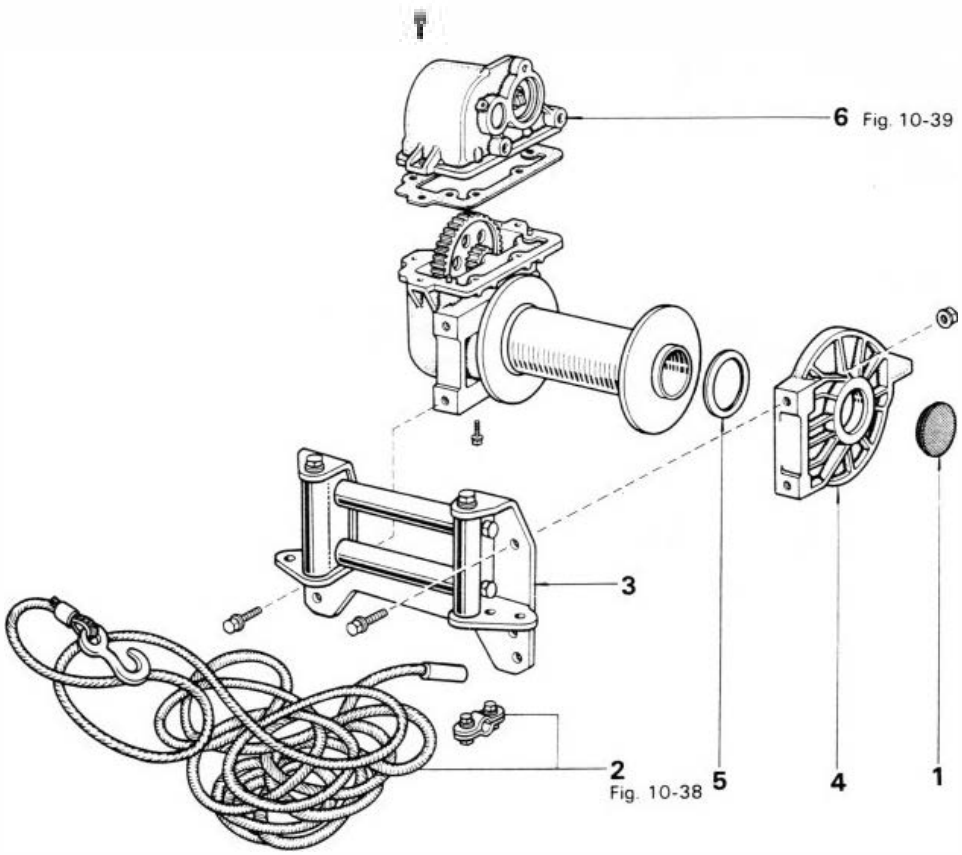
Fig. 10-36

Drain the fluid

DISASSEMBLY

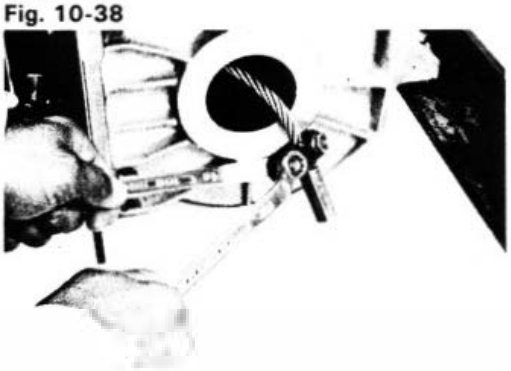
1. Disassemble the winch in the numerical order shown in the figure.

Fig. 10-37



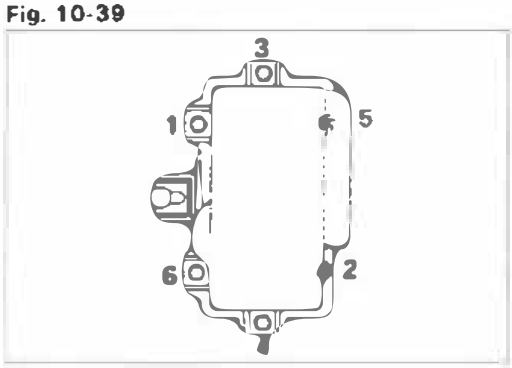
1. Housing Cover
2. Cable
3. Winch Set Plate
4. Winch Housing
5. Drum Spacer
6. Case Cover

Fig. 10-38



Remove the winch cable.

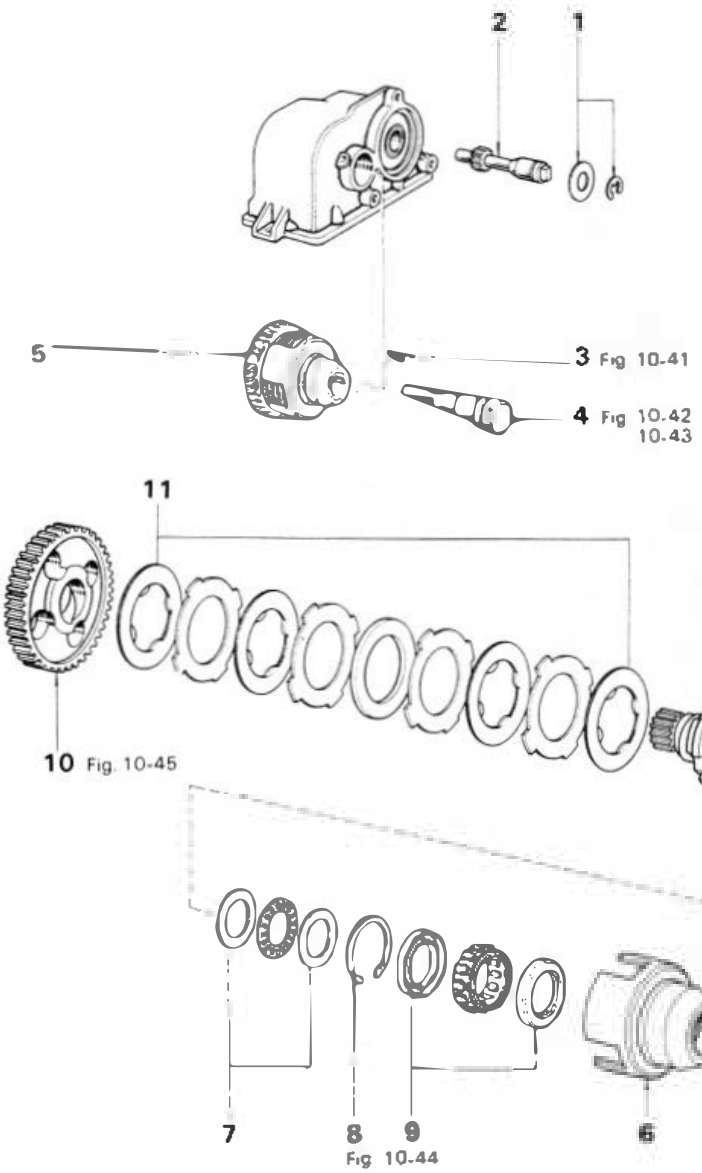
Fig. 10-39



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

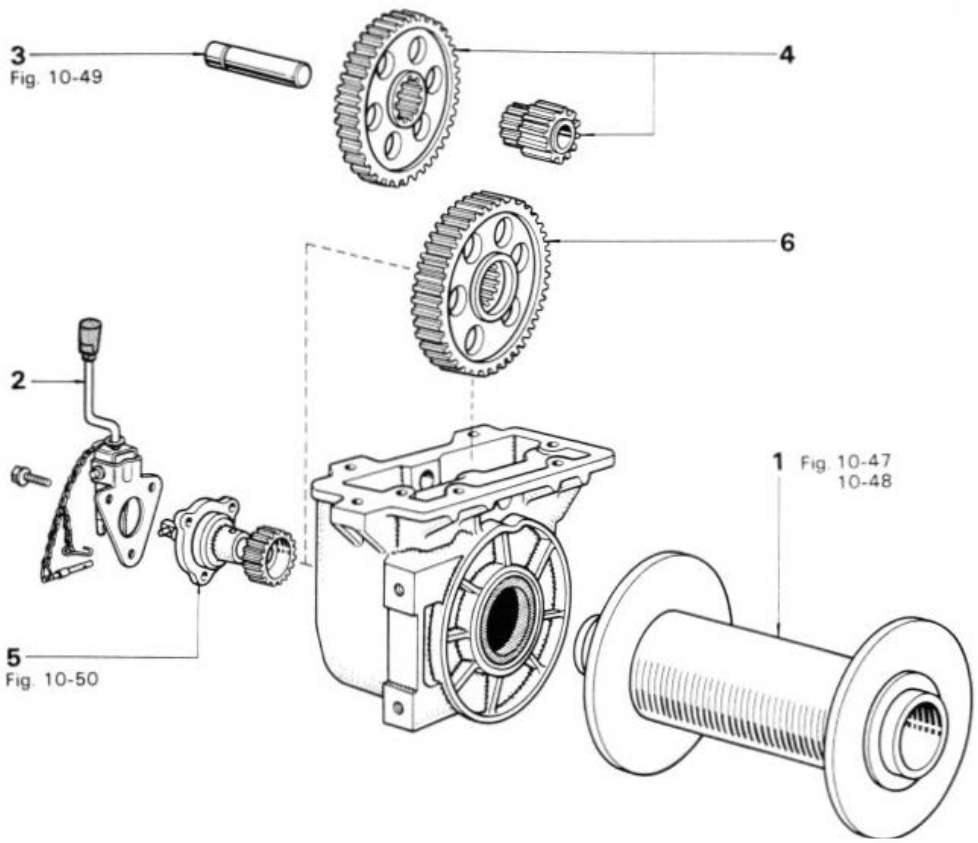
Remove the snap ring

Fig. 10-45

Remove No. 1 counter gear

3. Disassemble the winch case in the numerical order shown in the figure.

Fig. 10-46

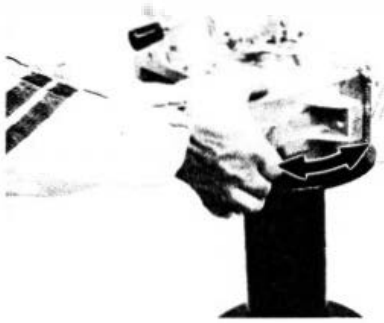


1 Winch Drum & Spacer
2 Shift Lever
3 No 2 Counter Shaft
4 No 3 & No 4 Counter Gear
5 Free Spool
6 Output Gear

Fig. 10-47

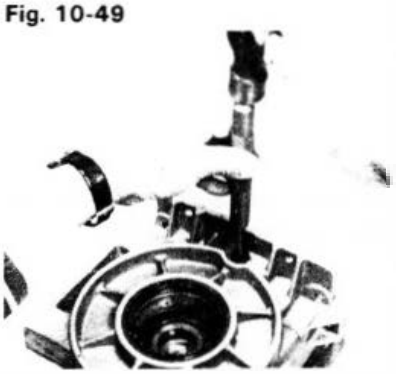
⚠ Before removing the winch drum, shift the lever to the lock position.

Fig. 10-48



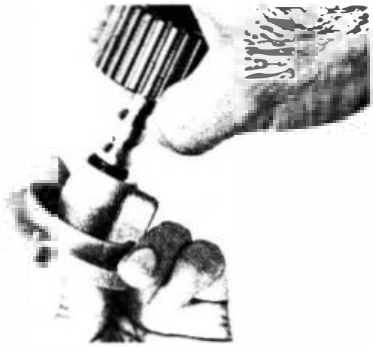
Remove the winch drum.

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.

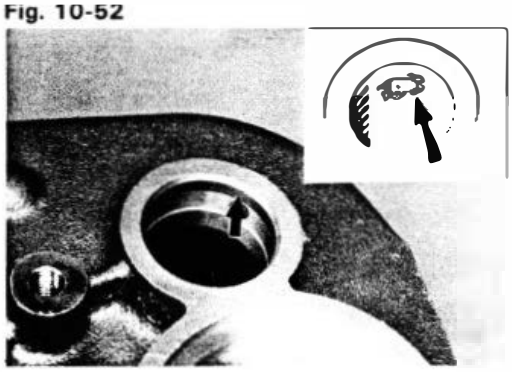
Fig. 10-51

INSPECTION & REPAIR

Case Cover

Check for damage.

Fig. 10-52

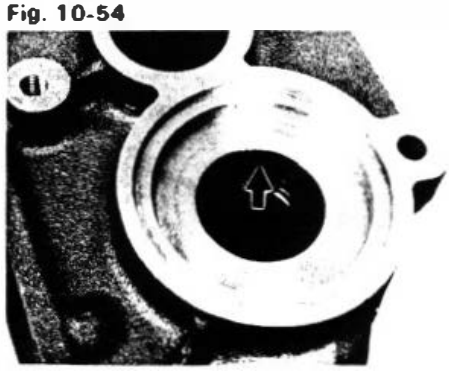


Check the slotted spring hole for bits of debris

Fig. 10-53

Thoroughly remove all debris from the hole as it will cause damage to the O ring.

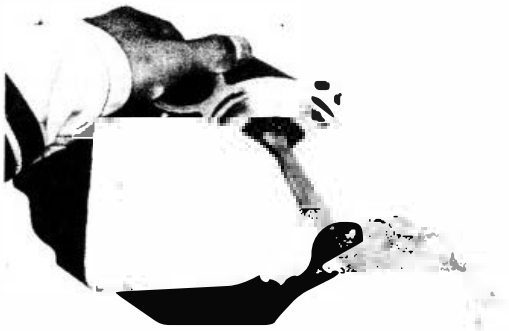
Fig. 10-54



Oil Seal

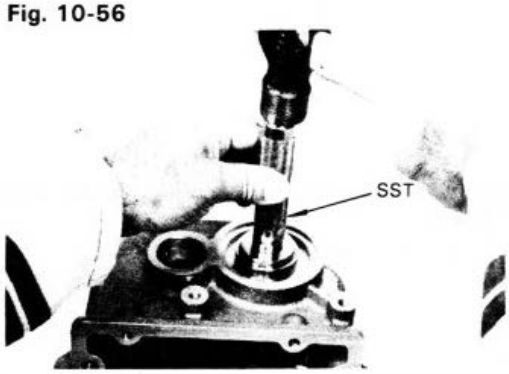
1 Check the lip for wear or damage

Fig. 10-55



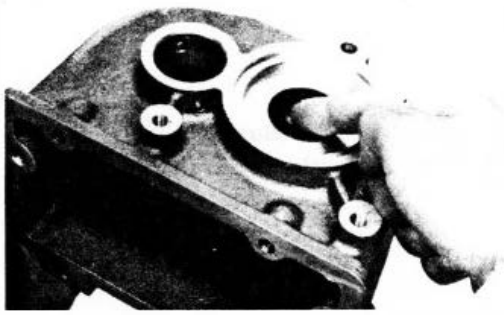
2 Replace the oil seal.
(1) Remove the oil seal.

Fig. 10-56



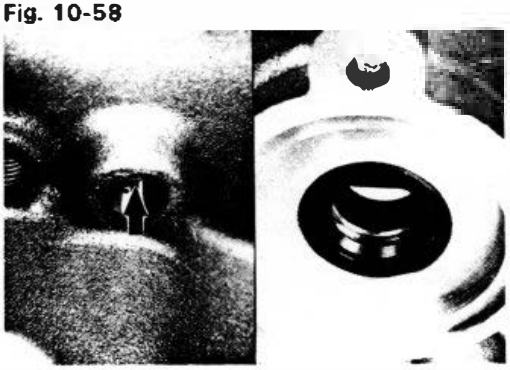
(2) Install the oil seal with SST.
SST [09608-30021]

Fig. 10-57



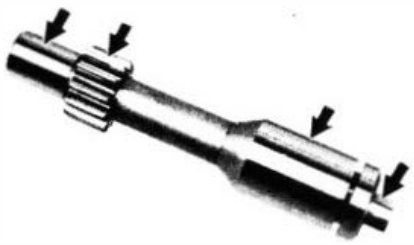
3. Coat the lip with MP grease.

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

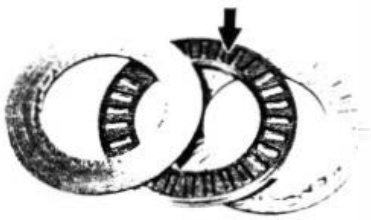
Fig. 10-60

No.1 Counter Shaft & Slotted Spring Pin
Check for wear or damage

Fig. 10-61

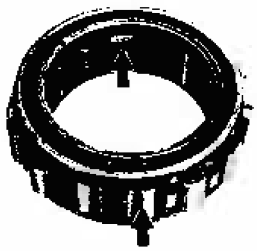
Outer Race & Bushing
Check for wear or damage

Fig. 10-62



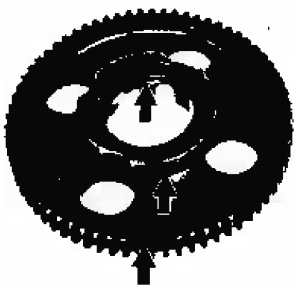
Thrust Bearing & Race
Check for burning, wear or damage

Fig. 10-63



One-way Clutch
Check for wear or damage

Fig. 10-64

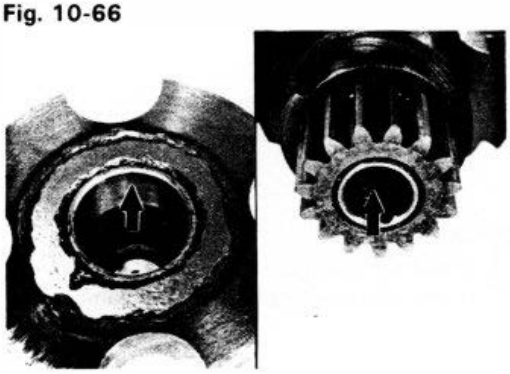


No.1 Counter Gear
Check for wear or damage

Fig. 10-65

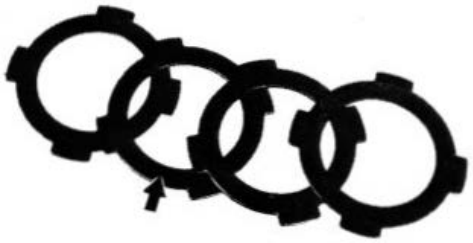
No.2 Counter Gear
1. Check for wear or damage.

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

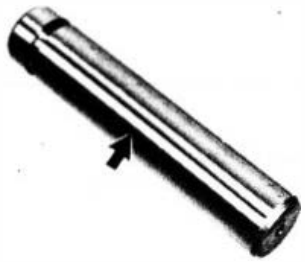
Fig. 10-69

Winch Drum
Check for damage

Fig. 10-70

Shift Lever
Check for damage
Check the bushing for wear or damage

Fig. 10-71

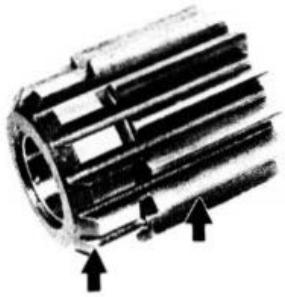


No.2 Counter Shaft
Check for wear or damage

Fig. 10-72

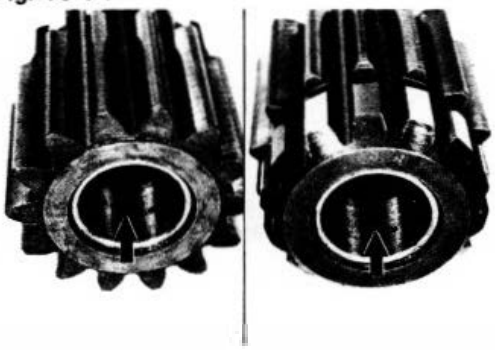
No.3 Counter Gear
Check for wear or damage

Fig. 10-73



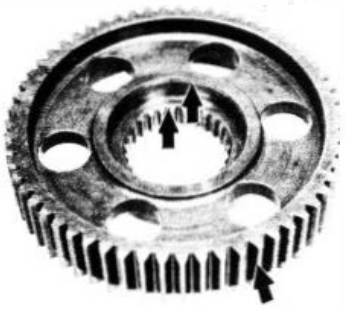
No.4 Counter Gear
1. Check for wear or damage.

Fig. 10-74



2. Check the bushing for wear or damage.

Fig. 10-75

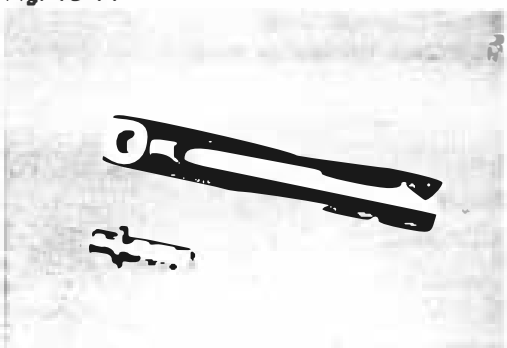


Output Gear
Check for wear or damage

Fig. 10-76

Shift Shaft Retainer, Spring & Ball
Check for wear or damage

Fig. 10-77

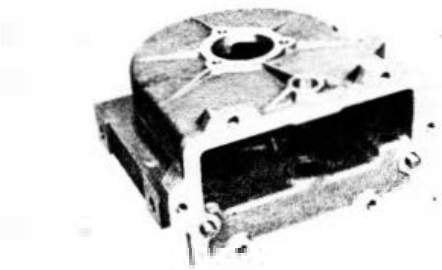


Sleeve Shift Shaft & Pin
Check for wear or damage

Fig. 10-78

Inner Hub
Check for wear or damage

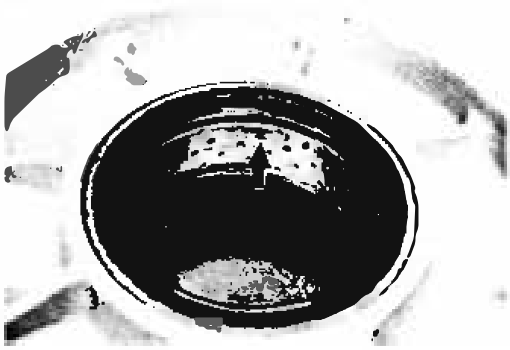
Fig. 10-79



Winch Case

1. Check for wear or damage.

Fig. 10-80



2. Check the bushing for wear or damage.

Fig. 10-81

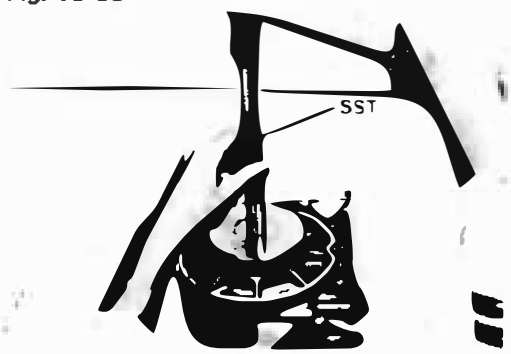
3. Check the oil seal for wear or damage.

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]

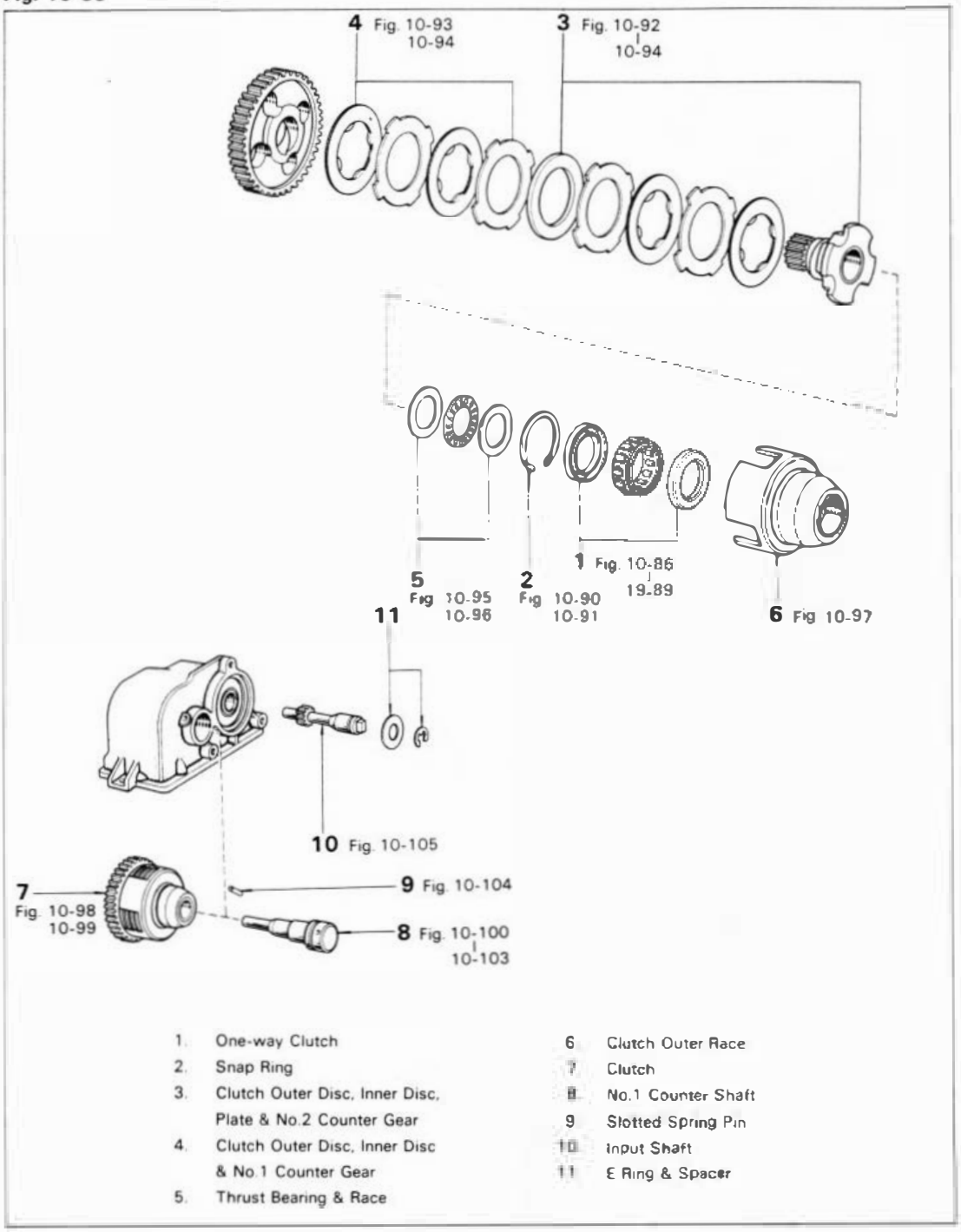
Fig. 10-84

3 Coat the oil seal with MP grease

ASSEMBLY

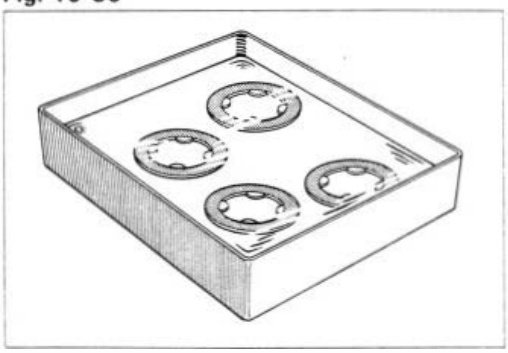
1 Assemble the case cover in the numerical order shown in the figure

Fig. 10-85



1. One-way Clutch
2. Snap Ring
3. Clutch Outer Disc, Inner Disc, Plate & No.2 Counter Gear
4. Clutch Outer Disc, Inner Disc & No.1 Counter Gear
5. Thrust Bearing & Race
6. Clutch Outer Race
7. Clutch
8. No.1 Counter Shaft
9. Slotted Spring Pin
10. Input Shaft
11. E Ring & Spacer

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

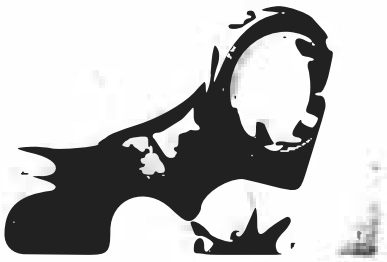


Fig. 10-89

Assemble the one-way clutch as shown in the figure

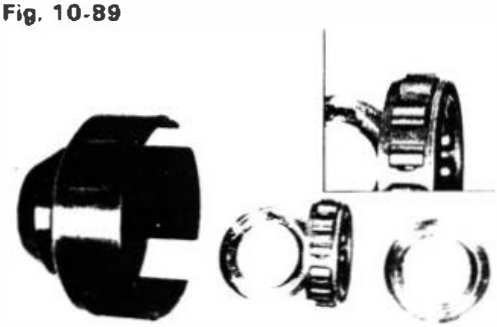


Fig. 10-90

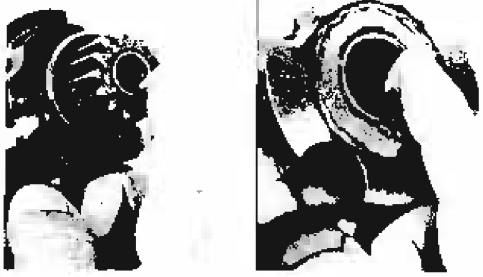
Install the snap ring

– Note –
Confirm that the snap ring is securely installed.

Fig. 10-91

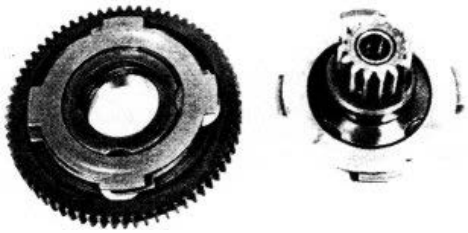
Check the one-way clutch

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. 10-9 4

Hold the clutch disc and plate by hand and assemble the No 1 and No 2 counter gears as shown in the figure

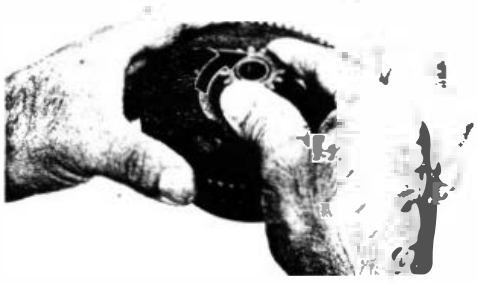
Fig. 10-95

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

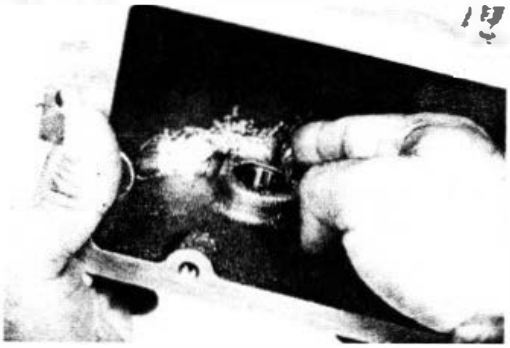


Turn the No 2 counter gear clockwise and lock

Fig. 10-98

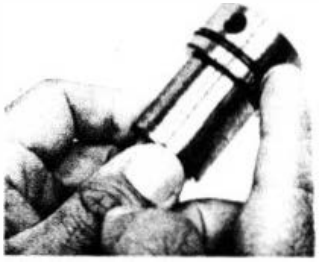
Confirm that the thrust bearing and race are aligned in the center.

Fig. 10-99



Coat the bearing parts of the case cover with MP grease.

Fig. 10-100

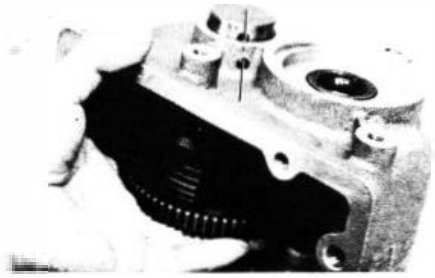


Install a new O ring and coat with MP grease

Fig. 10-101

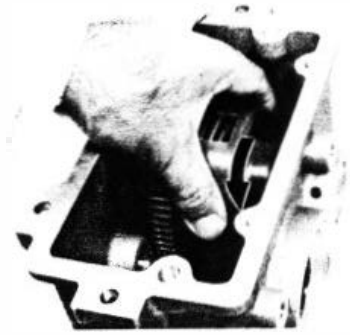
Hold No 1 counter gear by hand and push in No 1 counter shalt

Fig. 10-102



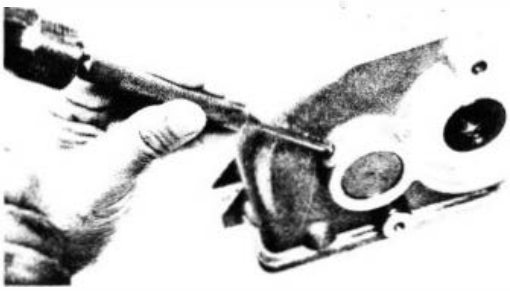
– Note –
At this time, align the case cover hole and counter shaft hole.

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



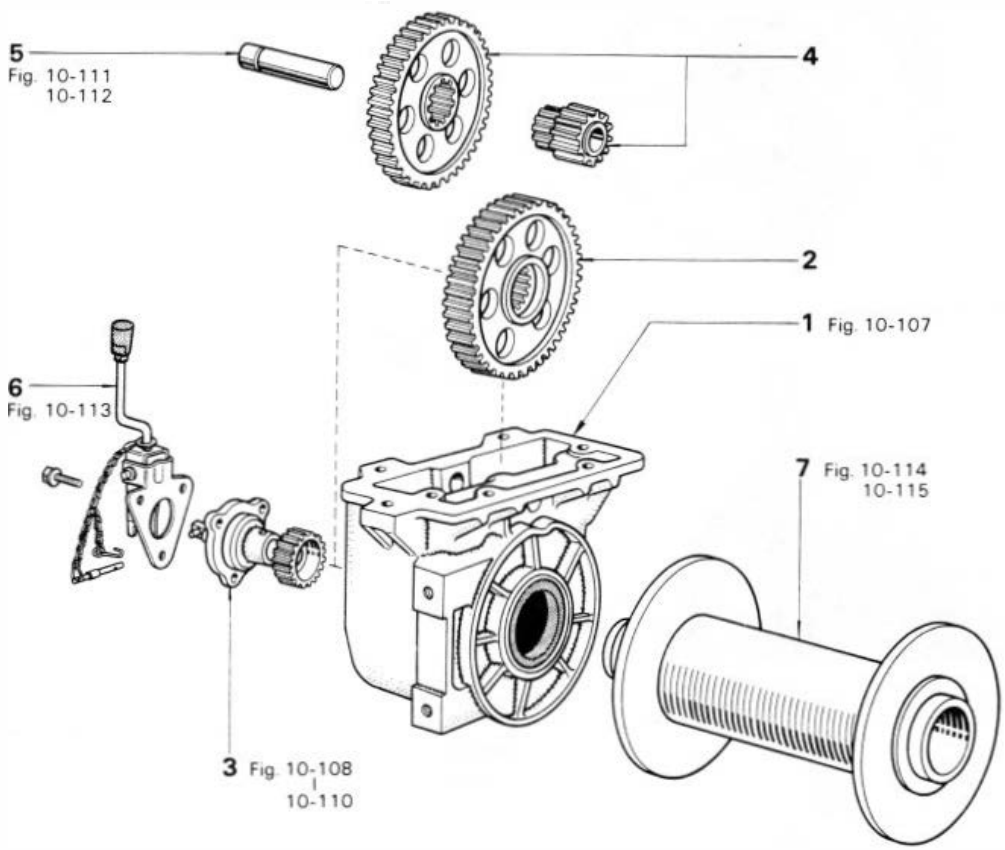
Tap in the slottled spring pin with a pin punch

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



1. Winch Case
2. Output Gear
3. Free Spool
4. No 3 & No 4 Counter Gear
5. No 2 Counter Shaft
6. Shift Lever
7. Winch Drum & Spacer

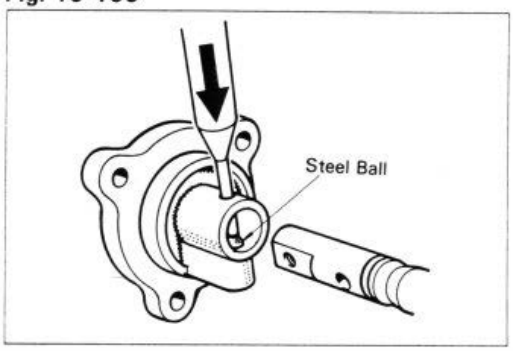
Fig. 10-107

Coat the winch case bushing with MP grease

Fig. 10-108

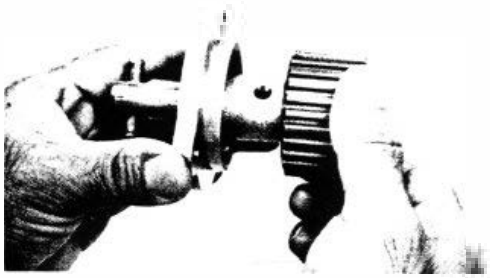
Coat the sleeve shift shaft and O ring with MP grease.

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

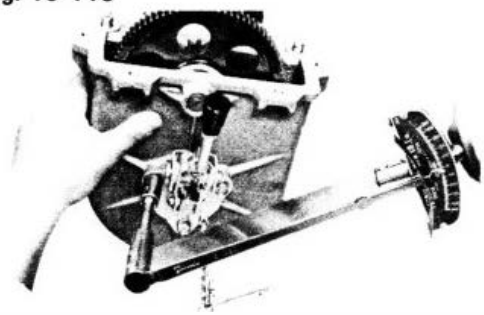
Fig. 10-111

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

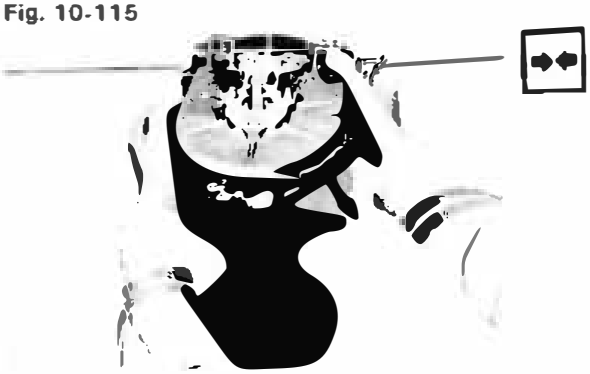


Tighten the shift lever support.
Tightening torque: 1.5 – 2.2 kg-m (11 – 15 ft-lb)

Fig. 10-114

Coat the spacer with MP grease

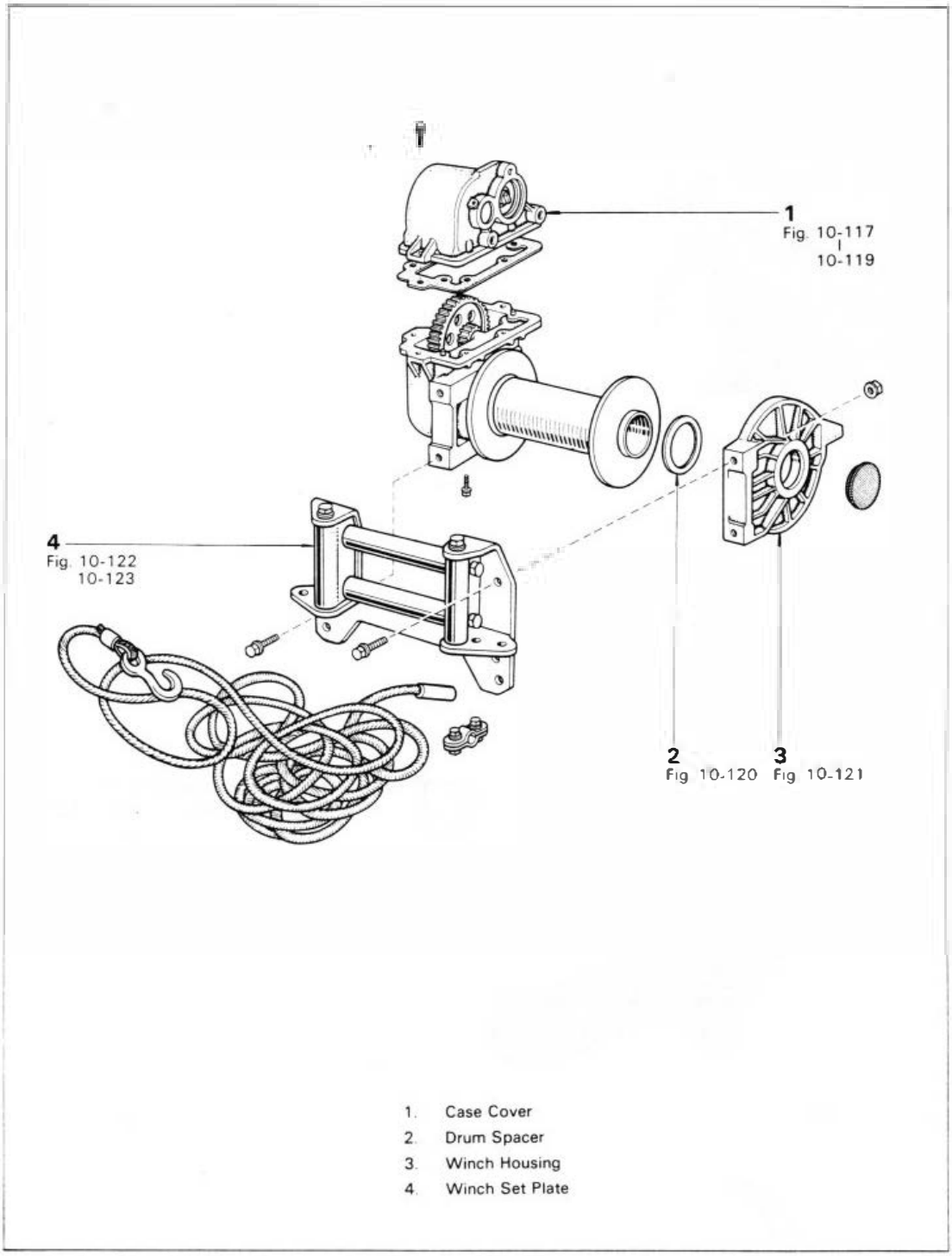
Fig. 10-115



Install the winch drum

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

Fig. 10-116

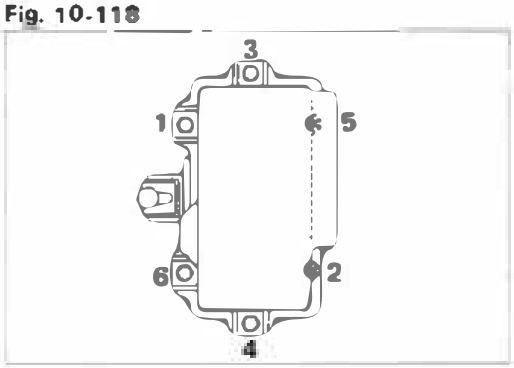


1. Case Cover
2. Drum Spacer
3. Winch Housing
4. Winch Set Plate

Fig. 10-117

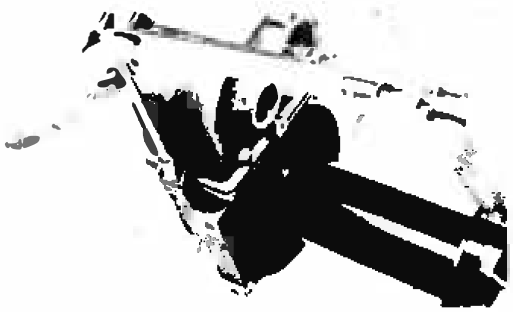
First, install the bolt in the place shown in the figure.

Fig. 10-118



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

Fig. 10-119



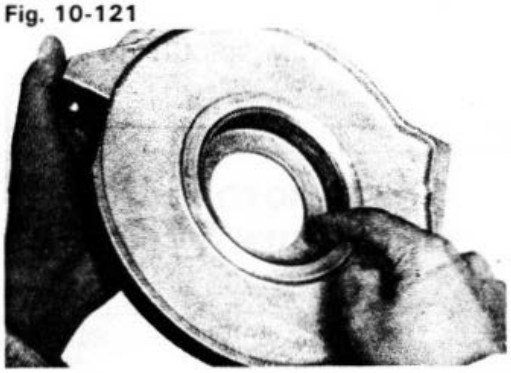
Tighten the bolts to specified torque.

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

Fig. 10-120

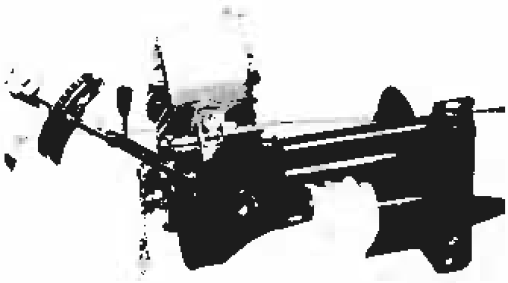
Coat the drum spacer with MP grease

Fig. 10-121



Coat the bushing of the housing with MP grease

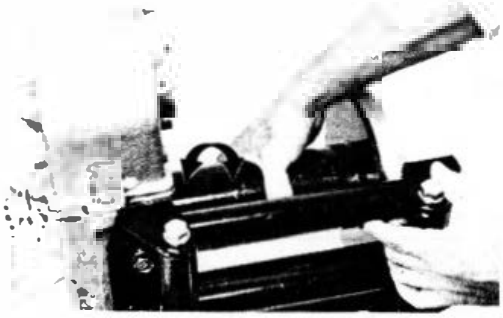
Fig. 10-122



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

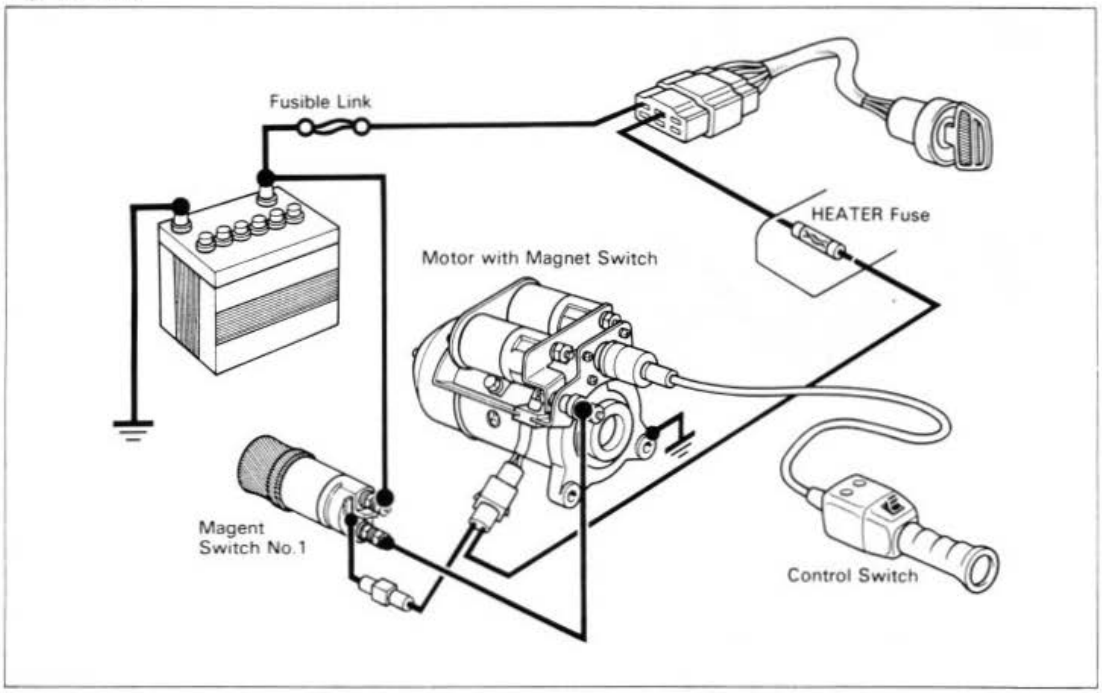
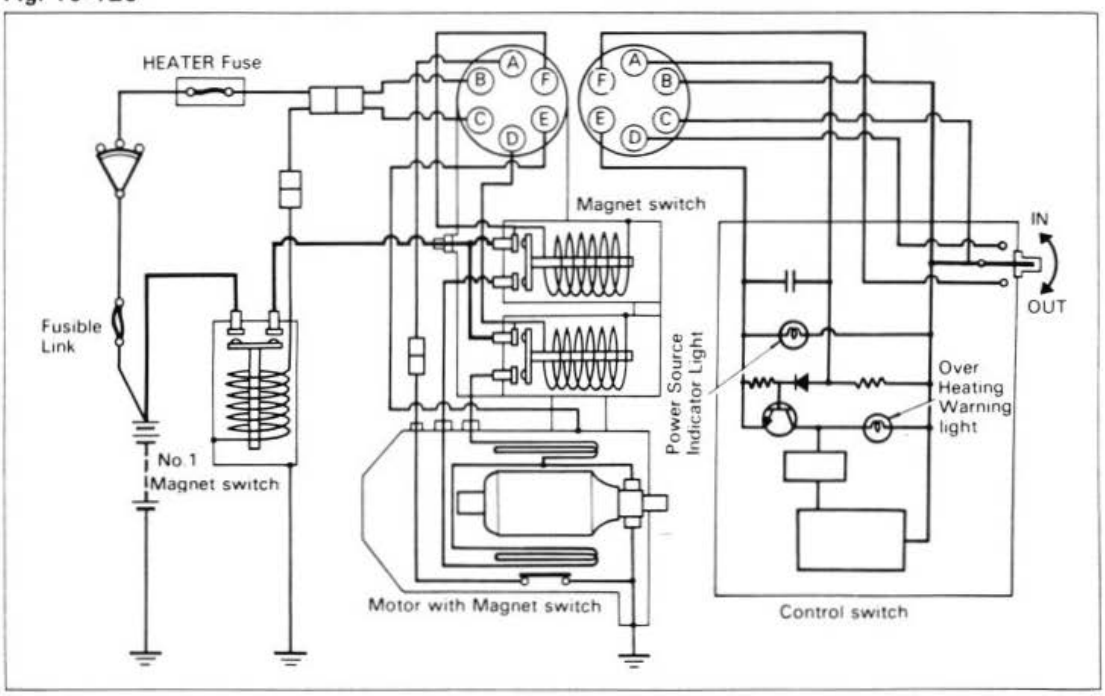


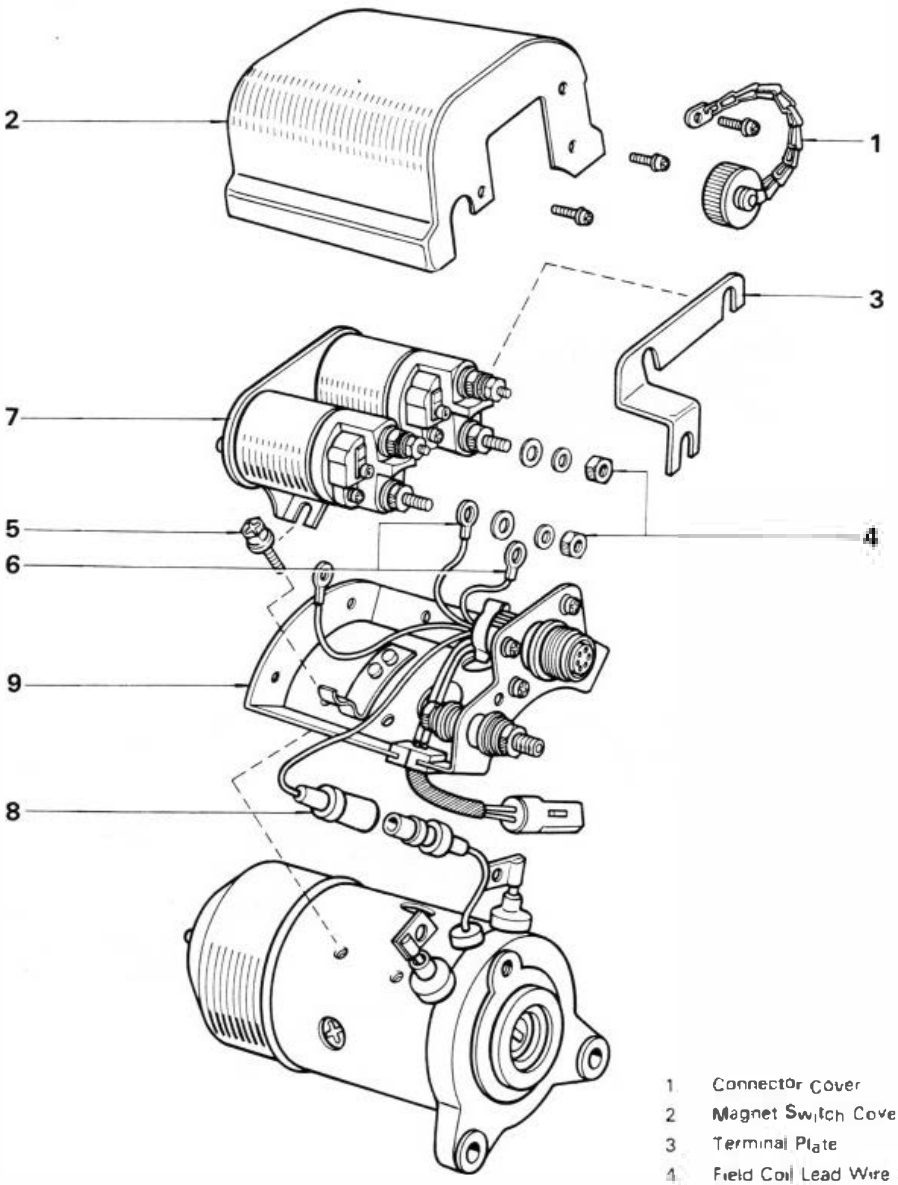
Fig. 10-125



DISASSEMBLY

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

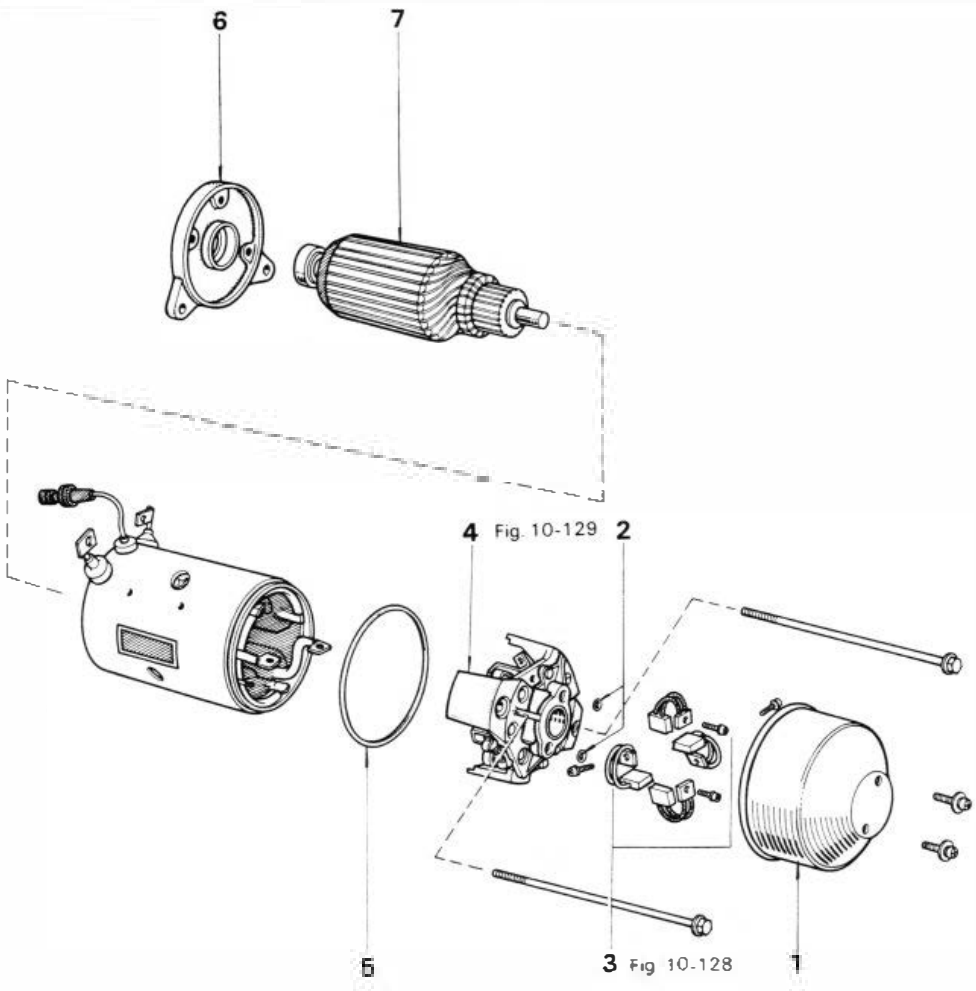
Fig. 10-126



1 Connector Cover
2 Magnet Switch Cover
3 Terminal Plate
4 Field Coil Lead Wire Set Nut
5 Base Set Bolt
6 Lead Wire
7 Magnet Switch
8 Connector
9 Base

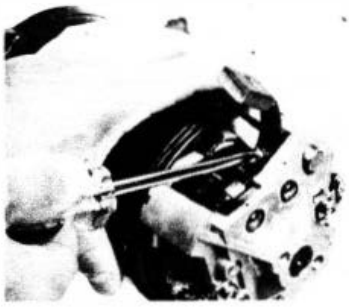
2 Disassemble the parts in the numerical order shown in the figure

Fig. 10-127



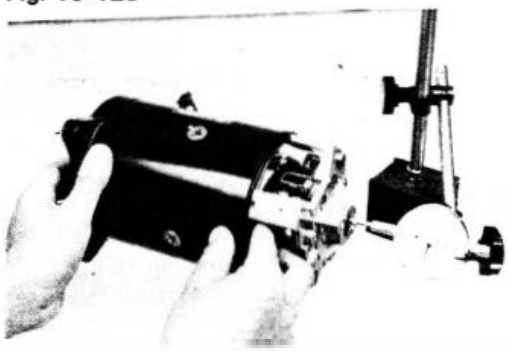
1 Motor Cover
2 O Ring
3 Brush
4 Commutator End Frame
5 O Ring
6 End Frame
7 Armature

Fig. 10-128



Take off the brushes and remove the screw.

Fig. 10-129

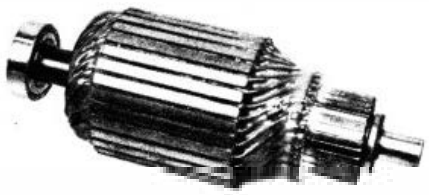


Measure the armature shaft thrust clearance.

Thrust clearance:
0.05 – 0.50 mm
(0.0020 – 0.0197 in.)

Thrust washer thickness:
1.6 mm
(0.063 in.)

Fig. 10-130

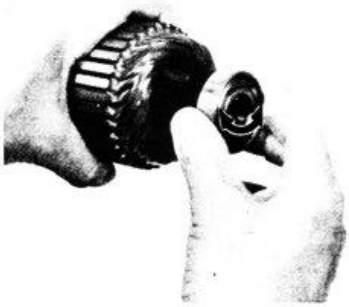


INSPECTION & REPAIR

Armature Shaft

Check for wear or damage

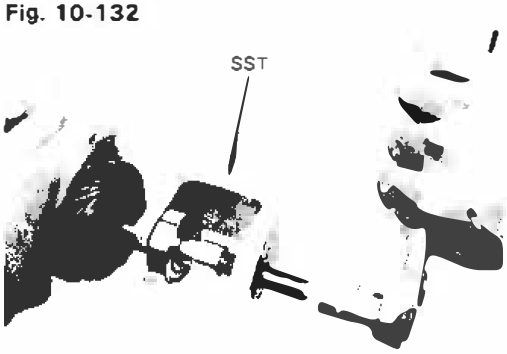
Fig. 10-131



Bearing

1 Check to see that there is no drag or the bearing when it is turned with force

Fig. 10-132



2 Replace the bearing

(1) Remove the bearing with SST
SST [09611-12010]

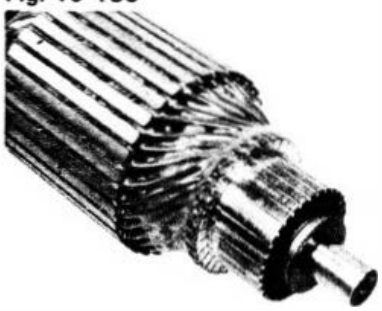
Fig. 10-133

(2) Install the bearing with a press

Fig. 10-134

(3) Check the bearing condition

Fig. 10-135

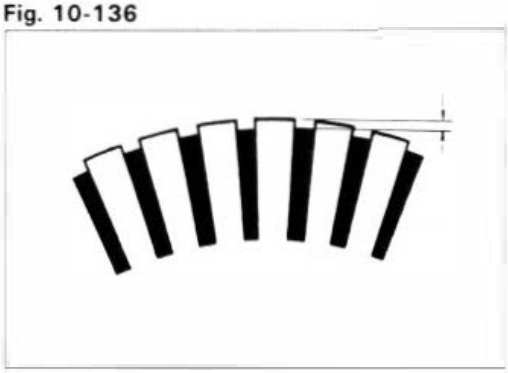


Commutator

Check for following items and repair or replace

1. Dirty or burnt surface
   Correct by sandpaper if necessary

Fig. 10-136

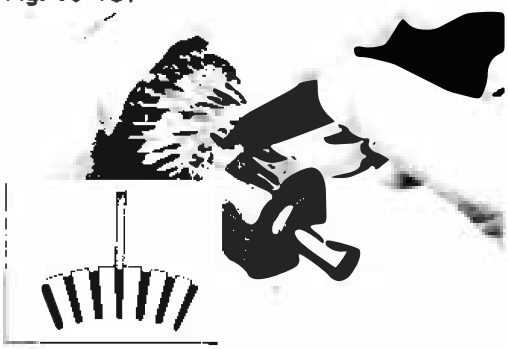


2. Depth of segument mica.

Mica depth:

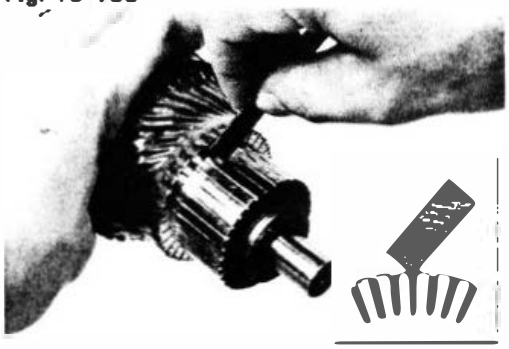
STD	**0.7 mm (0.028 in.)**
Limit	**0.3 mm (0.012 in.)**

Fig. 10-137



3. Correct with a hacksaw blade
   After correcting, eliminate chips using sandpaper

Fig. 10-138

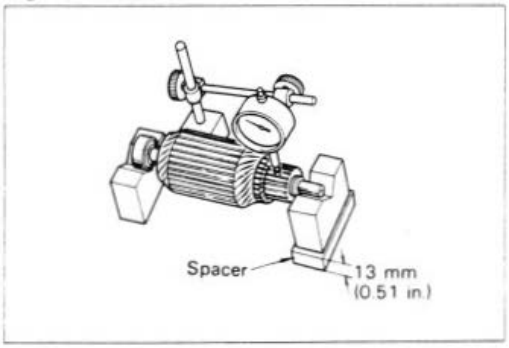


4 Smooth out the edge with a hacksaw blade

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.)**

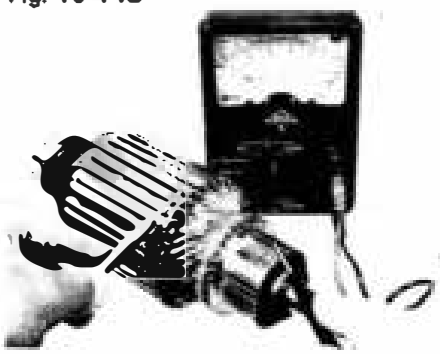
Fig. 10-141

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



Armature Coil

1. Ground test
   Check commutator and armature coil core. If there is continuity, armature is grounded and must be replaced.

Fig. 10-143

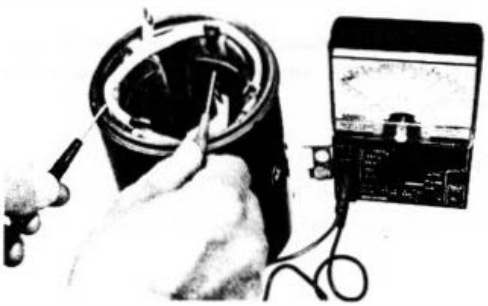
2. Open circuit test
   Check for continuity between the segu-ments.
   If there is no continuity at any test point, there is an open circuit and armature must be replaced.

Fig. 10-144

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 opencir-cuit in field coil and it should be replaced.

Fig. 10-145



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

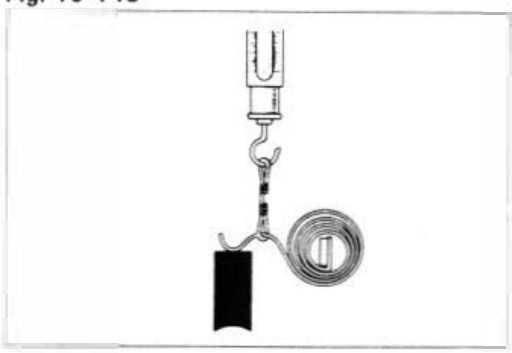
Brush

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

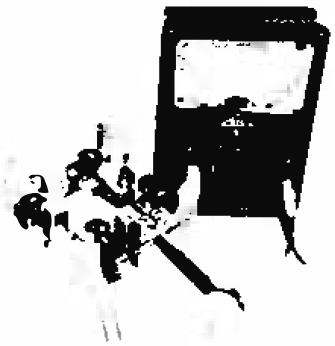
If the reading is below standard, replace the spring.

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.

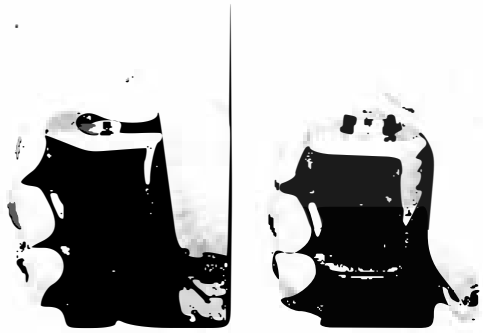
Fig. 10-149



Brush Holder

Check insulation between (–) brush holder and (+) brush holder. Repair or replace if continuity is indicated

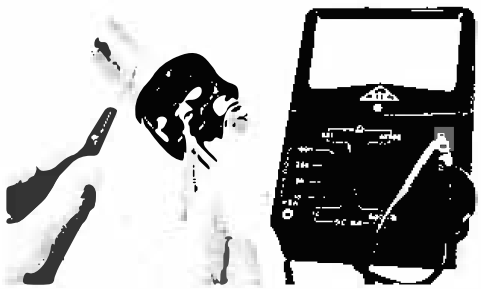
Fig. 10-150



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

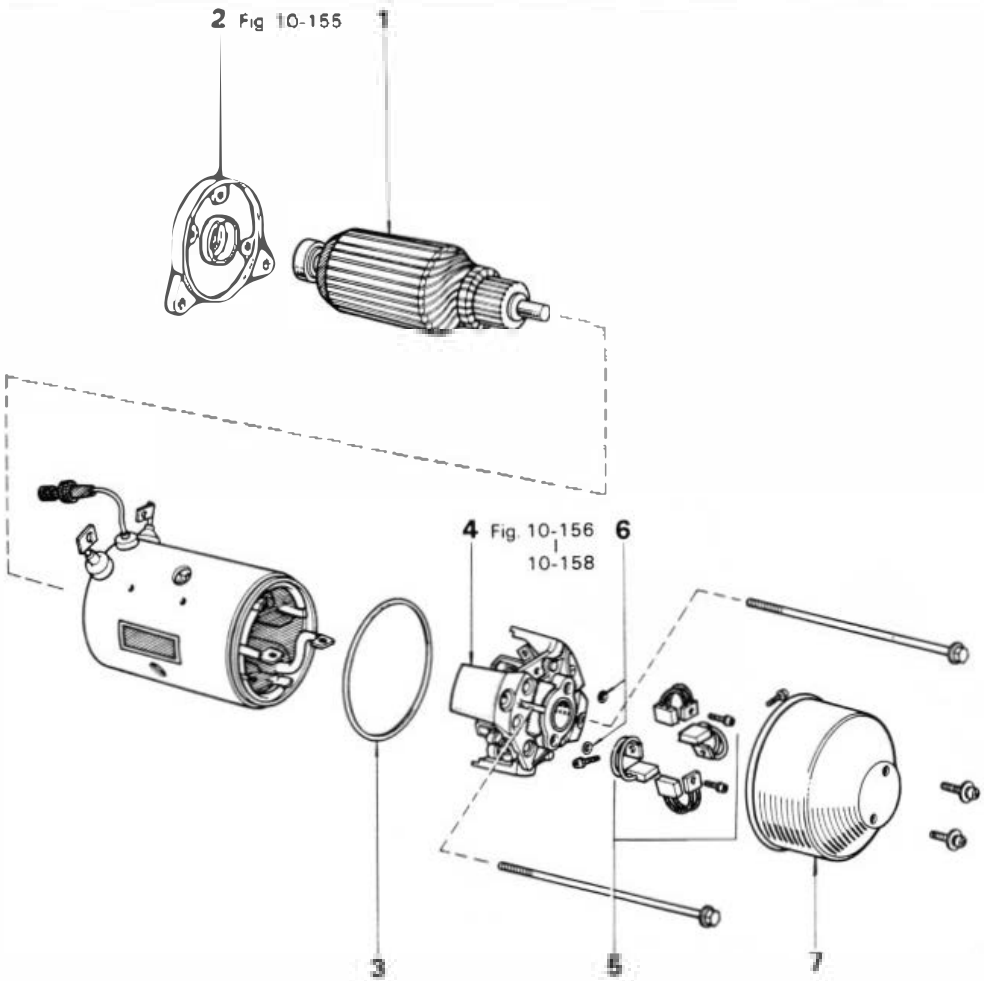
4 Push in the plunger until it stops
Check for continuity

— 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

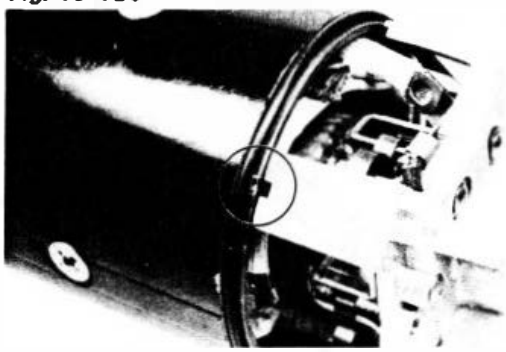


1 Armature
2 End Frame
3 O Ring
4 Commutator End Frame
5 Brush
6 O Ring
7 Motor Cover

Fig. 10-155

Align yoke dowel with center bearing hole.

Fig. 10-156



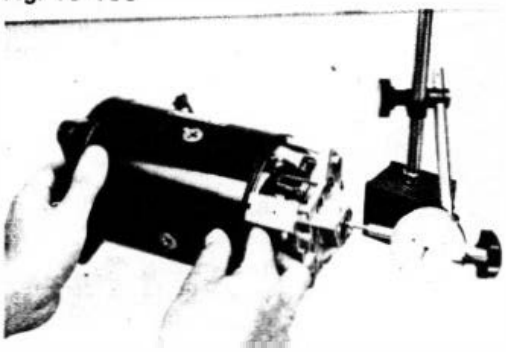
Align yoke edge dowel with groove on commutator end frame.

Fig. 10-157

Apply retaining compound to the bolts.

– **Note** –
Use Lock-Tight.

Fig. 10-158



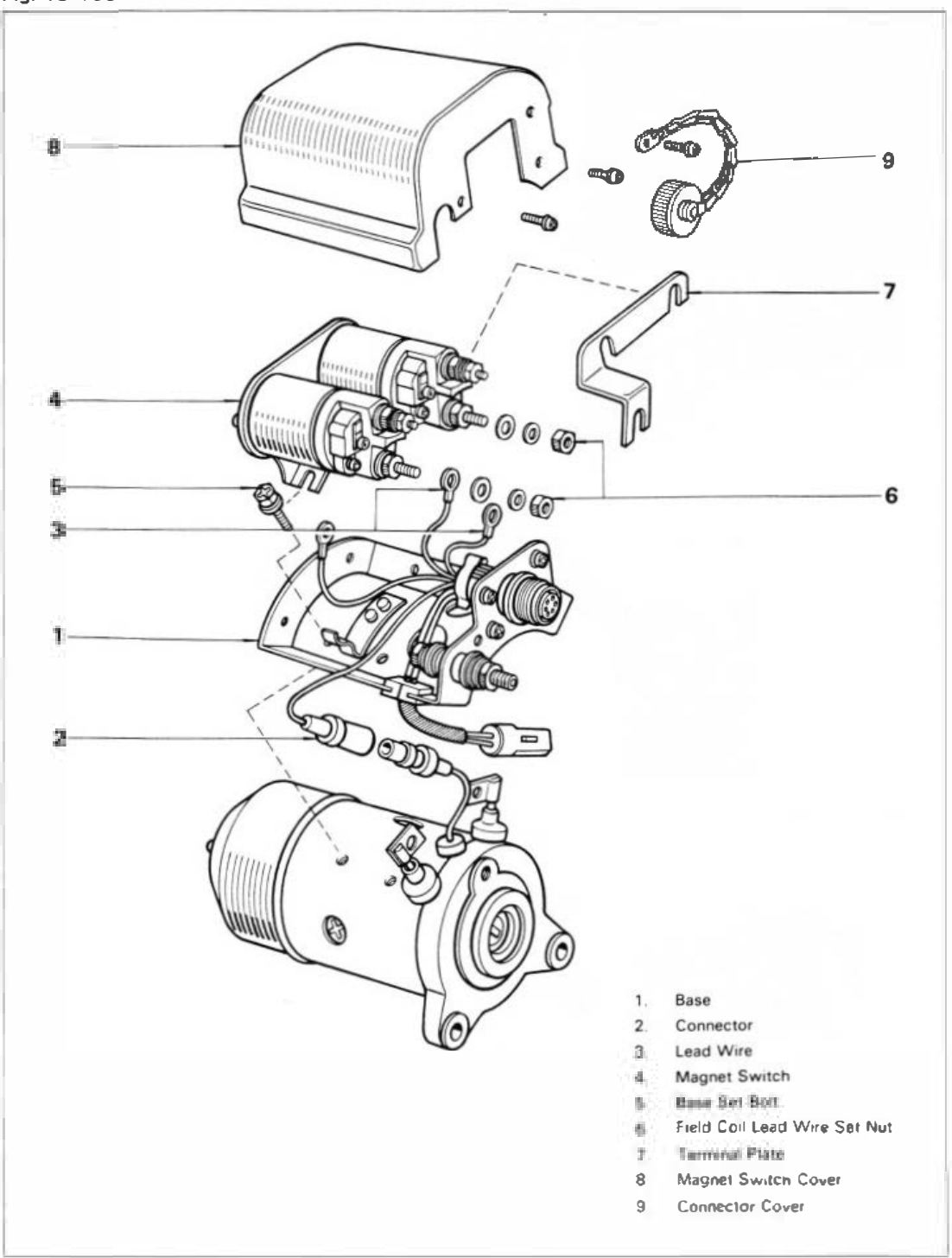
Recheck armature shaft thrust clearance.

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.

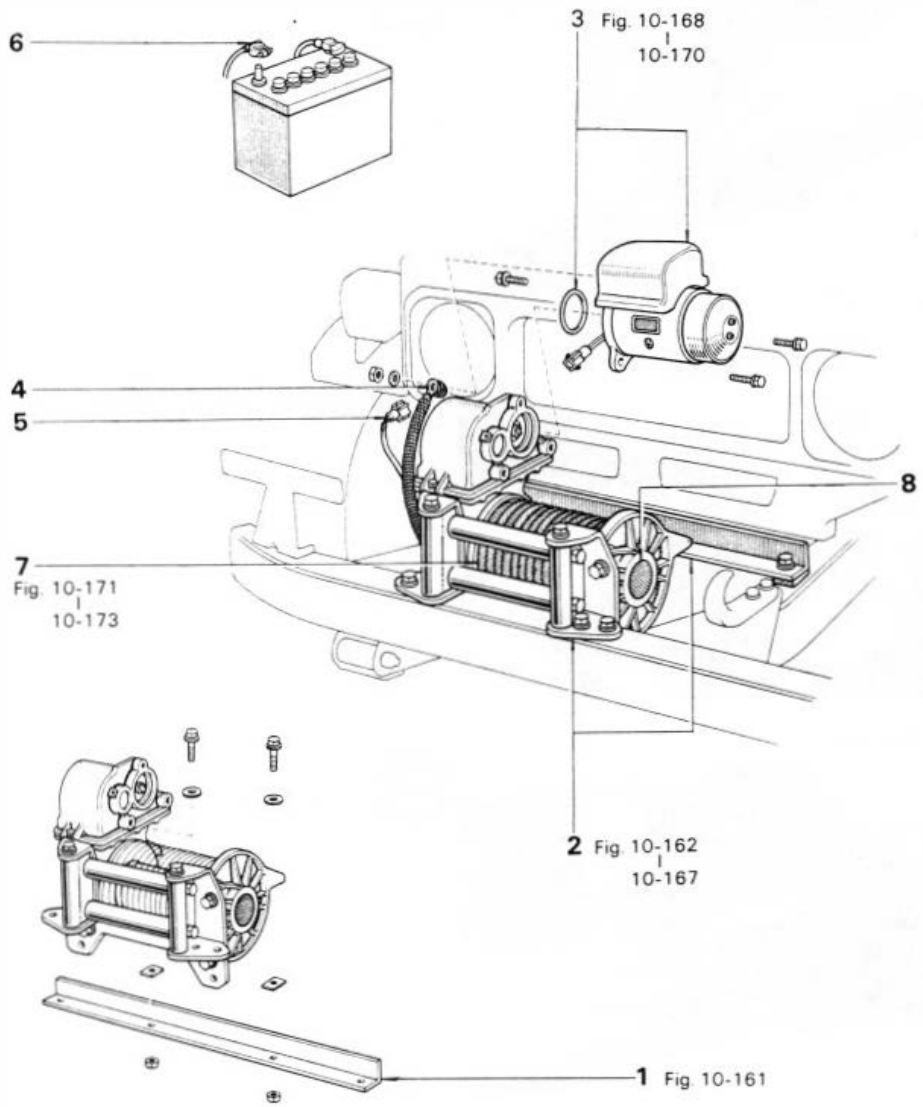
Fig. 10-159



INSTALLATION

Install the parts in the numerical order shown in the figure

Fig. 10-160



1. Rear Base Member
2. Winch with Rear Base Member
3. Motor & O Ring
4. Wiring Harness
5. Connector
6. Negative Battery Terminal
7. Wire
8. Housing Cover

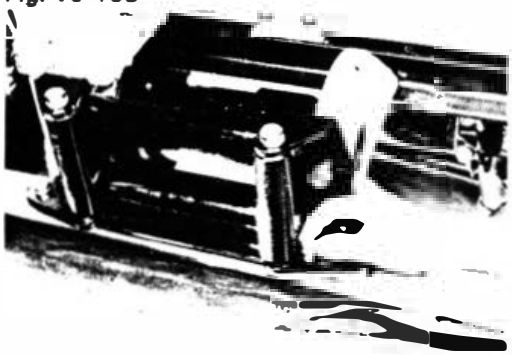
Fig. 10-161

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)

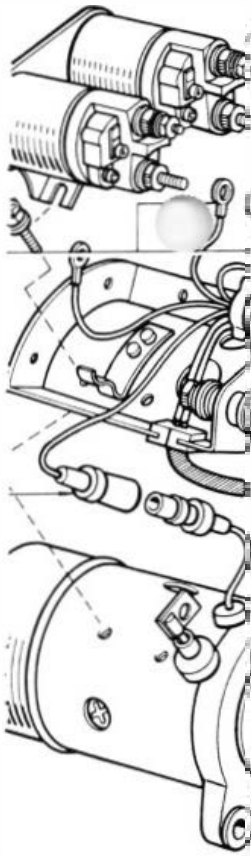
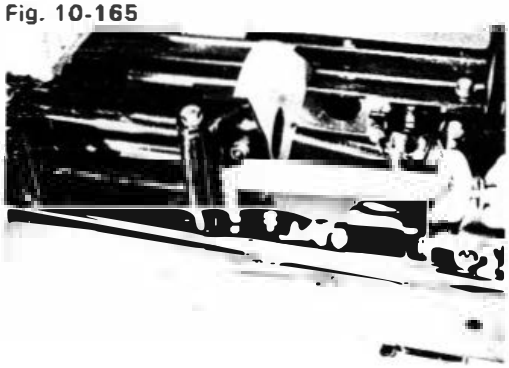
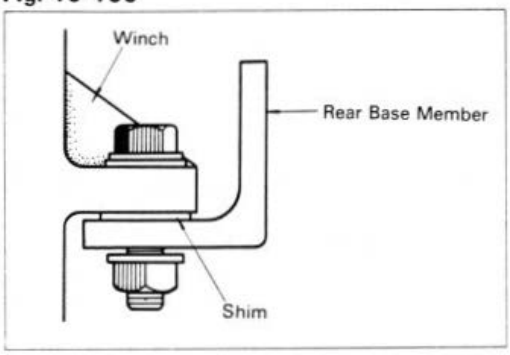


Fig. 10-165



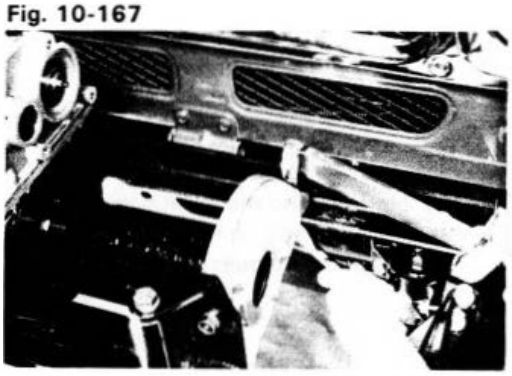
Tighten the winch front mounting bolts.
Tightening torque: 3.0 – 4.5 kg-m (22 – 32 ft-lb)

Fig. 10-166



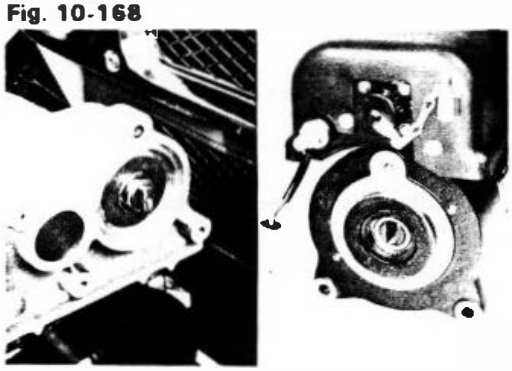
Check the clearance between the rear base member and winch rear mount.
If there is clearance, insert shims.

Fig. 10-167



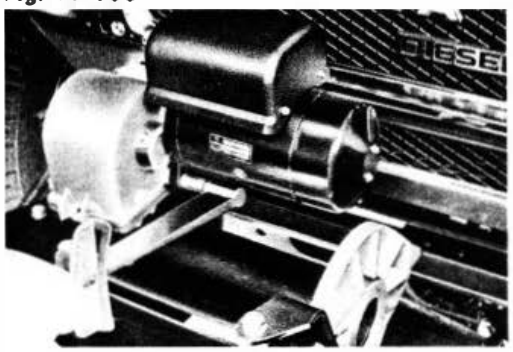
Tighten the winch rear mounting bolts.
Tightening torque: 3.0 – 4.5 kg-m (22 – 32 ft-lb)

Fig. 10-168



Align the protrusion and groove, and install the motor.

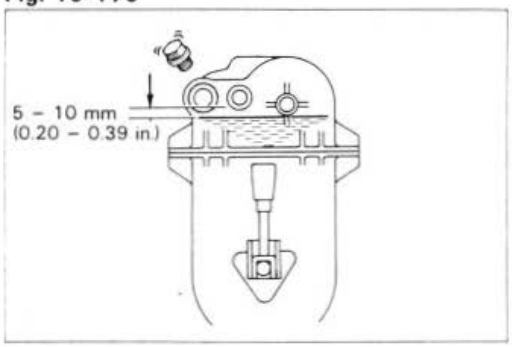
Fig. 10-169



Tighten the motor mounting bolts.

Tightening torque: 1.5 – 2.0 kg-m (11 – 14 ft-lb)

Fig. 10-170



Fill with about 2 litters 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)

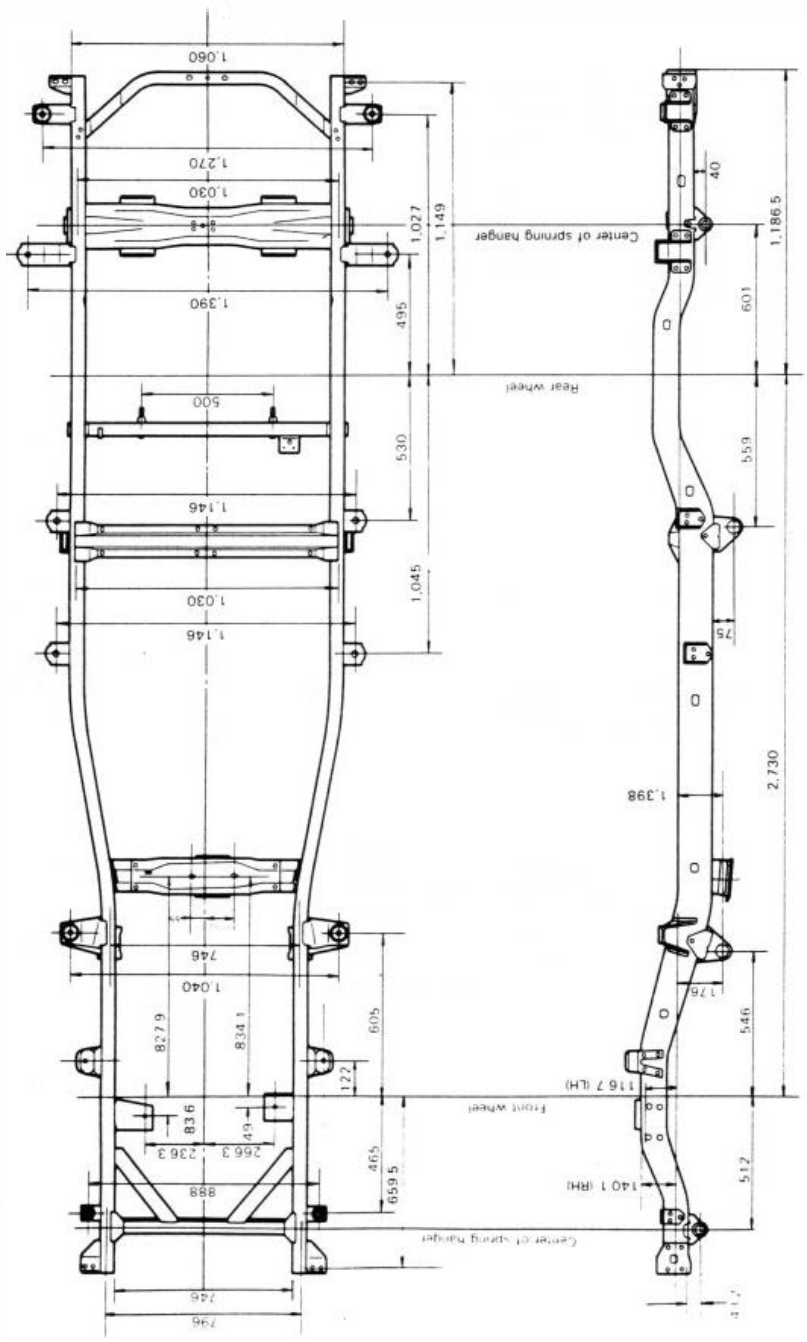
Fig. 10-172

Shift the lever to the lock position.

FRAME DIMENSION

FJ, BJ, HJ6_SERIES

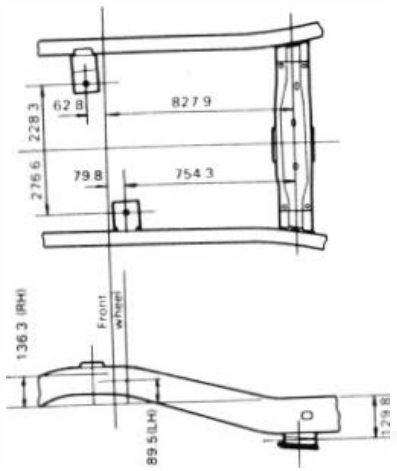
Fig. 11-1



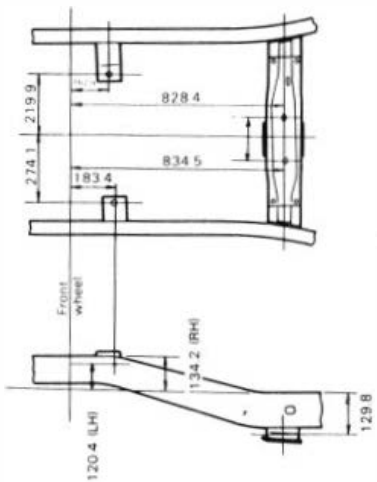
FJ6 – Series

Fig. 11-2

HJ6 _ Series



BJ6 _ Series



Conversion table — mm (in.)

40 (1.57)	120.4 (4.740)	183.4 (7.220)	500 (19.69)	754.3 (28.942)	1,040 (40.94)
43.2 (1.701)	122 (4.80)	219.9 (8.438)	512 (20.16)	796 (31.34)	1,045 (41.14)
62.8 (2.472)	129.8 (5.110)	228.3 (8.760)	530 (20.87)	827.9 (31.767)	1,060 (41.73)
75 (2.95)	134.2 (5.283)	236.3 (9.067)	546 (21.50)	828.4 (31.786)	1,146 (45.12)
79.8 (3.142)	136.3 (5.366)	266.3 (10.218)	559 (22.01)	834.1 (32.004)	1,149 (45.24)
83.6 (3.291)	139.8 (5.504)	274.1 (10.517)	601 (23.66)	834.5 (32.020)	1,186.5 (46.713)
89.5 (3.524)	140.1 (5.516)	276.6 (10.613)	605 (23.82)	888 (34.96)	1,270 (50.00)
113.2 (4.343)	162.9 (6.413)	465 (18.31)	659.5 (25.965)	1,027 (40.43)	1,390 (54.72)
116.7 (4.594)	176 (6.93)	495 (19.49)	746 (29.37)	1,030 (40.55)	2,730 (107.48)

FJ40, BJ40 · 42 SERIES

Fig. 11-3

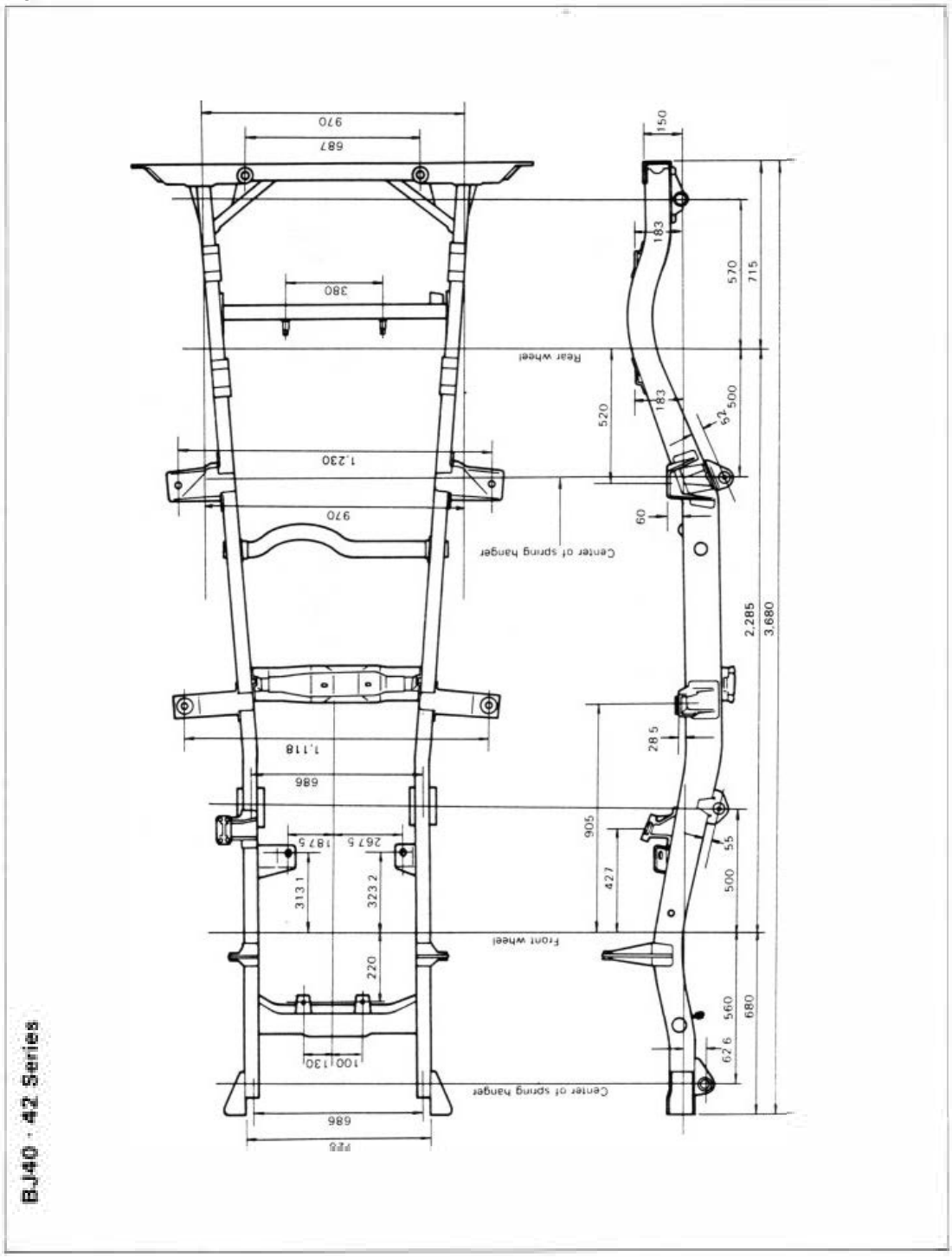
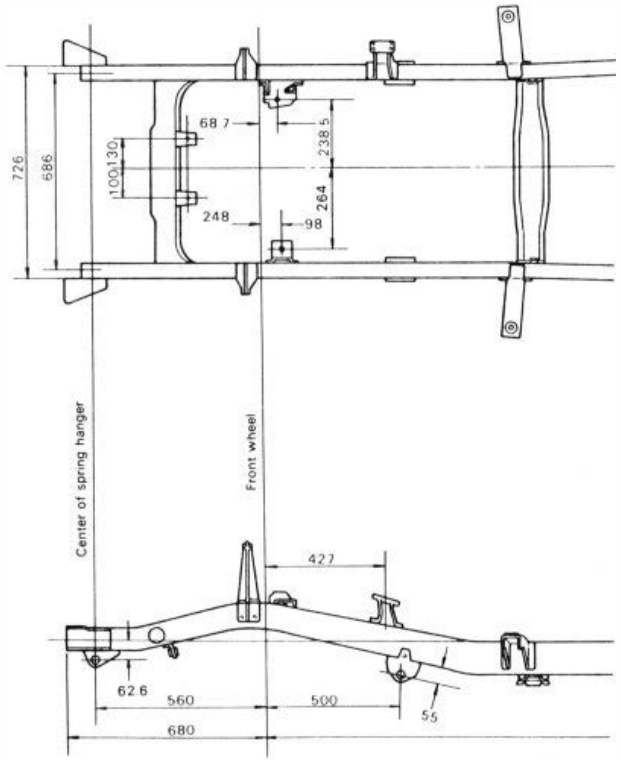


Fig. 11-4

FJ40 Series



Conversion table mm (in.)

28.5 (1.122)	100 (3.94)	238.5 (9.390)	380 (14.96)	680 (26.77)	970 (38.19)
52 (2.05)	130 (5.12)	248 (9.76)	427 (16.81)	686 (27.01)	1,188 (46.77)
60 (2.36)	150 (5.91)	264 (10.39)	500 (19.69)	687 (27.05)	1,230 (48.43)
62.6 (2.465)	183 (7.20)	267.5 (10.531)	520 (20.47)	715 (28.15)	2,285 (89.96)
68.7 (2.705)	187.5 (7.382)	313.1 (12.327)	560 (22.05)	726 (28.58)	3,680 (144.88)
98 (3.86)	220 (8.66)	323.2 (12.724)	570 (22.44)	905 (35.63)	

FJ43, BJ43 · 46 SERIES

Fig. 11-5

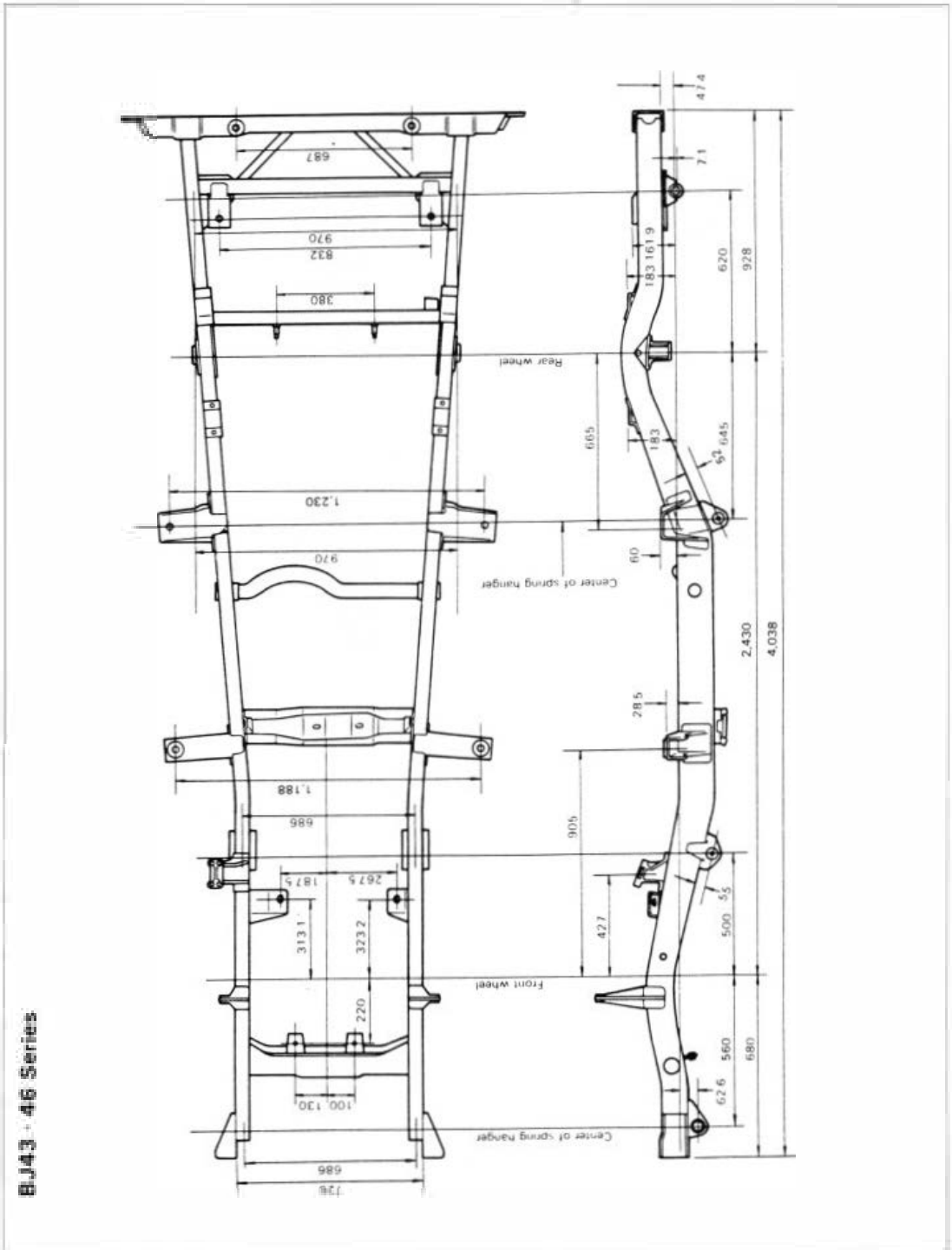
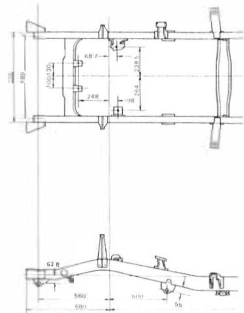


Fig. 11-6

FJ43 Series



Conversion table

mm (in.)

7.1 (0.280)	68.7 (2.705)	220 (8.66)	380 (14.96)	680 (26.77)	1 230 (48.43)
28.5 (1.122)	98 (3.86)	238.5 (9.390)	427 (16.81)	687 (27.05)	1 188 (46.77)
47.5 (1.866)	100 (3.94)	248 (9.76)	500 (19.69)	726 (28.58)	2 430 (95.67)
52 (2.05)	130 (5.12)	264 (10.39)	570 (22.44)	832 (32.76)	4 038 (158.98)
55 (2.17)	161.9 (6.374)	267.5 (10.531)	620 (24.41)	905 (35.63)	
60 (2.36)	183 (7.21)	313.1 (12.367)	645 (25.39)	928 (36.54)	
62.6 (2.465)	187.5 (7.382)	323.2 (12.724)	665 (26.18)	970 (38.19)	

FJ45, BJ45, HJ47 SERIES

Fig. 11-7

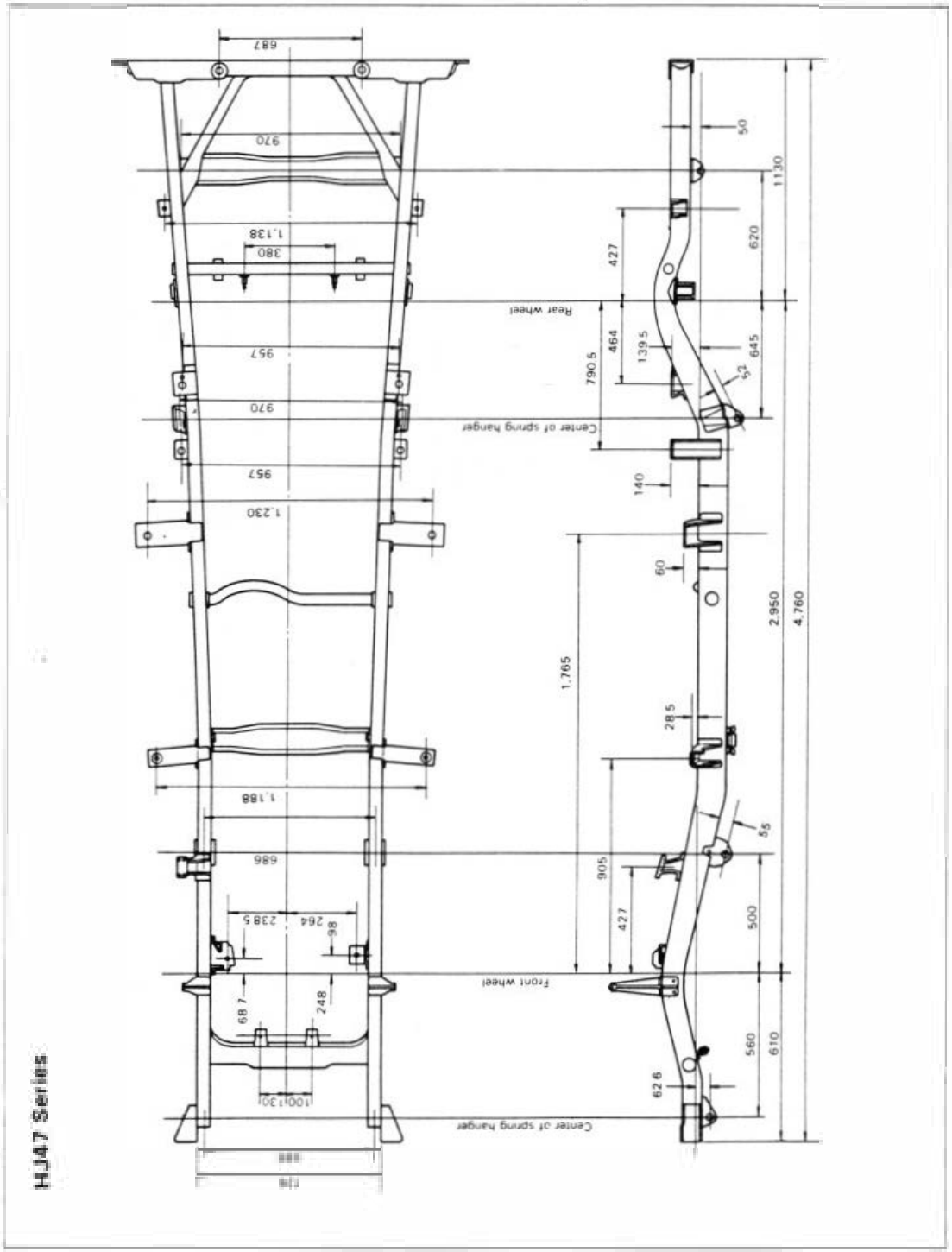
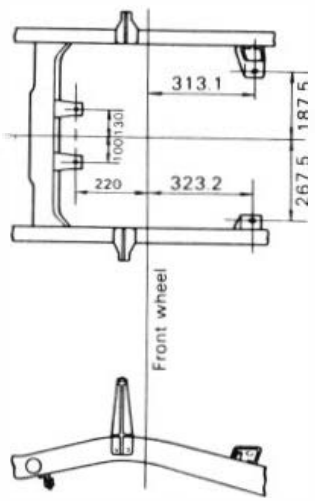


Fig. 11-8

BJ45 Series



Conversion table

mm (in.)

28.5 (1.122)	98 (3.86)	238.5 (9.390)	427 (16.81)	686 (27.01)	1,130 (44.49)
50 (1.97)	100 (3.94)	248 (9.76)	464 (18.27)	687 (27.05)	1,138 (44.80)
52 (2.05)	130 (5.12)	264 (10.39)	500 (19.69)	726 (28.58)	1,188 (46.77)
55 (2.17)	139.5 (5.492)	267.5 (10.53)	560 (22.05)	790.5 (31.122)	1,230 (48.43)
60 (2.36)	140 (5.51)	313.1 (12.327)	610 (24.02)	905 (35.63)	1,765 (69.49)
62.6 (2.46)	187.5 (7.382)	323.2 (12.724)	620 (24.41)	957 (37.68)	2,950 (116.14)
68.7 (2.70)	220 (8.66)	380 (14.96)	645 (25.39)	970 (38.19)	4,760 (187.40)

BODY
[FJ , BJ , HJ6–SERIES]

[FJ , BJ4–SERIES]

BODY [FJ, BJ, HJ6_SERIES] ENGINE HOOD, HINGE, LOCK & HOOD LOCK CONTROL CABLE

COMPONENTS

Fig. 12-1

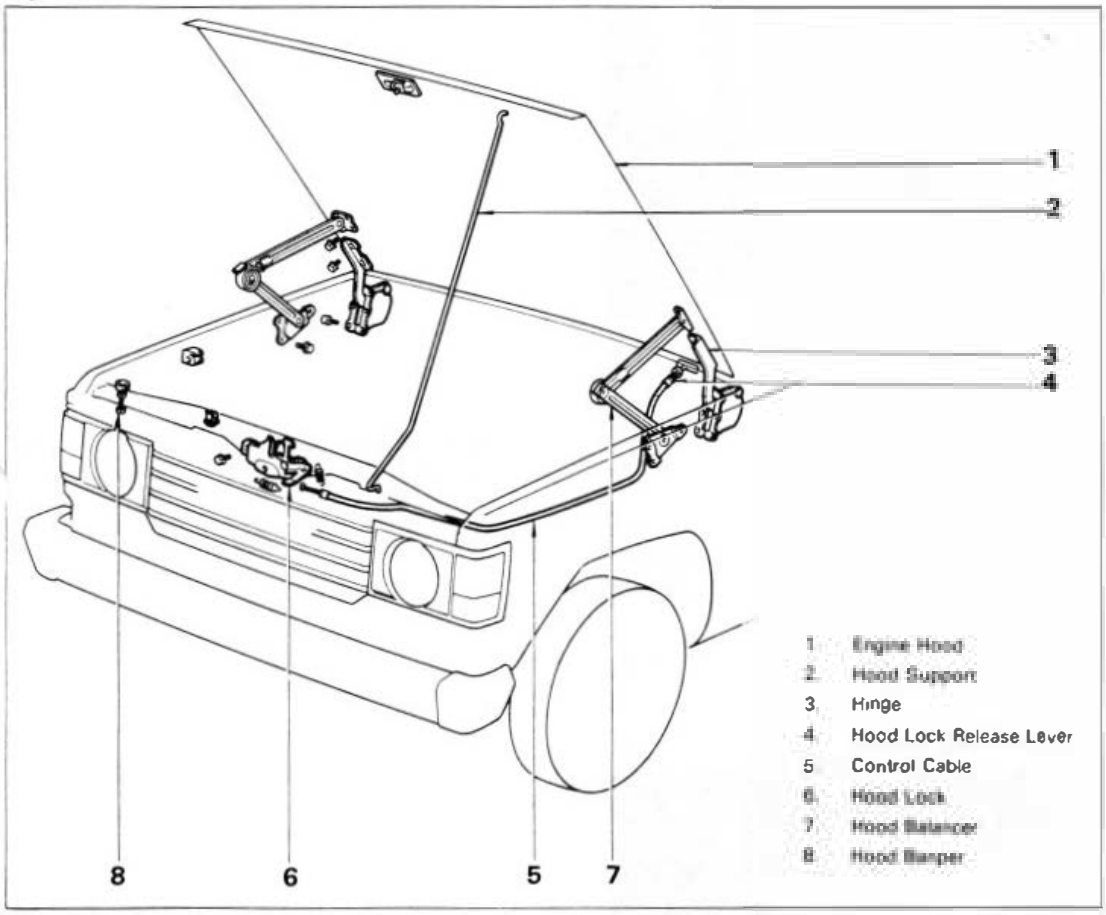
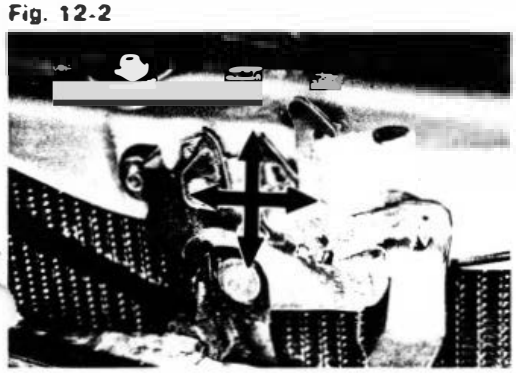


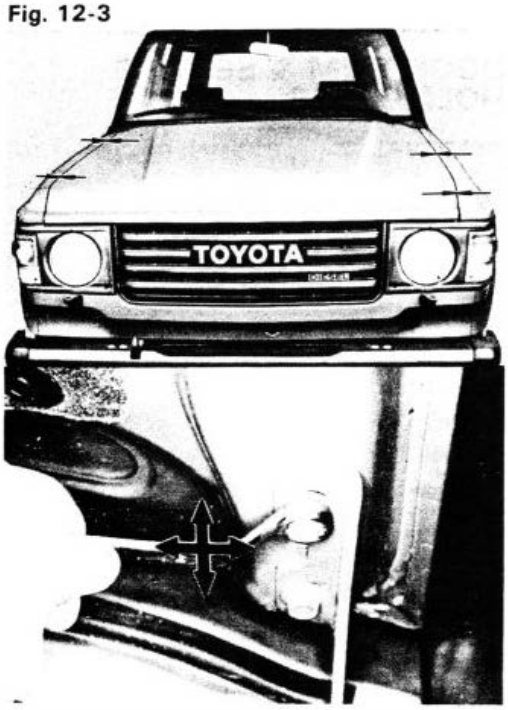
Fig. 12-2



ADJUSTMENT

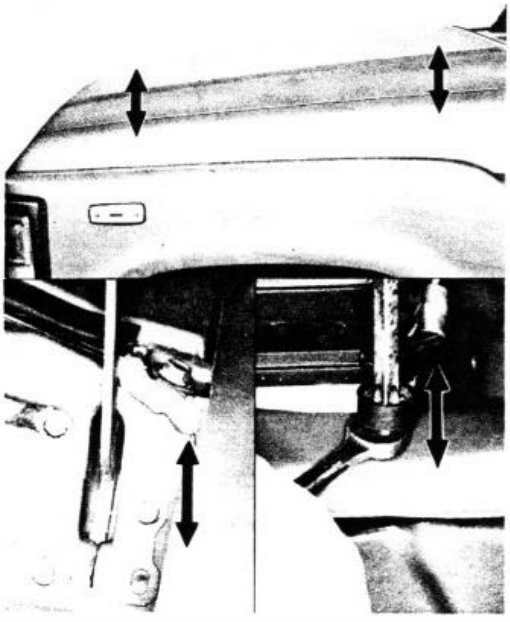
Loosen the 3 bolts and move the hood lock horizontally or vertically to adjust the hood

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.

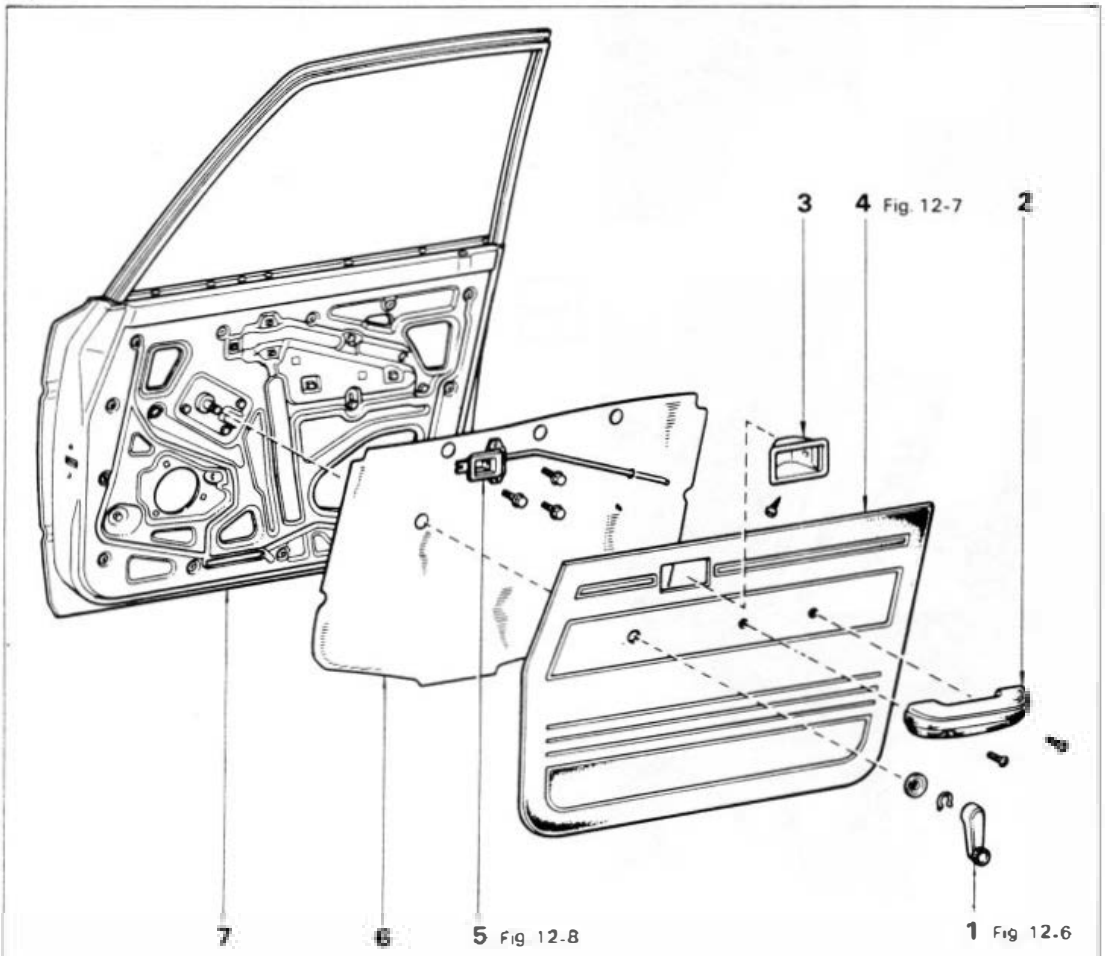
FRONT DOOR

DOOR TRIM & SERVICE HOLE COVER

REMOVAL

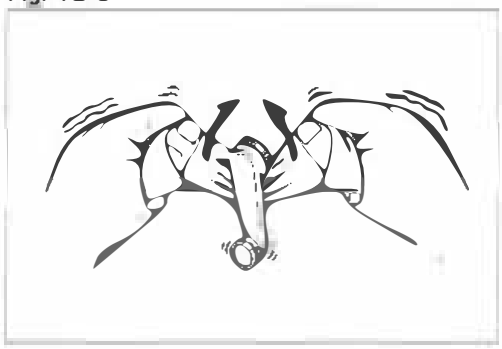
1. Lower the door glass to full down position.
2. Remove the parts in the numerical order shown in the figure.

Fig. 12-5



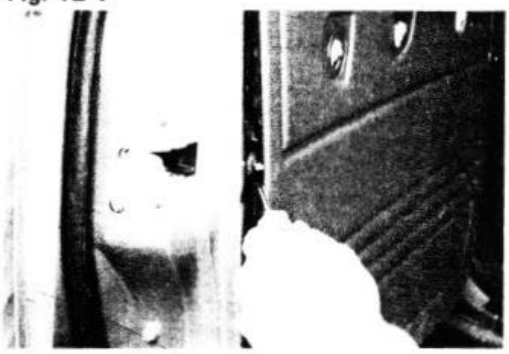
1. Window Regulator Handle
2. Armrest or Pull Handle
3. Door Inside Handle Bezel
4. Door Trim Board
5. Door Inside Handle
6. Service Hole Cover
7. Door

Fig. 12-6



Before removing the handle, pull off the snap ring with a piece of cloth and remove the window regulator handle

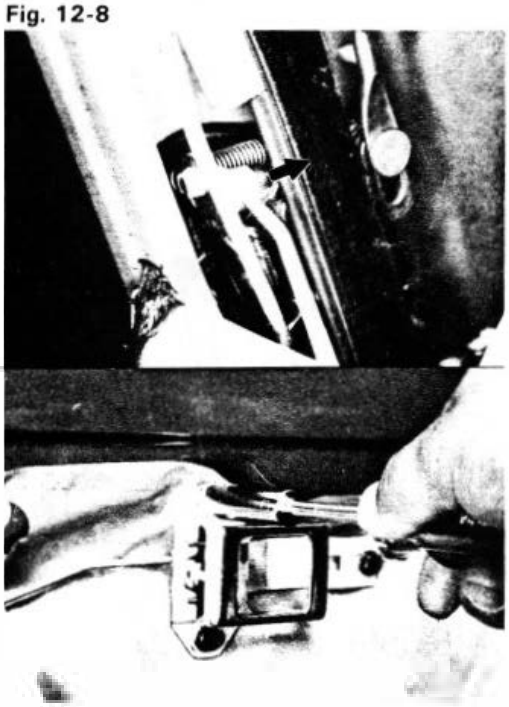
Fig. 12-7



Insert a screwdriver between the door panel and retainers and pry out

—Note—
Tape the screwdriver tip before use.

Fig. 12-8

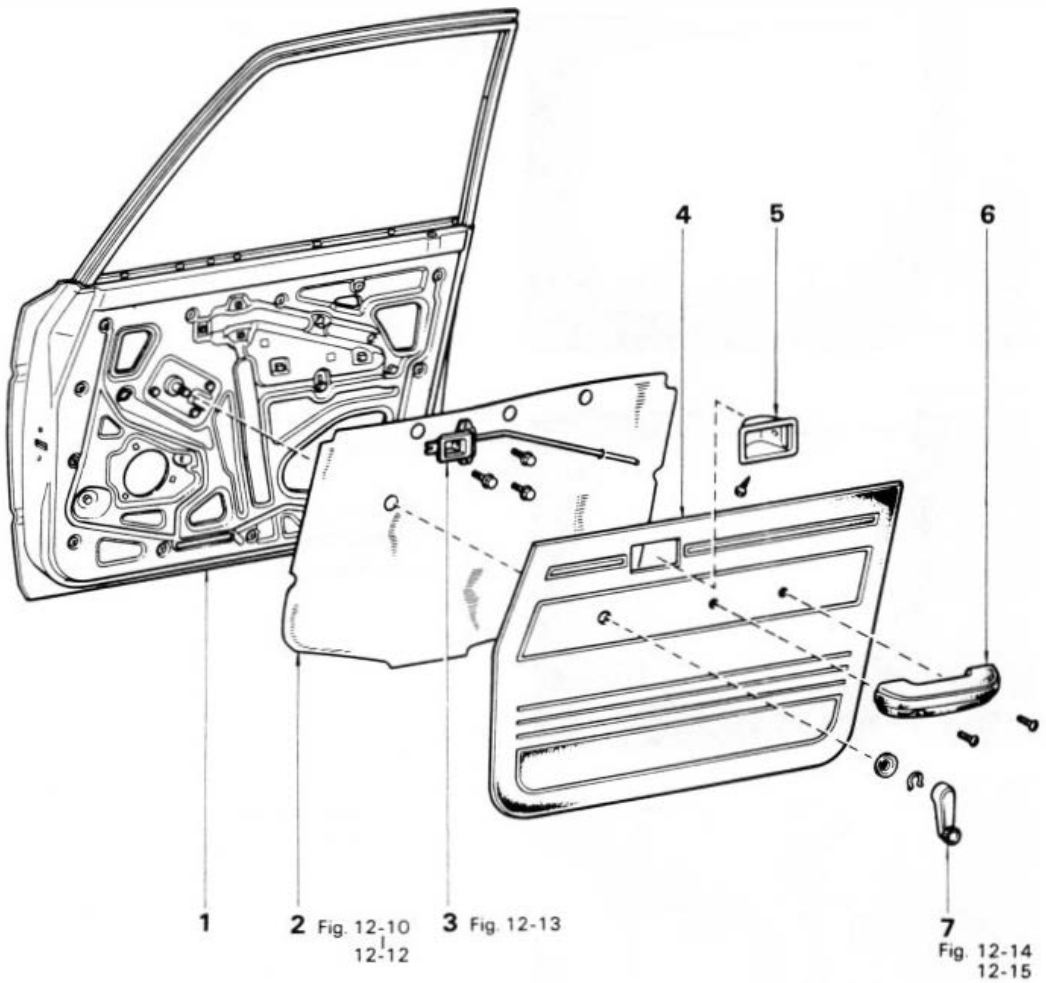


Disconnect the control link and remove the inside handle

INSTALLATION

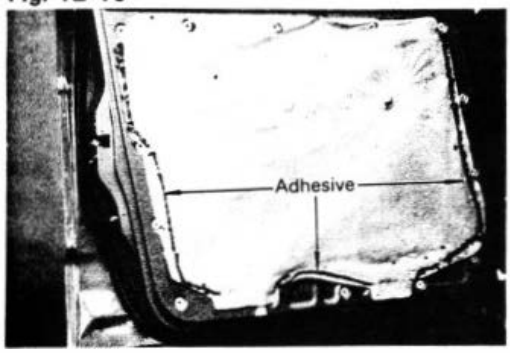
Install the parts in the numerical order shown in the figure.

Fig. 12-9



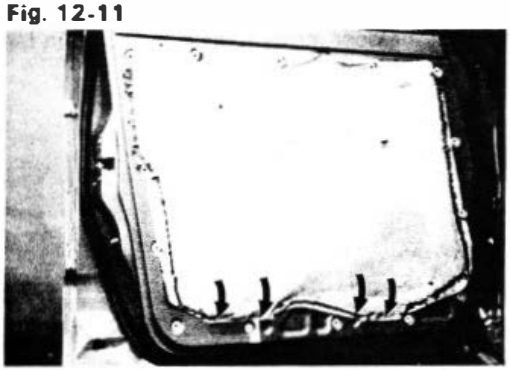
1 Door
2 Service Hole Cover
3 Door Inside Handle
4 Door Trim Board
5 Door Inside Handle Bezel
6 Armrest or Pull Handle
7 Window Regulator Handle

Fig. 12-10



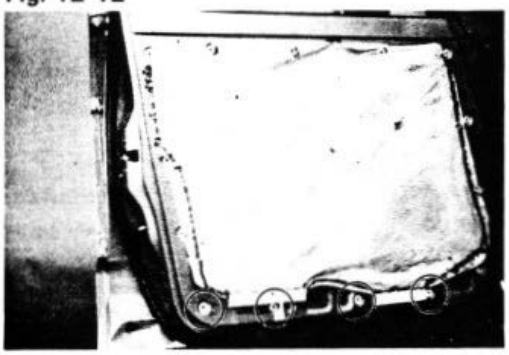
Seal the service hole cover with adhesive

Fig. 12-11



Insert the lower edge of the service hole cover into the panel slit

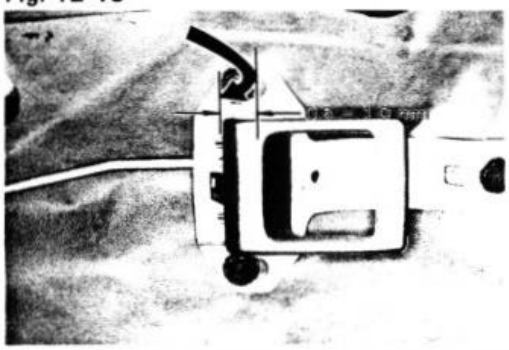
Fig. 12-12



Seal the service hole cover with cotton-covered tape.

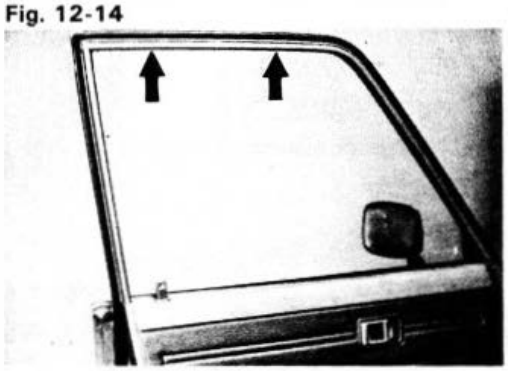
–Note–
Do not block the trim board clip seating with the tape.

Fig. 12-13



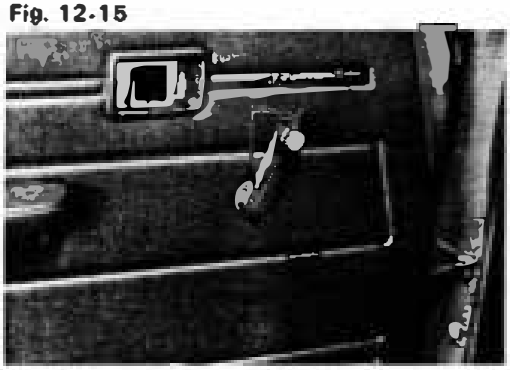
Adjust the link play
1. Loosen the screws
2. Move the handle forward to the point where strong resistance is felt
3. Move handle back 0.5 – 1.0 mm (0.020 – 0.039 in) and tighten

Fig. 12-14



Raise the window to the fully closed position

Fig. 12-15



Install the door inside handle as shown in the figure

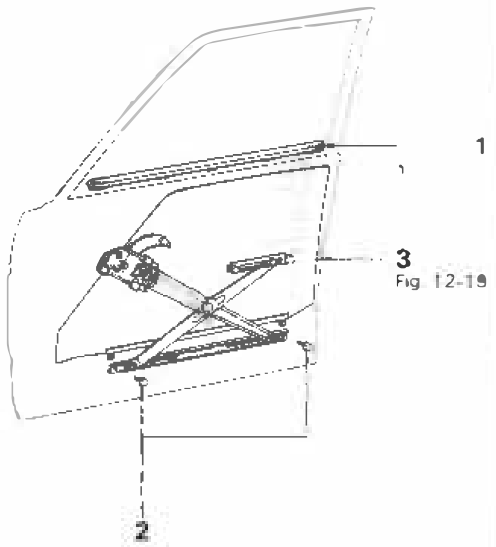
DOOR GLASS

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.

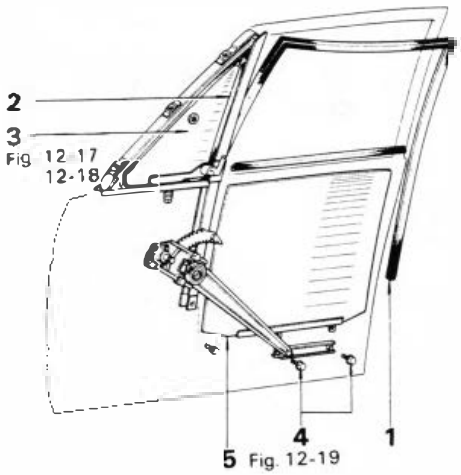
Fig. 12-16

Without Ventilator Window



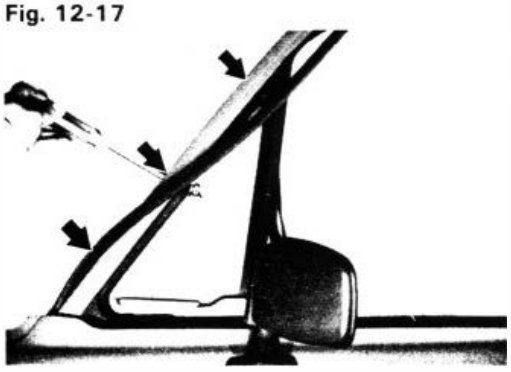
1 Weatherstrip
2 Channel Mounting Bolt
3 Glass & Channel

With Ventilator Window



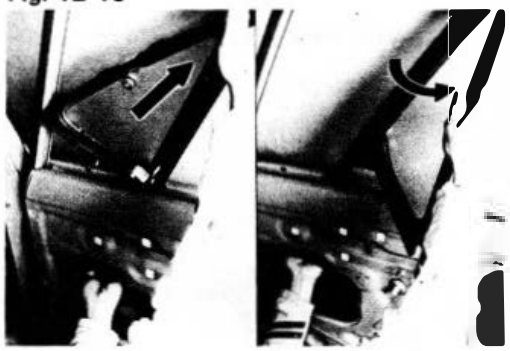
1 Glass Run
2 Division Bar
3 Vent Window
4 Channel Mounting Bolt
5 Glass & Channel

Fig. 12-17



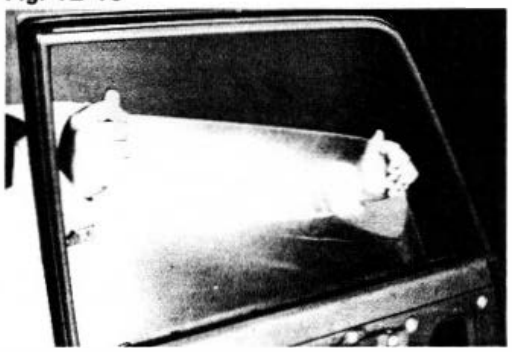
[Ventilator Window]
Remove the bolt

Fig. 12-18



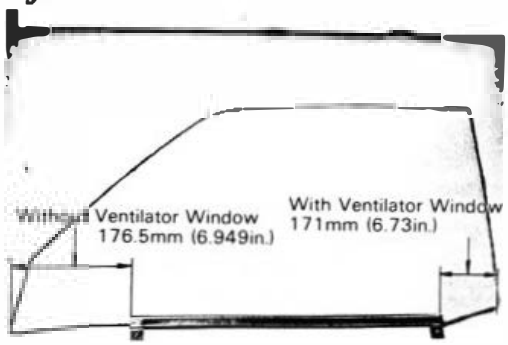
[Ventilator Window]
Take out the ventilator window.
1. Pull up the ventilator window.
2. Turn the ventilator window to the left.

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

Without Ventilator Window

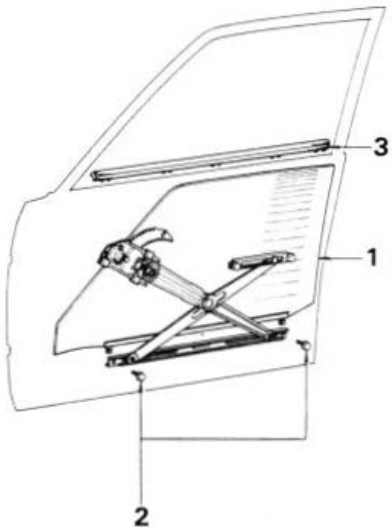


Fig. 12-22

1 Glass & Channel
2 Channel Mounting Bolt
3 Weatherstrip

With Ventilator Window

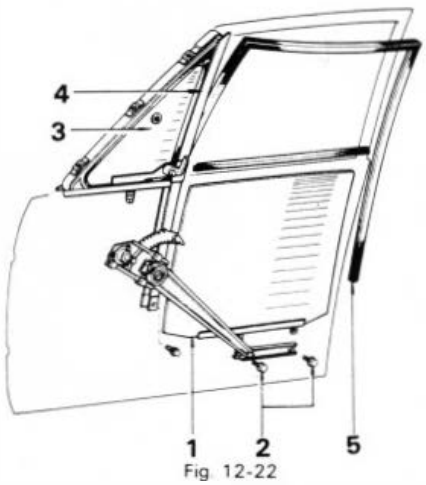
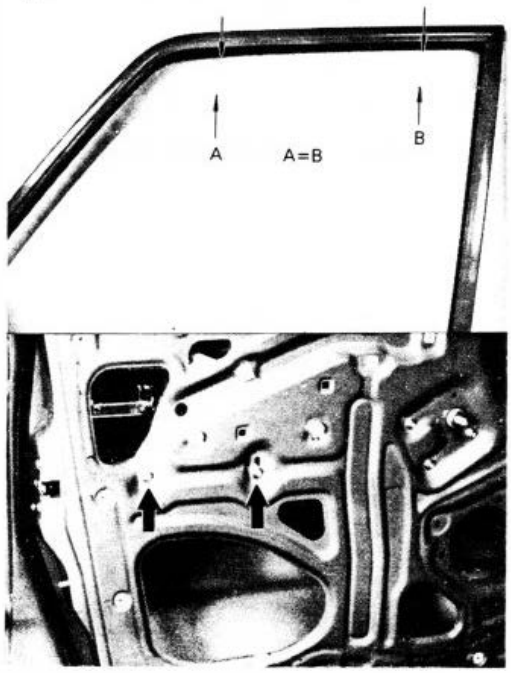


Fig. 12-22

1. Glass & Channel
2. Channel Mounting Bolt
3. Ventilator Window
4. Division Bar
5. Glass Run

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

Without Ventilator Window

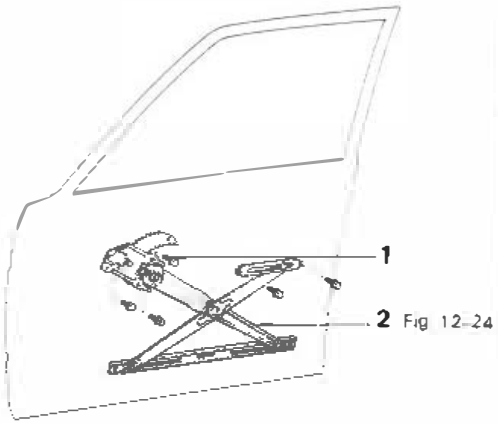


Fig. 12-24

1. Window Regulator Set Bolt
2. Window Regulator

With Ventilator Window

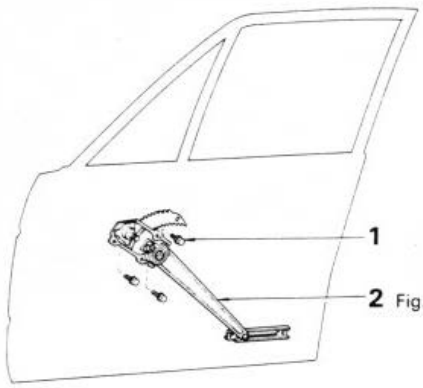
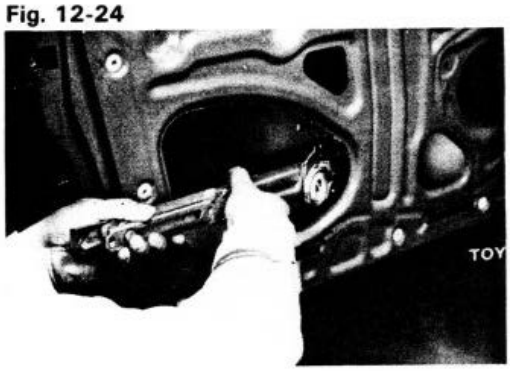


Fig. 12-24

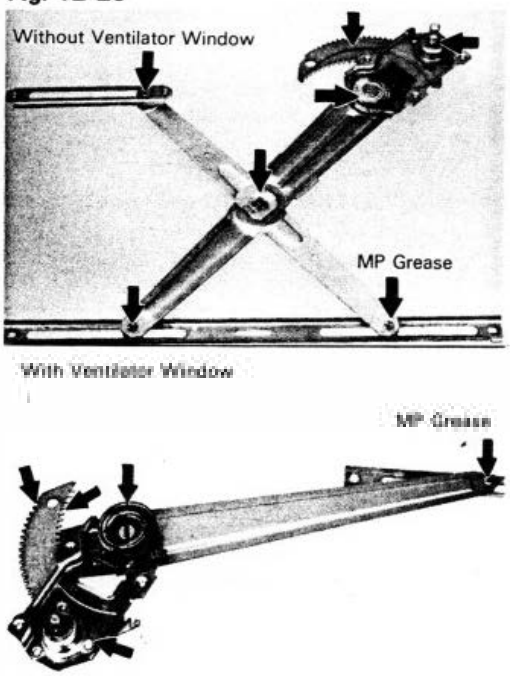
1. Window Regulator Set Bolt
2. Window Regulator

Fig. 12-24



Remove the window regulator through the service hole.

Fig. 12-25



INSPECTION

Check the following.

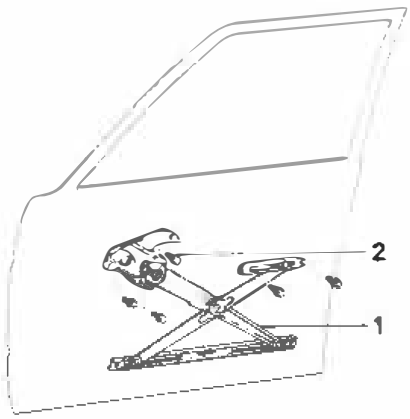
1. Gears for wear or damage
2. Spring for deterioration or breaks
3. Lubrication of regulator sliding parts

INSTALLATION

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

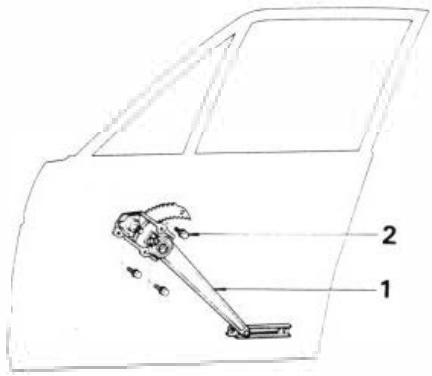
Fig. 12-26

Without Ventilator Window



1. Window Regulator
2. Window Regulator Set Bolt

With Ventilator Window



1. Window Regulator
2. Window Regulator Set Bolt

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

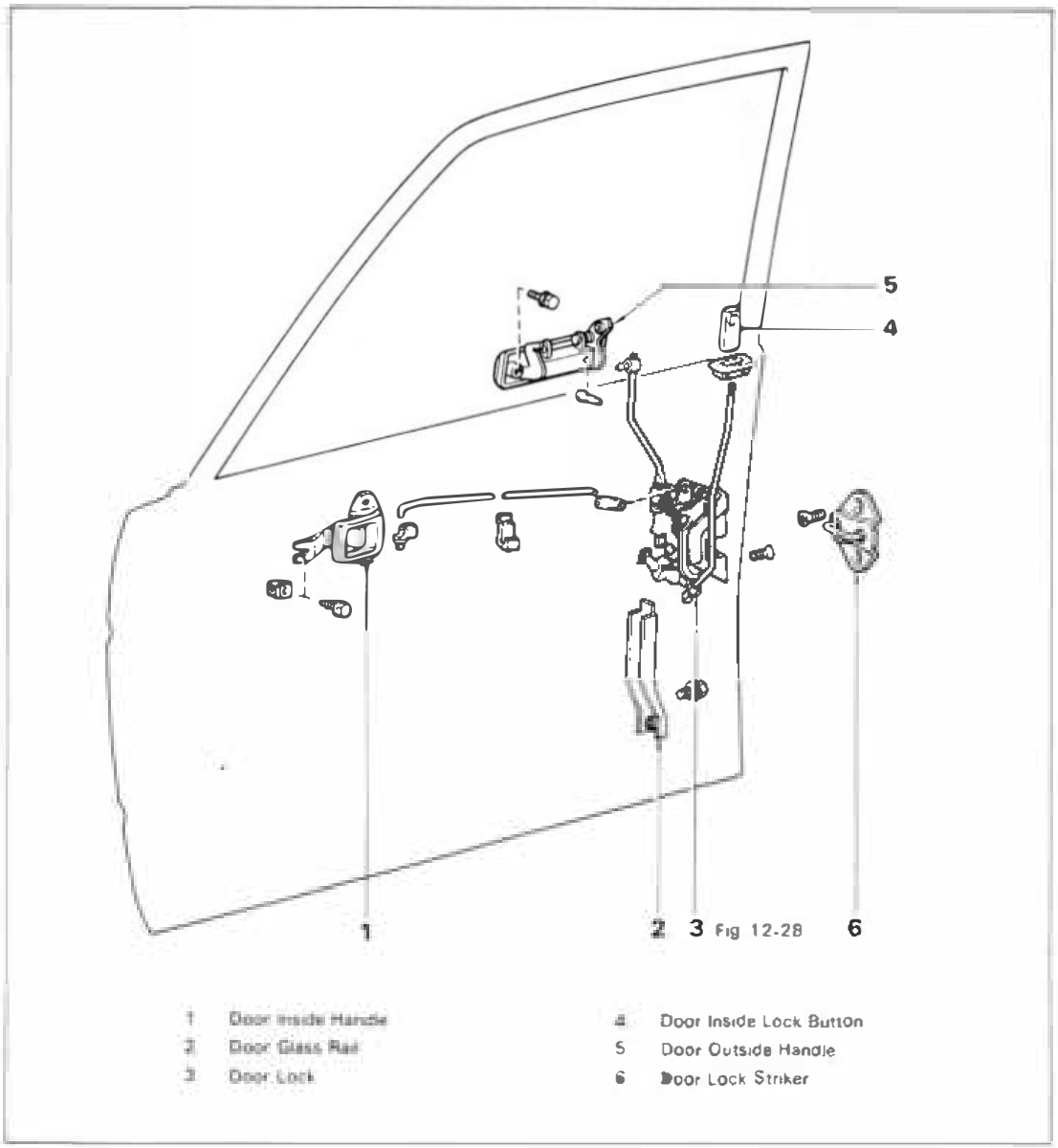


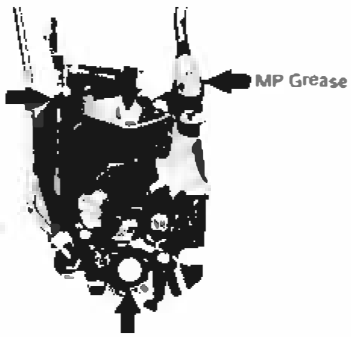
Fig. 12-28

1. Door Inside Handle
2. Door Glass Rail
3. Door Lock
4. Door Inside Lock Button
5. Door Outside Handle
6. Door Lock Striker

Fig. 12-28

Remove the door lock through the service hole.

Fig. 12-29



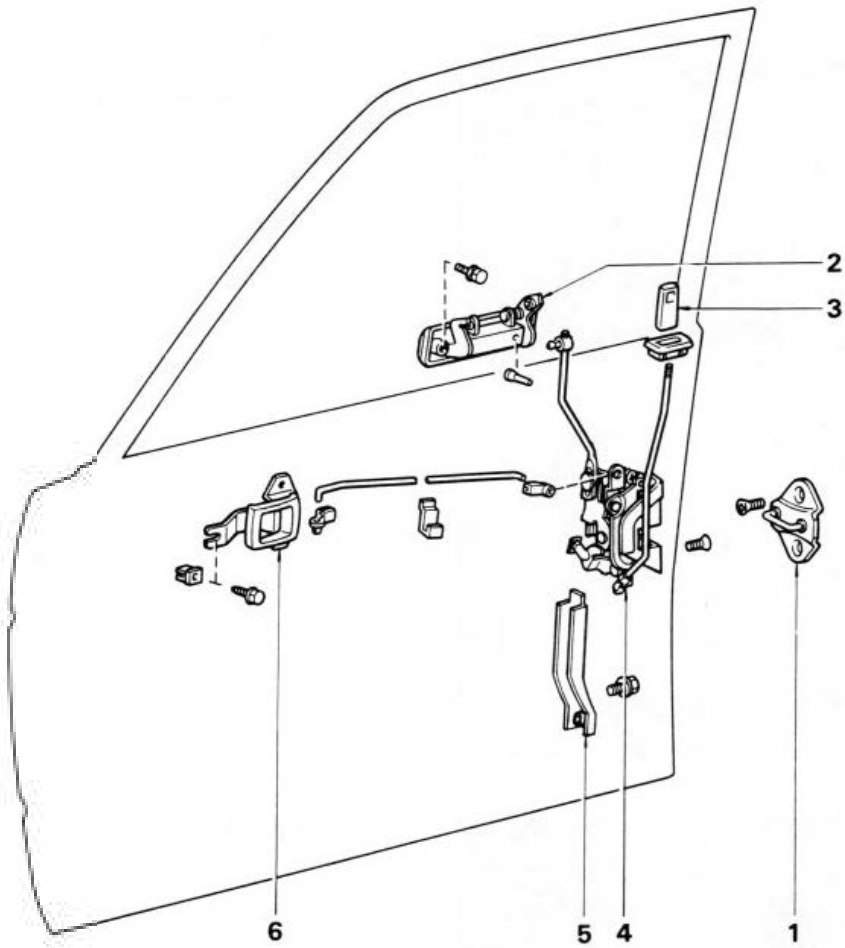
INSPECTION

1 Operation of moving parts
2 Lubrication of lock sliding parts

INSTALLATION

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

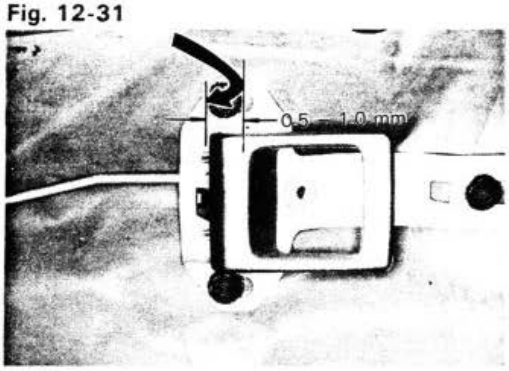
Fig. 12-30



1. Door Lock Striker
2. Door Outside Handle
3. Door Inside Lock Button
4. Door Lock
5. Door Glass Rail
6. Door Inside Handle

2. Install the service hole cover and door trim.
(See Fig. 12-9 to 12-15)

Fig. 12-31

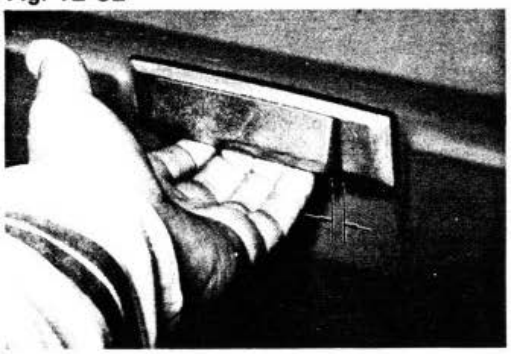


ADJUSTMENT

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– 1.0mm (0.020– 0.039in.) and tighten.

Fig. 12-32

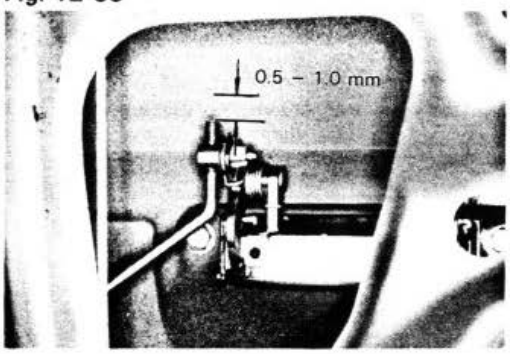


Outside Handle

1. Check the outside handle play.

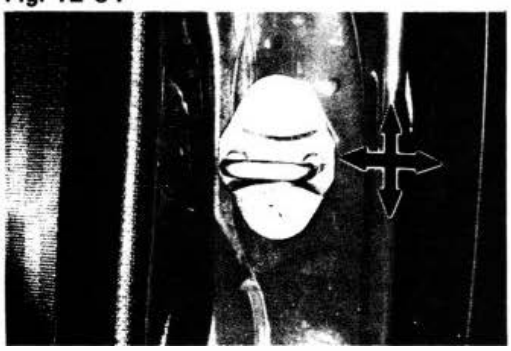
Control link play:
0.5 – 1.0 mm
(0.020 – 0.039 in.)

Fig. 12-33



2. Adjust the control link play within 0.5 – 1.0mm (0.020 – 0.039in.).

Fig. 12-34



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

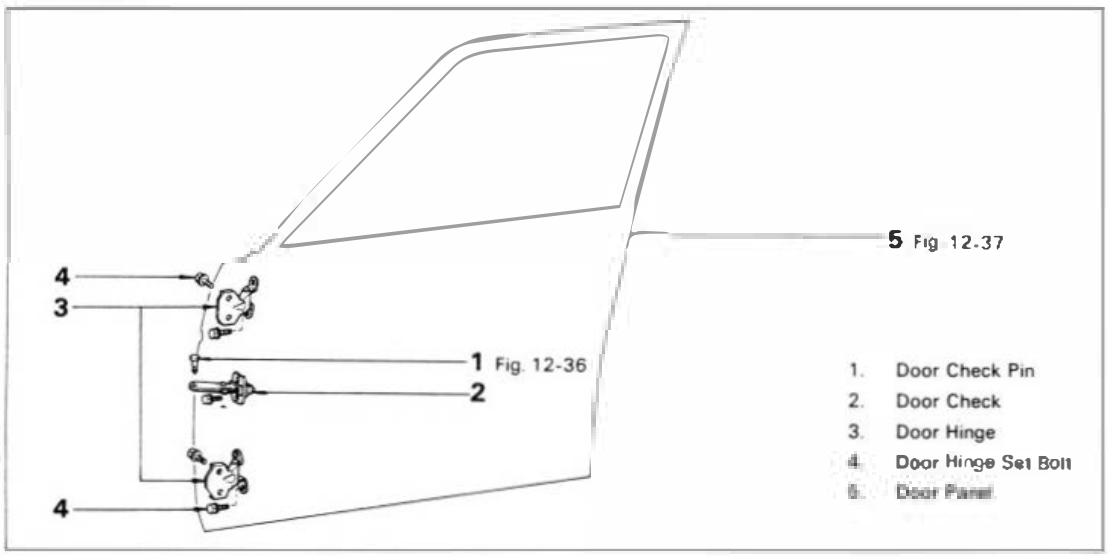
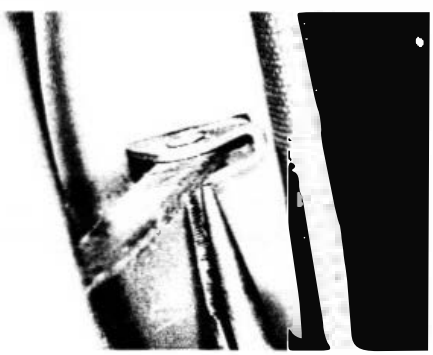


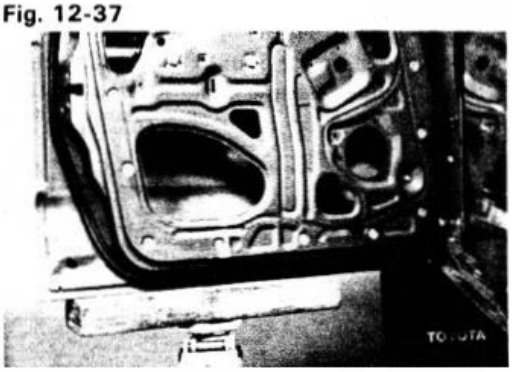
Fig. 12-36



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

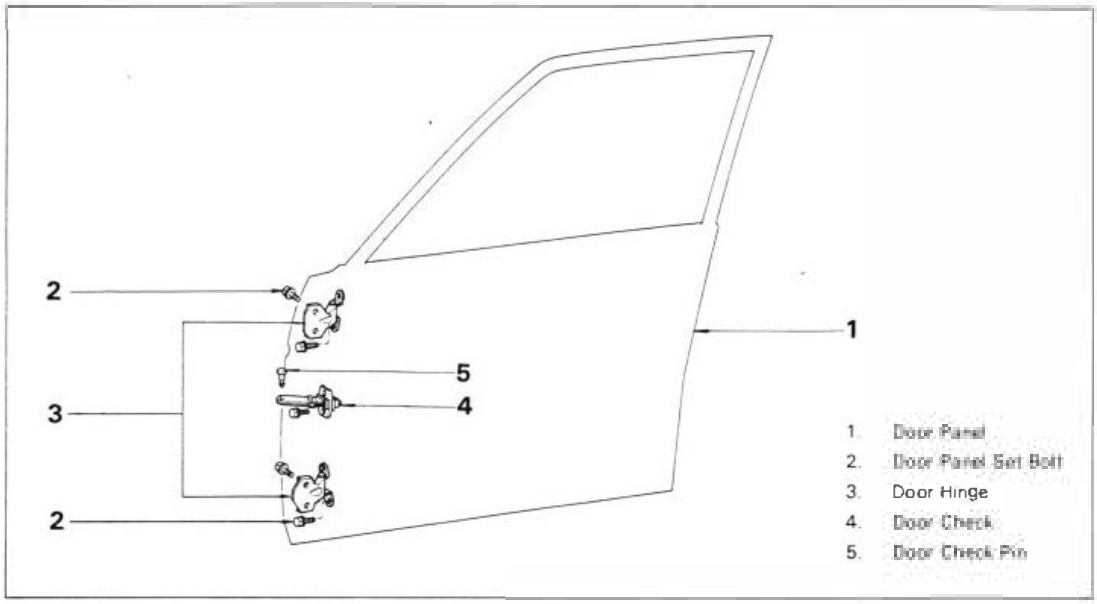
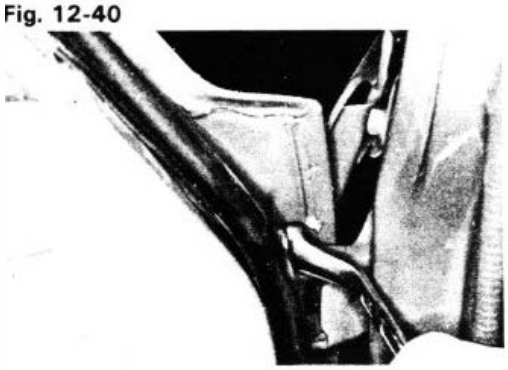


Fig. 12-39

ADJUSTMENT

1. Loosen the body hinge bolts with SST and adjust the door forward-rearward and up-down positions
   SST [09812-22010]

Fig. 12-40



2. Loosen the door hinge bolts and adjust the left-right and up-down positions of the door

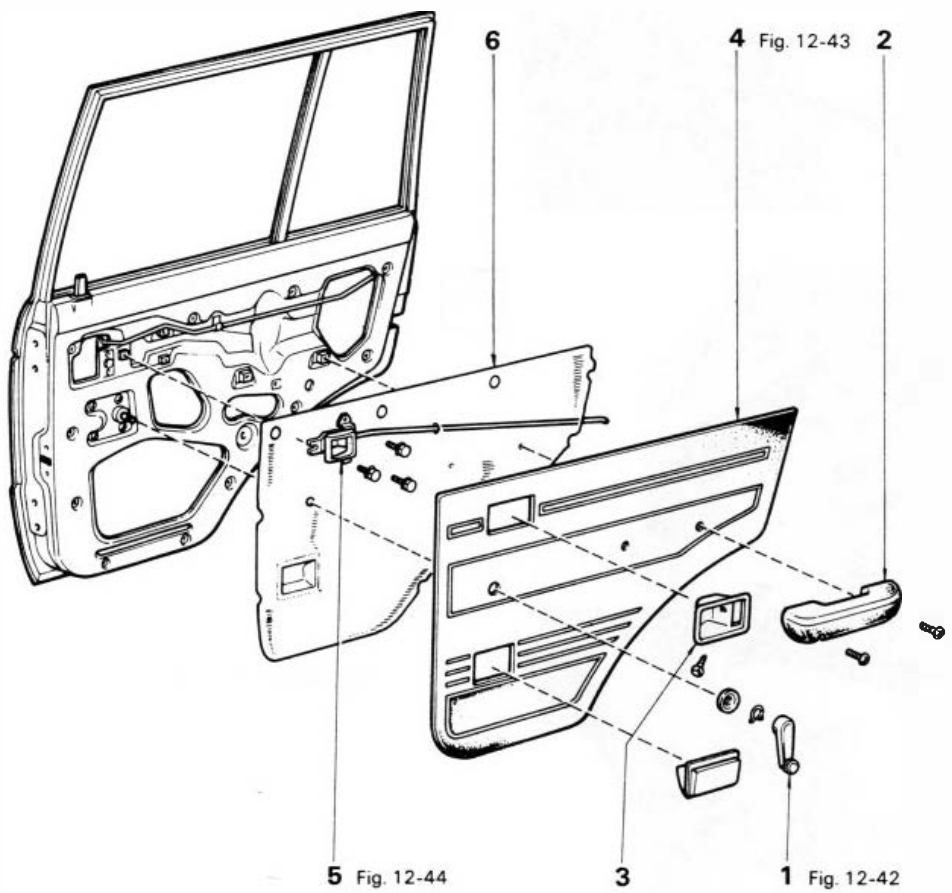
REAR DOOR

DOOR TRIM & SERVICE HOLE COVER

REMOVAL

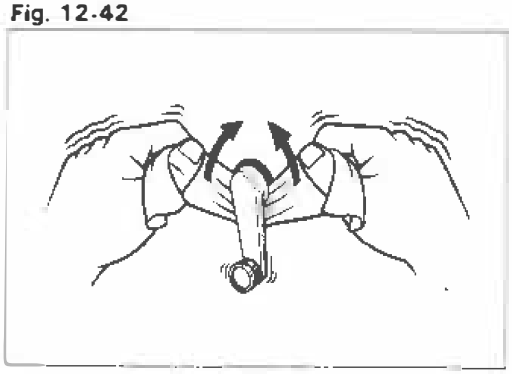
Remove the parts in the numerical order shown in the figure

Fig. 12-41



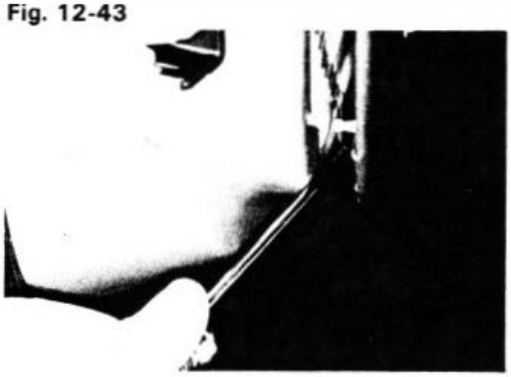
1 Window Regulator Handle
2 Armrest or Pull Handle
3 Door Inside Handle Bezel
4 Door Trim Board
5 Door Inside Handle
6 Service Hole Cover

Fig. 12-42



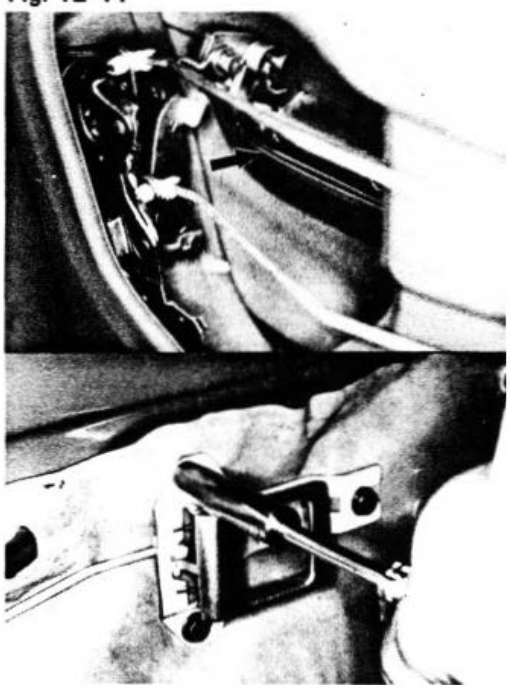
Before removing the handle, pull off the snap ring with a cloth and remove the window regulator handle

Fig. 12-43



Insert a screwdriver between the panel and panel retainers and pry out

Fig. 12-44



Remove the inside handle

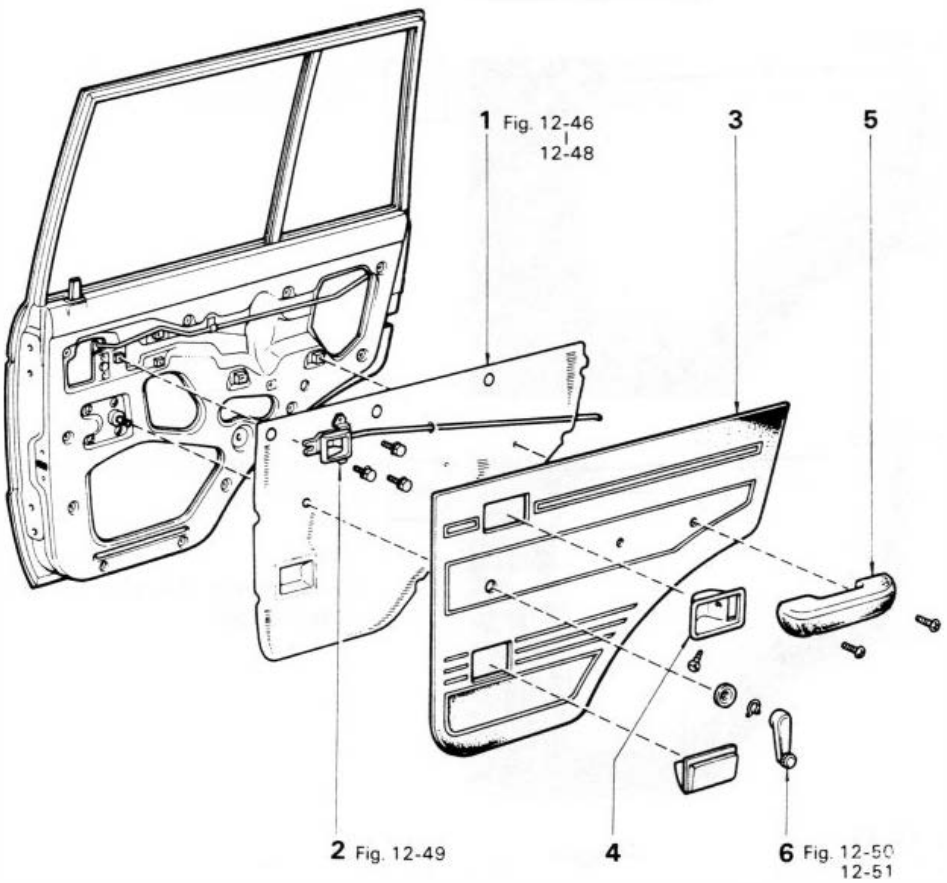
1 Disconnect the link.

2 Remove the handle

INSTALLATION

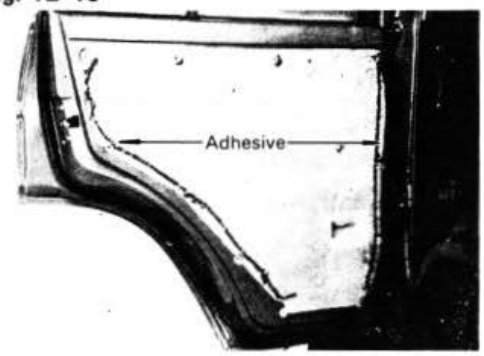
Install the parts in numerical order shown in the figure.

Fig. 12-45



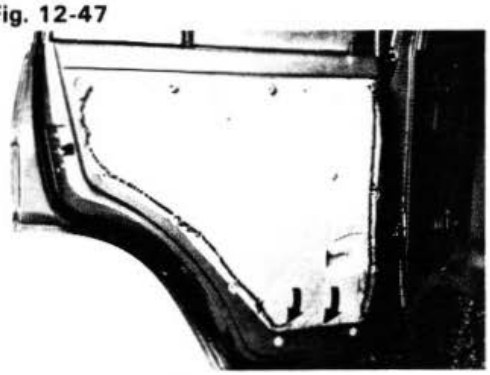
1. Service Hole Cover
2. Door Inside Handle
3. Door Trim Board
4. Door Inside Handle Bezel
5. Armrest or Pull Handle
6. Window Regulator Handle

Fig. 12-46



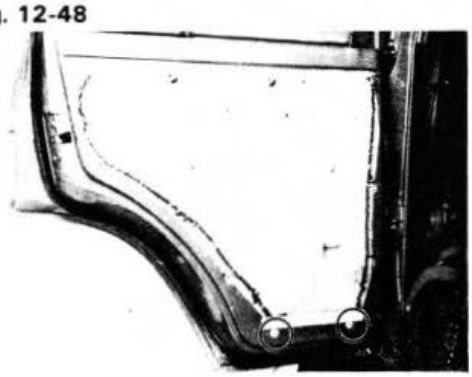
Seal the service hole cover with adhesive

Fig. 12-47



Insert the lower edge of the service hole cover into the panel slit

Fig. 12-48

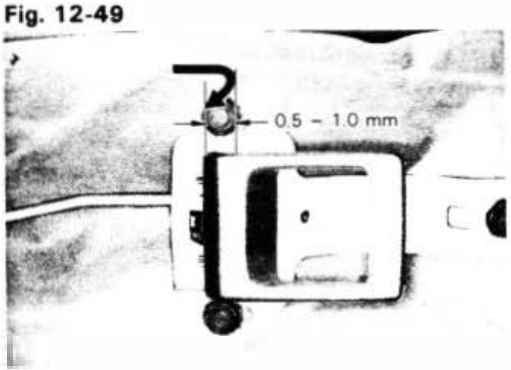


Seal the service hole cover with cotten-covered tape

— Note —

Do not block the trim board clip seating with the tape.

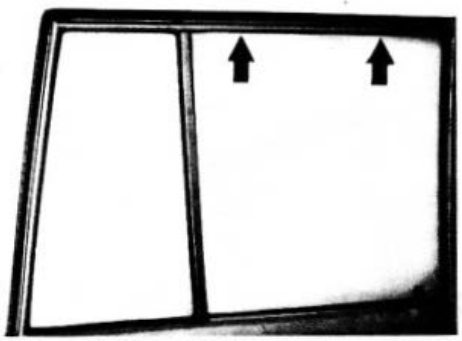
Fig. 12-49



Adjust the link play

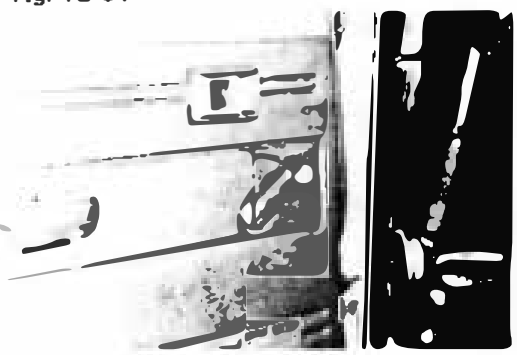
1 Loosen the screws
2 Move the handle forward to the point where strong resistance is felt
3 Move handle back 0.5 — 1.0 mm (0.020 — 0.039 in.) and tighten

Fig. 12-50



Raise the window to the fully closed position.

Fig. 12-51



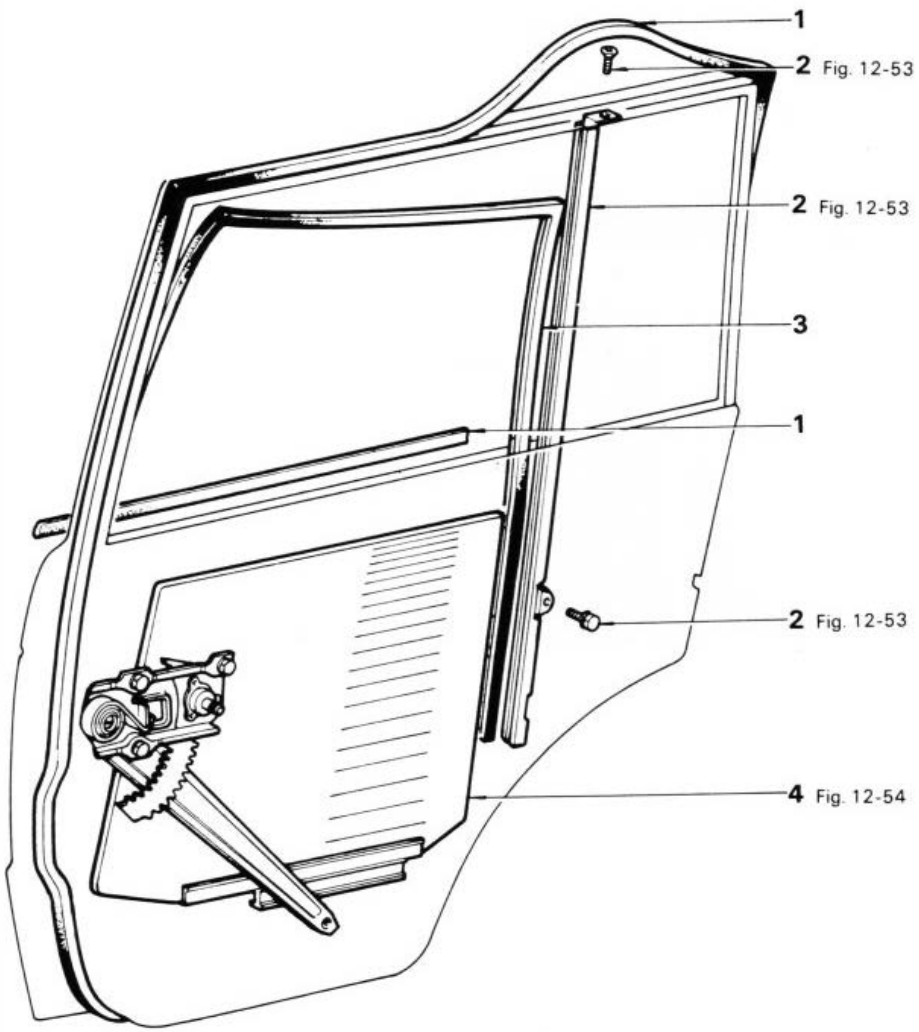
Install the door inside handle as shown in the figure

DOOR GLASS

REMOVAL

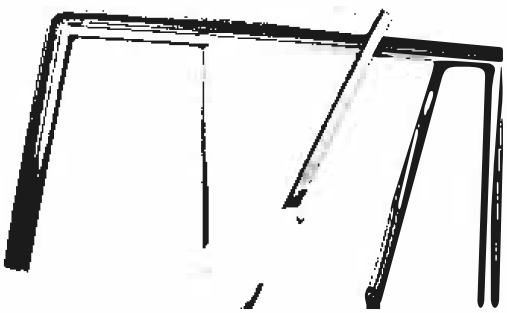
1. Remove the door trim and service hole cover. (See Fig. 12-41 to 12-44)
2. Remove the parts in the numerical order shown in the figure.

Fig. 12-52



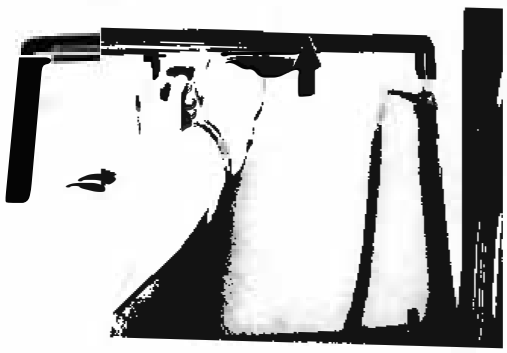
1. Weatherstrip
2. Division Bar & Set Screw
3. Glass Run
4. Door Glass

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

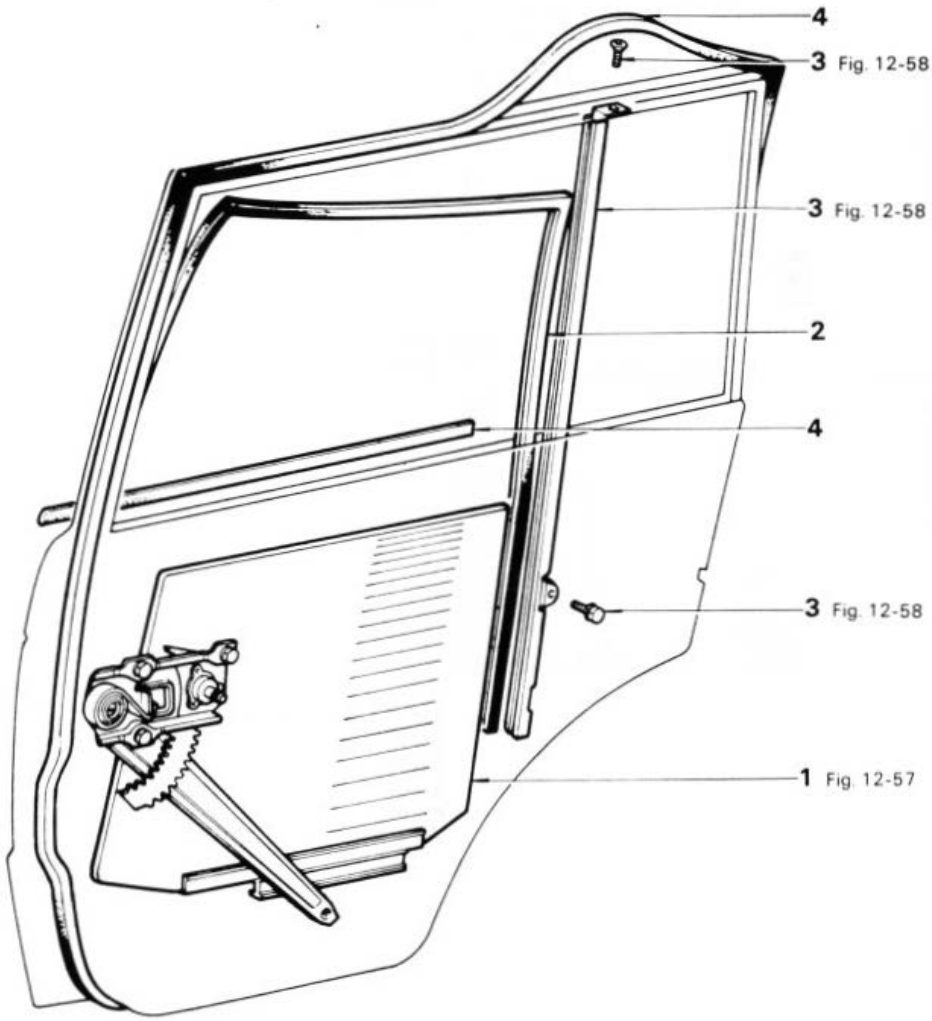
REPLACEMENT

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

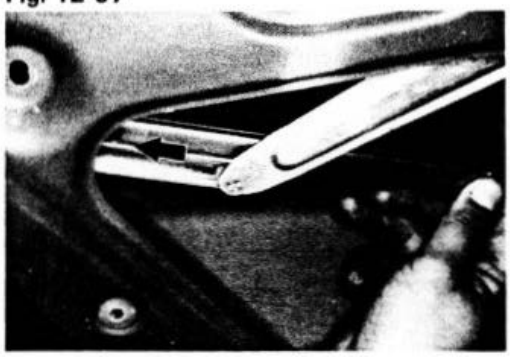
Fig. 12-56



1 Door Glass
2 Glass Run
3 Division Bar & Set Screw
4 Weatherstrip

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

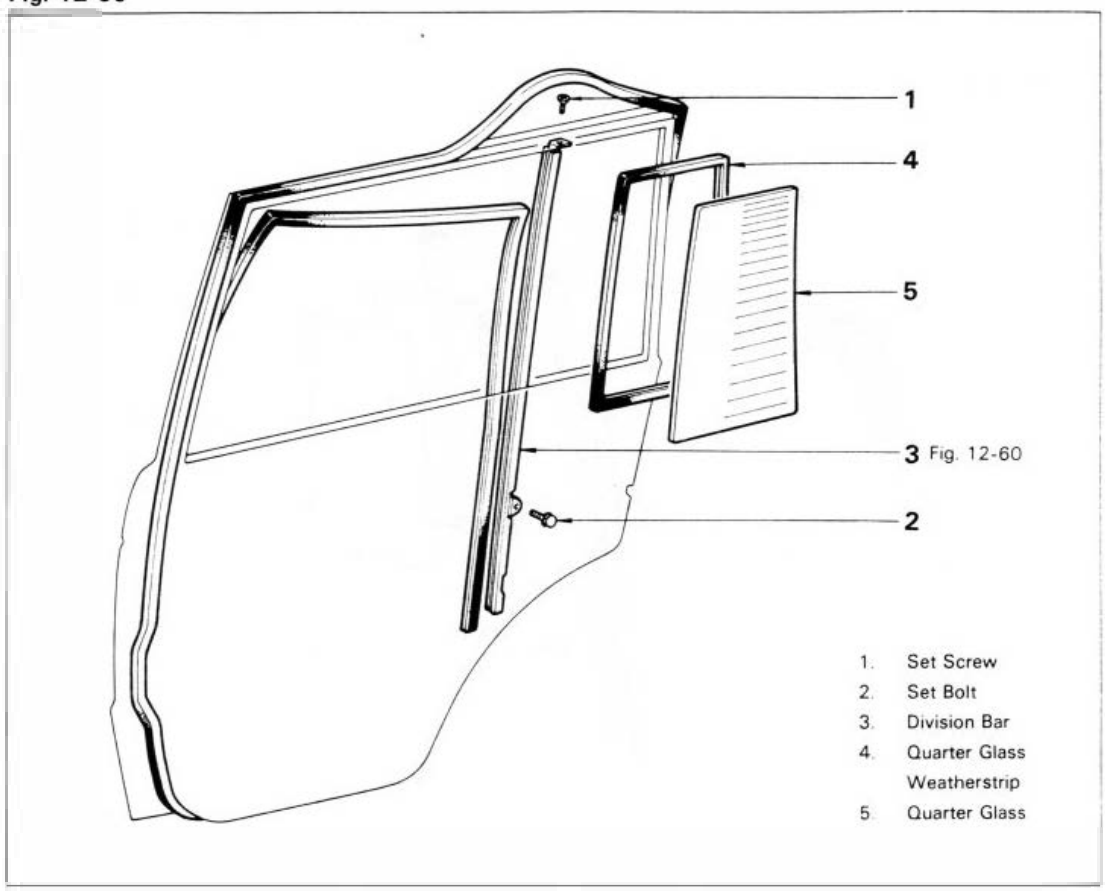


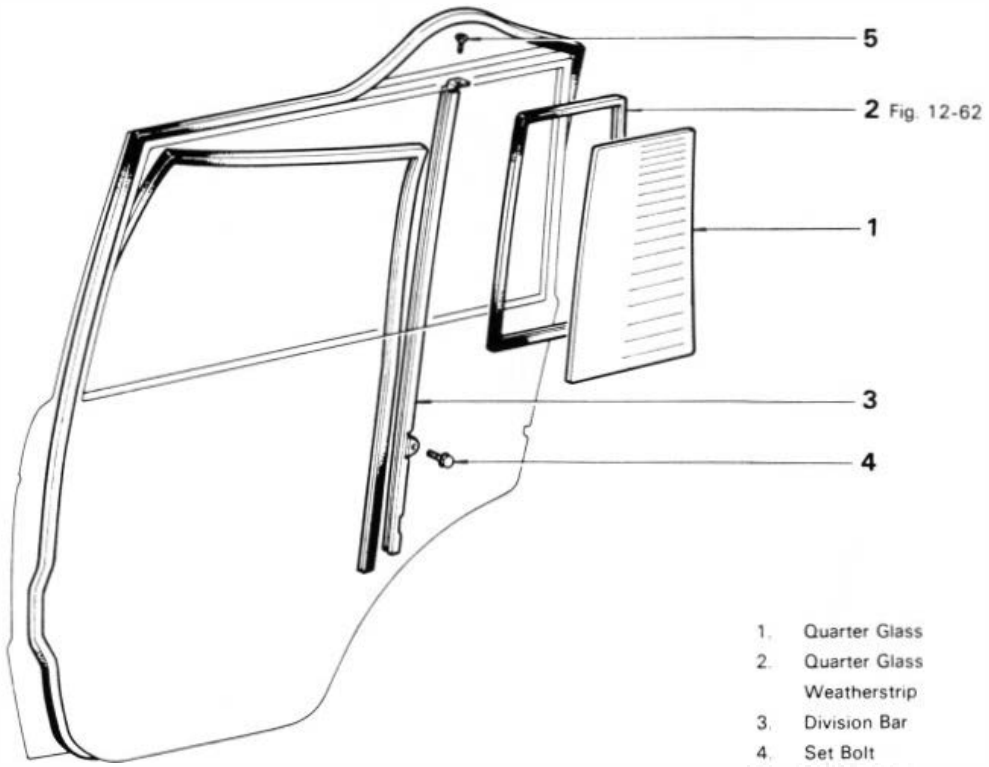
Fig. 12-60

Remove the glass run and the division bar.

INSTALLATION

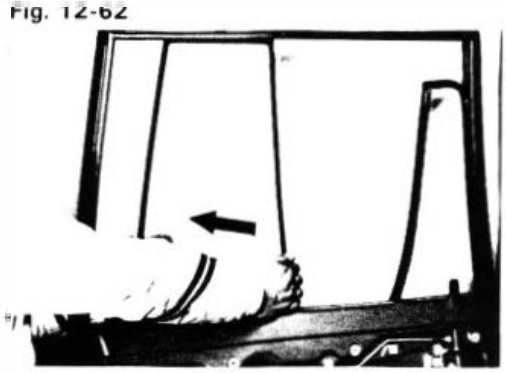
1 Install the parts in the numerical order shown in the figure.

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

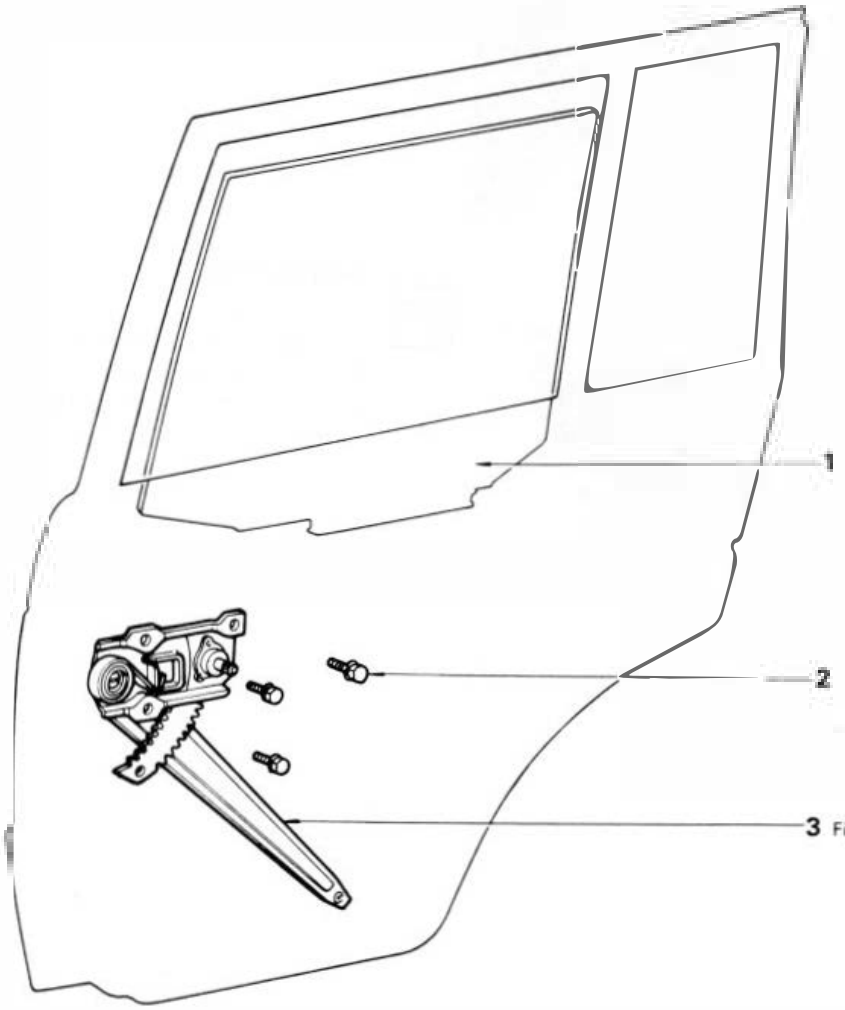
— Note —
Apply soapy water to the weatherstrip.

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.

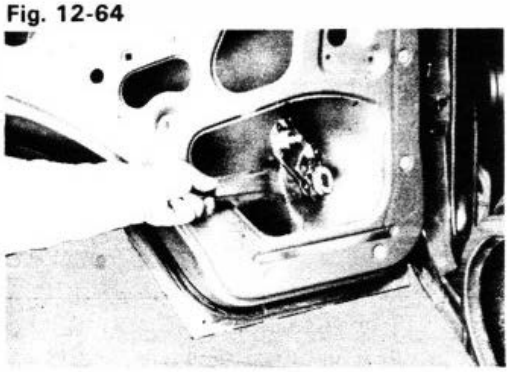
Fig. 12-63



1 Door Glass
2 Set Bolt
3 Window Regulator

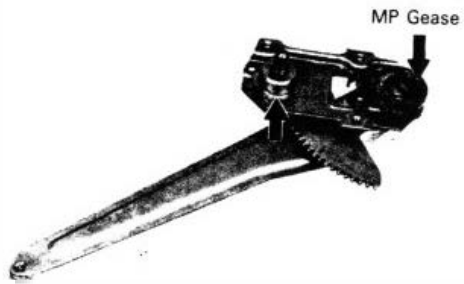
Fig. 12-64

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

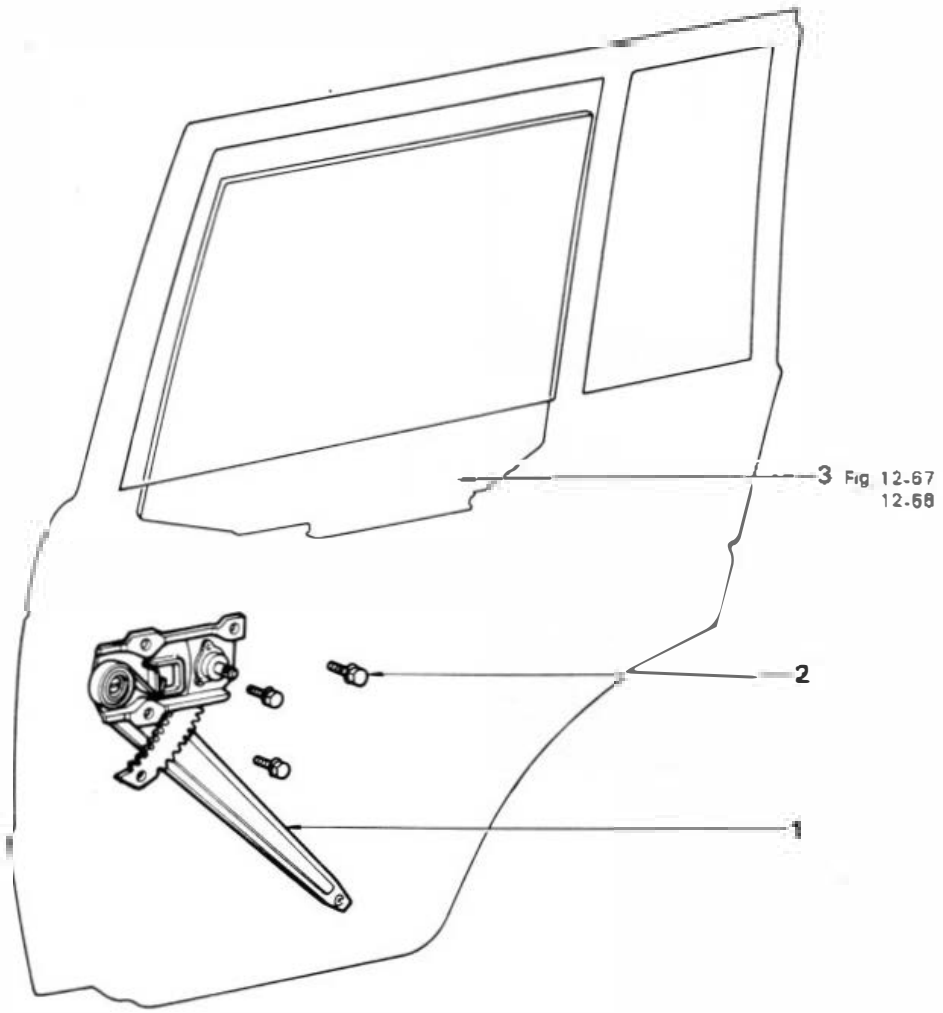
Check the following.

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

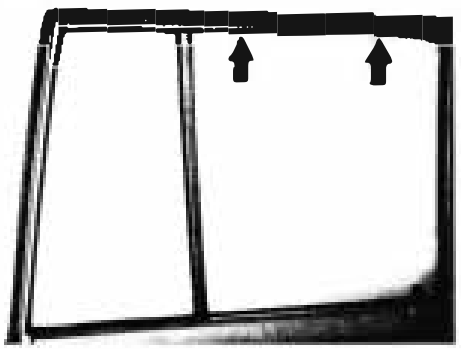
Fig. 12-66



1 Regulator
2 Set Bolt
3 Door Glass

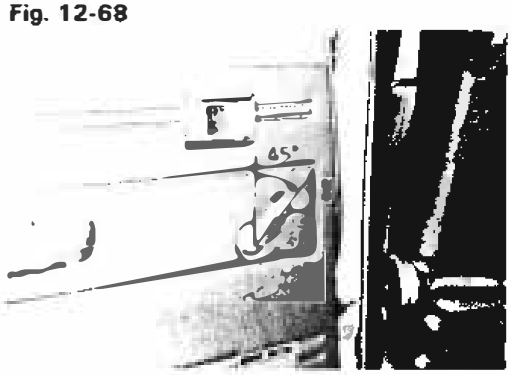
2 Install the service hole cover and door trim.
(See Fig 12-45 to 12-51)

Fig. 12-67



Raise the window to the fully closed position

Fig. 12-68

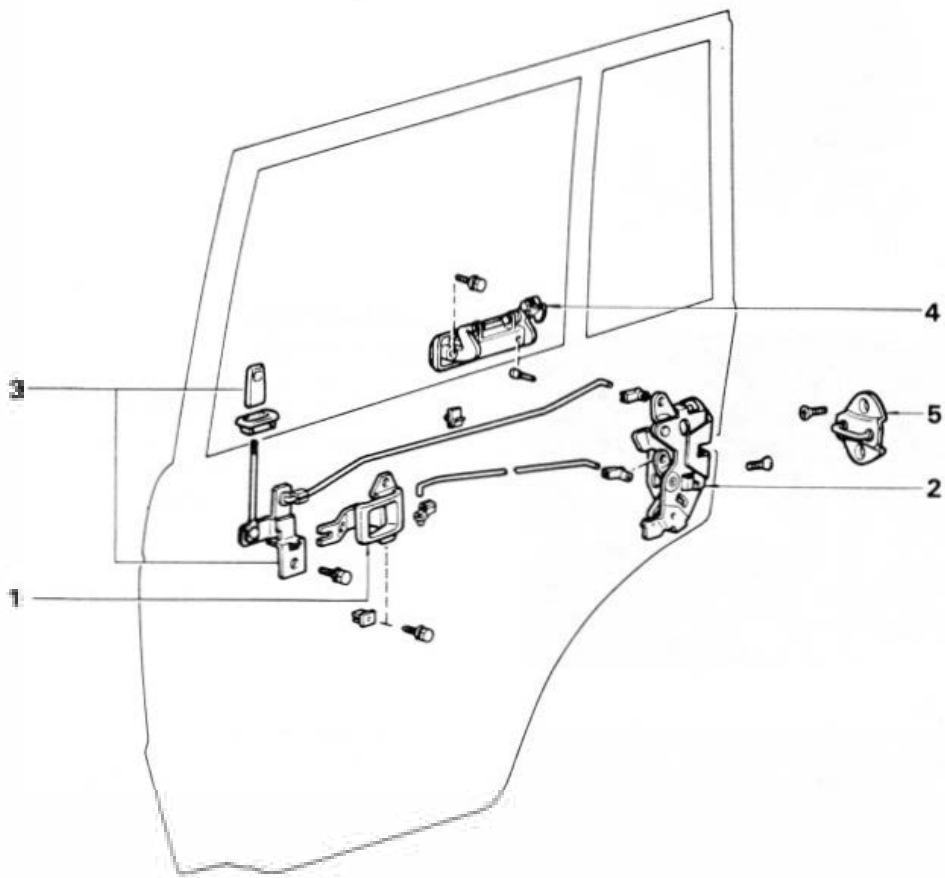


Install the regulator handle in position as shown in the figure

DOOR LOCK
INSIDE HANDLE
OUTSIDE HANDLE
DOOR LOCK STRIKER

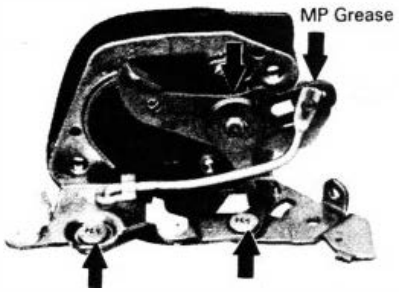
COMPONENTS

Fig. 12-69



1 Door Inside Handle
2 Door Lock
3 Door Inside Lock Button
4 Door Outside Handle
5 Door Striker

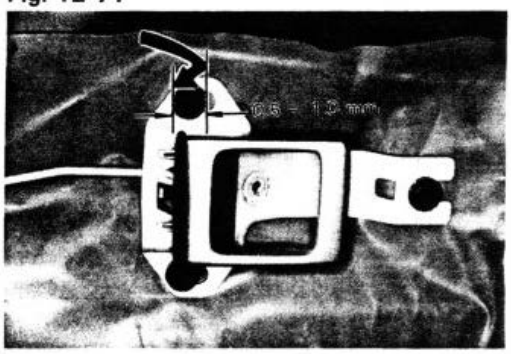
Fig. 12-70



INSPECTION

1. Operation of moving parts
2. Lubrication of lock sliding parts

Fig. 12-71

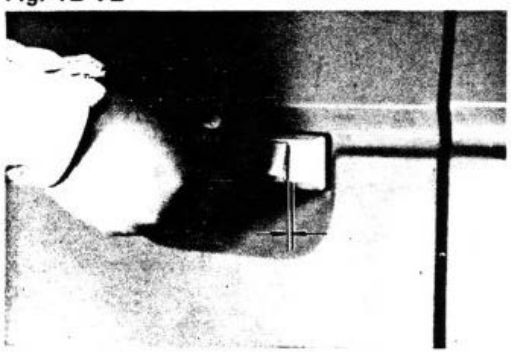


ADJUSTMENT

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

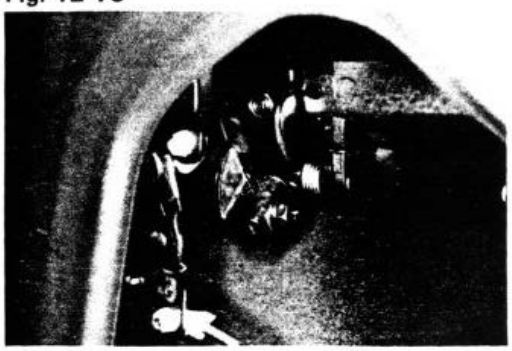


Outside Handle

1. Check the outside handle play.

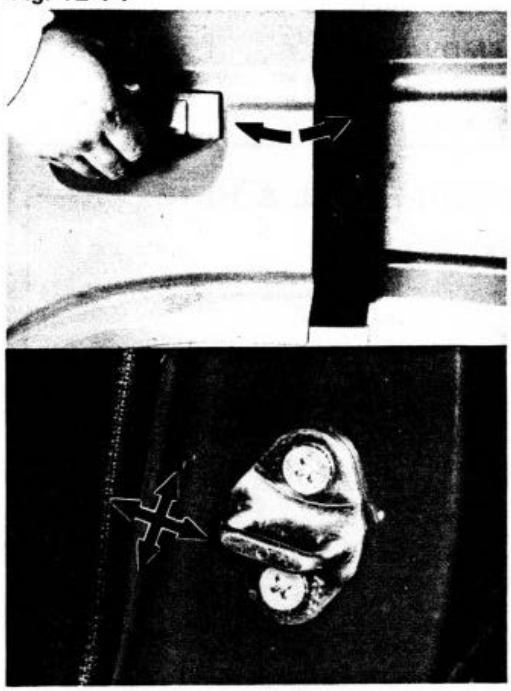
Handle and lever gap:
0.5 – 1.0 mm
(0.020 – 0.039 in.)

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

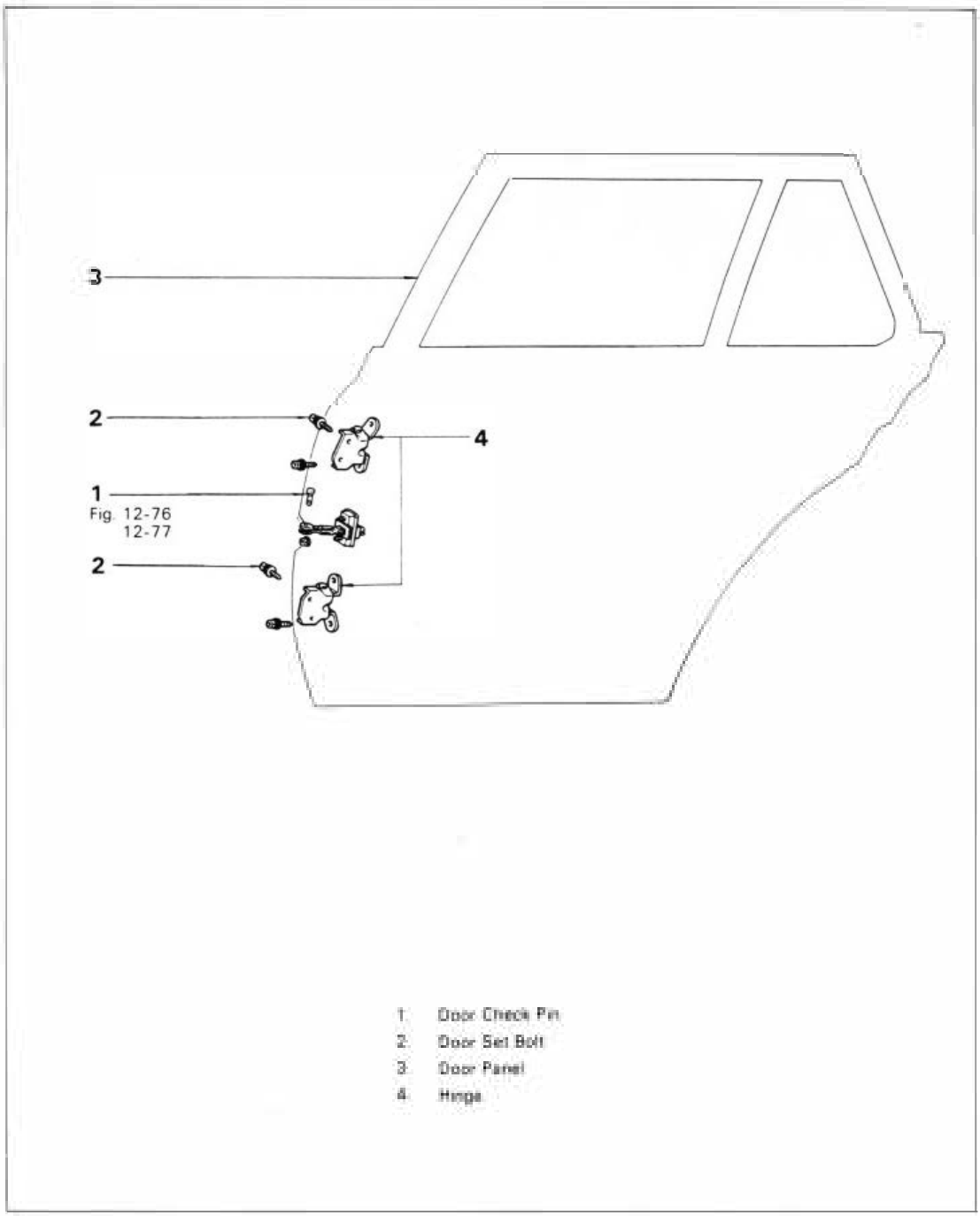
Open and close the door with the outside handle and insure that the door lock does not contact the striker.

DOOR PANEL & HINGE

REMOVAL

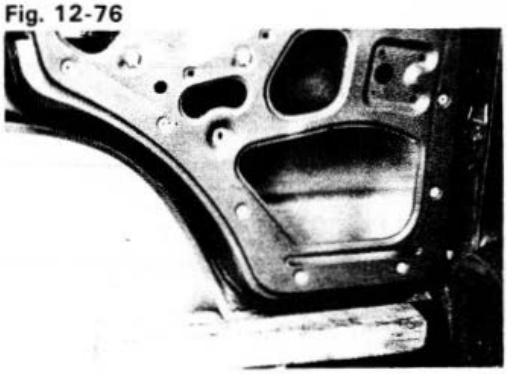
Remove the parts in the numerical order shown in the figure.

Fig. 12-75



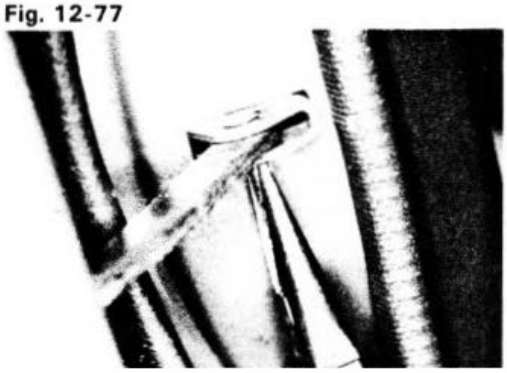
1. Door Check Pin
2. Door Set Bolt
3. Door Panel
4. Hinge

Fig. 12-76



Place a wooden block under the door panel and support it with a jack.

Fig. 12-77



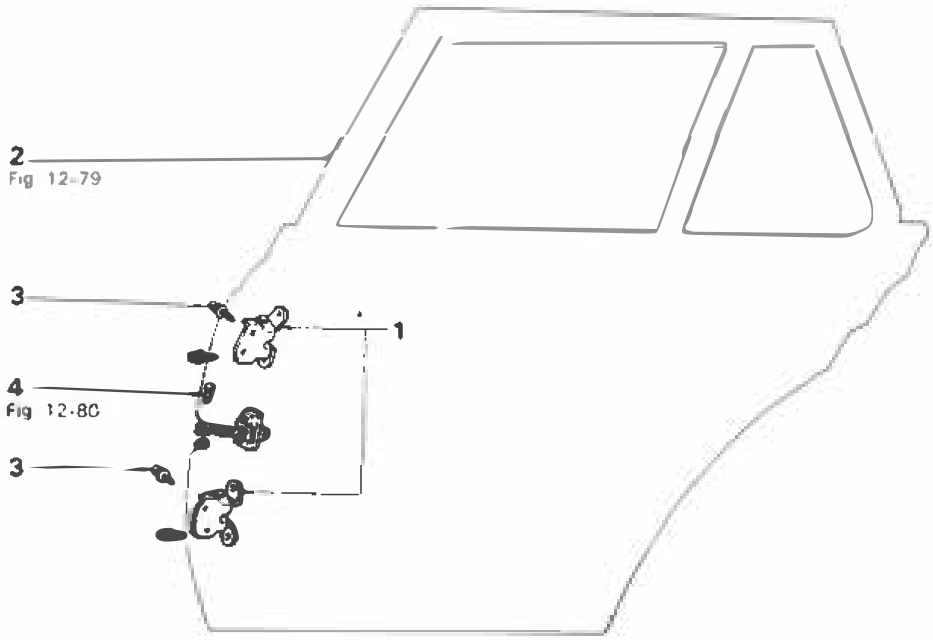
Depress the claws and pull out the pin.

– Note –
Replace the pin if the claw is bent.

INSTALLATION

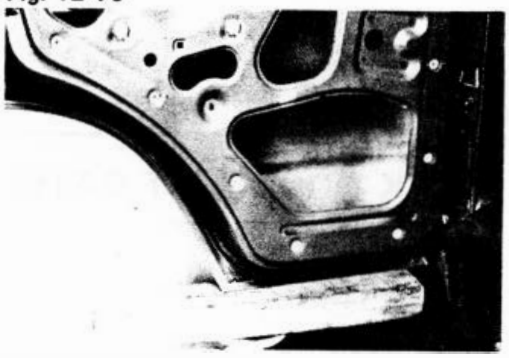
Install the parts in the numerical order shown in the figure

Fig. 12-78



1. Hinge
2. Door Panel
3. Door Panel Set Bolt
4. Door Check Pin

Fig. 12-79

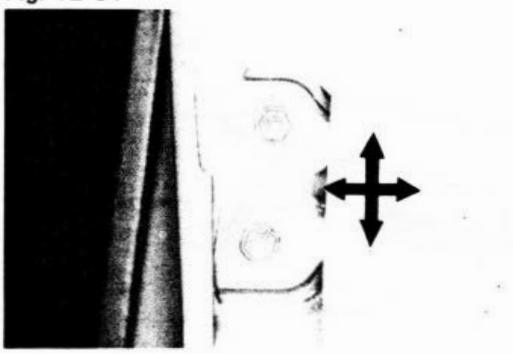


Place a wooden block under the panel and support at with a jack.

Fig. 12-80

Apply MP grease to the areas indicated by the arrow before installing the pin.

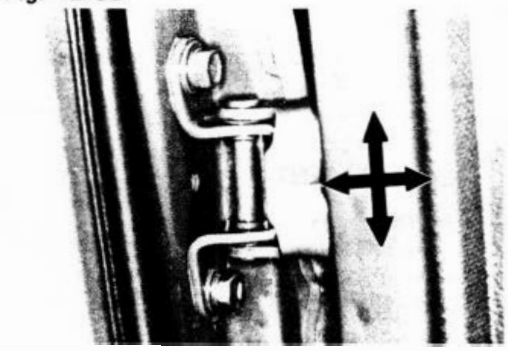
Fig. 12-81



ADJUSTMENT

1. Adjust the door forward-rearward and vertical directions by loosening the body side hinge bolts.

Fig. 12-82



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

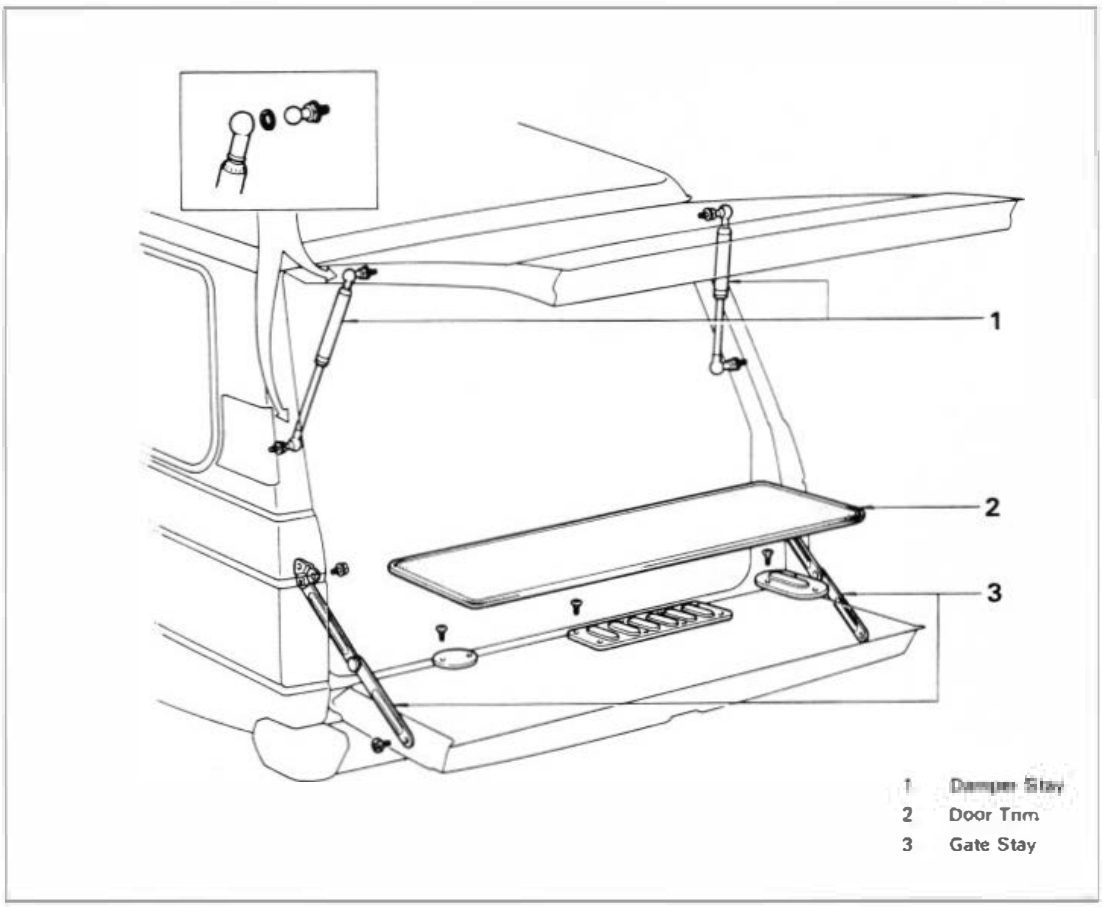
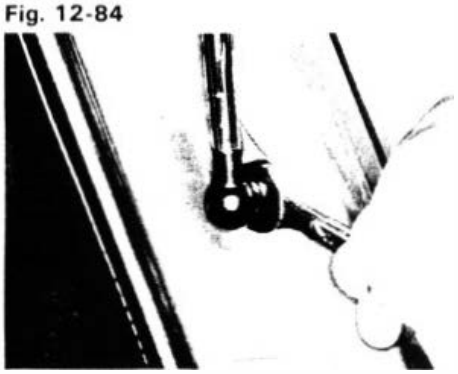


Fig. 12-84

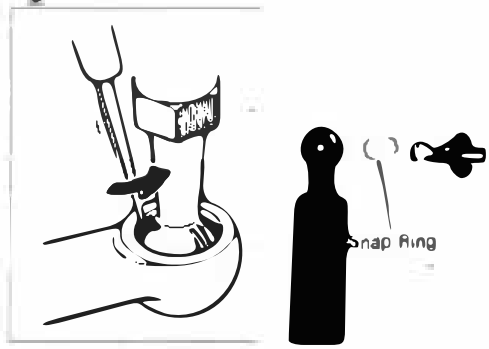


REPLACEMENT

Damper Stay

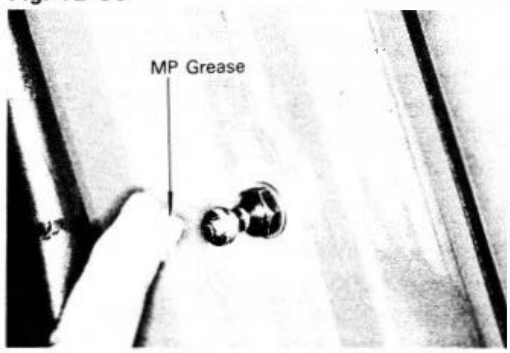
1 Remove the stud and stay together

Fig. 12-85



2 Remove the snap ring and separate the stud from the stay

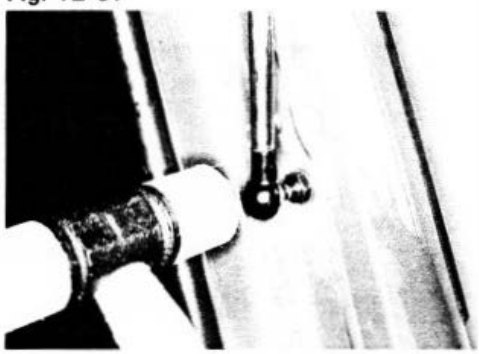
Fig. 12-86



3 Install the stud

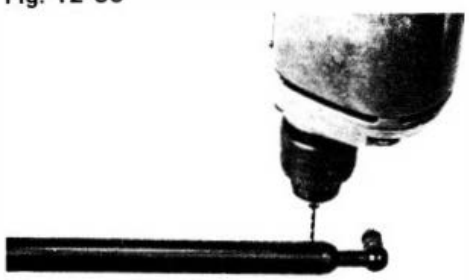
– Note –
Apply MP grease to the stud.

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!)

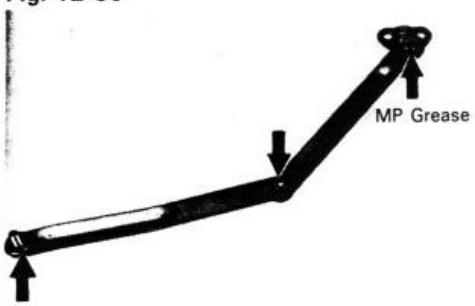
Fig. 12-89

– 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

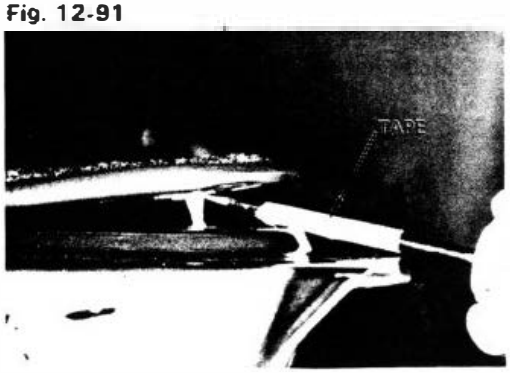


Gate Stay

Check thefollowing

1 Spring for deteriotion
2 Other components for damage
3 Lubrication of sliding parts

Fig. 12-91



Door Trim

Removethe clips by prying witha screwdriver

DOOR LOCK
DOOR HANDLE
DOOR LOCK
DOOR LOCK STRIKER
LINK TURN BLOCK

COMPONENTS

Fig. 12-92

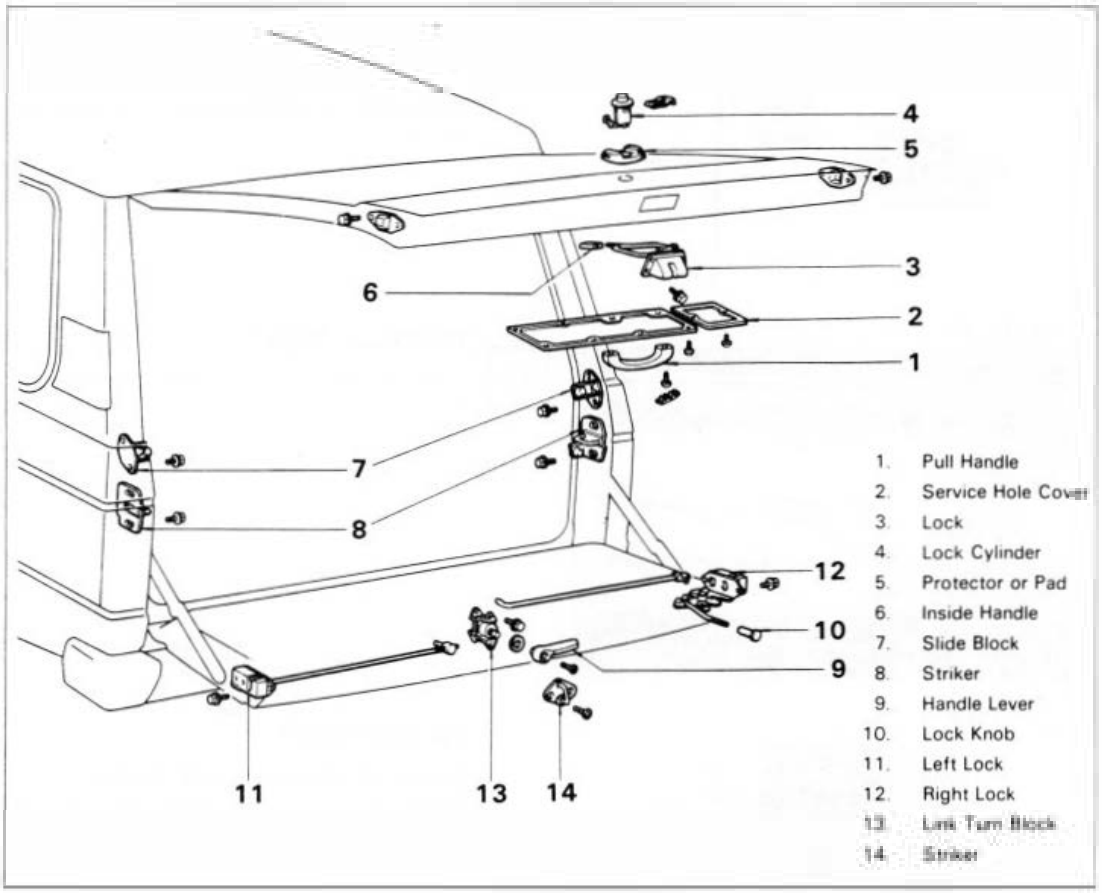
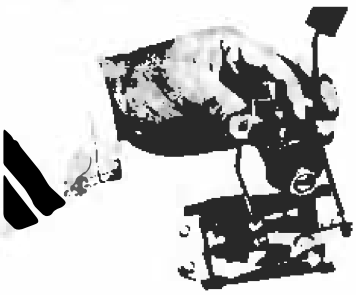


Fig. 12-93



INSPECTION

Lift Door Lock

1 Operation of moving parts
2 Lubrication of lock sliding parts

Fig. 12-94

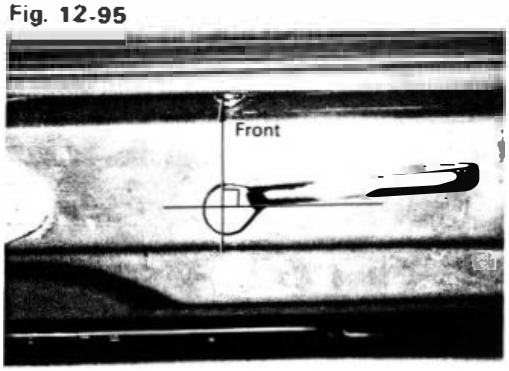
Gate Door Lock

1. Operation of moving parts
2. Lubrication of lock sliding parts

— Note —

Assemble the child protector lever in a free state.

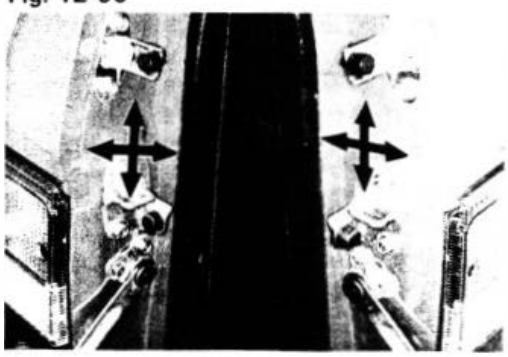
Fig. 12-95



INSTALLATION

Install the door inside handle as shown in the figure

Fig. 12-96

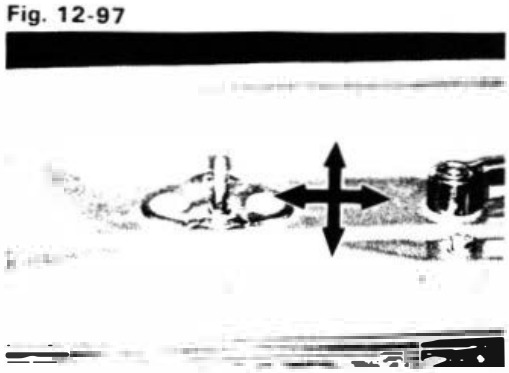


ADJUSTMENT

Lower Gate Door Lock Striker

Open and close the door and adjustso that the door lock does not contact the striker

Fig. 12-97



Upper Lift Door Lock Striker

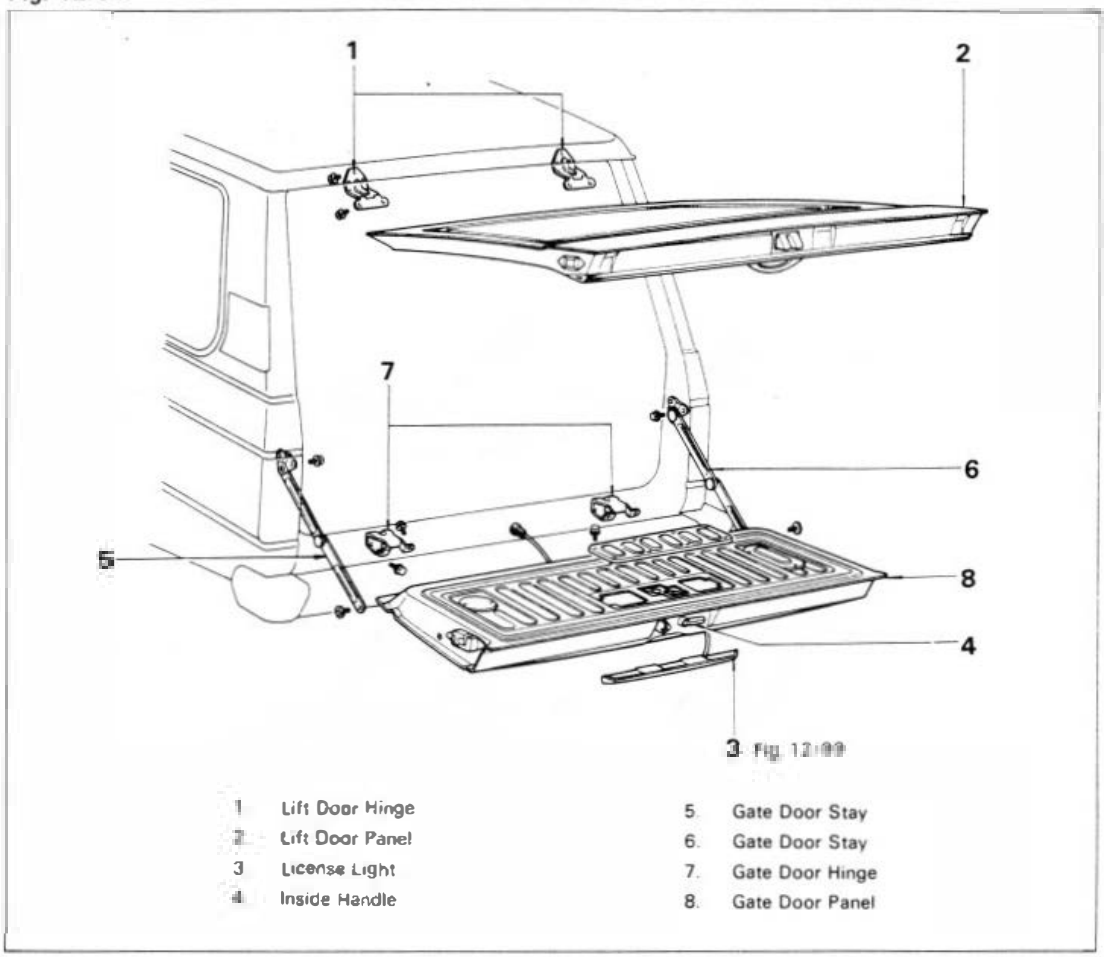
Open and close the door andadjust so that the door lock does not contact the striker

DOOR PANEL & HINGE

REMOVAL

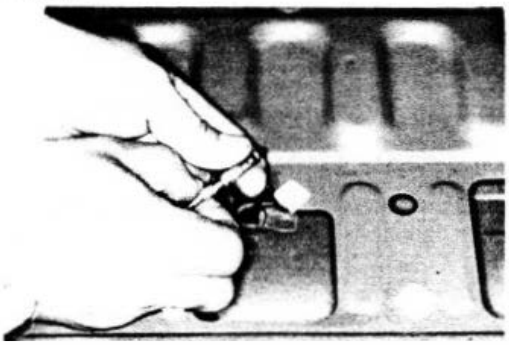
Remove the parts in the numerical order shown in the figure.

Fig. 12-98



1. Lift Door Hinge
2. Lift Door Panel
3. License Light
4. Inside Handle
5. Gate Door Stay
6. Gate Door Stay
7. Gate Door Hinge
8. Gate Door Panel

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

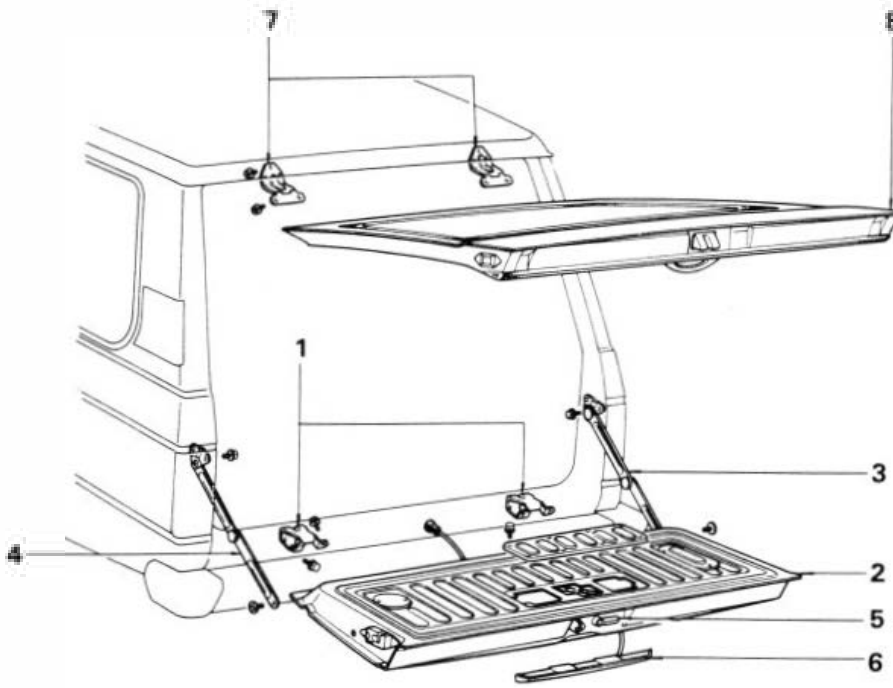
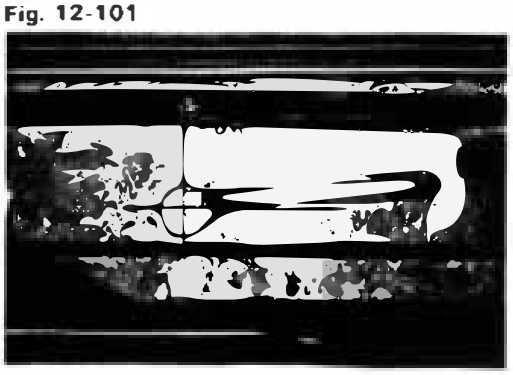


Fig. 12-101

1. Gate Door Hinge
2. Gate Door Panel
3. Gate Door Stay
4. Gate Door Stay
5. Inside Handle
6. License Light
7. Lift Door Hinge
8. Lift Door Panel

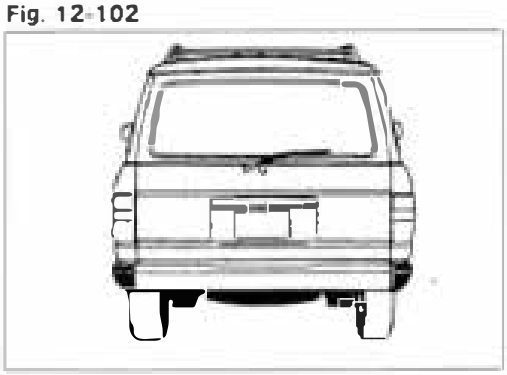
Fig. 12-101



INSTALLATION

Install the door inside handle as shown in the figure

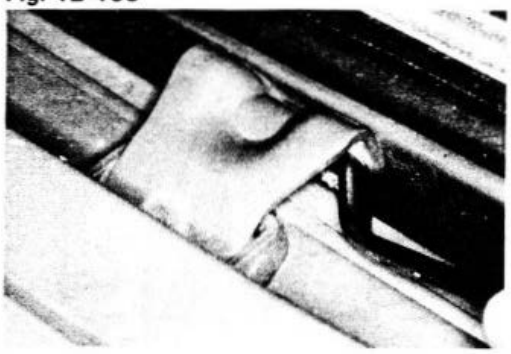
Fig. 12-102



ADJUSTMENT

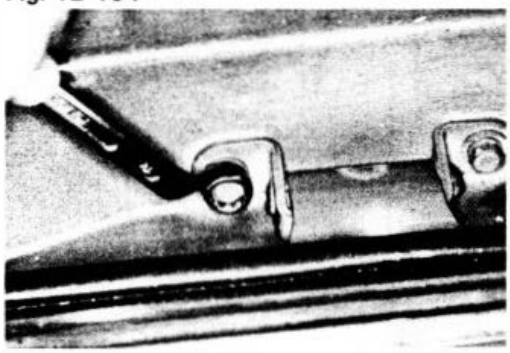
Check the door framework

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

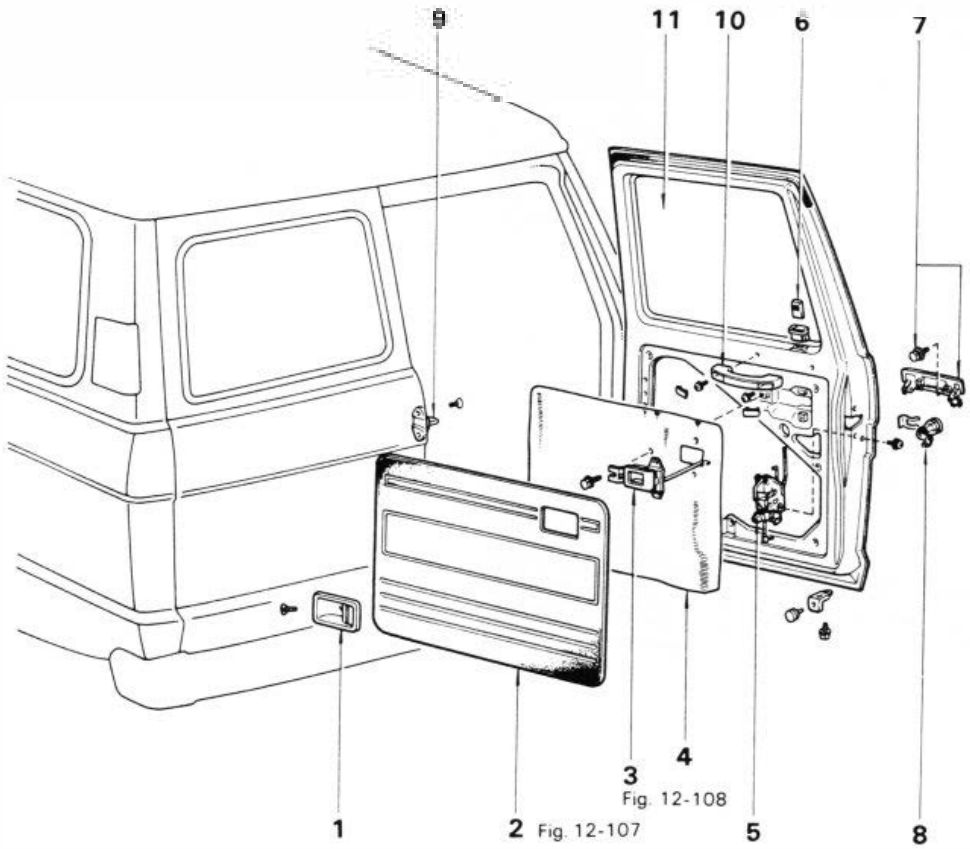
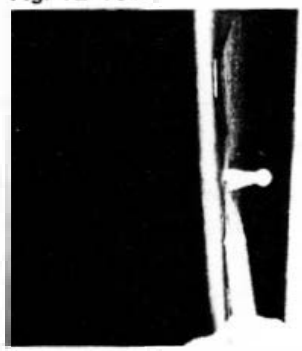


Fig. 12-108

Fig. 12-107

1. Door Inside Handle Bezel
2. Door Trim
3. Door Inside Handle & Link
4. Service Hole Cover
5. Door Lock
6. Door Inside Lock Lever
7. Door Outside Handle
8. Door Lock Cylinder
9. Door Lock Striker
10. Door Pull Handle
11. Right Door

Fig. 12-107

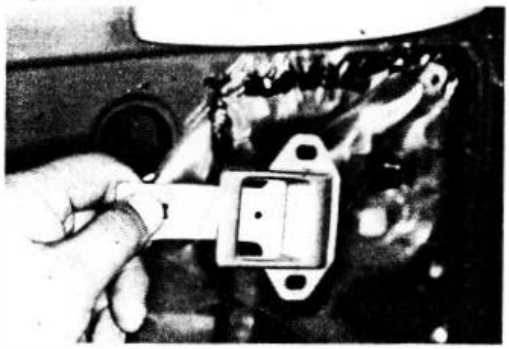


Insert a screwdriver between the door panel and retainers and pry out.

— Note —

Tape the screwdriver before use.

Fig. 12-108



Remove the inside handle

Fig. 12-109

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

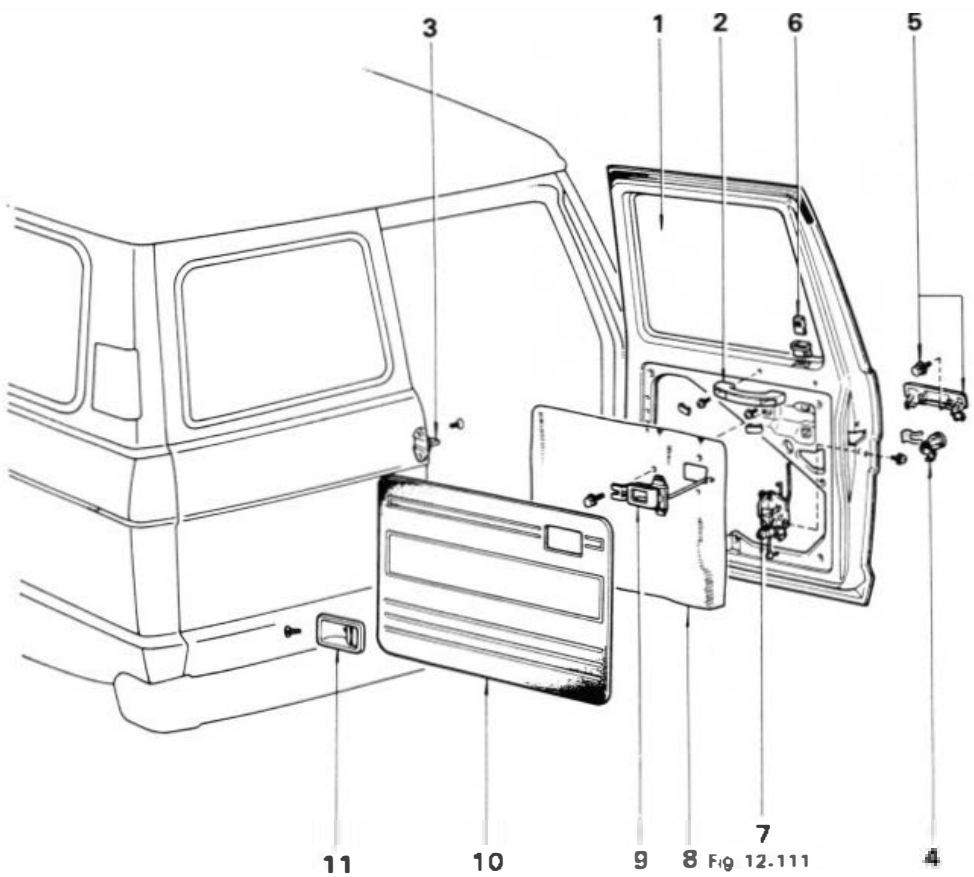


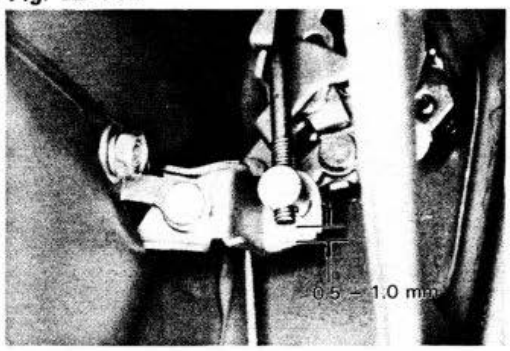
Fig 12.111

1 Right Door
2 Door Pull Handle
3 Door Lock Striker
4 Door Lock Cylinder
5 Door Outside Handle
6 Door Inside Lock Lever
7 Door Lock
8 Service Hole Cover
9 Door Inside Handle & Link
10 Door Trim
11 Door Inside Handle Bezel

Fig. 12-111

Seal the service hole cover with adhesive

Fig. 12-112

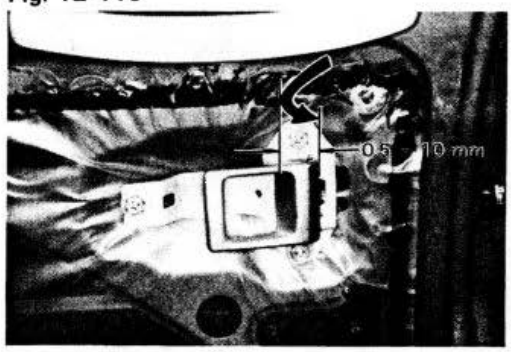


ADJUSTMENT

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

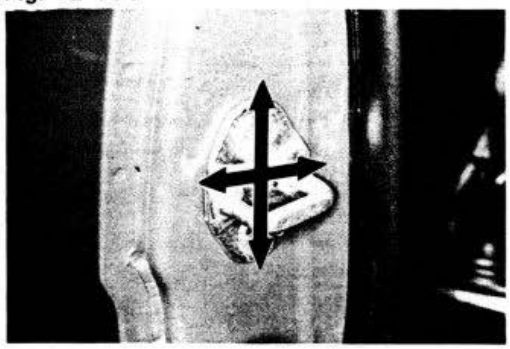
Fig. 12-113



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 thedoor by the outside handle and adjust so thatthe 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

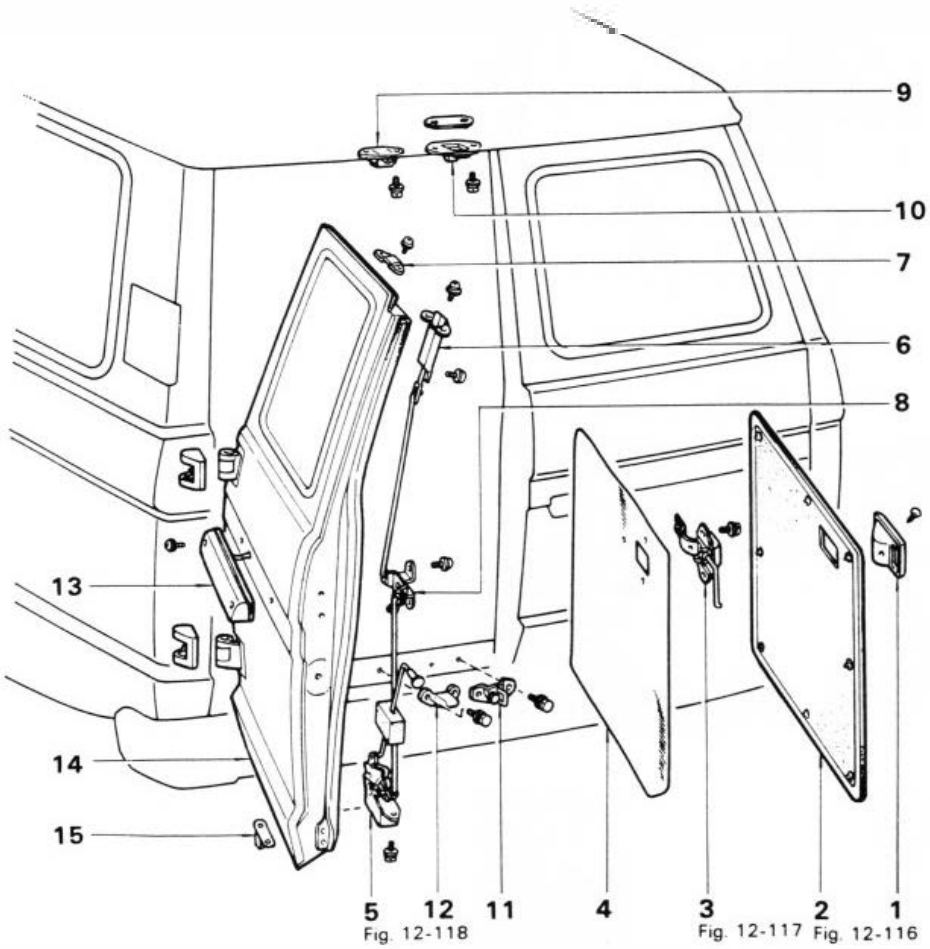
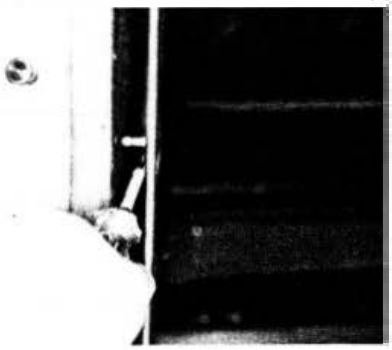


Fig. 12-118 Fig. 12-117 Fig. 12-116

1. Door Inside Handle Bezel
2. Door Trim
3. Door Inside Handle & Link
4. Service Hole Cover
5. Door Lock Lower
6. Door Lock Upper
7. Slide Block
8. Link Turn Block
9. Slide Block
10. Upper Lock Striker & Spacer
11. Lower Lock Striker
12. Slide Block
13. License Light
14. Left Door
15. Slide Block

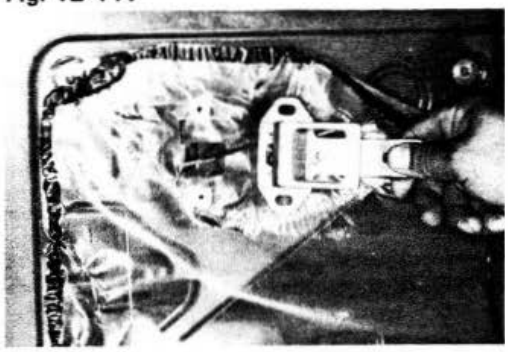
Fig. 12-116



Insert a screwdriver between the door panel and retainers and pry out

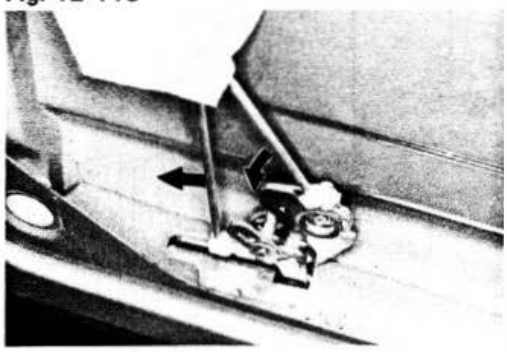
– Note –
Tape the screwdriver tip before use.

Fig. 12-117



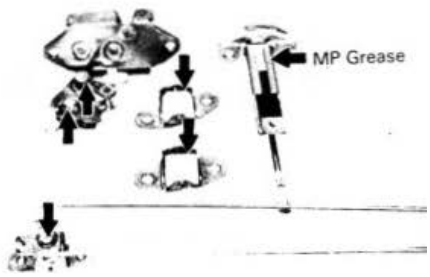
Remove the inside handle.

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

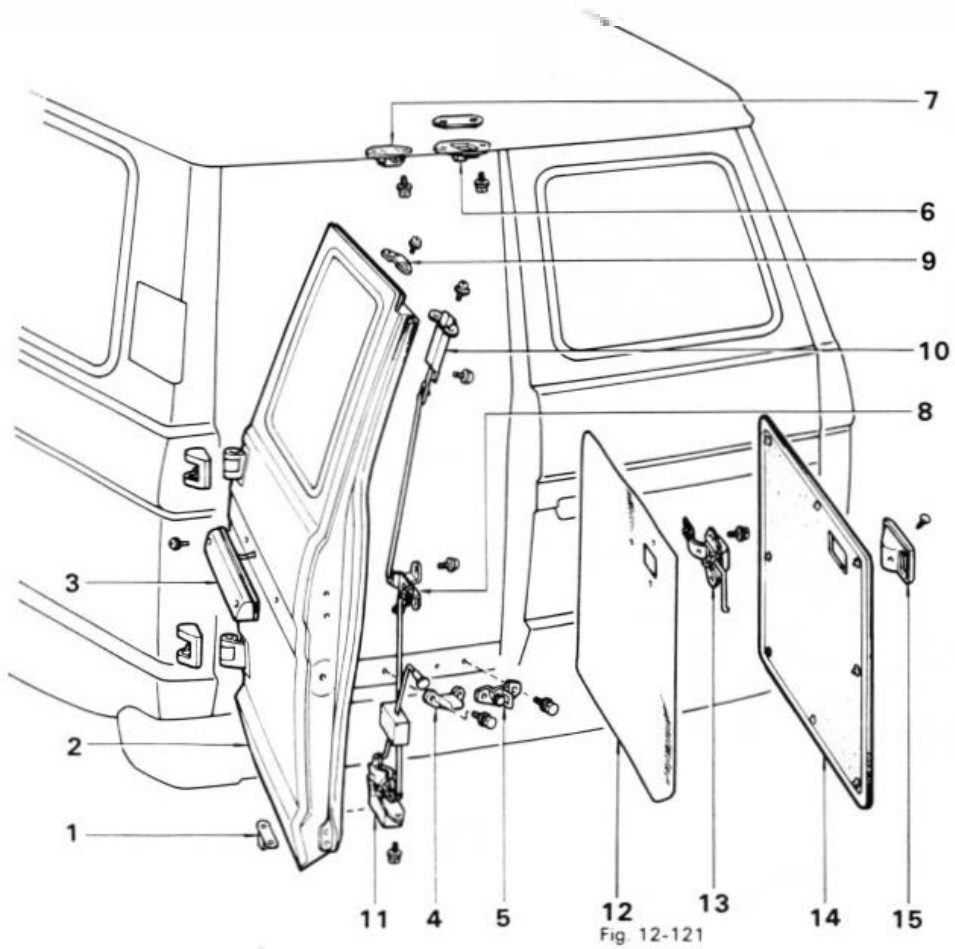
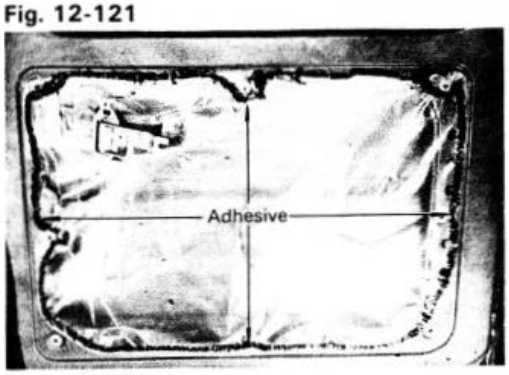


Fig. 12-121

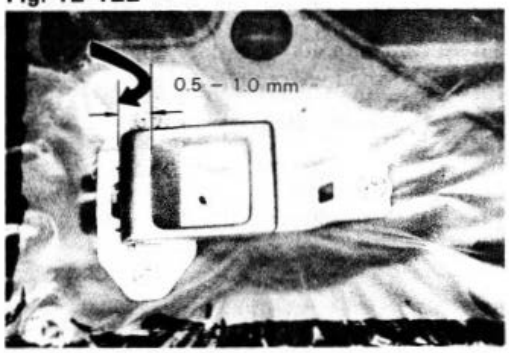
1. Slide Block
2. Left Door
3. License Light
4. Slide Block
5. Lower Lock Striker
6. Upper Lock Striker
7. Slide Block
8. Link Turn Block
9. Slide Block
10. Door Lock Upper
11. Door Lock Lower
12. Service Hole Cover
13. Door Inside Handle & Link
14. Door Trim
15. Door Inside Handle Bezel

Fig. 12-121



Seal the service holecover with adhesive

Fig. 12-122

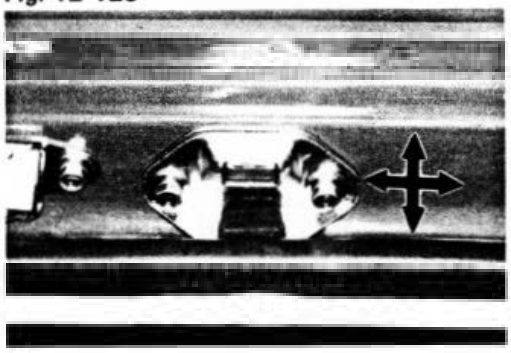


ADJUSTMENT

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. 12-123



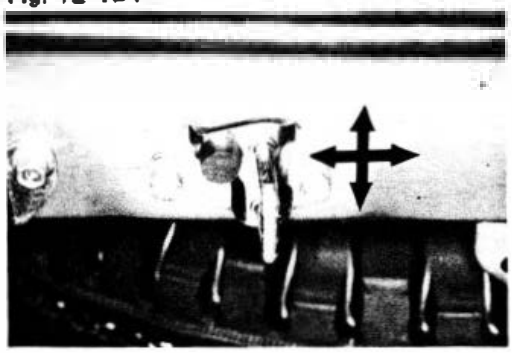
Door Lock Striker (Upper)

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.

Fig. 12-124



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

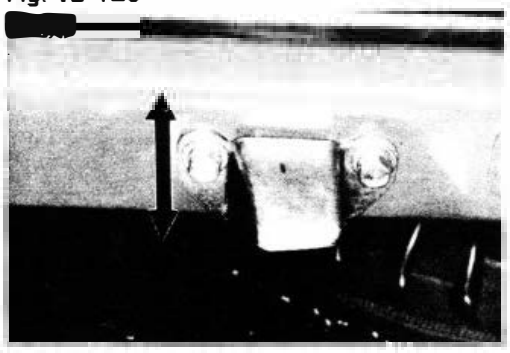


Fig. 12-126

Slide Block

Loosen the set screws and adjust so the door closes softly.

– Note –

1. **When closing the door becareful 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:

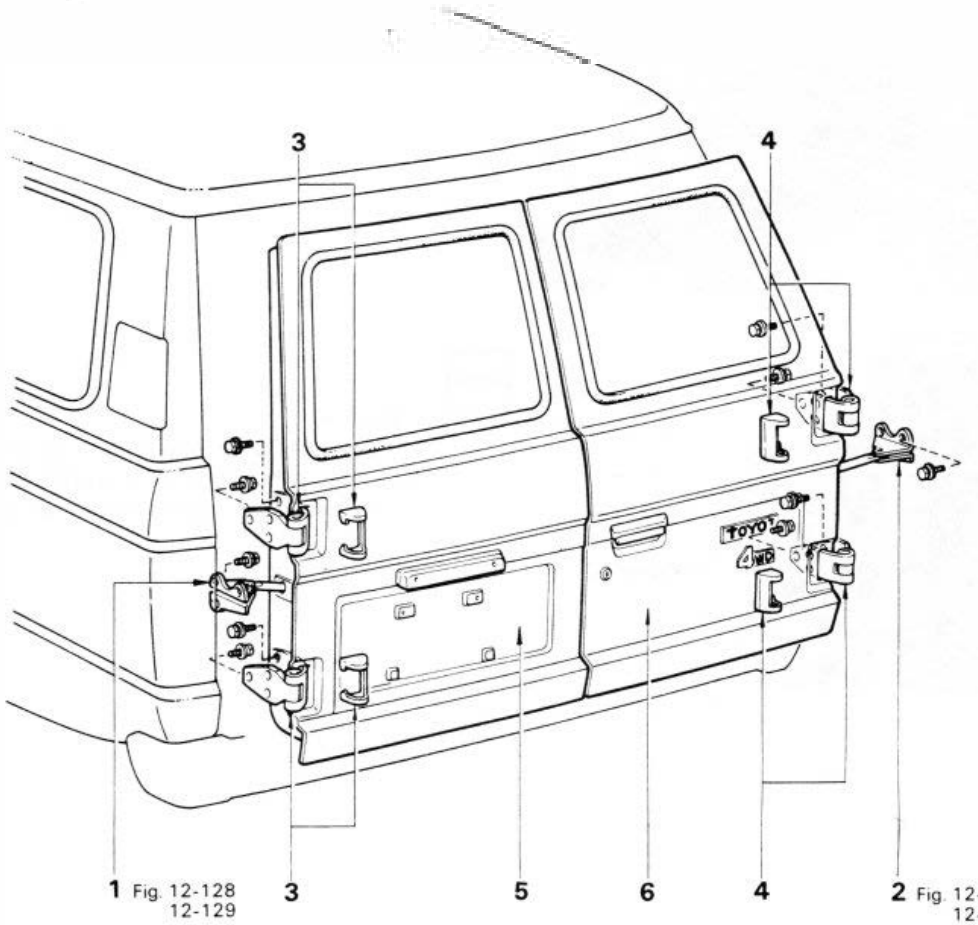
Limit **14.5 ± 1.5 mm**
(0.571 ± 0.059 in.)

DOOR PANEL

REMOVAL

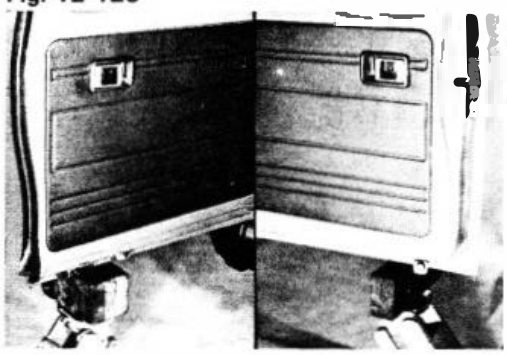
Remove the parts in the numerical order shown in the figure.

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. The remove the hinge body mounting bolts.

Fig. 12-129

Push in the claw and pull up the pin.

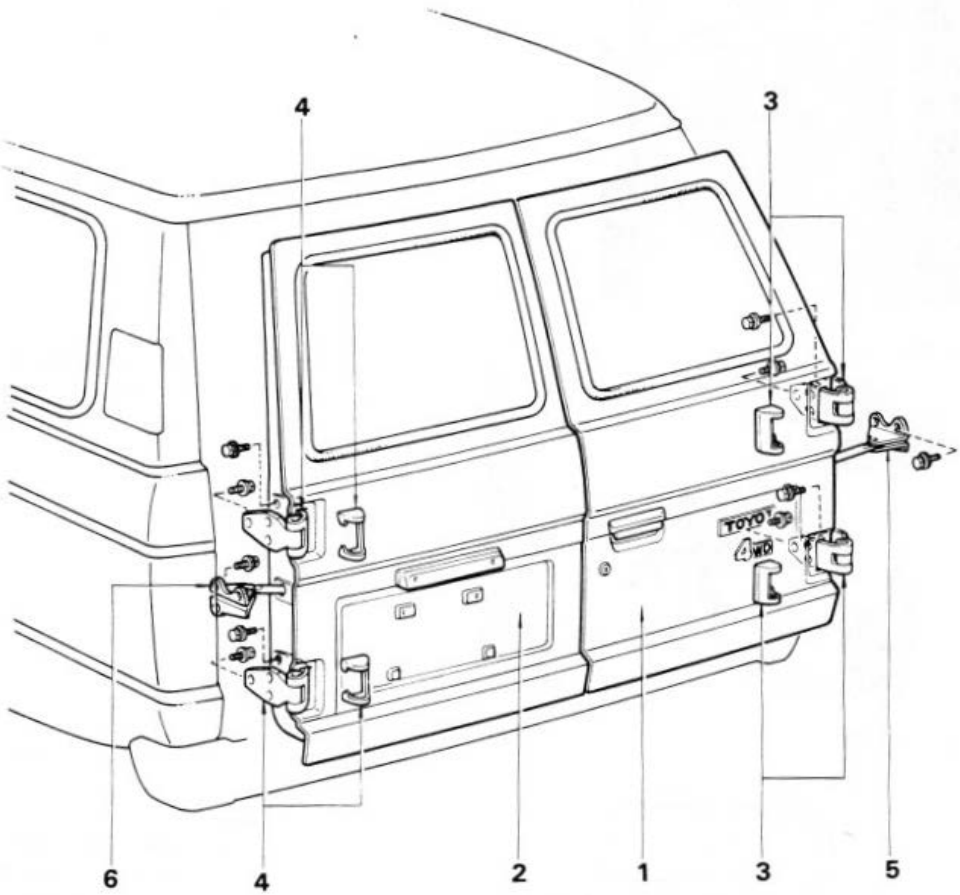
— Note —

1. **After removal, leave claw raised.**
2. **Apply MP grease to the area indicated by the arrow before installing the pin.**

INSTALLATION

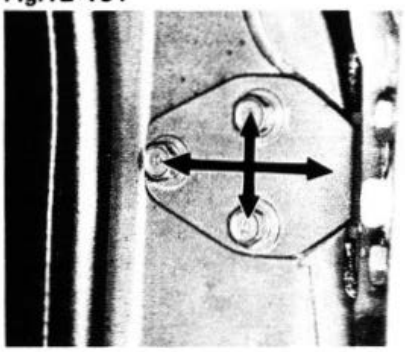
Install the parts in the numerical order shown in the figure.

Fig. 12-130



1. Right Door Panel
2. Left Door Panel
3. Right Door Hinge
4. Left Door Hinge
5. Right Door Check Pin
6. Left Door Check Pin

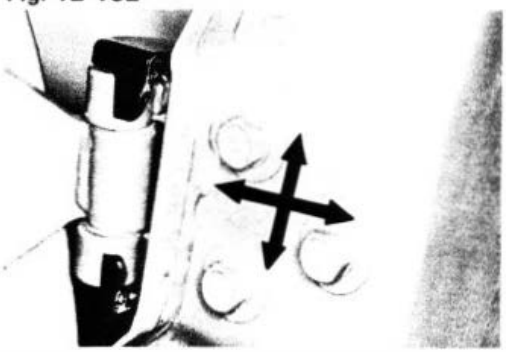
Fig.12-131



ADJUSTMENT

1 Adjust the door forward-rearward and vertical directions by loosening the body side hinge bolts

Fig. 12-132



2 Adjust the door left-right and vertical directions by loosening the door side hinge bolts

Fig. 12-133

3 Check back the door framework

Clearance:

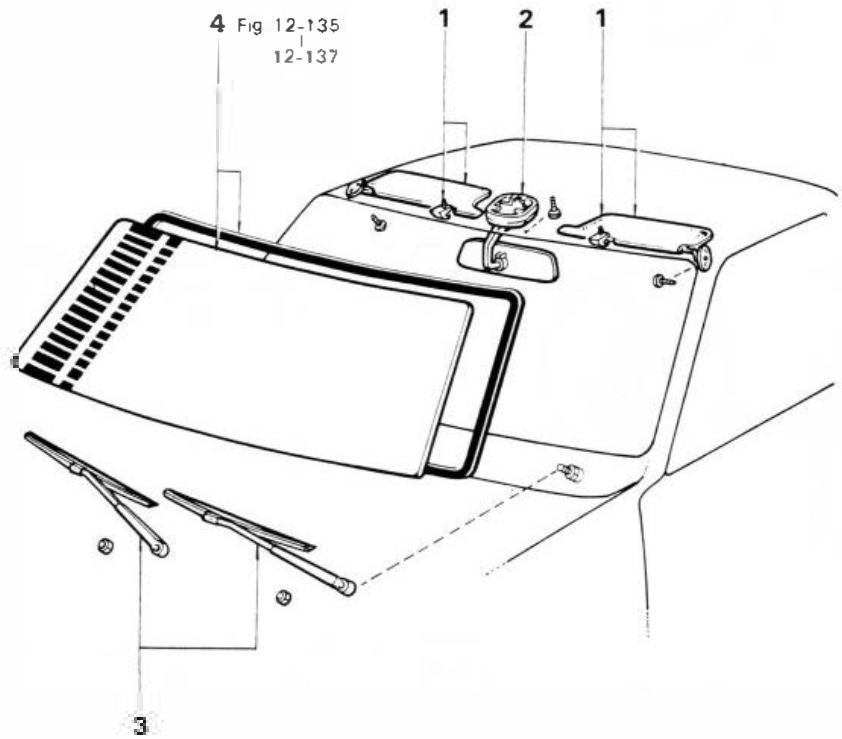
A	5.8 ± 2.0 mm (0.228 ± 0.079 in.)
B	0.2 – 2.0 mm (0.008 – 0.079 in.)
C	0.2 – 2.0 mm (0.008 – 0.079 in.)

WINDSHIELD

REMOVAL

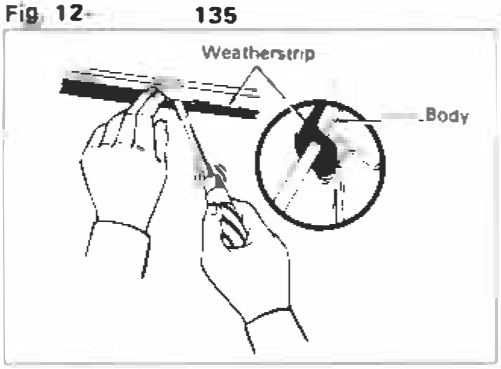
Remove the parts in the numerical order shown in the figure.

Fig. 12-134



1. Sun Visor & Holder
2. Inside Rear View Mirror
3. Wiper Arm
4. Glass with Weatherstrip

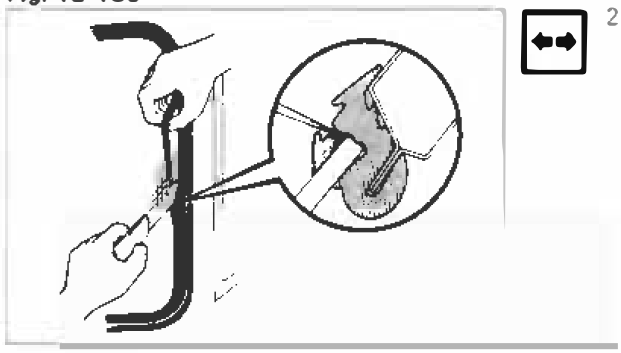
Fig. 12-135



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

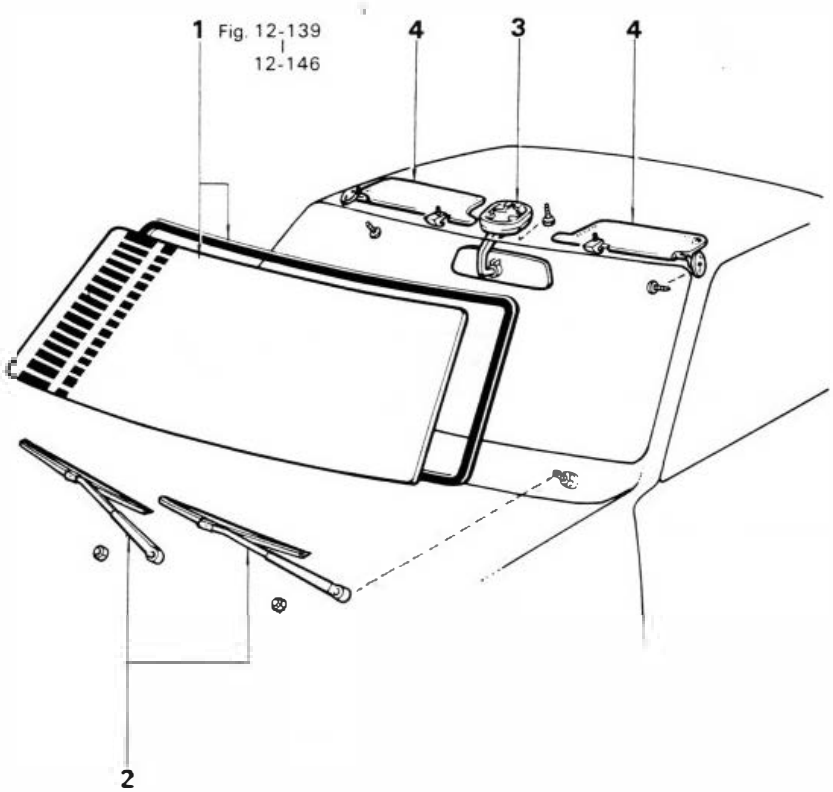
Push the glass surface near the upper side of the weatherstrip toward the outside and remove the glass

– Note –
Use a uniform force when pushing out glass.

INSTALLATION

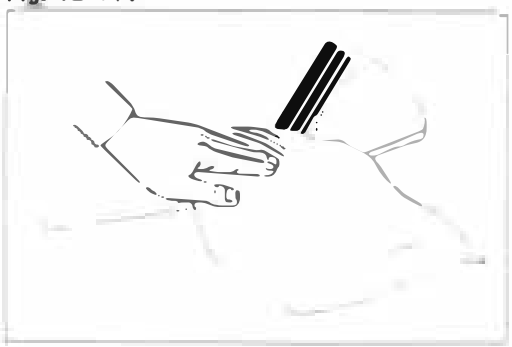
Install the parts in the numerical order shown in the figure.

Fig. 12-138



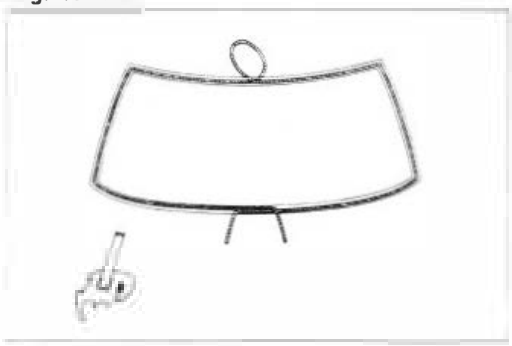
1. Glass with Weatherstrip
2. Wiper Arm
3. Inside Rear View Mirror
4. Sun Visor & Holder

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

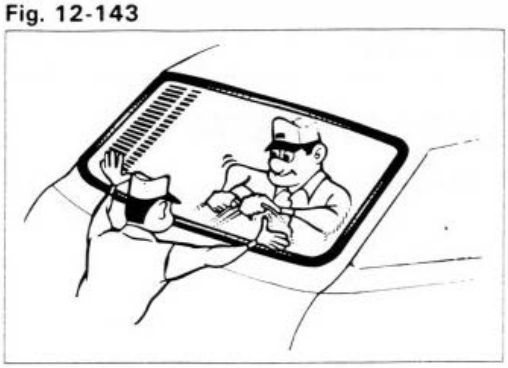
Fig. 12-141

Apply soapy water to the weatherstrip and body contacting surfaces.

Fig. 12-142

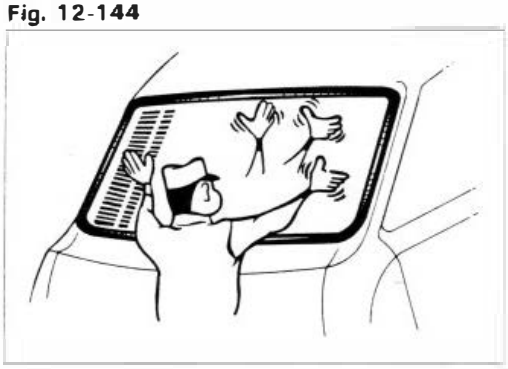
Position the windshield accurately on the body

Fig. 12-143



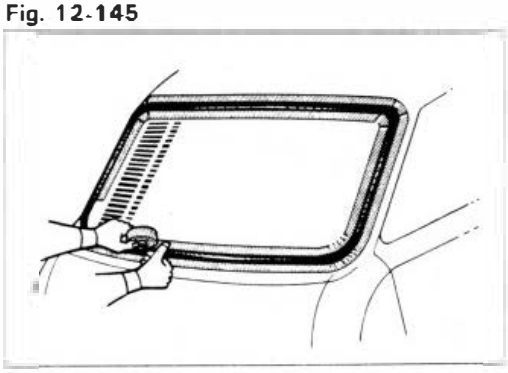
Pull the cords from inside and, at the same time, tap the glass surface near the weatherstrip with the palm of the hand from the outside. Begin installation from the lower center.

Fig. 12-144



After installing the glass, tap it from the outside with the palm of the hand until it is fully seated.

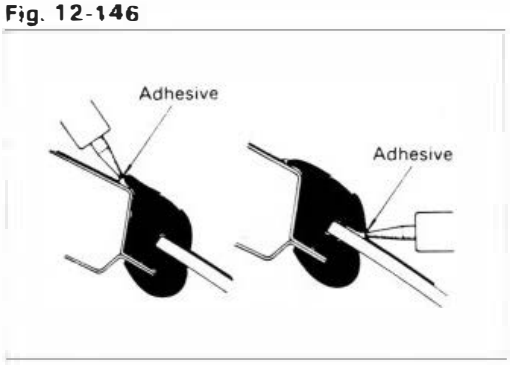
Fig. 12-145



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



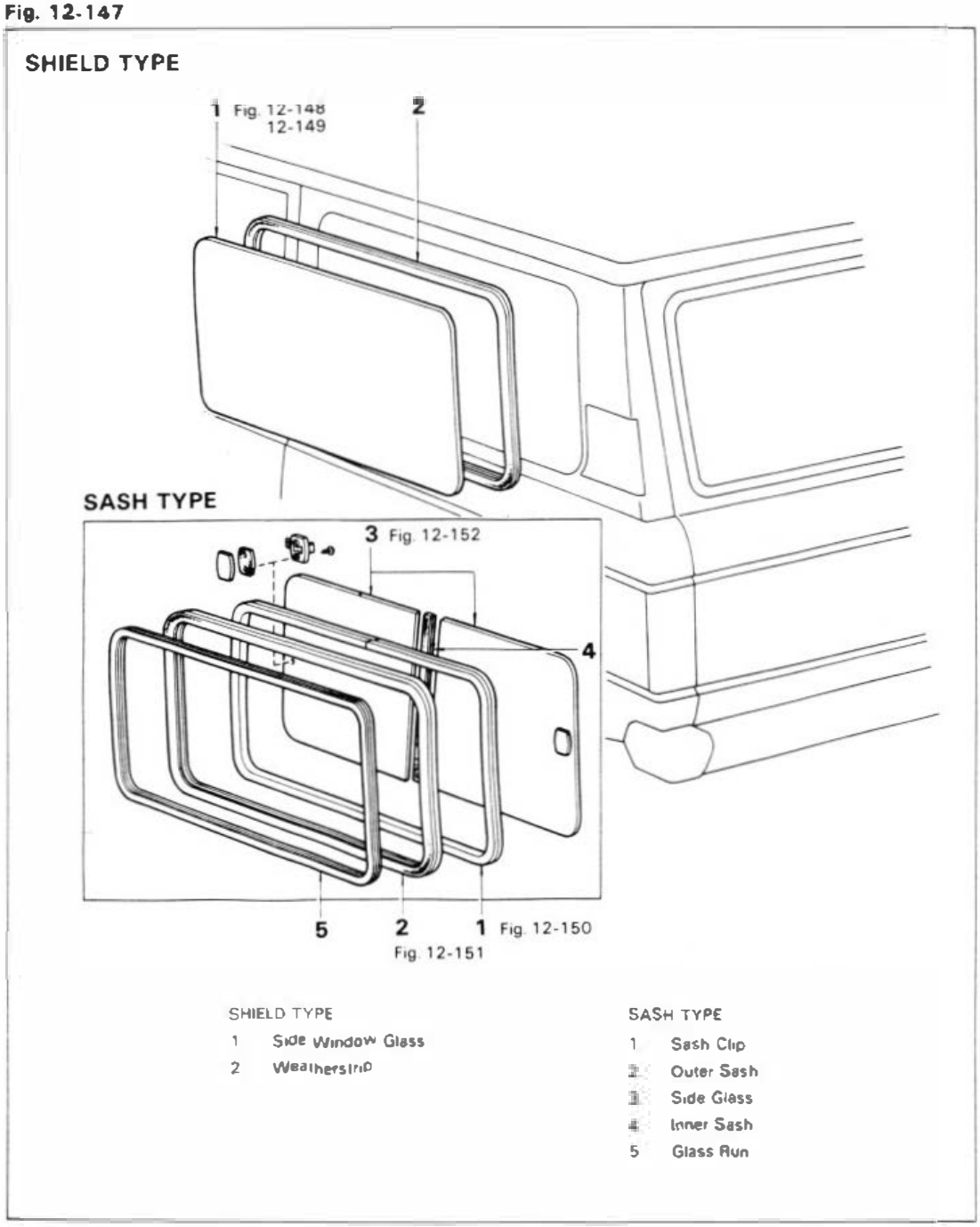
2. Fill in the adhesive from the outside.

SIDE WINDOW

REMOVAL

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

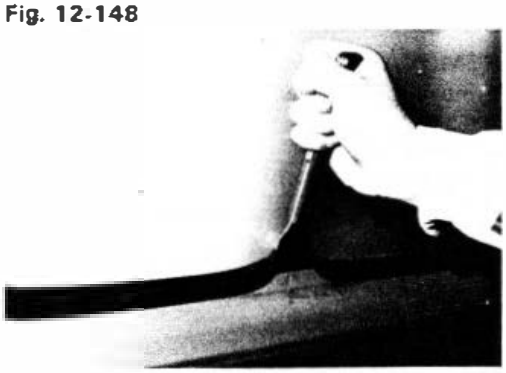
Fig. 12-147



SHIELD TYPE
1 Side Window Glass
2 Weatherstrip

SASH TYPE
1 Sash Clip
2 Outer Sash
3 Side Glass
4 Inner Sash
5 Glass Run

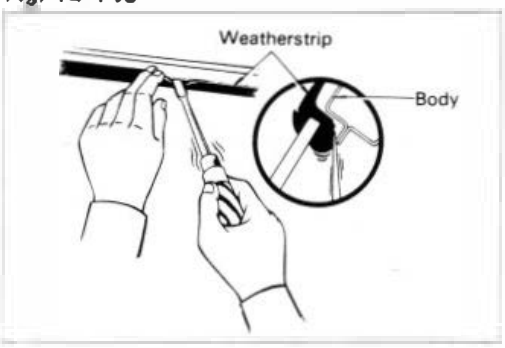
Fig. 12-148



{SHIELD TYPE}

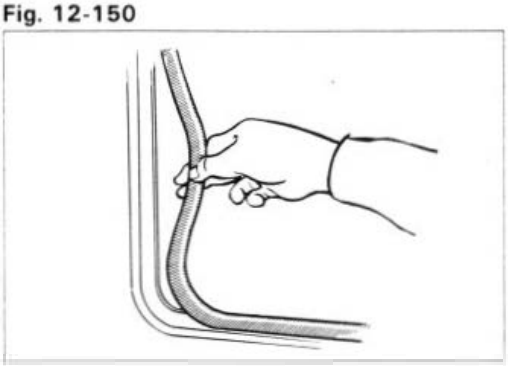
Remove the weatherstrip adhesive from the body with a scraper.

Fig. 12-149



From inside push out the weatherstrip lip with a screwdriver.

Fig. 12-150

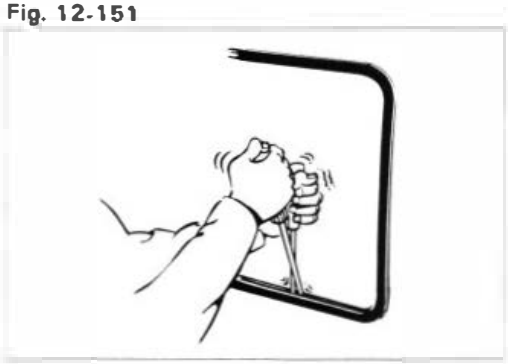


[SASH TYPE]

REMOVAL

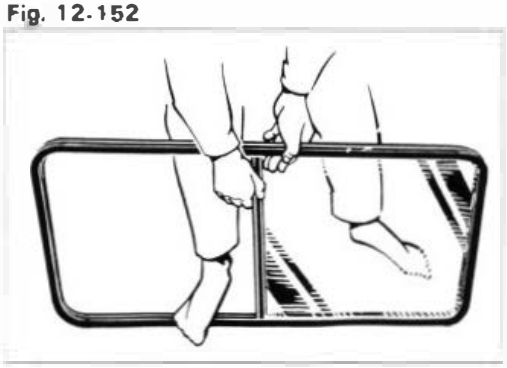
Remove the window frame clips.

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.

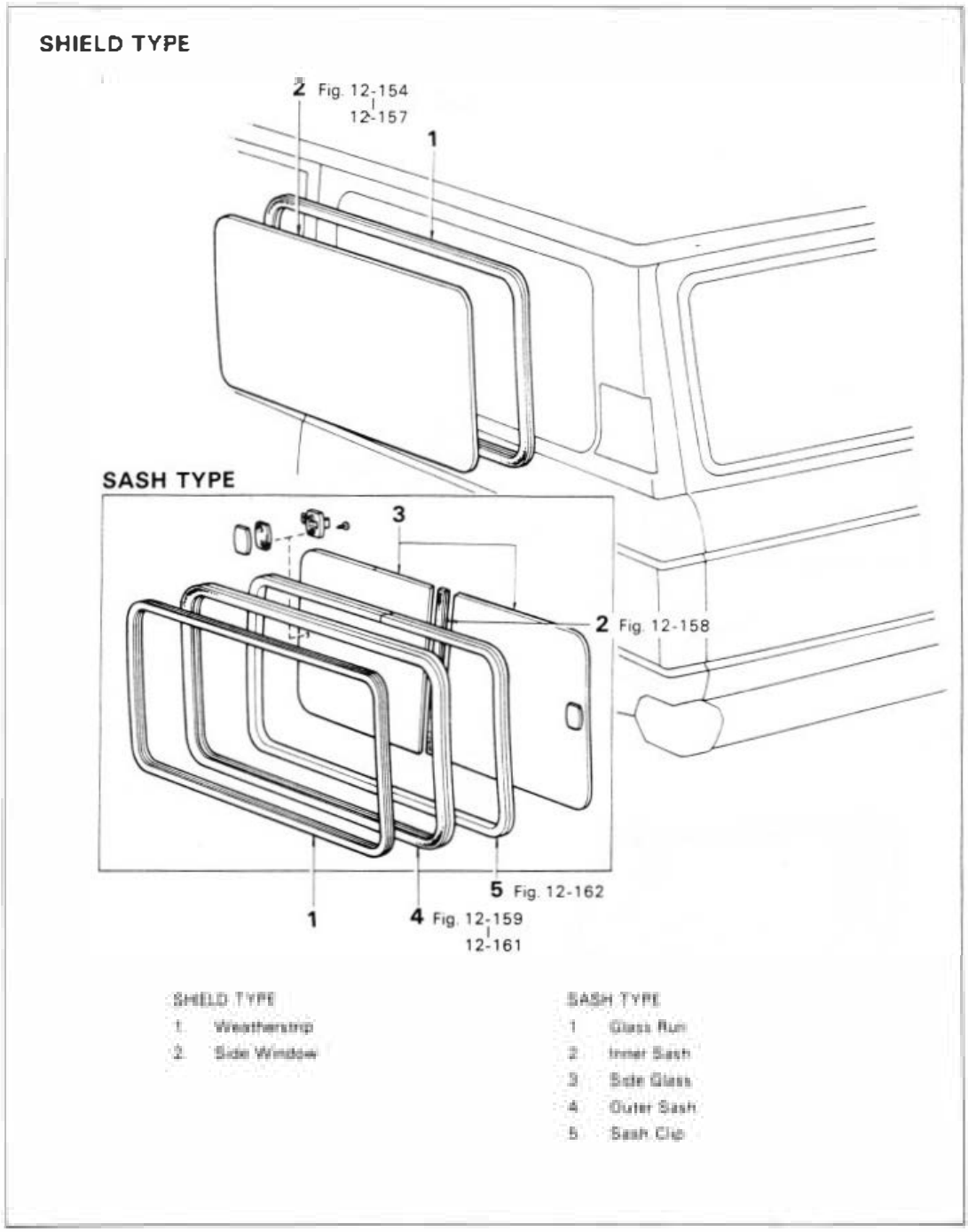
– Note –

To prevent glass from dropping, support it with fingers.

INSTALLATION

Install the parts in the numerical order shown in the figure

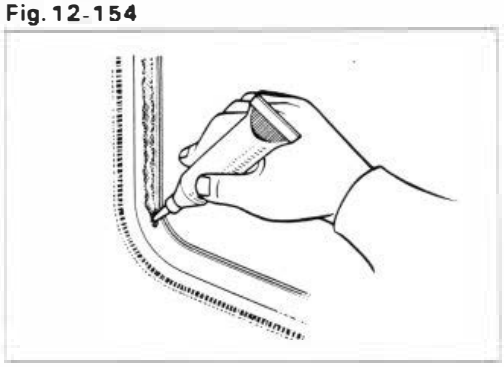
Fig. 12-153



SHIELD TYPE
1. Weatherstrip
2. Side Window

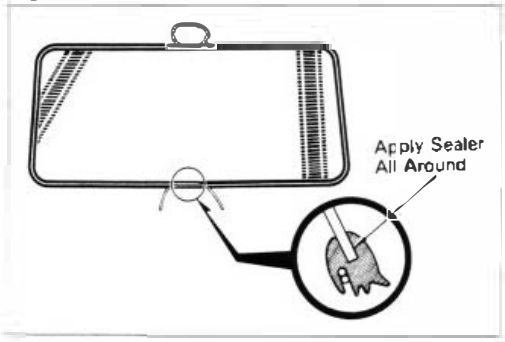
SASH TYPE
1. Glass Run
2. Inner Sash
3. Side Glass
4. Outer Sash
5. Sash Clip

Fig. 12-154



Apply adhesive to the body side.

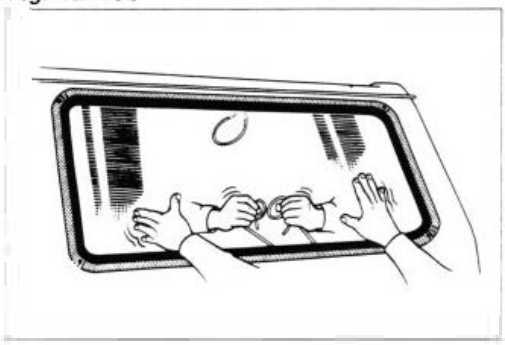
Fig. 12-155



Attach string as shown in the figure.

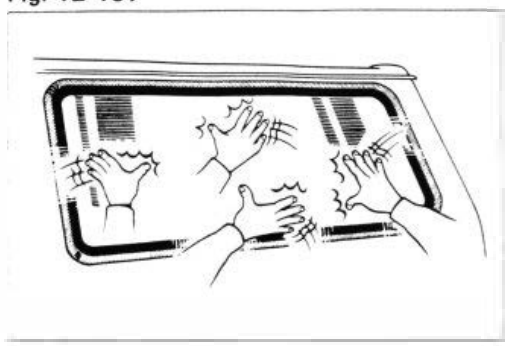
– Note –
Apply adhesive to the weatherstrip inside.

Fig. 12-156



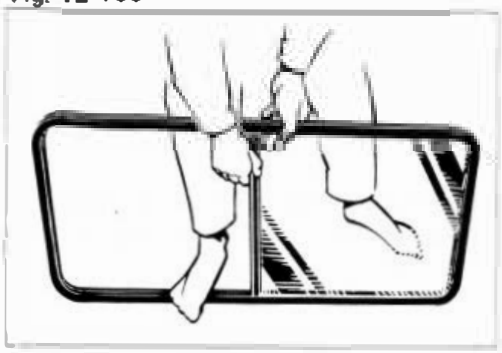
Install glass by pushing from the outside and pulling the string from the inside.

Fig. 12-157



Tap the glass from the outside to work in the weatherstrip.

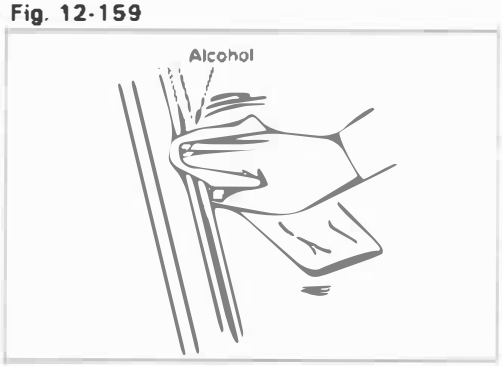
Fig. 12-158



[SASH TY E]

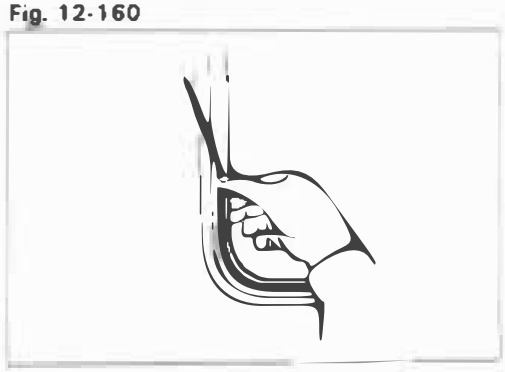
Pull a part the sash and install the inner sash

Fig. 12-159



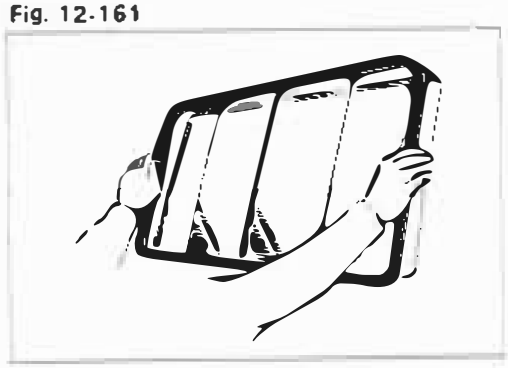
Clean the body side

Fig. 12-160



Apply adehesive tape around the body

Fig. 12-161

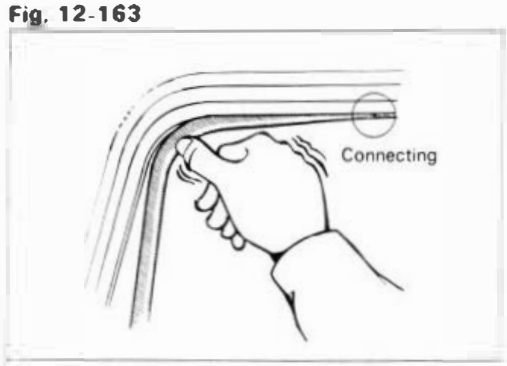


Install the window frame

Fig. 12-162

To compress the adehesive 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

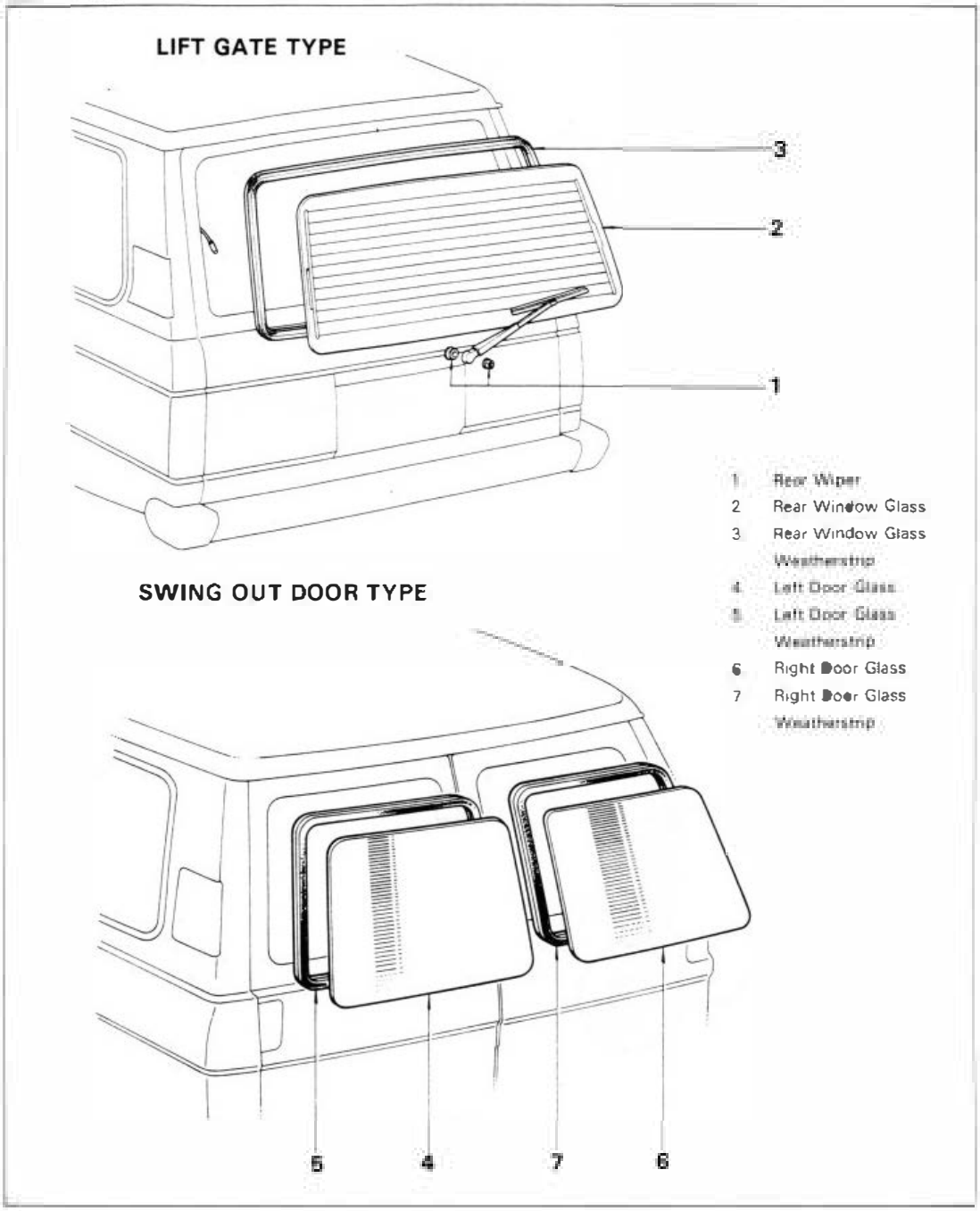
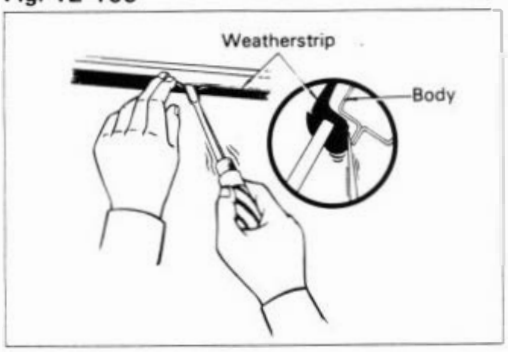


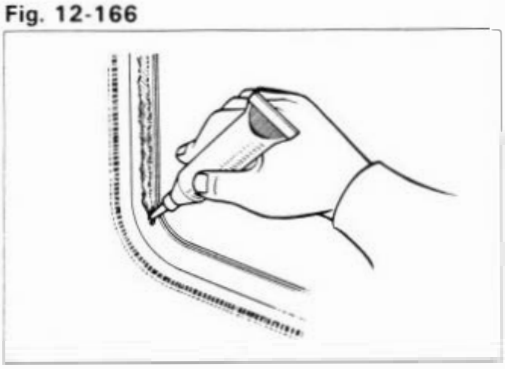
Fig. 12-165



REMOVAL

From inside push out weatherstrip lip with screwdriver

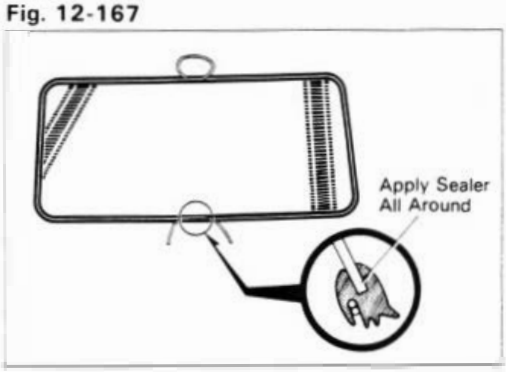
Fig. 12-166



INSTALLATION

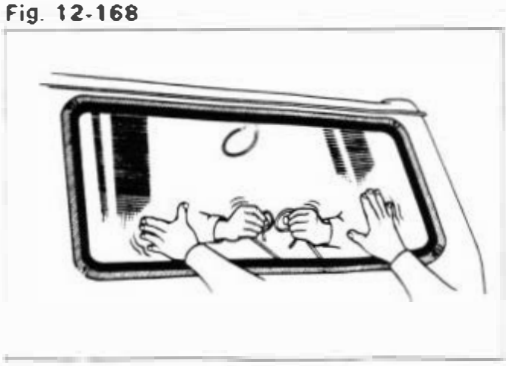
Apply adhesive to the body side

Fig. 12-167



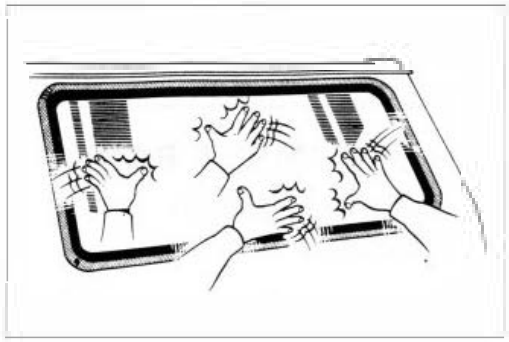
Attach string as shown in the figure

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.

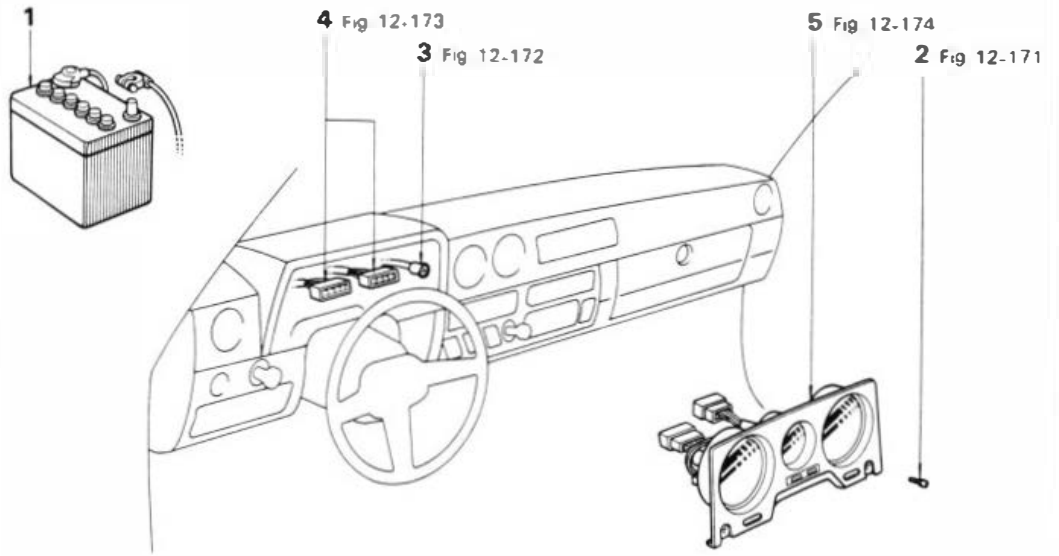
INSTRUMENT PANEL

METER CLUSTER

REMOVAL

Remove the parts in the numerical order shown in the figure

Fig. 12-170

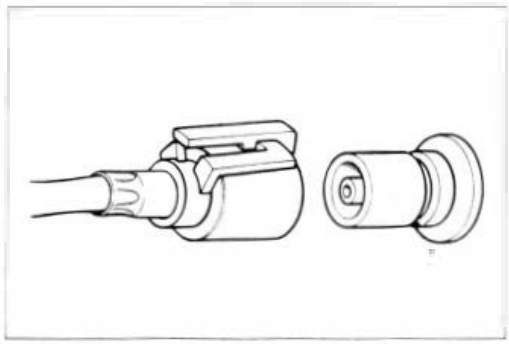


1. Battery Terminal
2. Set Screw
3. Meter Cable
4. Connector
5. Meter

Fig. 12-171

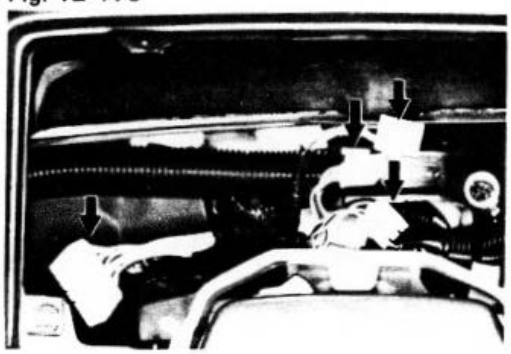
Remove the mounting screws.

Fig. 12-172



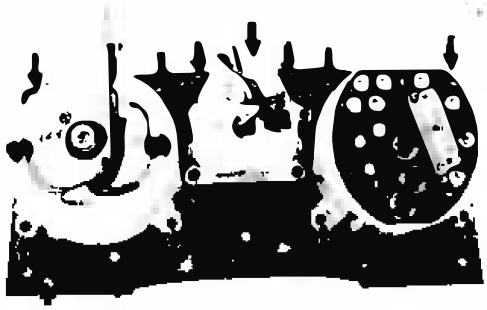
Pull out cable while depressing in on lock lever

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

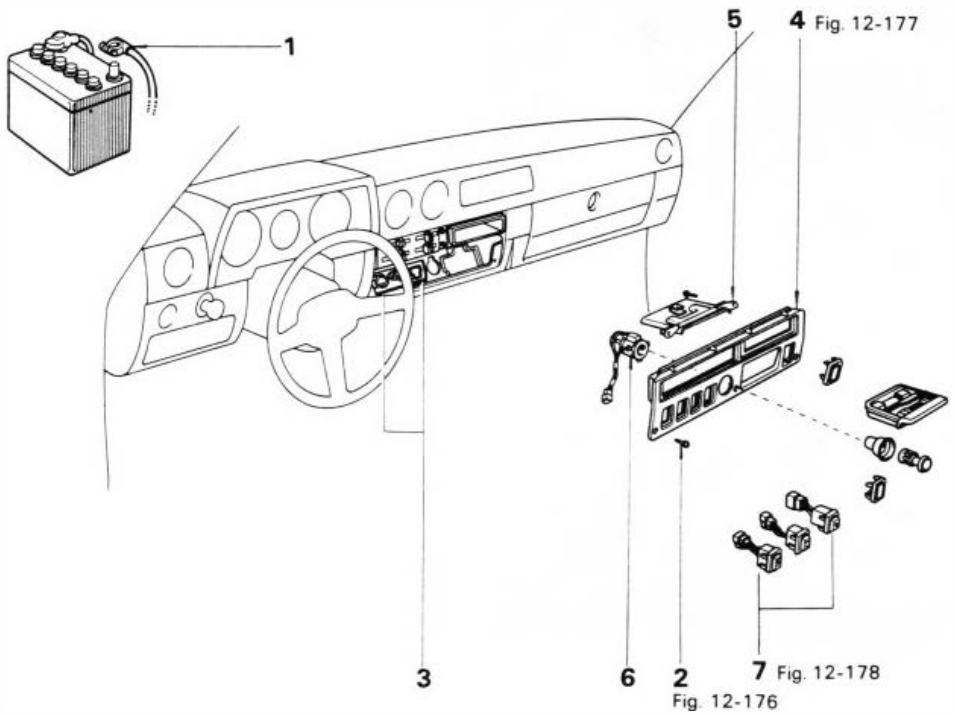


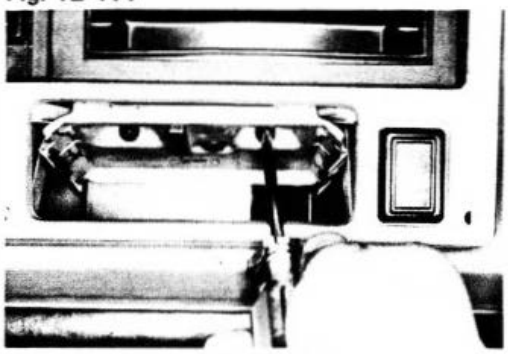
Fig. 12-176

1. Battery Terminal
2. Set Screw
3. Connector
4. Center Cluster
5. Ashtray Set Screw
6. Cigarette Lighter
7. Switch

Fig. 12-176

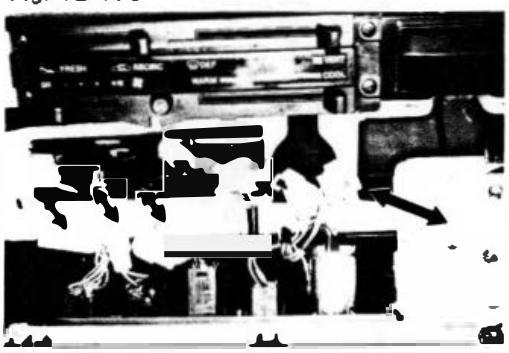
Remove the mounting screw.

Fig. 12-177

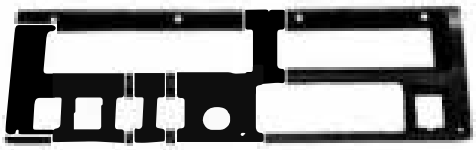


Remove the ashtray set screws.

Fig. 12-178



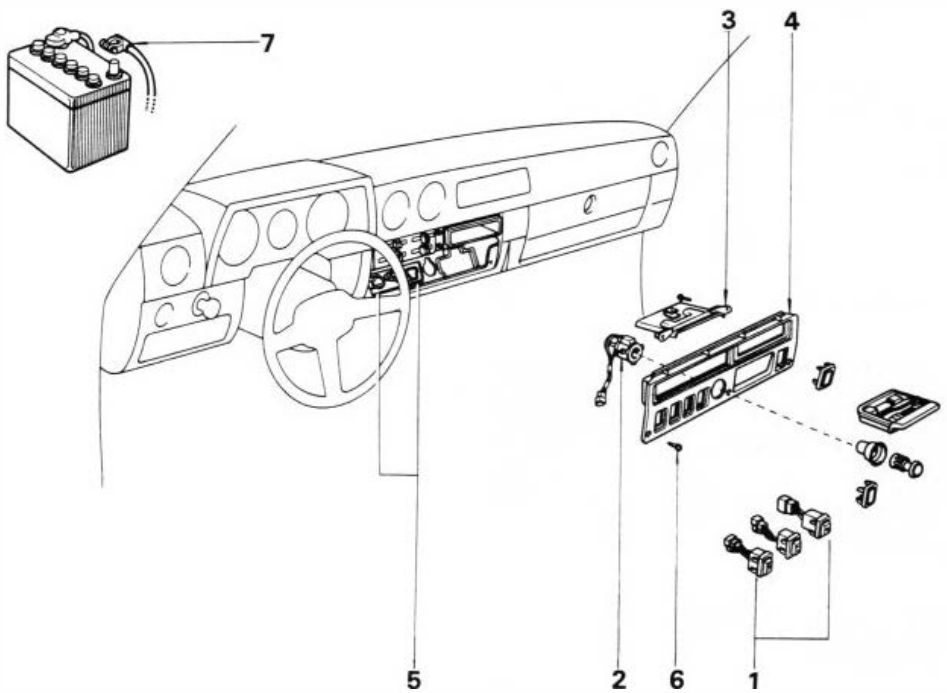
Disconnect the wiring connectors and remove the switches and cigarette lighter.



INSTALLATION

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

Fig. 12-179



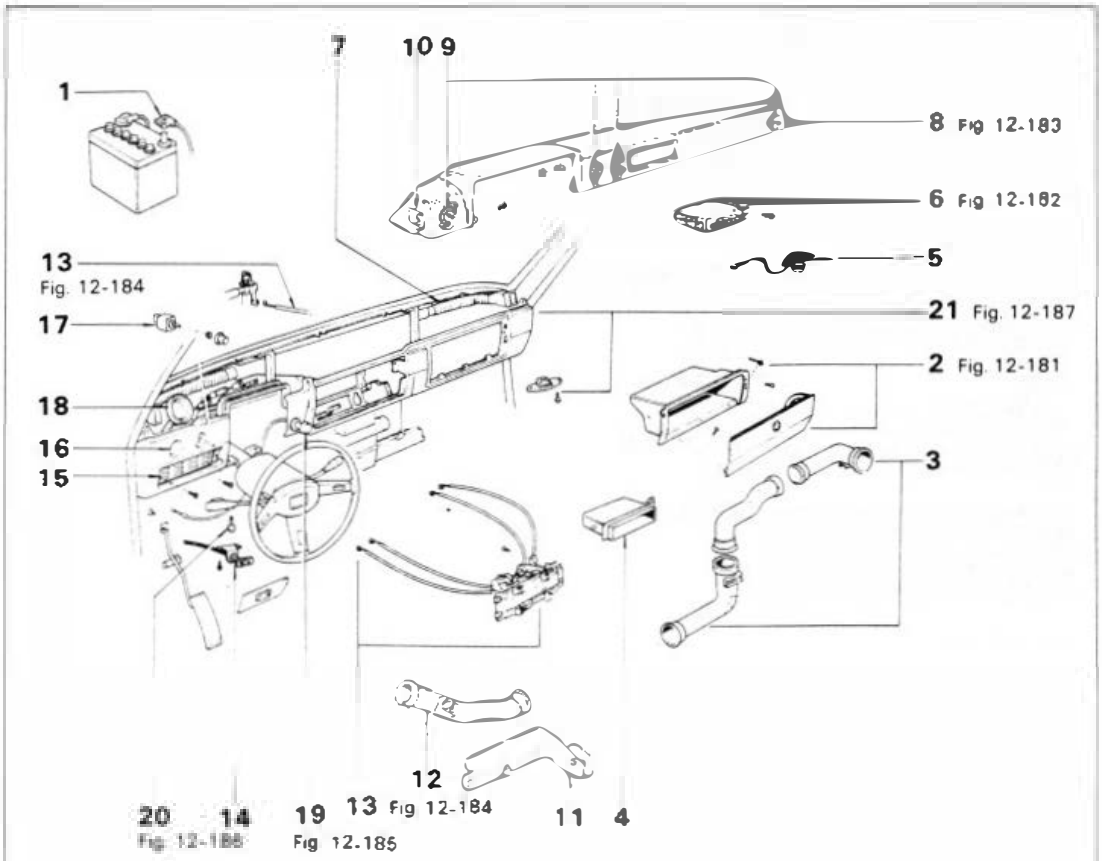
1. Switch
2. Cigarette Lighter
3. Ashtray Set Screw
4. Center Cluster
5. Connector
6. Set Screw
7. Battery Terminal

SAFETY PAD & INSTRUMENT PANEL

REMOVAL

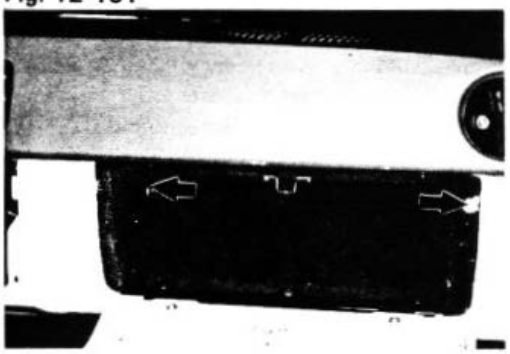
1. Remove the meter cluster.
   (Refer to Fig. 12-170)
2. Remove the center cluster.
   (Refer to Fig. 12-175)
3. Remove the parts in the numerical order shown in the figure.

Fig. 12-180



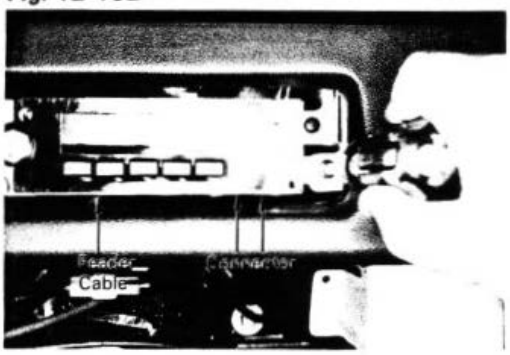
1	Battery Terminal	11	Heater Duct
2	Glove Box Compartment	12	Left Side Ventilation Duct
3	Right Side Ventilation Duct	13	Heater Control
4	Cassete Stereo, Hole Ornament	14	Hood Release Lever
5	Speaker	15	Fuse Box
6	Radio	16	Choke Knob (2F)
7	Side Defroster Hose	17	Rheostat Switch
8	Safety Pad	18	Side Ventilation Duct
9	Ventilation Resister	19	Throttle Lever
10	Side Defroster Duct	20	Steering Column
		21	Instrument Panel

Fig. 12-181



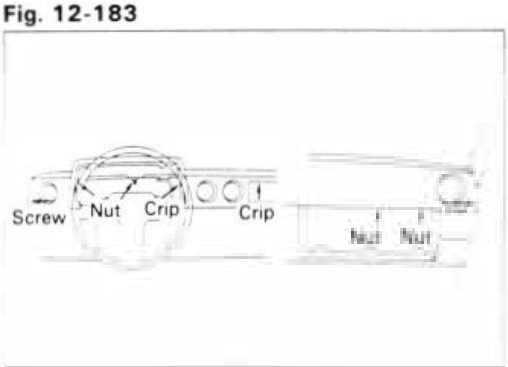
Remove the glove box light and switch.

Fig. 12-182



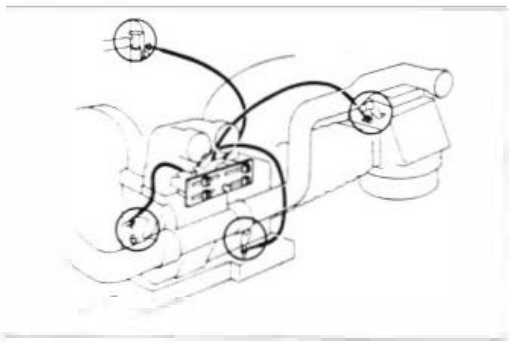
Remove the radio

Fig. 12-183



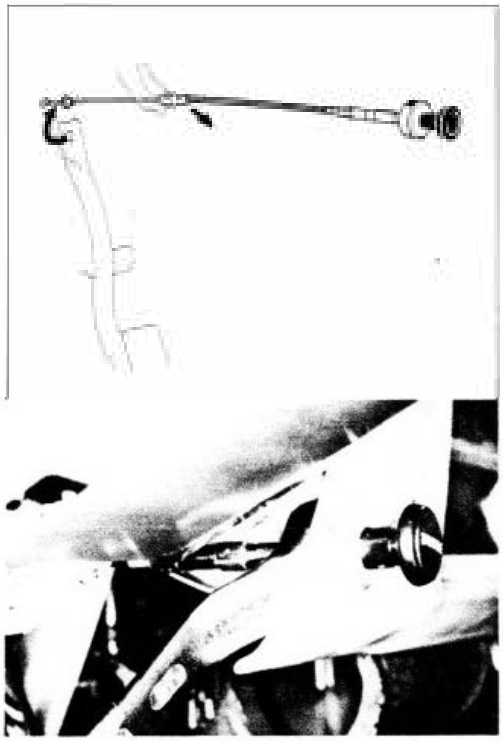
Remove the set nuts, screws and clips

Fig. 12-184



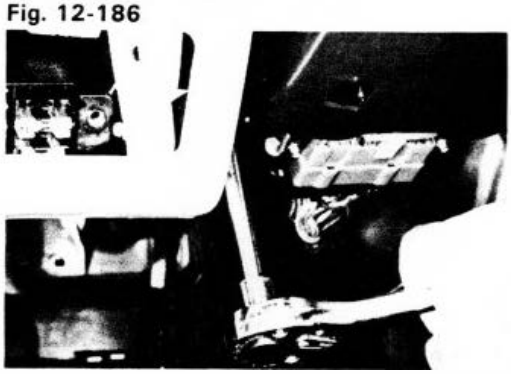
Disconnect the heater control cable as shown in the figure

Fig. 12-185



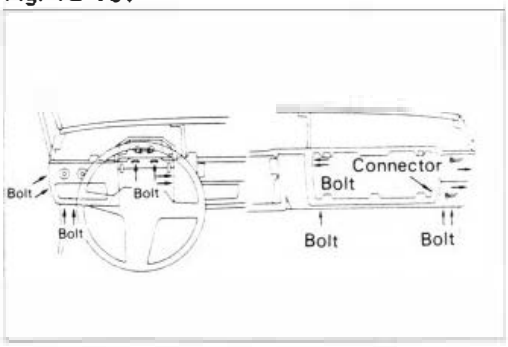
Remove the throttle cable.

Fig. 12-186



Remove the steering column.

Fig. 12-187

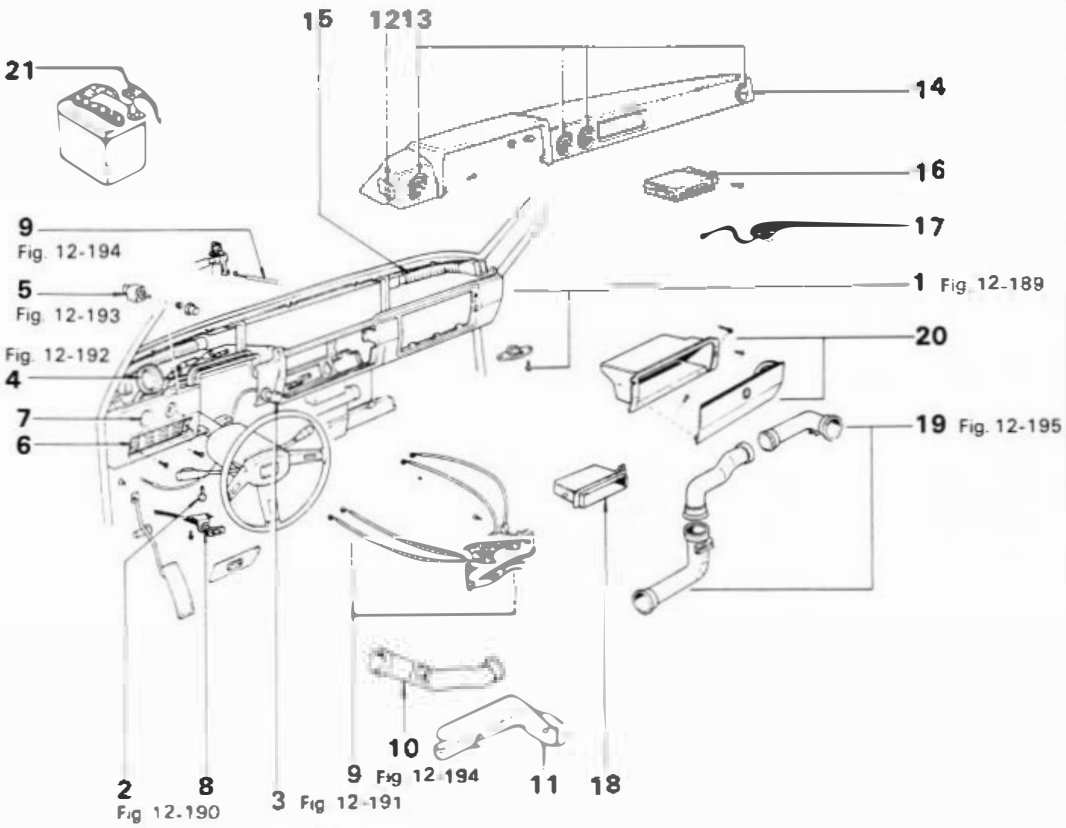


Remove the instrument panel.

INSTALLATION

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

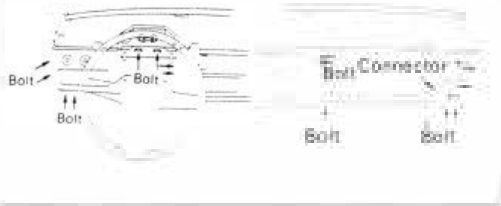
Fig. 12-188



1. Instrument Panel
2. Steering Column
3. Throttle Lever
4. Side Ventilation Duct
5. Rheostat Switch
6. Fuse Box
7. Choke Knob (2F)
8. Hood Release Lever
9. Heater Control
10. Left Side Ventilation Duct
11. Heater Duct
12. Side Defroster Duct
13. Ventilation Resister
14. Safety Pad
15. Side Defroster Hose
16. Radio
17. Speaker
18. Cassette Stereo or Ornament
19. Right Side Ventilation Duct
20. Glove Box Compartment
21. Battery Terminal

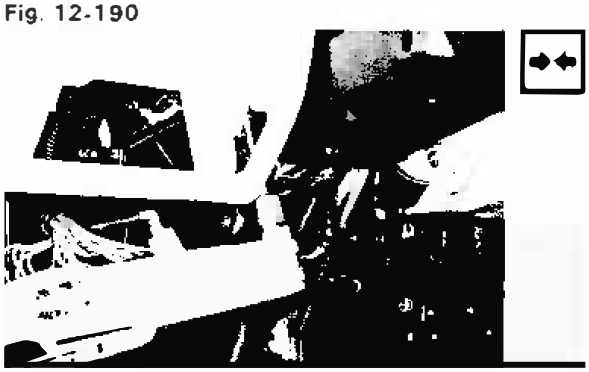
2. Install the center cluster.
3. Install the meter cluster.

Fig. 12-189



Install the instrument panel.

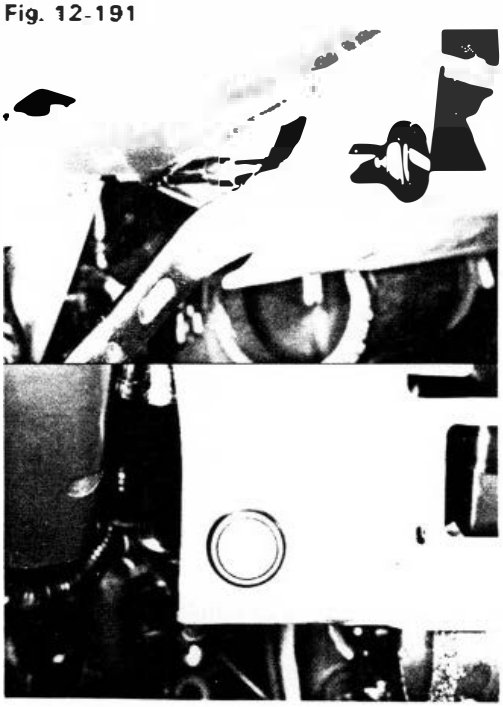
Fig. 12-190



Install the steering column bracket.

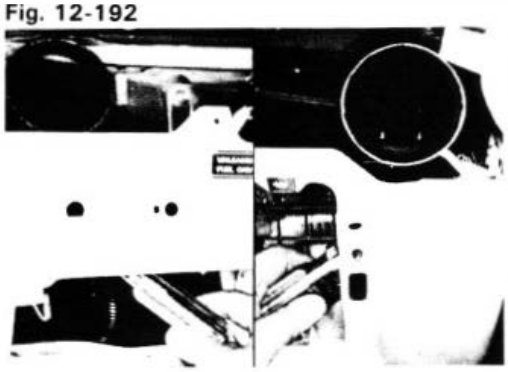
Tightening torque: 1.9 – 3.1 kg-m (14 – 15 ft-lb)

Fig. 12-191



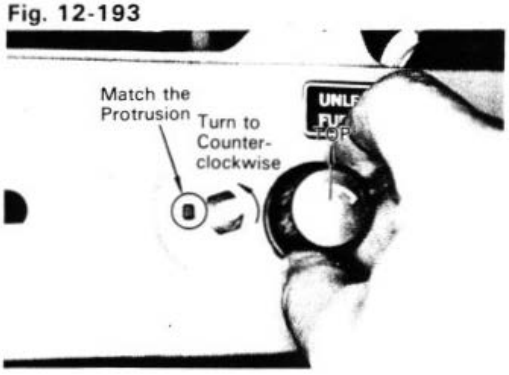
Install and check the throttle knob.

Fig. 12-192



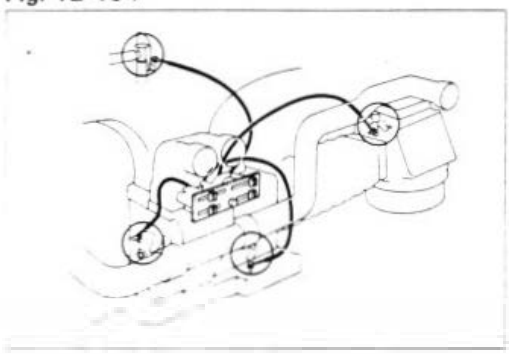
Install the side ventilation duct.

Fig. 12-193



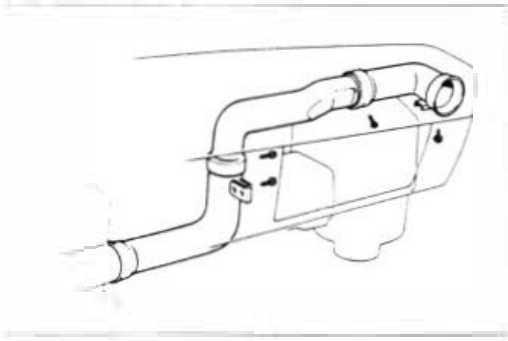
Align the protrusion on the switch to the hole of the panel.
Turn on the switch shaft to counterclockwise and install the knob as shown in the figure.

Fig. 12-194



Connect the heater control wire as shown in the figure

Fig. 12-195



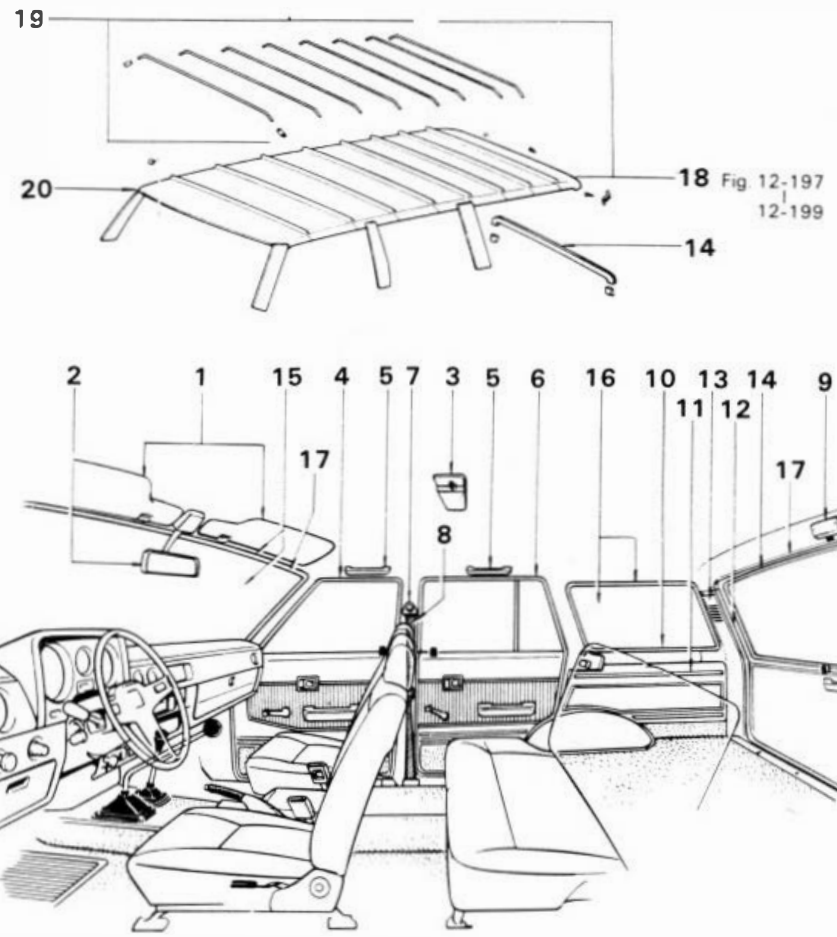
Install the right side ventilation duct as shown in the figure

ROOF HEADLINING

REMOVAL

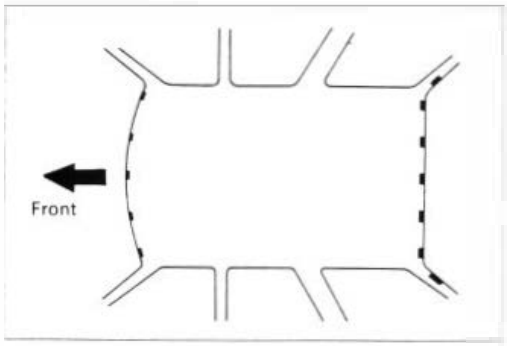
Remove the parts in the numerical order shown in the figure

Fig. 12-196



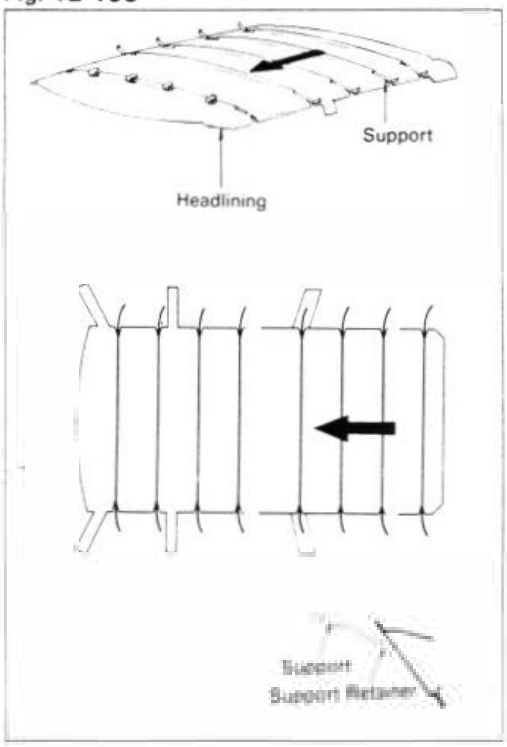
1	Sun Visor & Hanger	11	Deck Side Trim
2	Inner Rear View Mirror	12	Back Door Weatherstrip
3	Interior Light	13	Rear Piller Garnish
4	Front Door Opening Trim	14	Inside Rear Trim
5	Assist Grip	15	Front Windshield & Weatherstrip
6	Rear Door Opening Trim	16	Quarter Window Glass & Weatherstrip
7	Shoulder Anchor Bolt	17	Clip
8	Center Pillar Garnish	18	Roof Headlining & Support
9	Luggage Compartment Light	19	Roof Headlining Support
10	Quarter Window Inside Trim	20	Roof Headlining

Fig. 12-197



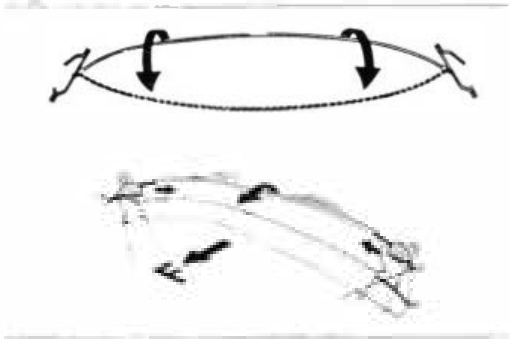
Remove the clip s as shown in the figure
Peel off the glued parts of the headlining

Fig. 12-198



Remove the supports in turn, begining with the rear

Fig. 12-199



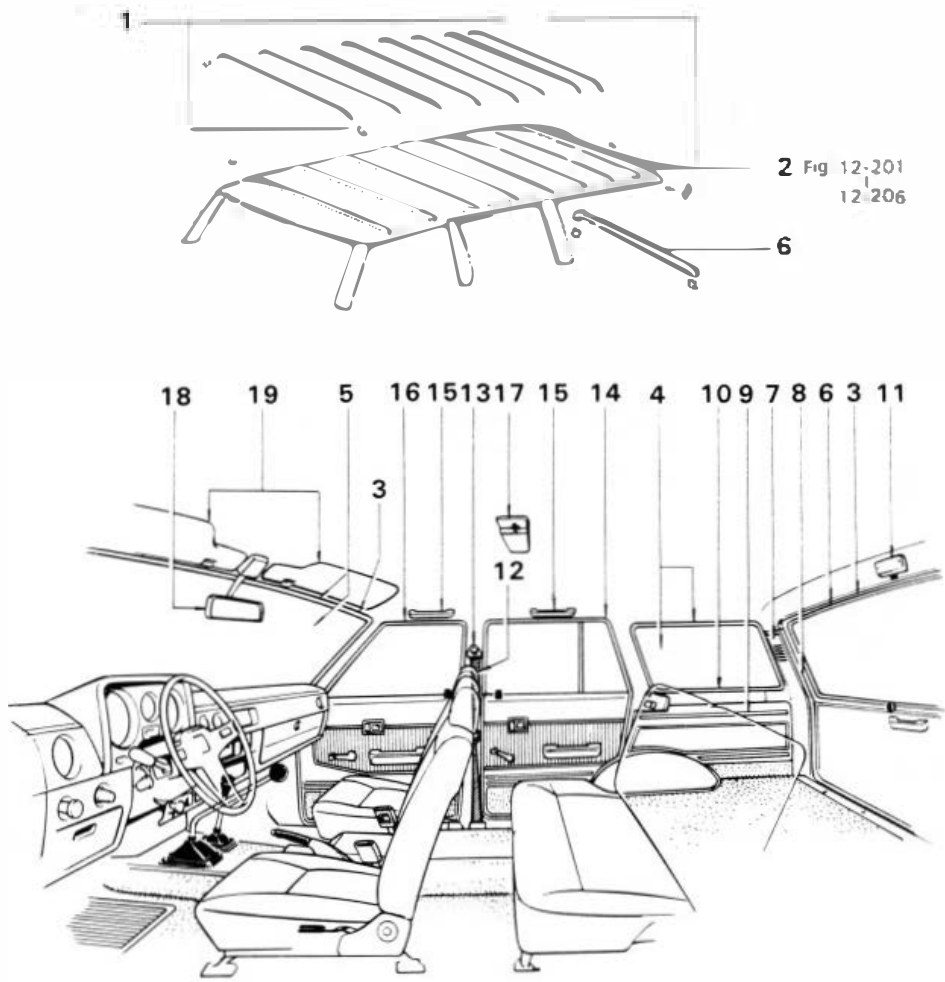
Compress the support inward at both ends, turn it 180° forward and remove it from the hole

– Note –
Do not turn the support more than 180°

INSTALLATION

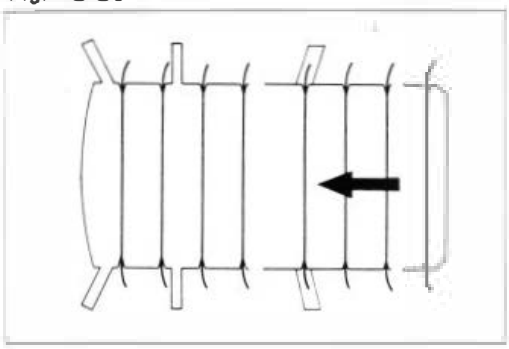
Install the parts in the numerical order shown in the figure

Fig. 12-200



1. Roof Headlining Support
2. Roof Headlining & Support
3. Clip
4. Quarter Window Glass & Weatherstrip
5. Front Windshield Glass & Weatherstrip
6. Inside Rear Trim
7. Rear Pillar Garnish
8. Back Door Weatherstrip
9. Deck Side Trim
10. Quarter Window Inside Trim
11. Luggage Compartment Light
12. Center Pillar Garnish
13. Shoulder Anchor Bolt
14. Rear Door Opening Trim
15. Assist Grip
16. Front Door Opening Trim
17. Interior Light
18. Inner Rear View Mirror
19. Sun Visor & Hanger

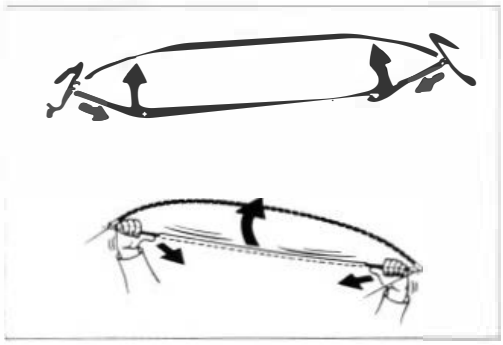
Fig. 12-201



Install from the rear tofront.

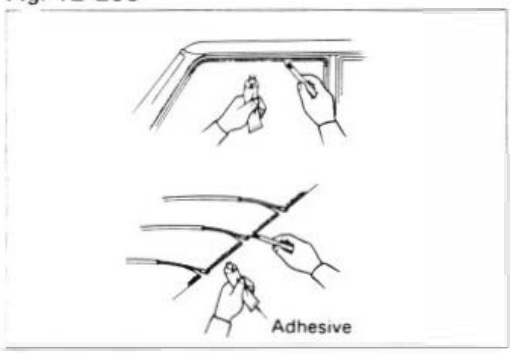
– Note –
Be sure the rear is in position.

Fig. 12-202



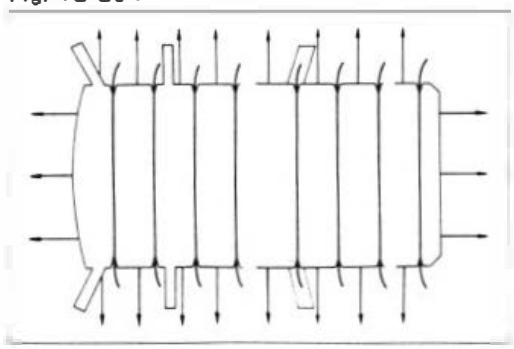
Insert the support with retainer into the hole, revolve 180° upward and install.

Fig. 12-203



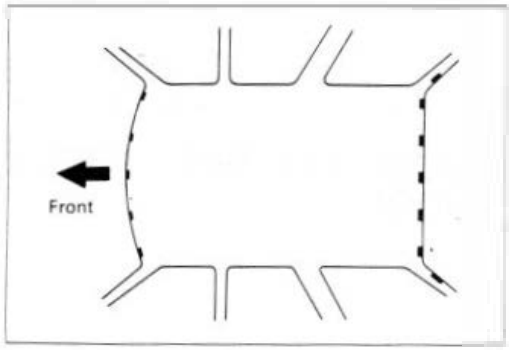
Apply adhesive to the headlining circumference.
Apply adhesive to the body and headlining.
Weatherstrip adhesive:
Part No. [08704-00010]

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.

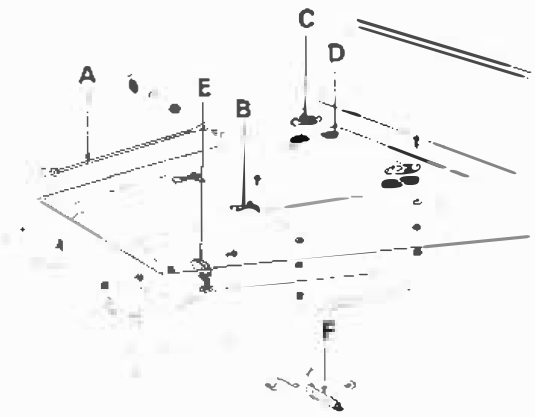
– Note –

Be careful not to overheat the area.

BODY [FJ, BJ4_SERIES]
HOOD

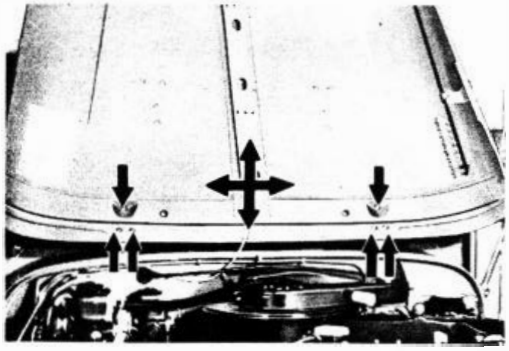
COMPONENTS

Fig. 12-207



A Hood Stopper
B Hood Fastener
C Hood Hinge
D Hood Hinge Seal
E Side Auxiliary Catch Hook
F Front Auxiliary Catch Hook

Fig. 12-208

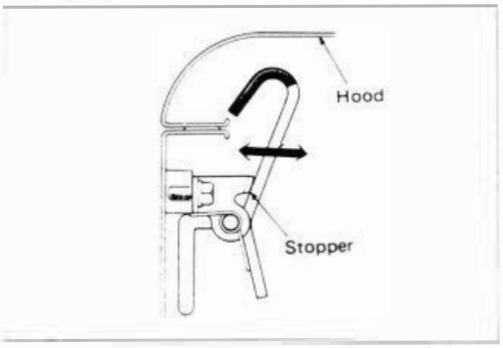


ADJUSTMENT

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

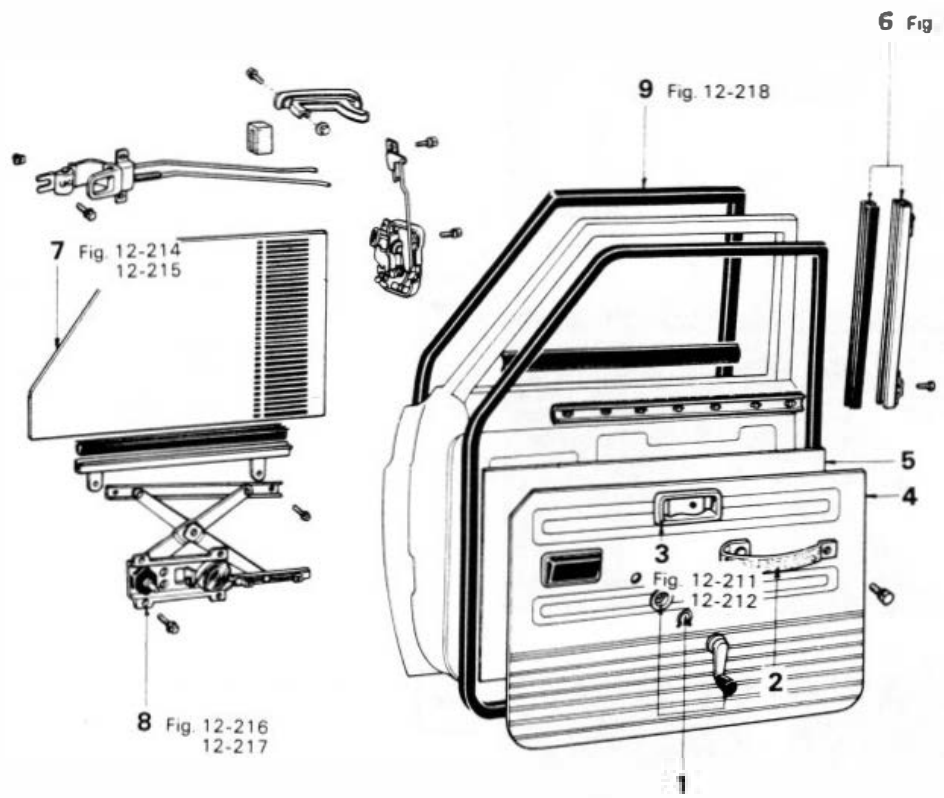
DOOR

REMOVAL

Door Window Glass, Regulator & Glass Run

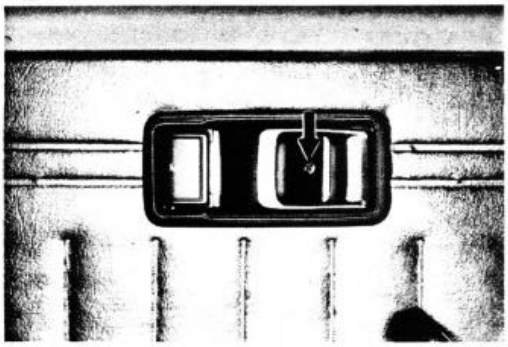
Remove the parts in the numerical order shown in the figure

Fig. 12-210



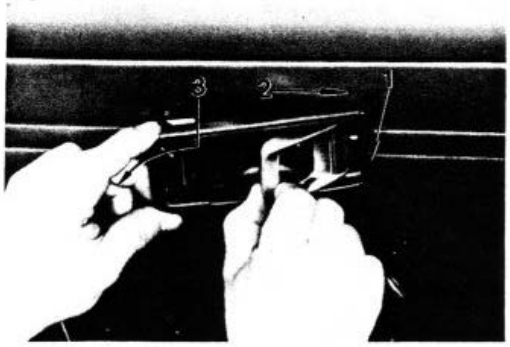
1. Regulator Handle
2. Pull Handle
3. Bezel
4. Trim Board
5. Service Hole Cover
6. Glass Run Rear Channel
7. Window Glass
8. Window Regulator
9. Galss Run

Fig. 12-211



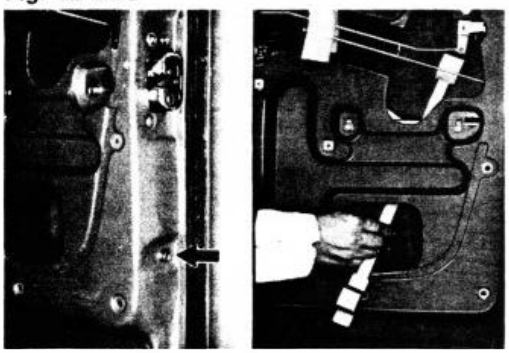
1. Remove the bezel
   (1) Remove the screws

Fig. 12-212



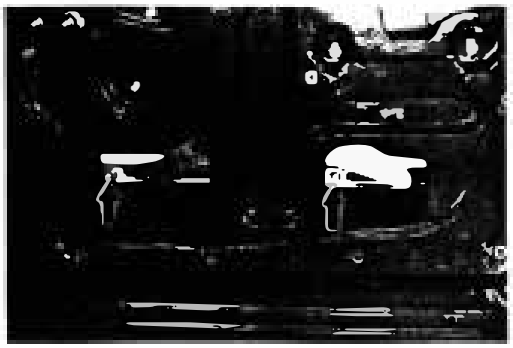
(2) Remove in the order of arrow marks
   — 1. Pull out the rearend
   — 2. Pull the bezel toward the rear
   — 3. Remove by pulling out the front end

Fig. 12-213



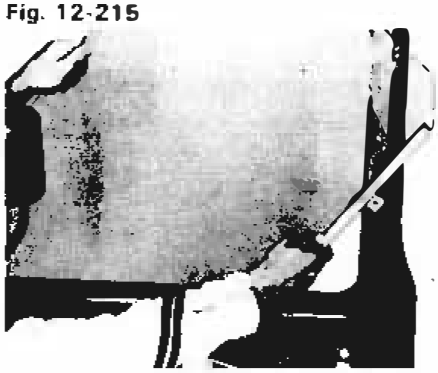
2. Remove the glass run rear channel

Fig. 12-214



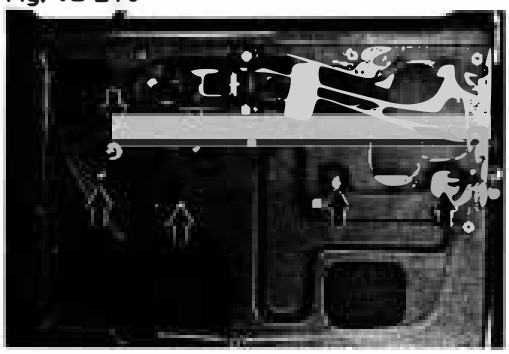
3. Remove the glass
   (1) Remove the bolts

Fig. 12-215



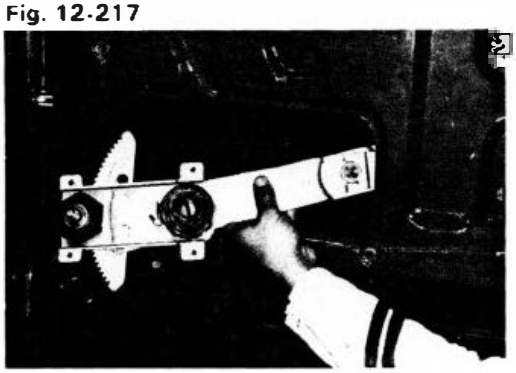
(2) Remove the glass with the glass holder

Fig. 12-216



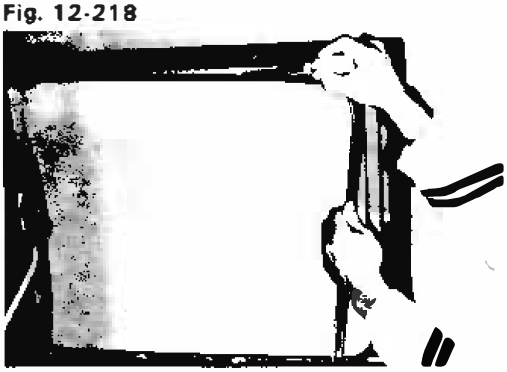
4. Remove the window regulator
(1) Remove the bolts.

Fig. 12-217



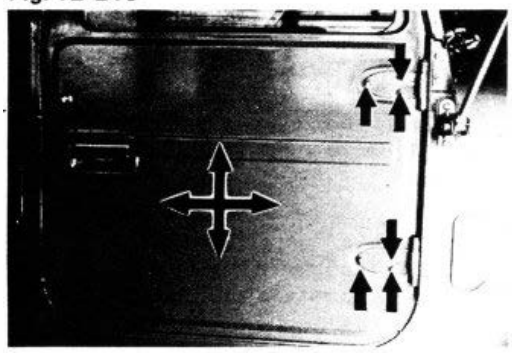
(2) Take out the regulator

Fig. 12-218



5. Remove the glass run

Fig. 12-219

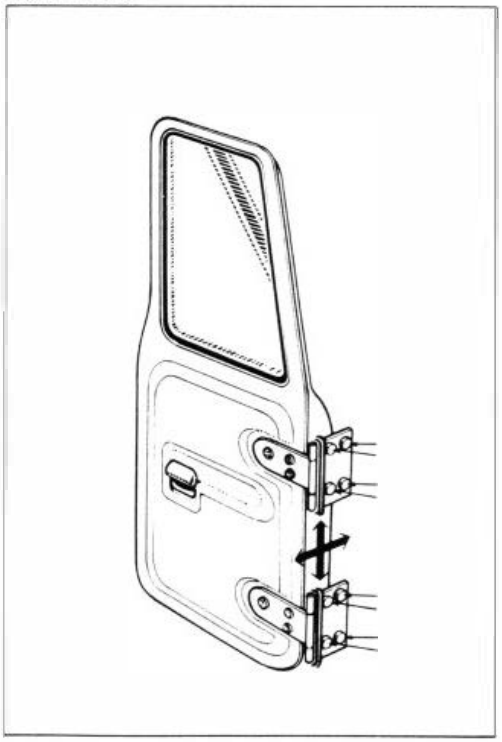


ADJUSTMENT

Door

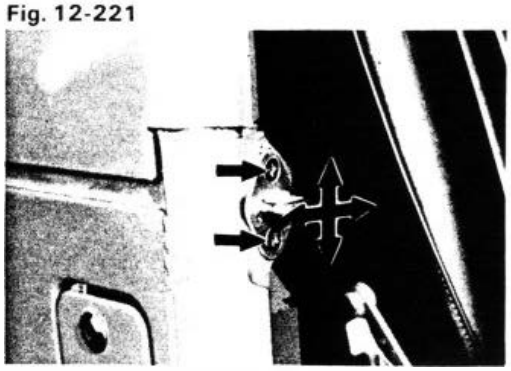
1 Adjust the door front-rear and vertical directions by loosening the door hinges at the door.

Fig. 12-220



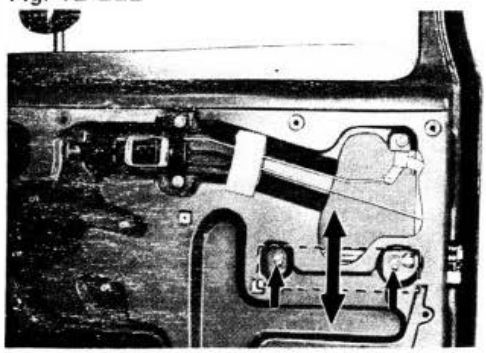
2 Adjust the surface difference with fender and in vertical direction by loosening the door hinges at the body.

Fig. 12-221



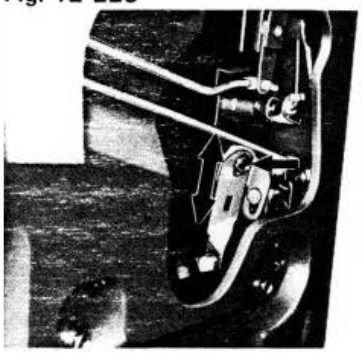
3 Correct improper door closure by adjusting the door lock striker.

Fig. 12-222



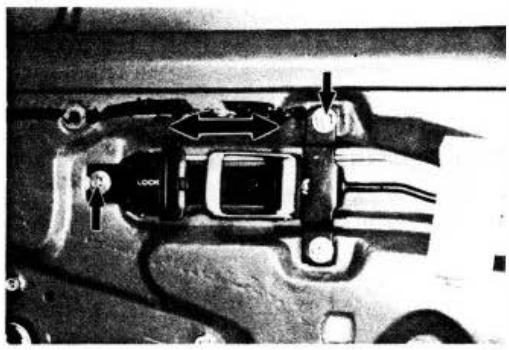
4 Adjust the window glass tilt

Fig. 12-223



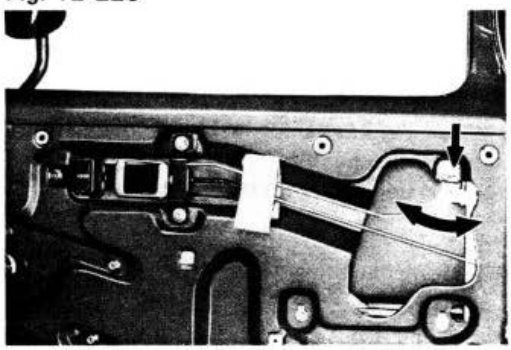
5 Adjust door outside handle play

Fig. 12-224



6 Adjust door inside handle play

Fig. 12-225



7 Adjust the door lock

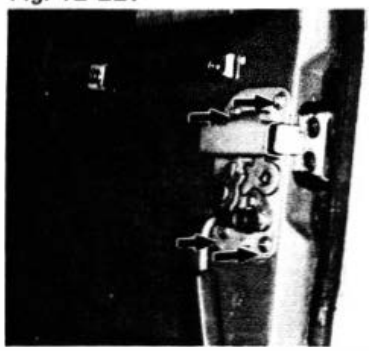
Fig. 12-226

REMOVAL

Tail Gate Lock & Handle

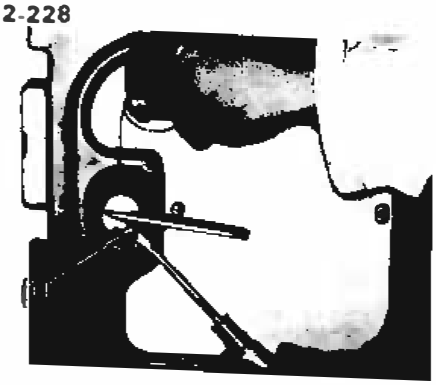
1. Remove the tail gate handle (1) by unscrewing the mounting nuts.

Fig. 12-227



2. Remove the tail gate lock by removing the screws.

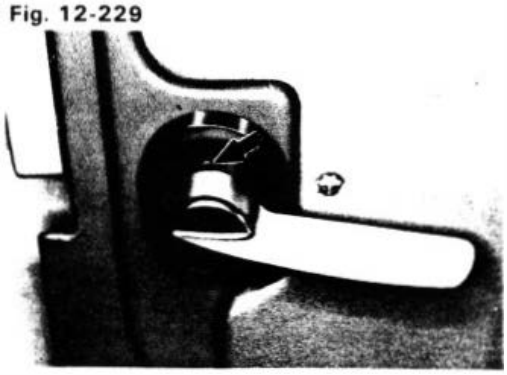
Fig. 12-228



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



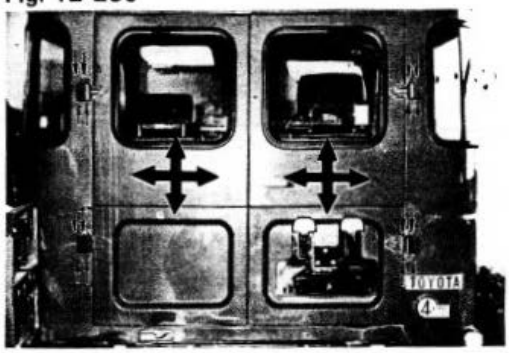
INSTALLATION

Perform the removal in reverse order.

— Note —

Install the back door inside handle with the slot in the handle (shown by arrow) positioned upward.

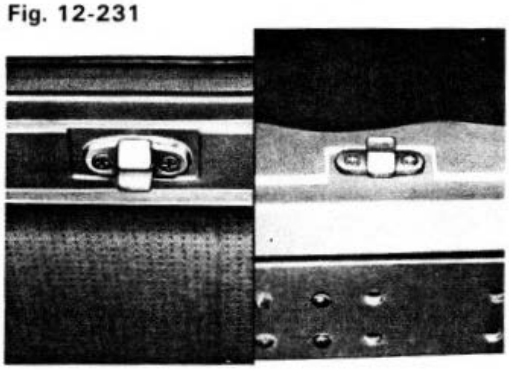
Fig. 12-230



ADJUSTMENT

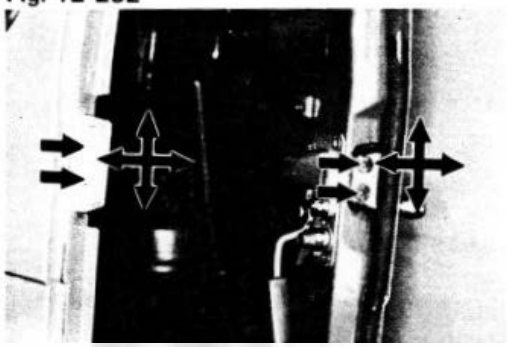
1 Adjust the door alignment by shifting the positions of the door hinges at the body

Fig. 12-231



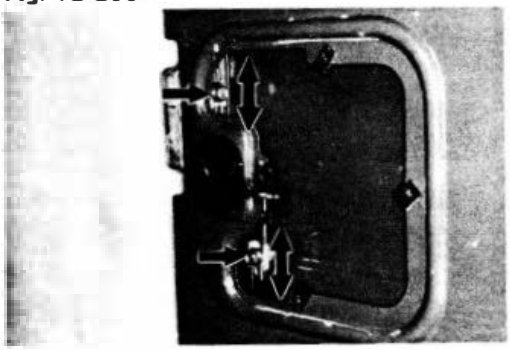
2 Adjust the door closing response
(1) Door on right side

Fig. 12-232



(2) Door on left side

Fig. 12-233



3 Adjust the inside handle play

BODY ELECTRICAL

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.

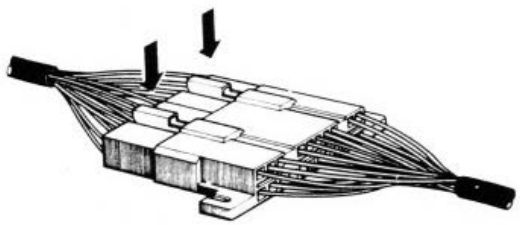
B	= Black	Br	= Brown	G	= Green
Gr	= Grey	L	= Light Blue	Lg	= Light Green
O	= Orange	P	= Pink	R	= Red
W	= White	Y	= Yellow		

Example: RG indicates a Red wire with a Green line.

2. BULKHEAD TYPE CONNECTOR HANDLING & INSPECTION

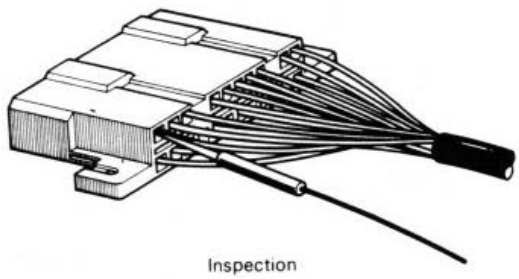
To remove the connector, push the lock levers shown in Fig. 13-1 and pull out.
When checking the continuity or voltage with a circuit tester, insertion of the test probe into the receptacle connector may open the fitting to the connector and result in poor contact. Therefore, insert the test probe only from the wire harness side as shown in Fig. 13-2.

Fig. 13-1



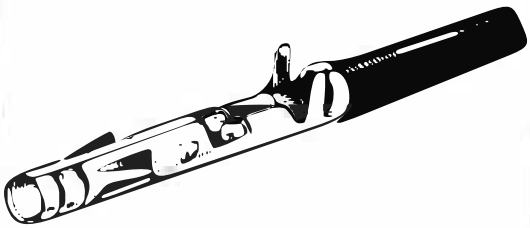
Connector Removal

Fig 13-2



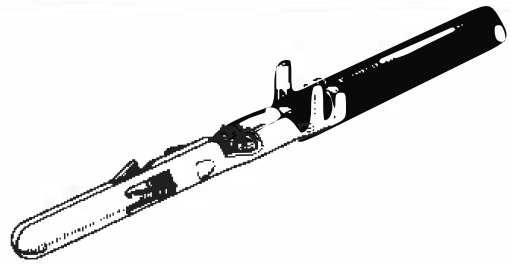
Inspection

Fig. 13-3



Connecting Part (Female)

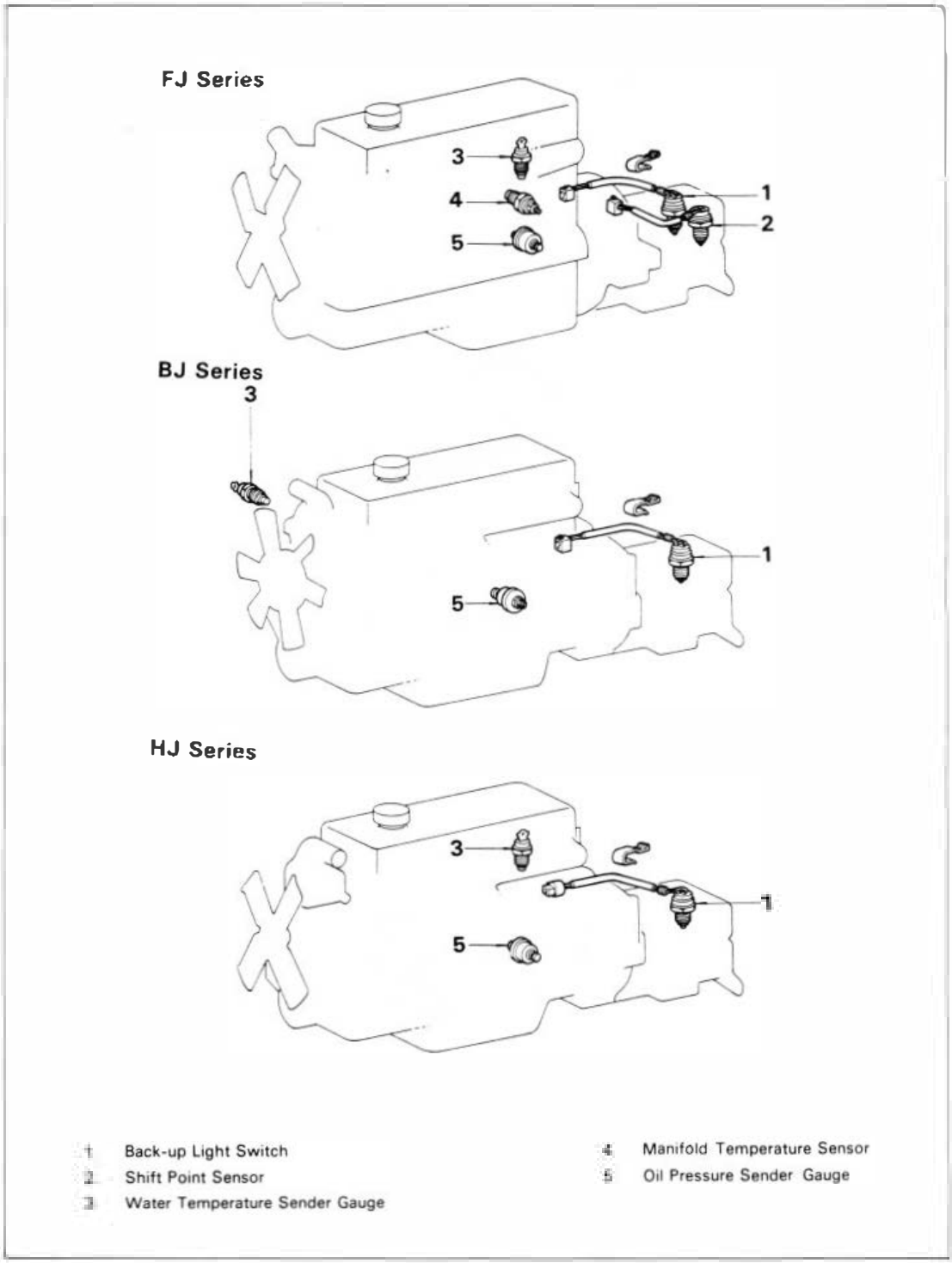
Fig 13-4



Connecting Part (Male)

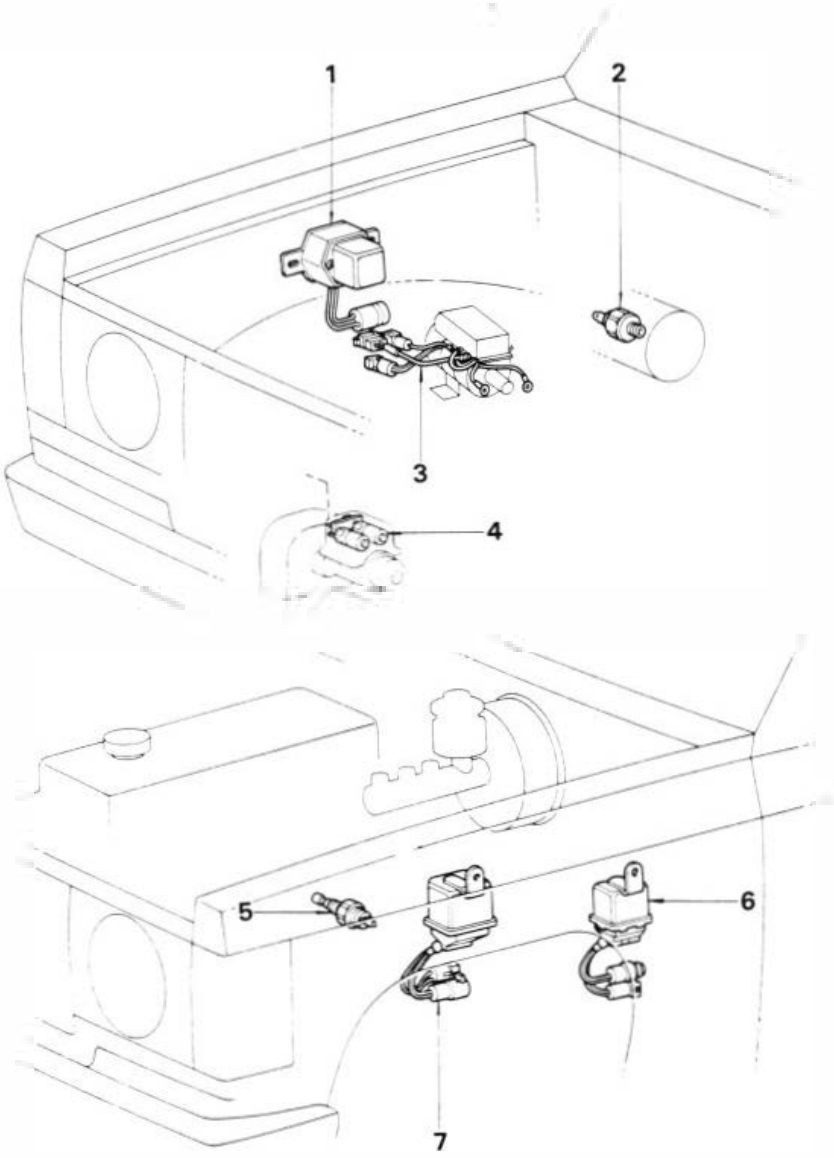
SWITCHES & RELAYS LOCATION

Fig. 13-5



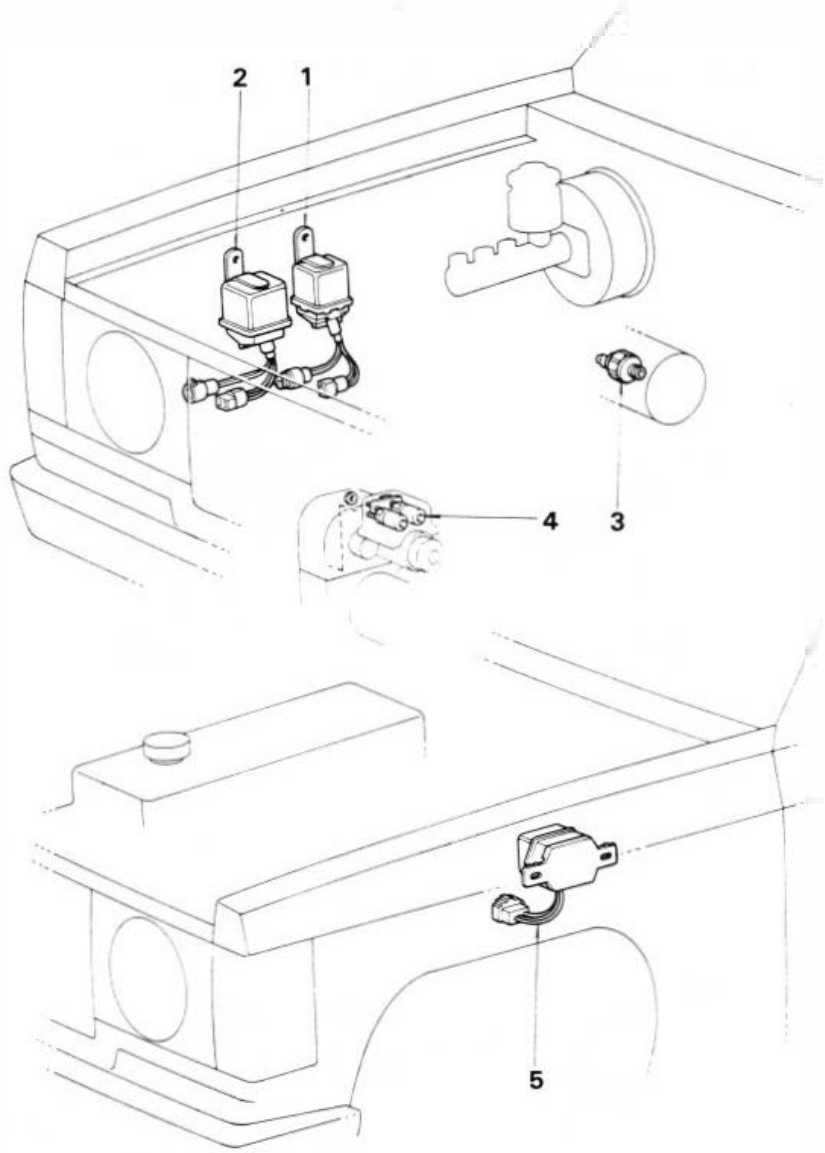
1. Back-up Light Switch
2. Shift Point Sensor
3. Water Temperature Sender Gauge
4. Manifold Temperature Sensor
5. Oil Pressure Sender Gauge

Fig. 13.6



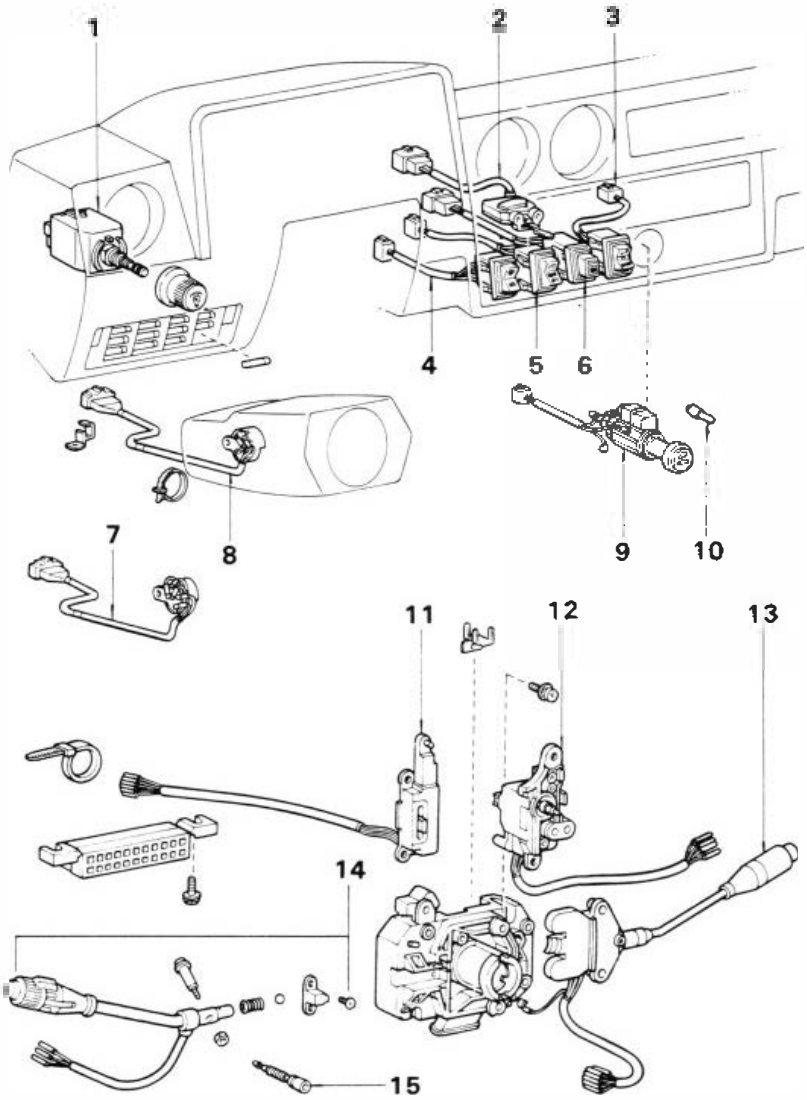
1. Generator Regulator
2. Vacuum Waring Switch
3. Igniter
4. Electric Winch Magnet Switch
5. Vacuum Switch
6. Glow Plug Relay
7. Stater Relay

Fig. 13-7



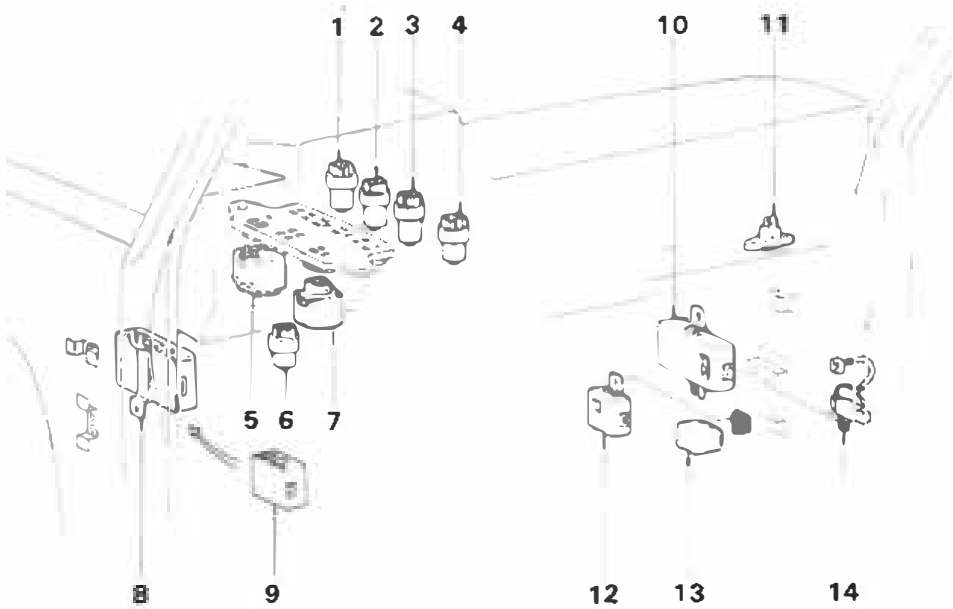
1. Glow Plug Relay
2. Starter Relay
3. Vacuum Warning Switch
4. Electric Winch Magnet Switch
5. Generator Regulator

Fig. 13-8



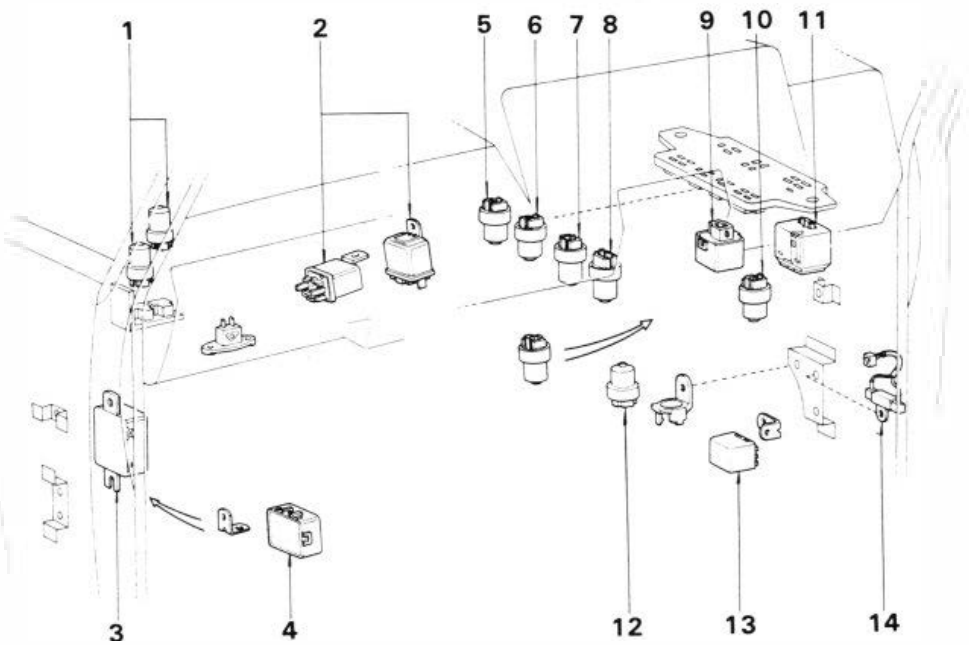
1 Light Control Rheostat
2 Front Heater Blower Switch
3 Antenna Switch
4 Windshield Wiper Switch
5 Rear Heater Blower Switch
6 Defogger Switch
7 Starter Switch
8 Ignition Switch
9 Cigarette Lighter
10 Cigarette Lighter Bulb
11 Hazard Warning Signal Switch
12 Headlight Dimmer Switch
13 Windshield Wiper Switch
14 Light Control Switch
15 Horn Contact Plate

Fig. 13-9



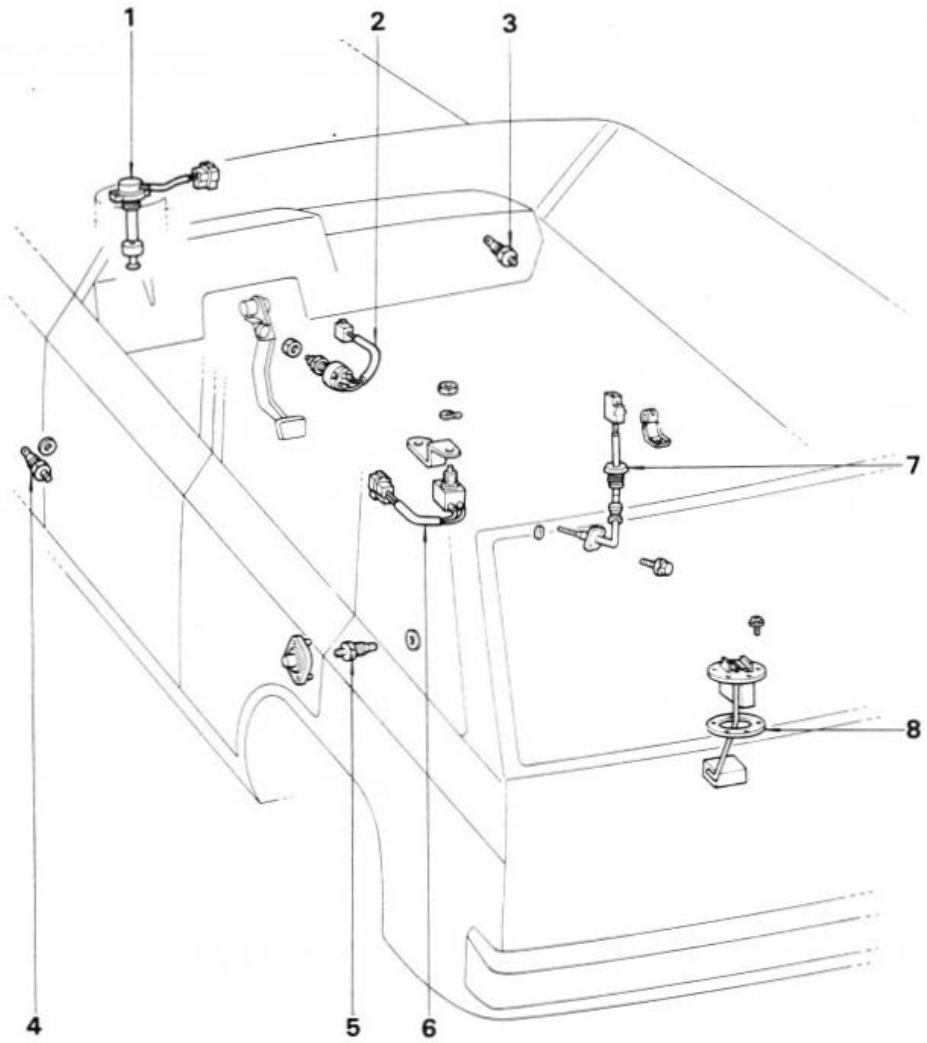
1 Ignition Control Relay
2 Light Control Relay
3 Tail Light Control Relay
4 Heater Blower Motor Relay
5 Windshield Wiper Relay
6 Cooling Fan Relay
Headlight Dimmer Relay (ECE)
7 Turn Signal Flasher
8 Emission Control Computer
9 Pre-heating Timer
10 Cooling Fan Computer (USA & Canada)
11 No 1 Inspection Light Socket
12 Seat Belt Warning Computer
13 Charge Light Warning Relay
14 Pilot Light Resistor

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)
Valve Check Relay (ARL)
11 Windshield Wiper Relay
12 Red Indicator Relay
13 Charge Light Warning Relay
14 Pilot Light Resistor

Fig. 13-11



1. Brake Fluid Level Warning Switch
2. Stop Light Switch
3. Courtesy Light Switch
4. Courtesy Light Switch
5. Courtesy Light Switch
6. Parking Brake Warning Switch
7. Exhaust Gas Temperature Sensor
8. Fuel Sender Gauge

LIGHT COMPONENTS

Fig. 13-12

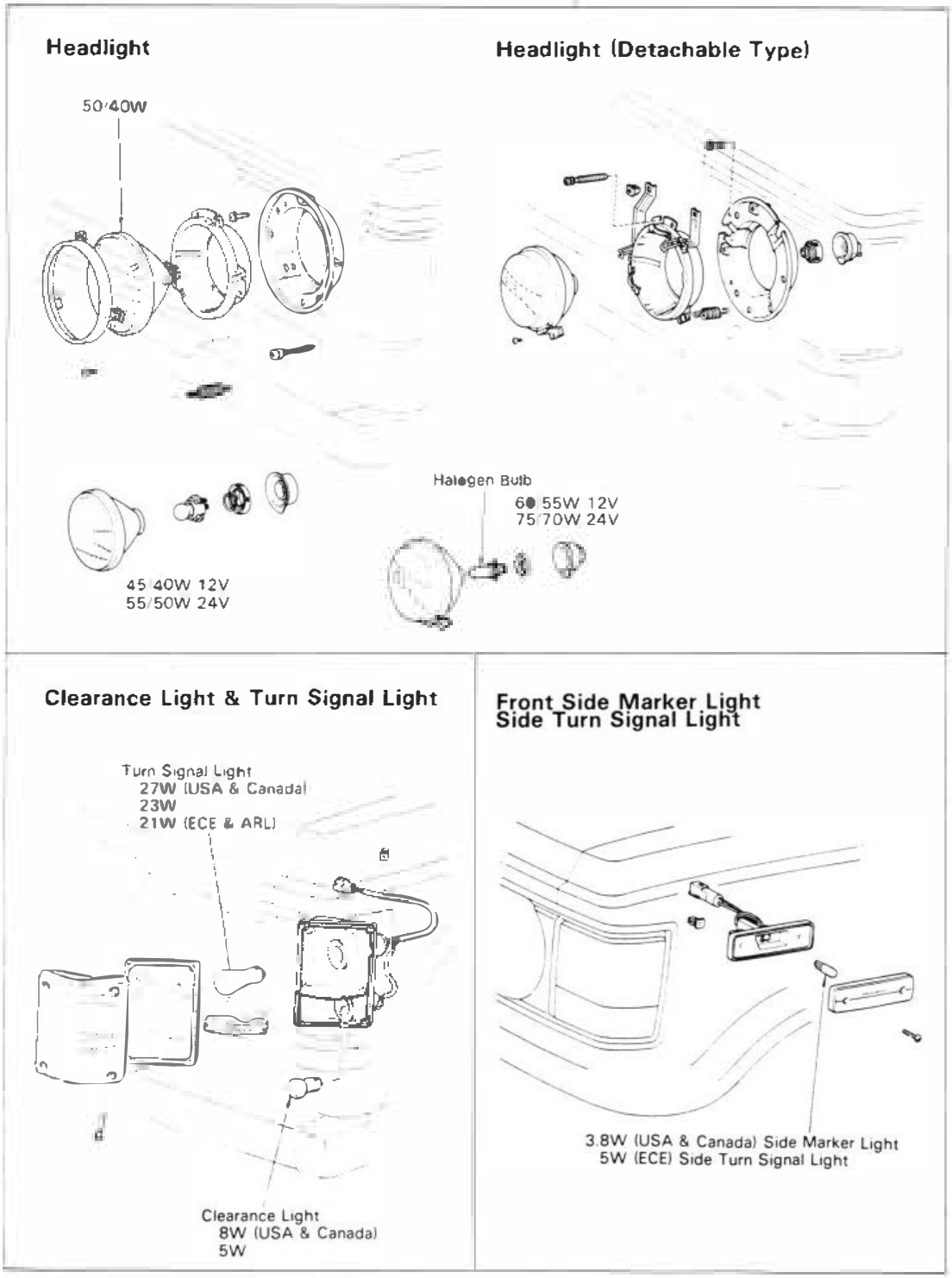
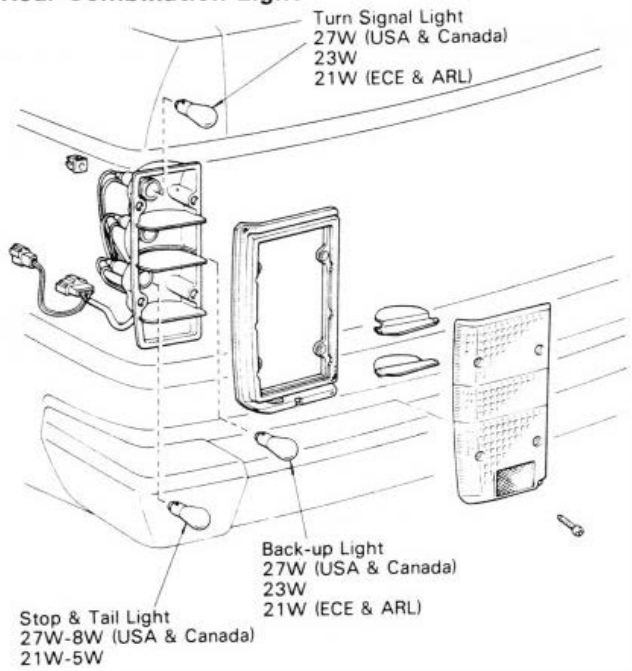
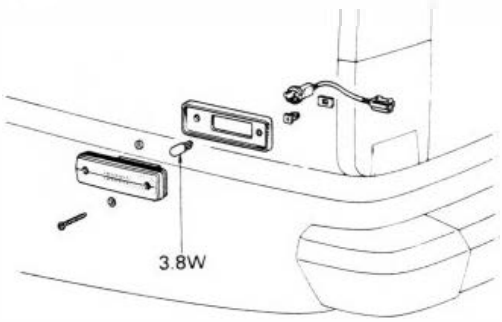


Fig. 13-13

Rear Combination Light



Rear Side Marker Light



License Plate Light

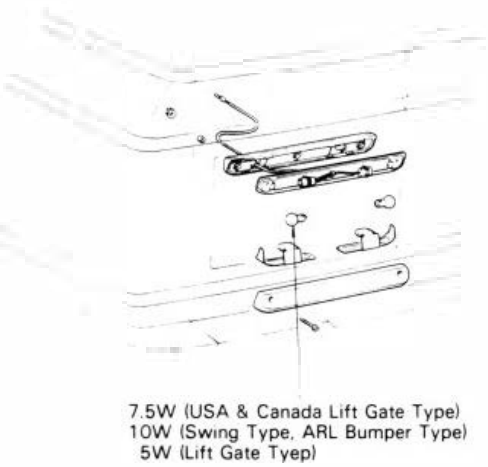
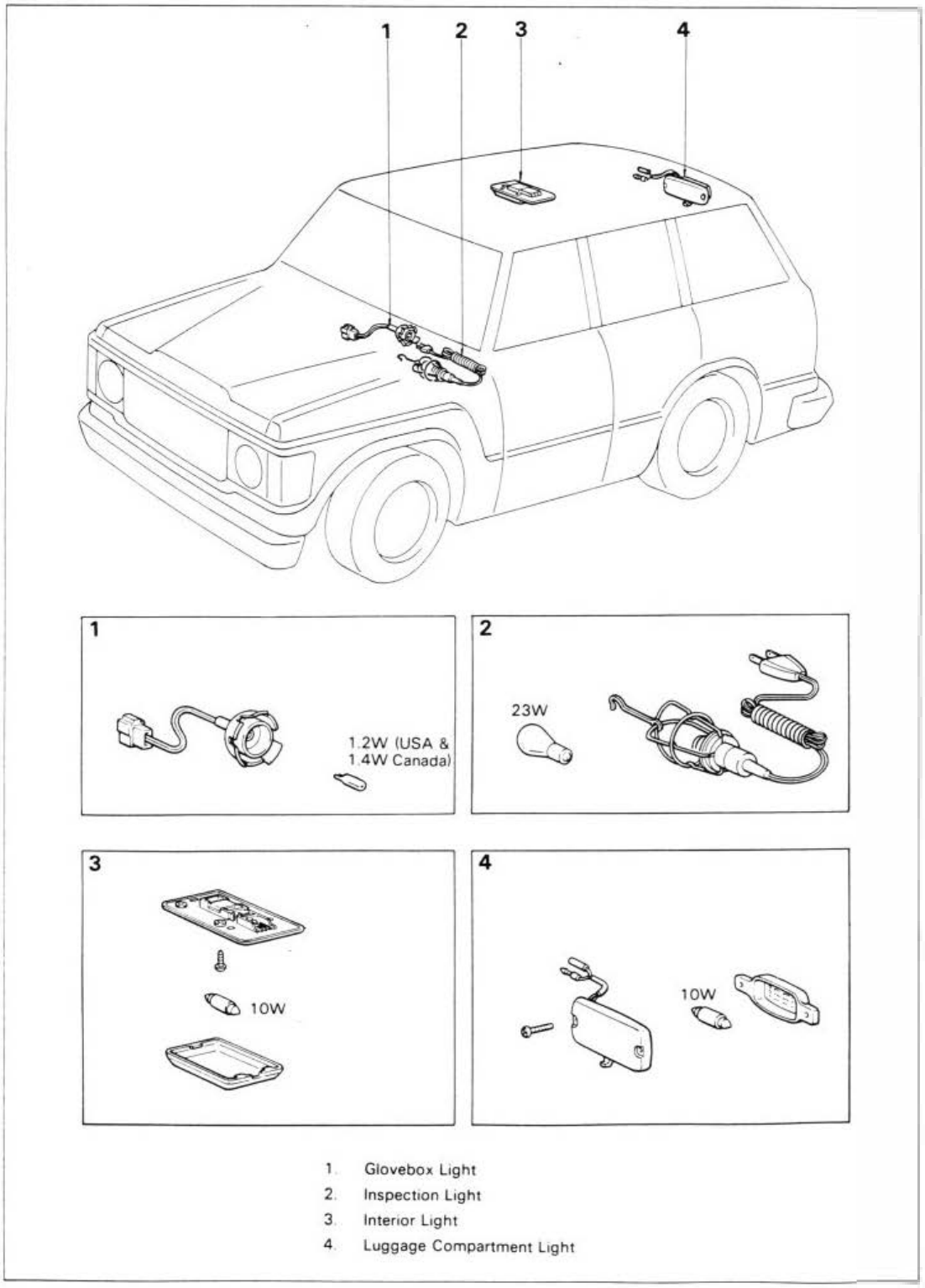


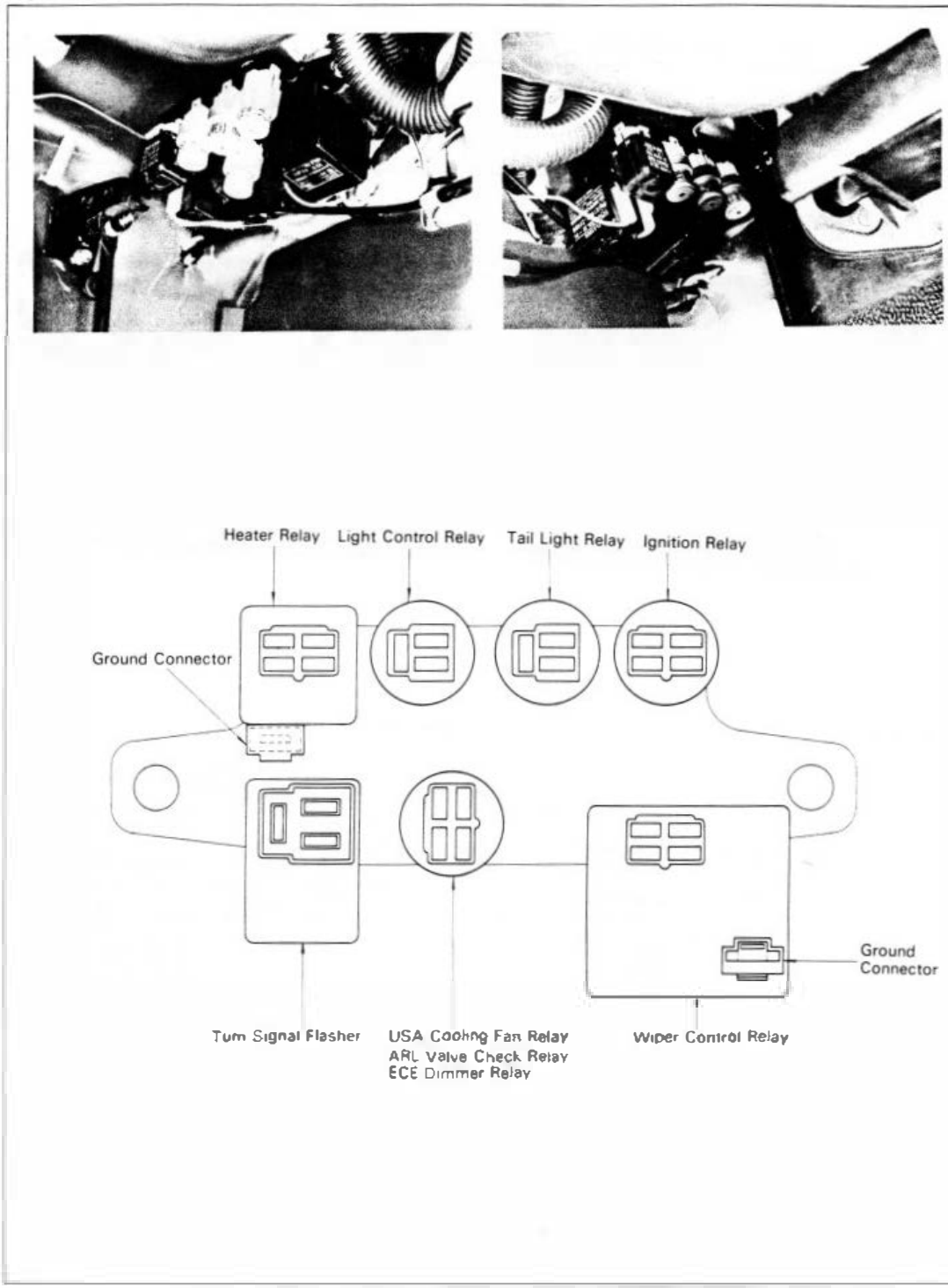
Fig. 13-14



1. Glovebox Light
2. Inspection Light
3. Interior Light
4. Luggage Compartment Light

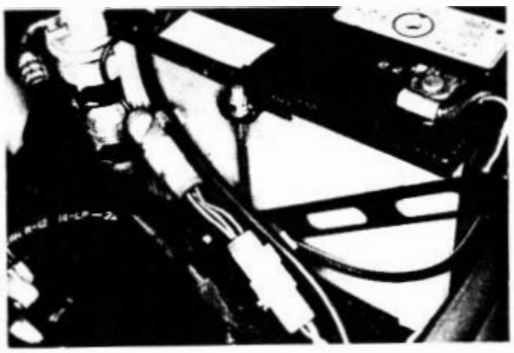
RELAY BLOCK

Fig. 13-15

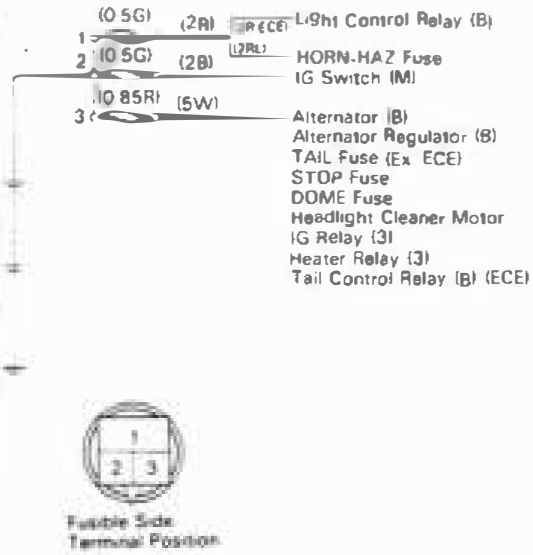


FUSIBLE LINK

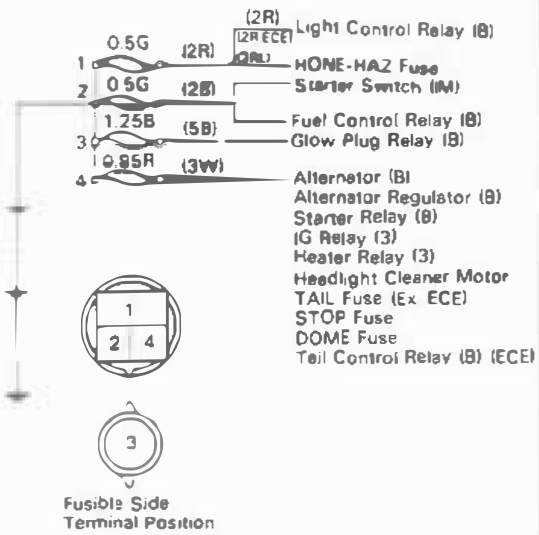
Fig. 13-16



FJ Series



BJ, HJ Series



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

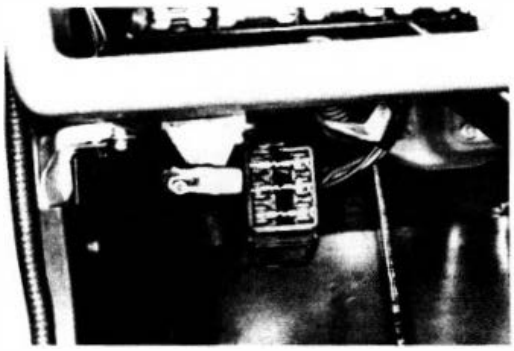
Fig. 13-17

MAIN FUSE BLOCK

LHD

RHD

SUB FUSE BLOCK



Fuses & Circuits

Each fuse is connected to the following circuits:

FJ Series

[From IG SWITCH (I G)]
- GAUGES 5A
  - Oil Pressure Gauge
  - Water Temperature Gauge
  - Fuel Gauge
  - Belt 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 (L)
- CHARGE 5A (With IC Regulator)
  - Alternator (L)
  - 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 Wiper & Washer Motor
  - Headlight Cleaner
  - Fr Wiper Control Switch (B)

[From IG SWITCH (ACC)]
- RADIO 5A
  - Radio
  - Stereo
- CIG L 15A
  - Cigarette Light (F)
  - Clock (Antenna)

[From FUSIBLE LINK (0.5) G]
- HORN HAZ 10A
  - Turn & Hazard Switch (B)
  - Horn

[From FUSIBLE LINK (0.85) 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
  - Solvent 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
  - 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 (AR L)

[From IG RELAY]
- ENGINE 15A
  - Alternator Regulator (IG)
  - Oil Pressure Gauge
  - Water Temperature Gauge
  - Fuel Gauge
  - Volt Gauge
  - Sediment Indicator Light
  - Tachometer
  - Charge Light
  - Brake Indicater Light
  - Seat Belt Warning Relay (Canada)
  - Brake Warning Light (ARL)
  - PKB Light
  - Alternator (IG) (W/IC Regulator)
  - Charge Light Relay (IG) (Regulator)
- CHARGE 5A
  - (W/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
  - Resistor (24V only)
  - Radio
  - Stereo
- CIG L 15A
  - Cigarette Lighter
  - Power 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 Morker Light
  - Defogger Light
  - Speedometer Light
  - Combination Light
  - Tachometer Light
  - Heater Control Light
  - Cigarette Lighter Light

  (Illumination)
- 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)

IGNITION SWITCH

CIRCUIT DIAGRAM

Fig. 13-18

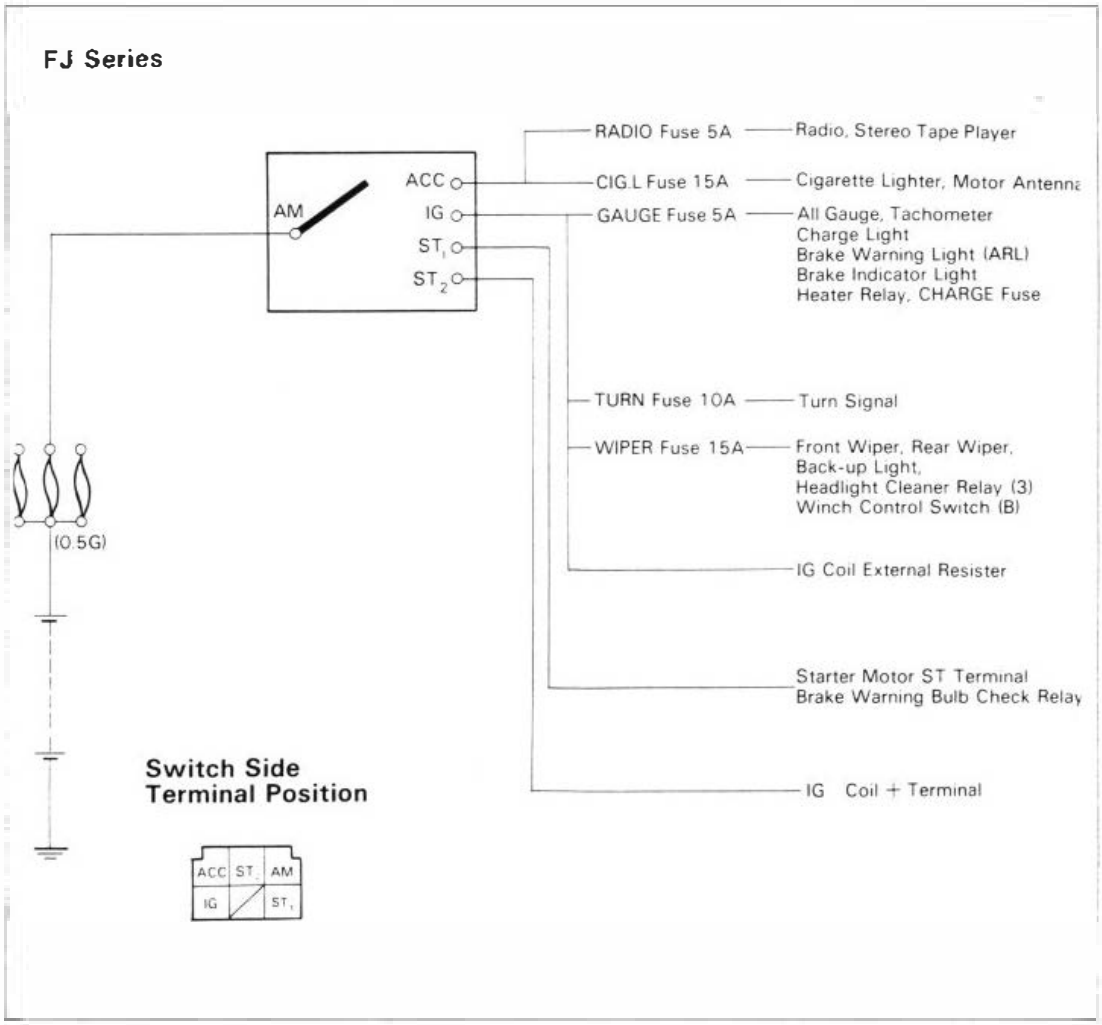
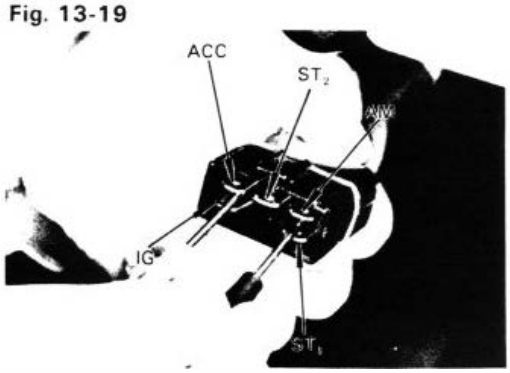


Fig. 13-19



ON-VEHICLE INSPECTION

Check continuity between terminals

Terminal / Position	AM	ACC	IG	ST1	ST2
LOCK					
ACC	○——	——○			
ON	○——	——○	——○		
START	○——		——○	——○	——○

CIRCUIT DIAGRAM

Fig. 13-20

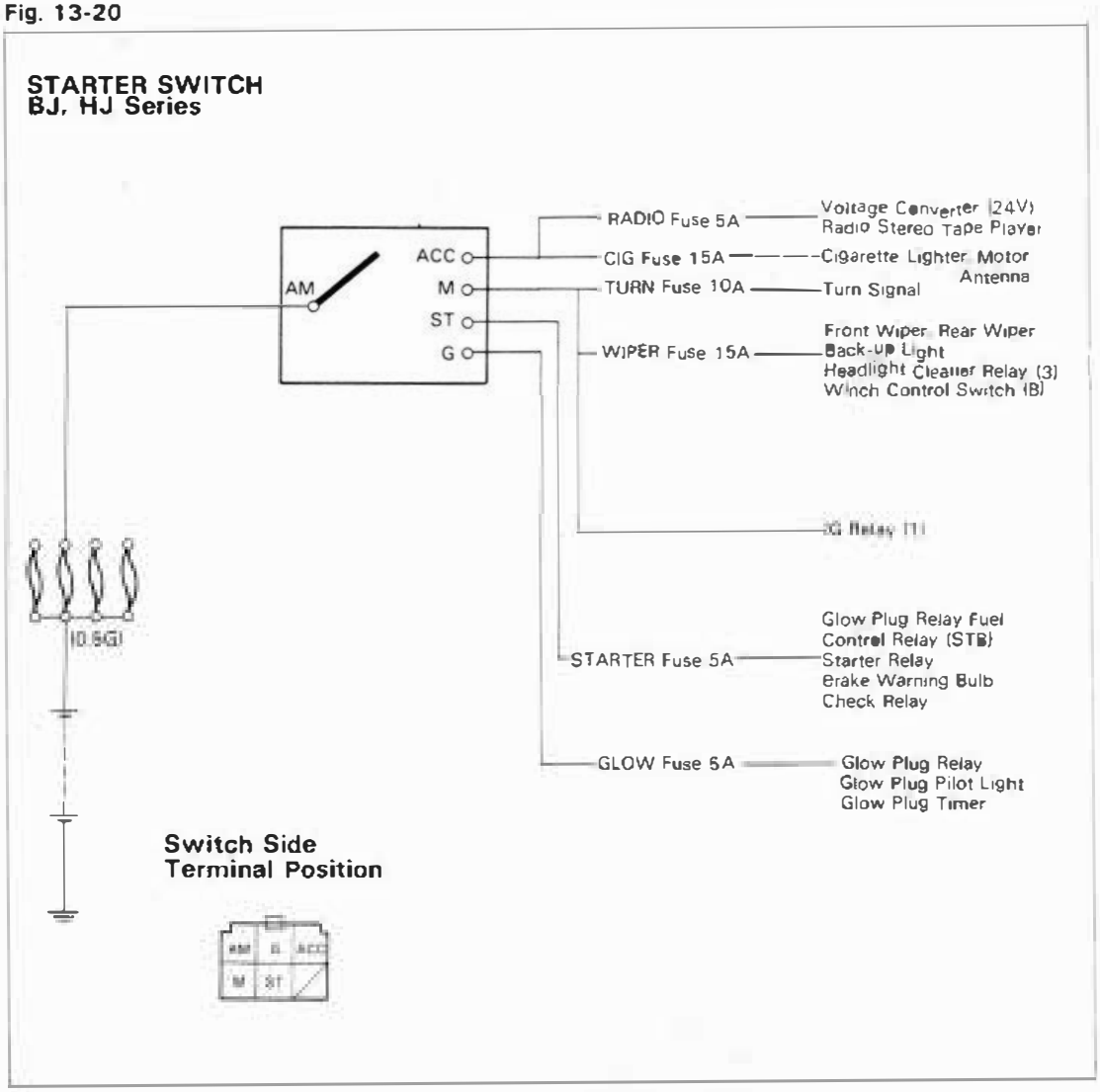
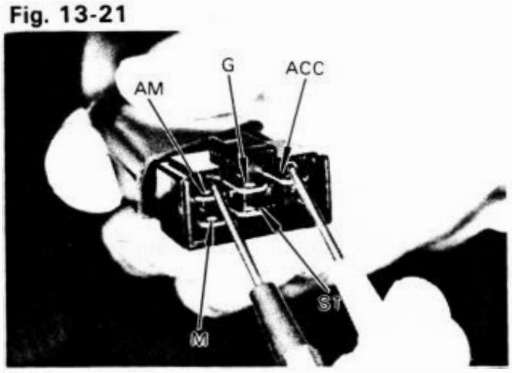


Fig. 13-21



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

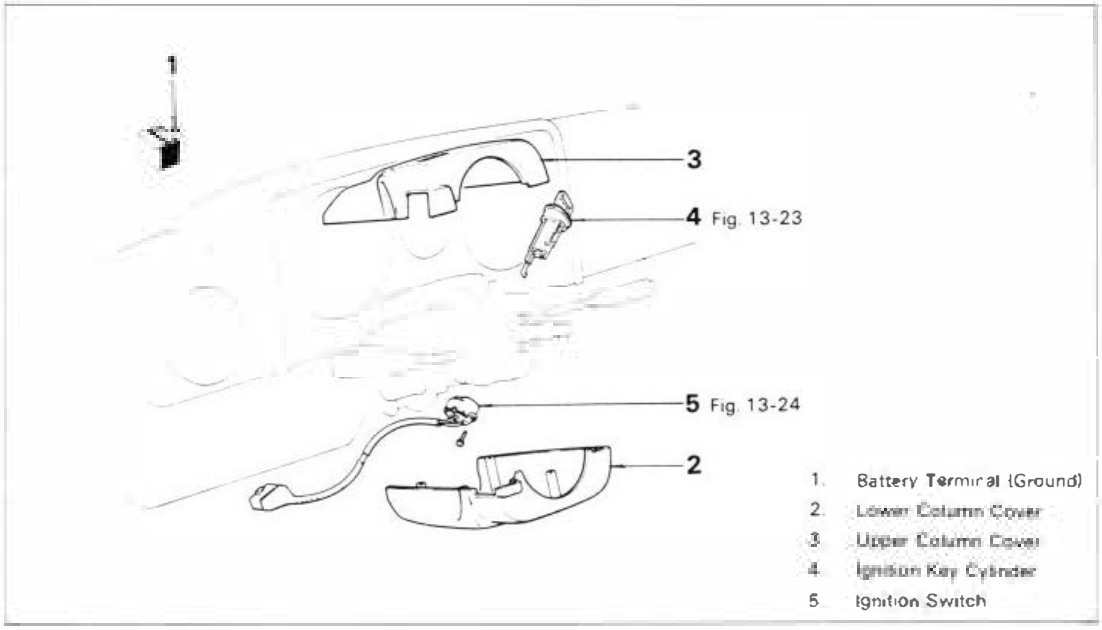


Fig. 13-23

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

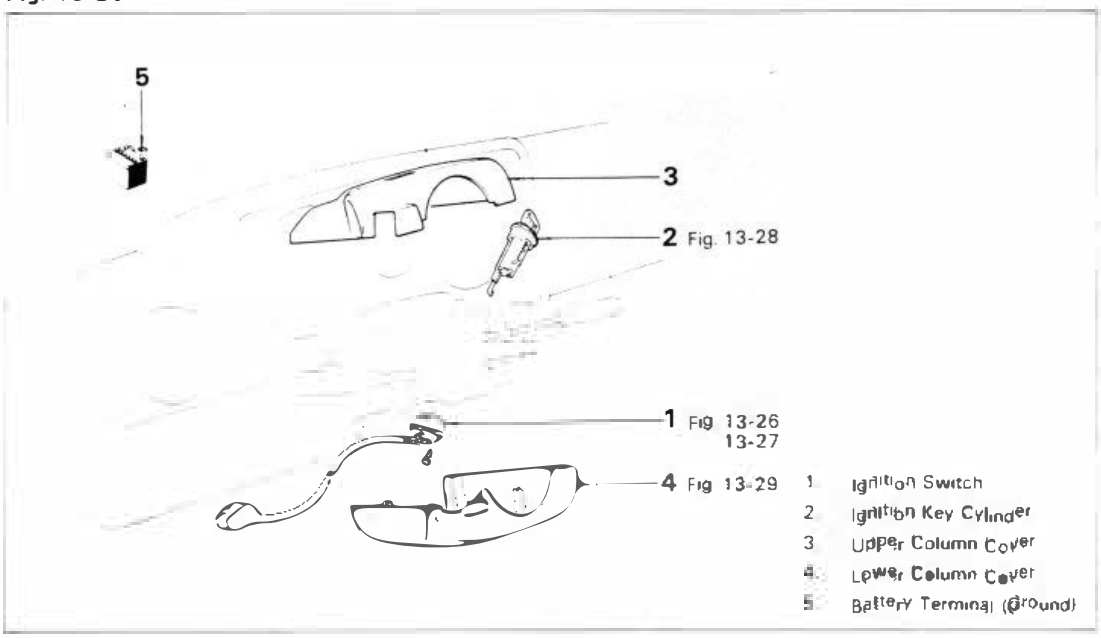
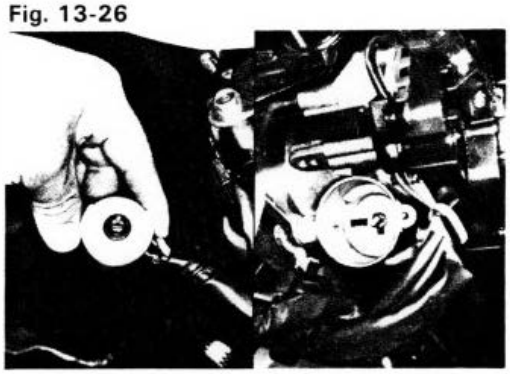
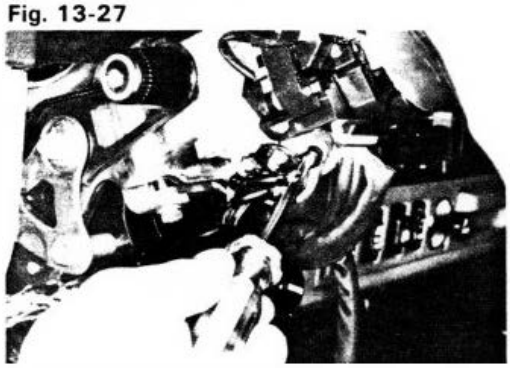


Fig. 13-26



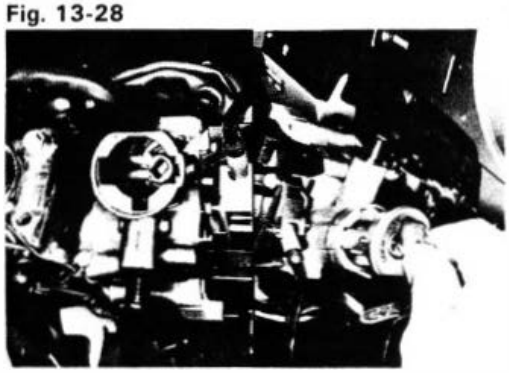
Install the ignition switch with the switch recess and the bracket tab correctly positioned

Fig. 13-27



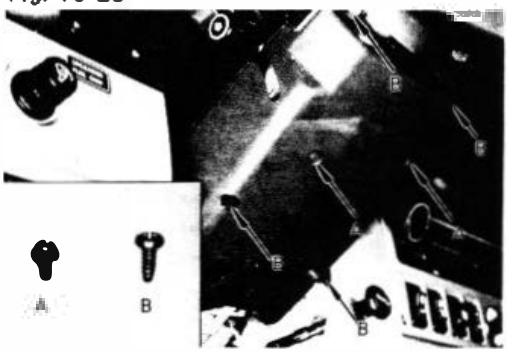
Install the ignition switch.

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

COMBINATION SWITCH

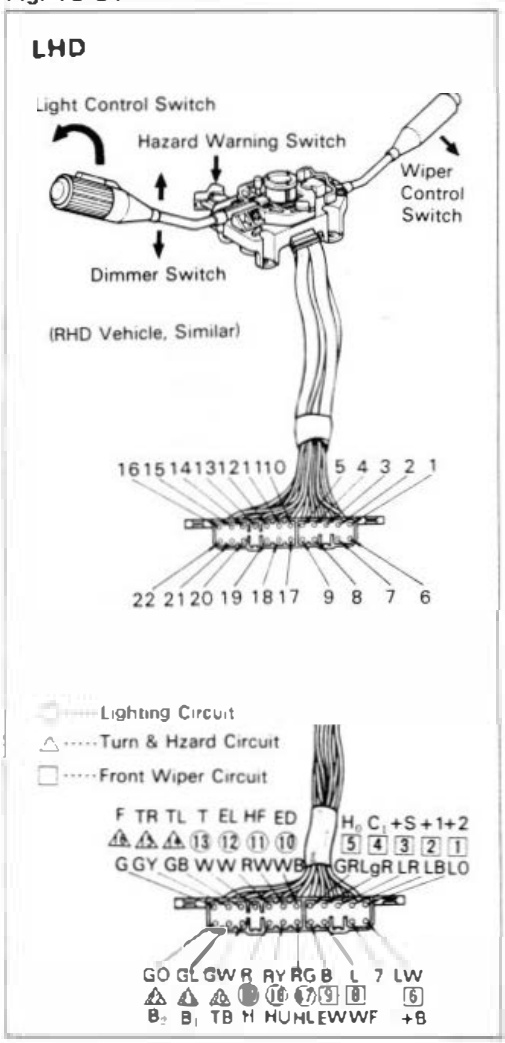
INSPECTION

Remove the following parts

1 Column cover
2 Wiring connector
3 Connector

Check the continuity between the terminals If there is continuity between the terminalsas shown in the table below, the switch is in good condition

Fig. 13-31



Light control & dimmer switch

Switch position		Terminal (Wire color) (No.) T (W) (12)	H (R) (19)	EL (W) (13)	ED (WB) (10)	HU (RY) (18)	HL (RG) (17)	HF (RW) (11)
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.) TL (GB) (14)	TB (GW) (20)	TR (GY) (15)	B1 (GL) (21)	F (G) (16)	B2 (GO) (22)
Turn Signal	R		○	○	○	○	
	N				○	○	
	L	○			○	○	
Hazard		○	○	○		○	

Wiper control switch

Switch position	Terminal (Wire color) (No.) B (LW) (6)	+S (LR) (3)	+1 (LB) (2)	+2 (LO) (1)	Cq (LgR) (4)	Ew (B) (9)	Wr (L) (8)
OFF		○	○				
*INT		○	○		○	○	
LO	○		○				
HI	○			○			
WASHER						○	○

* Intermittent Type

REMOVAL

Remove the parts in the numerical order shown in the figure

Fig. 13-32

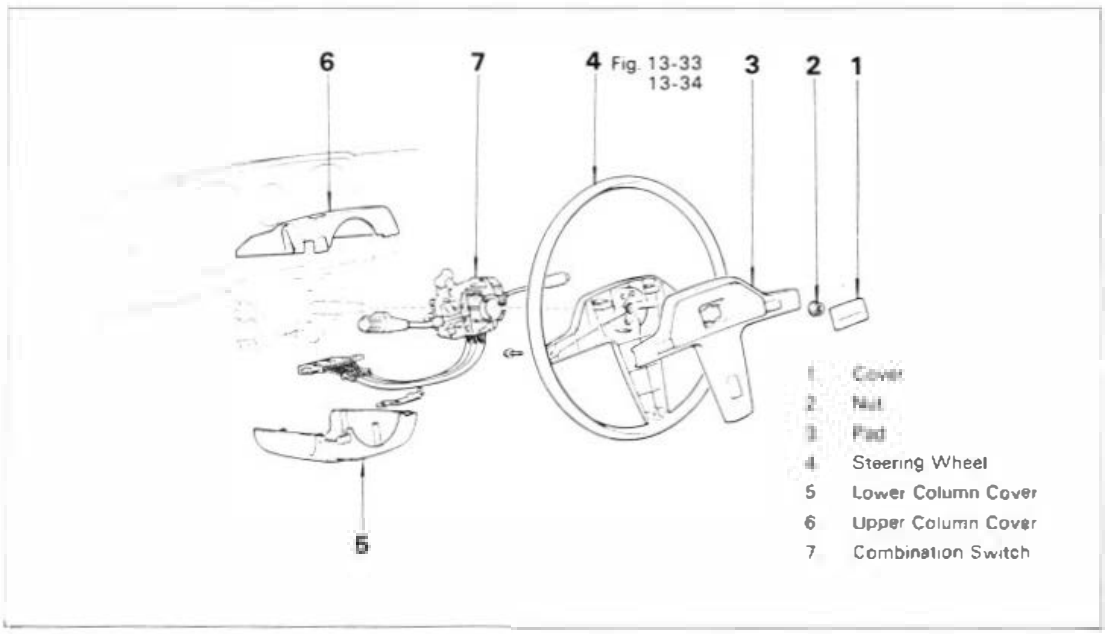
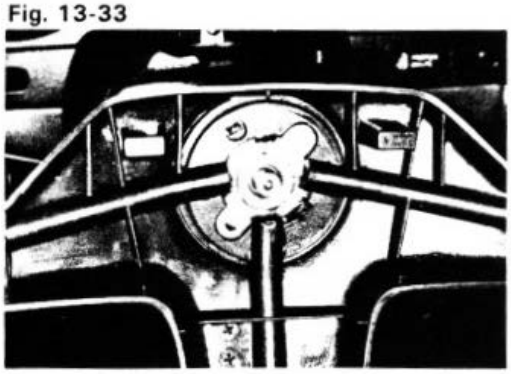
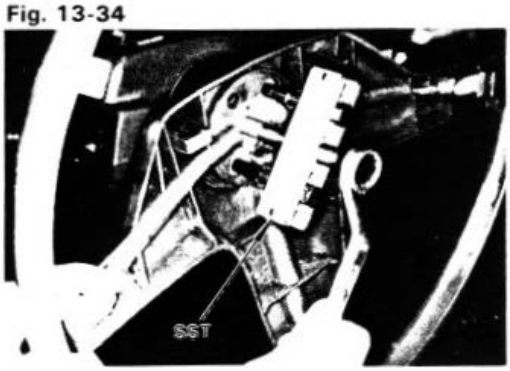


Fig. 13-33



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

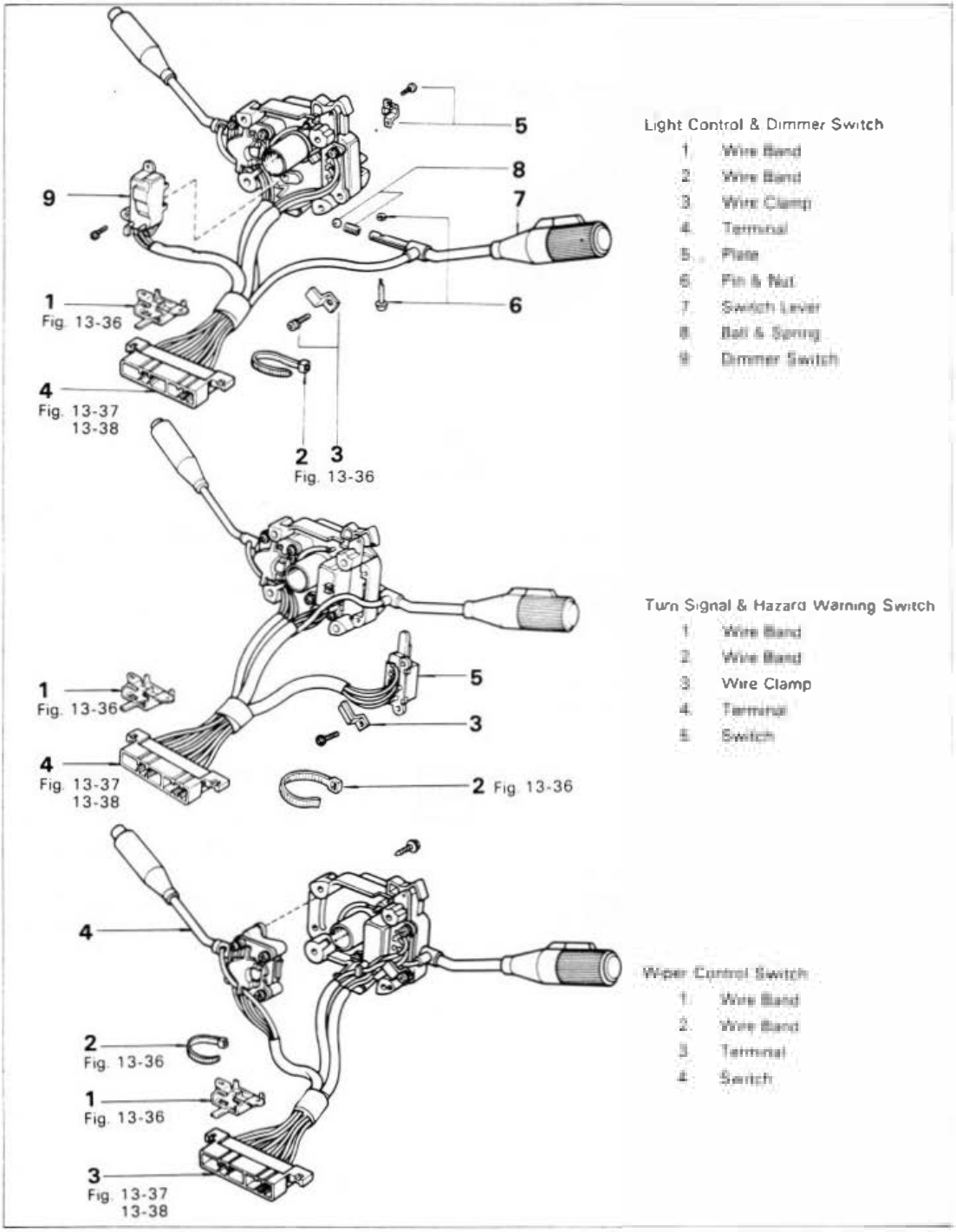
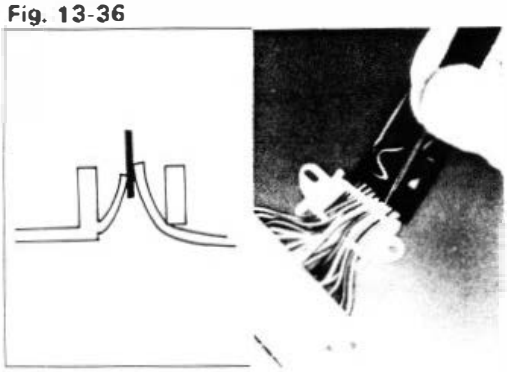
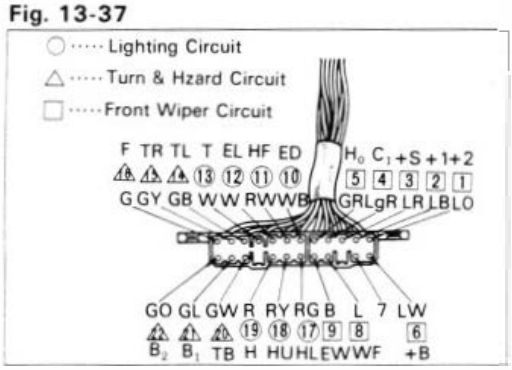


Fig. 13-36



Remove the wiring band with screwdriver

Fig. 13-37



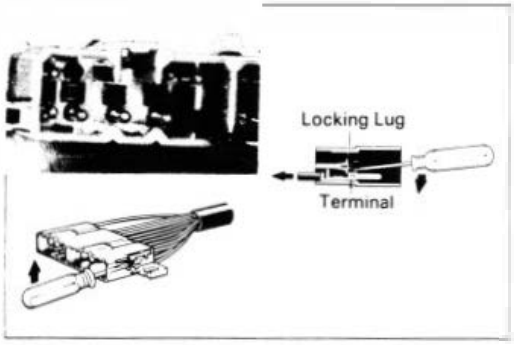
Each terminal of circuit is installed following number

Light control & Dimmer switch
○ mark 10, 11, 12, 13, 17, 18, 19

Turn signal & Hazard warning switch
△ Mark 14, 15, 16, 20, 21, 22

Wiper control switch
□ Mark 1, 2, 3, 4, 6, 8, 9

Fig. 13-38



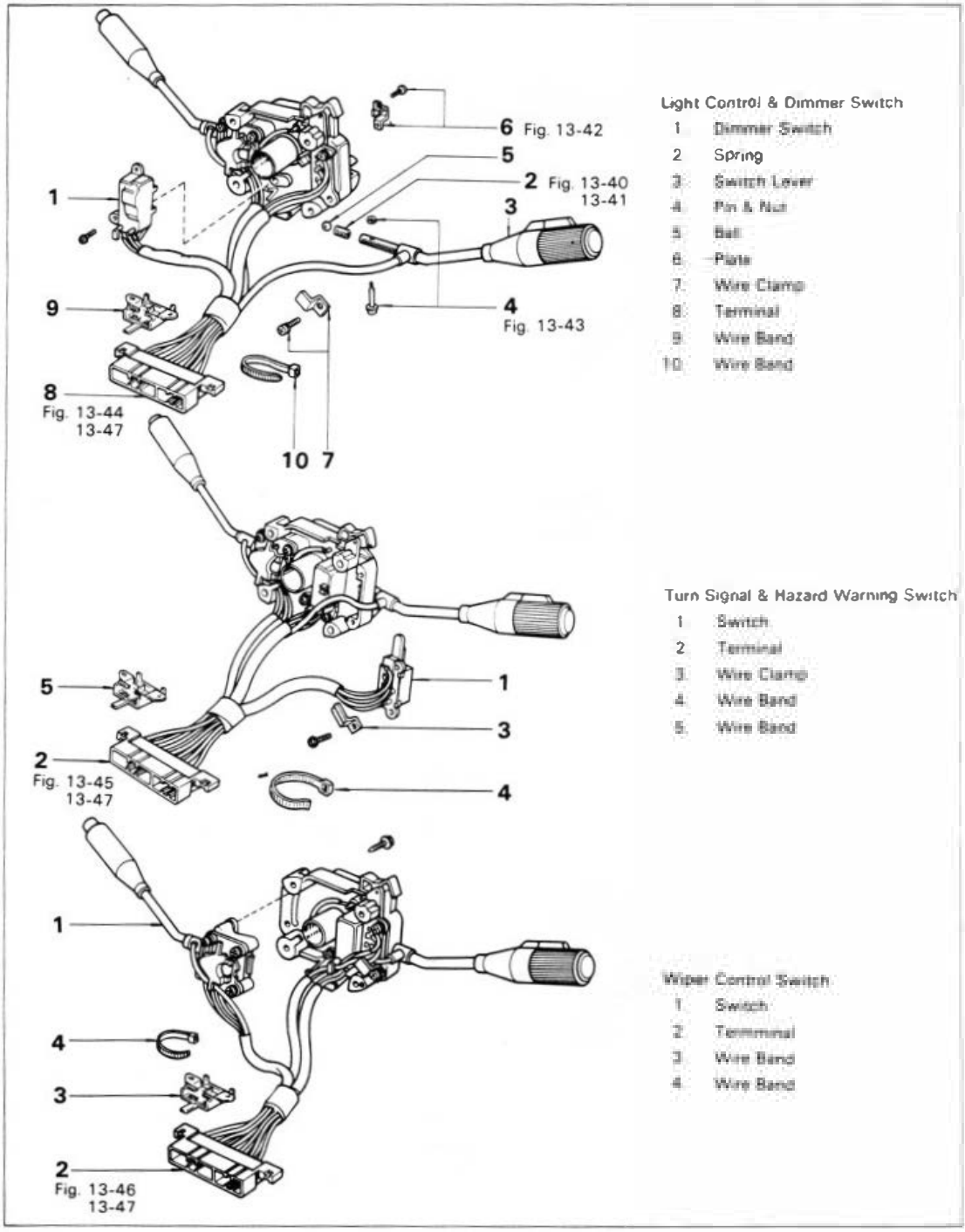
Remove the terminals from the bulkhead connector

1. From the open end, insert a miniture screwdriver between the locking lugsand terminal
2. Pry up the locking lugs with the screwdriverand pull the terminal out from the rear

ASSEMBLY

Assemble the parts in the numerical order shown in the figure

Fig. 13-39



Light Control & Dimmer Switch
1. Dimmer Switch
2. Spring
3. Switch Lever
4. Pin & Nut
5. Ball
6. Plate
7. Wire Clamp
8. Terminal
9. Wire Band
10. Wire Band

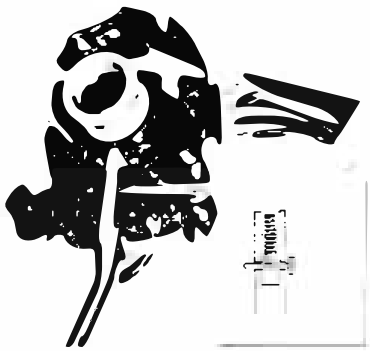
Turn Signal & Hazard Warning Switch
1. Switch
2. Terminal
3. Wire Clamp
4. Wire Band
5. Wire Band

Wiper Control Switch
1. Switch
2. Terminal
3. Wire Band
4. Wire Band

Fig. 13-40

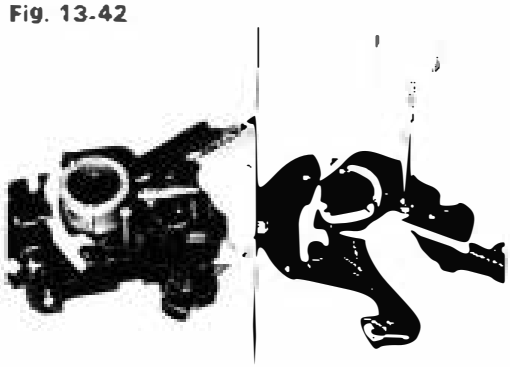
Install thesp ring into the lever

Fig. 13-41



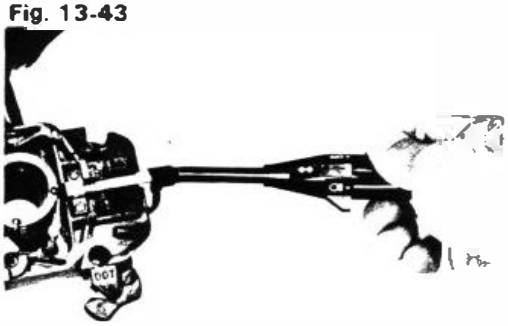
Place the spring position as shown in the figure when installing the switch lever

Fig. 13-42



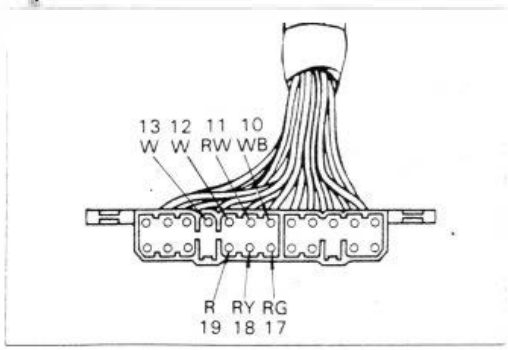
Put on the steel ball on the spring and install the plate while turn on the lever in the Hi beam side

Fig. 13-43



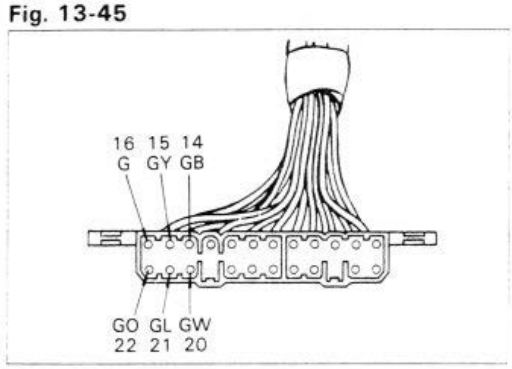
Insure that the switch operates smoothly

Fig. 13-44



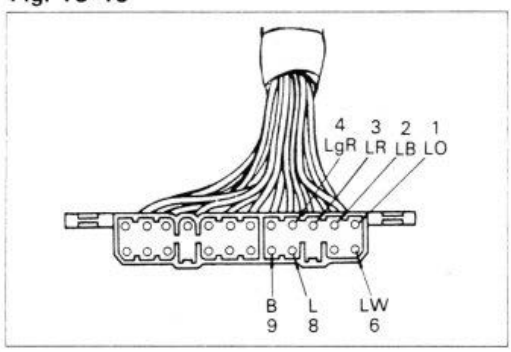
Install the lighting circuit terminals as shown in the figure.

Fig. 13-45



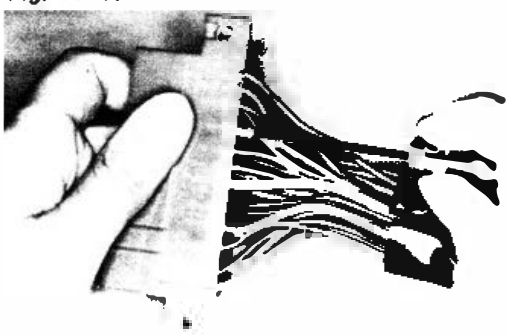
Install the turn signal and hazard warning circuit terminals as shown in the figure.

Fig. 13-46



Install the front wiper circuit terminals as shown in the figure.

Fig. 13-47

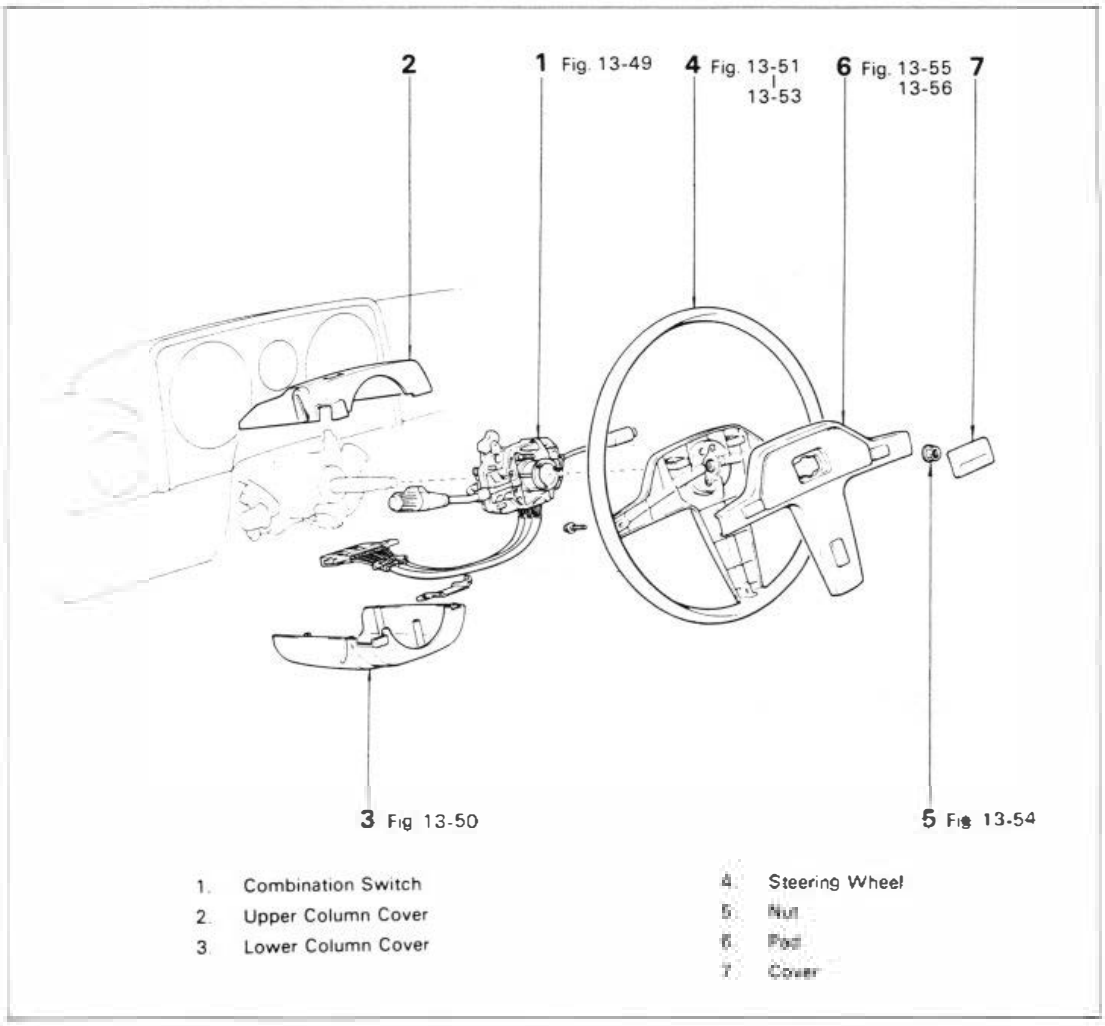


Insert the terminal until terminal is caught on a projection in the connector.
Make sure that terminal is not removal.

INSTALLATION

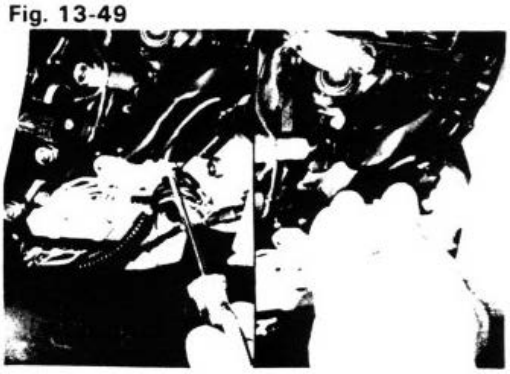
Install the parts in the numerical order shown in the figure

Fig. 13-48



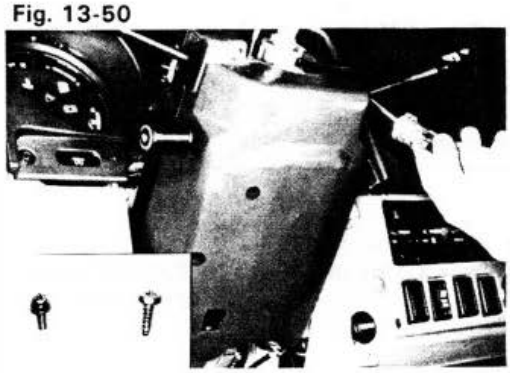
1. Combination Switch
2. Upper Column Cover
3. Lower Column Cover
4. Steering Wheel
5. Nut
6. Pad
7. Cover

Fig. 13-49



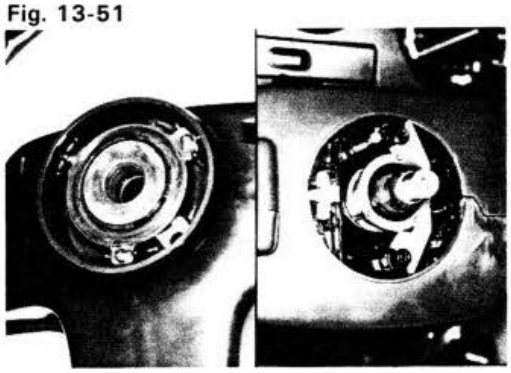
Install the wire harness band and connector

Fig. 13-50



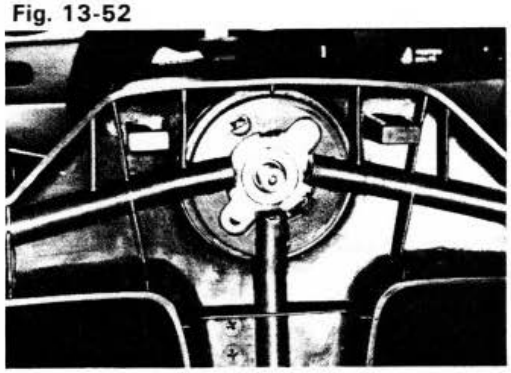
Install the cover

Fig. 13-51



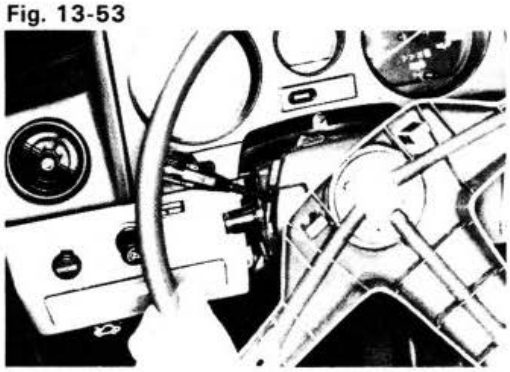
Align auto-cancel mechanism pin and hole

Fig. 13-52



Align the matchmarks on main shaft and steering wheel

Fig. 13-53



Check auto-cancel action

Fi . 13-5 4 g

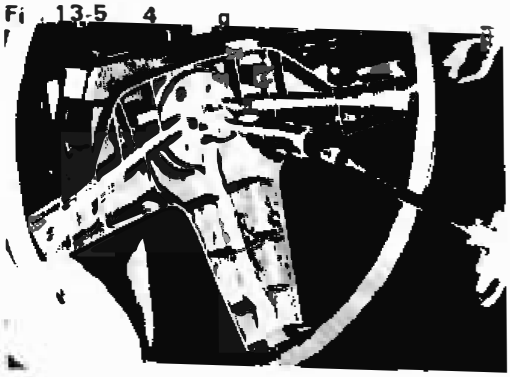
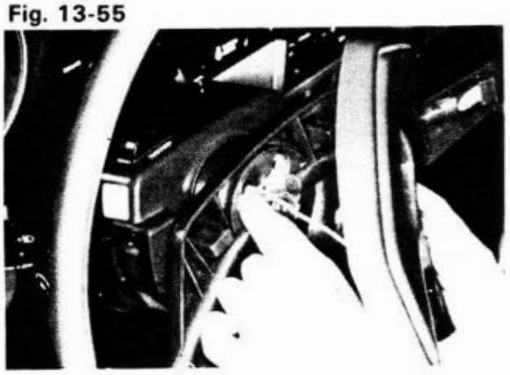


Fig. 13-55

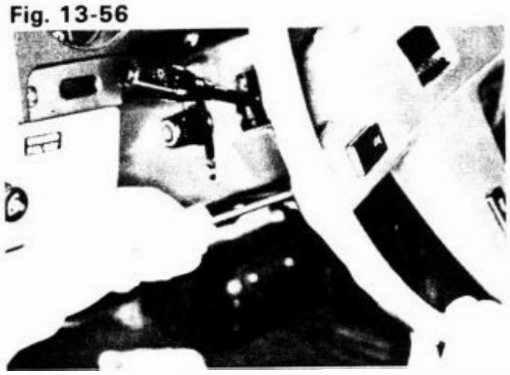
Tighten the nut.

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



Connect the horn terminal.

Fig. 13-56

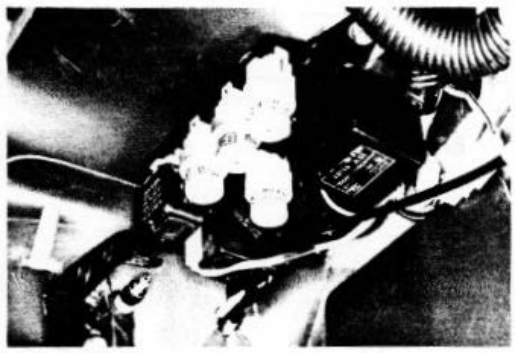


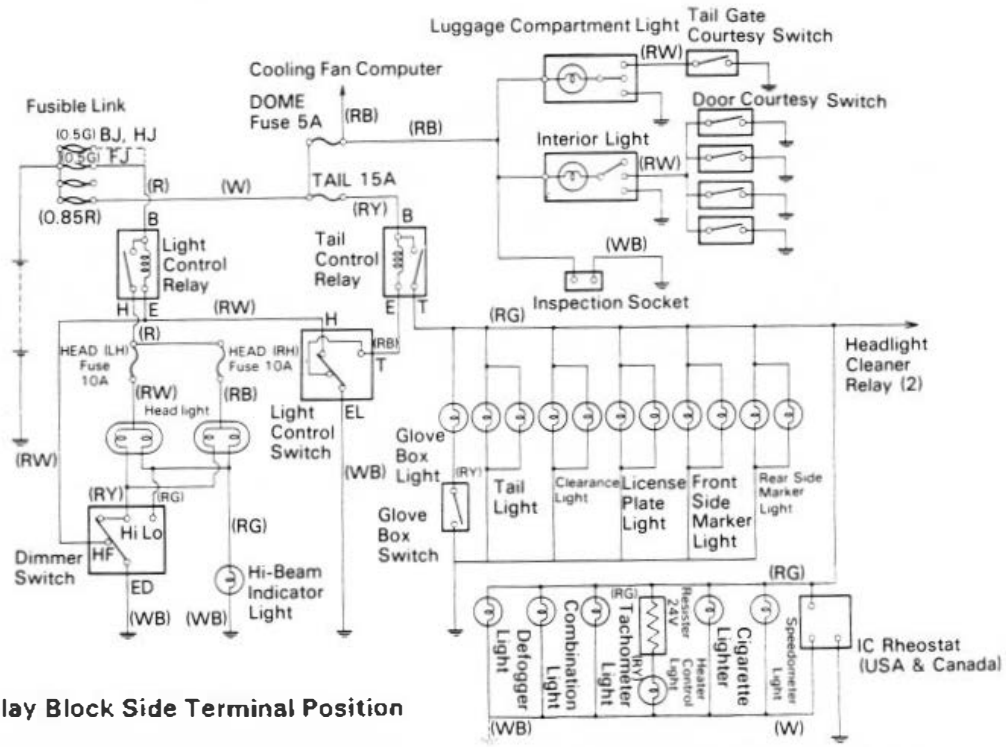
Install the pad set screw facing the back side.

LIGHTING

CIRCUIT DIAGRAM

Fig. 13-57





Relay Block Side Terminal Position

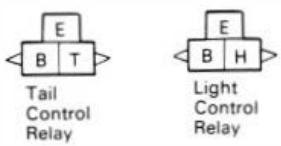
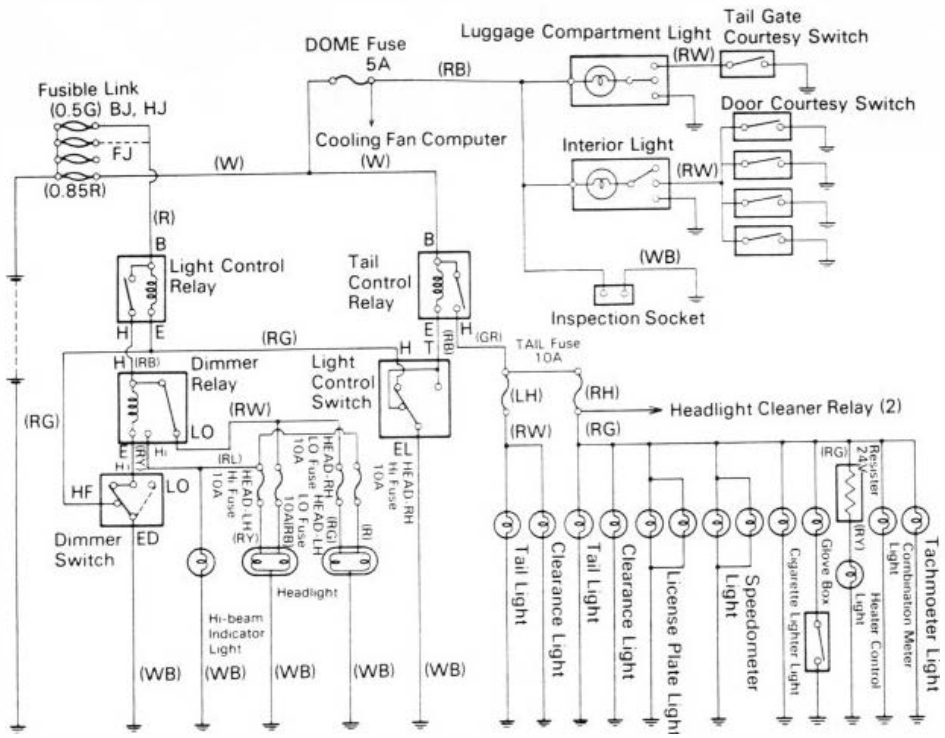


Fig. 13-58

ECE



Relay Block Side Terminal Position

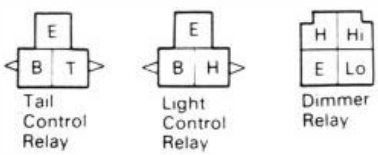
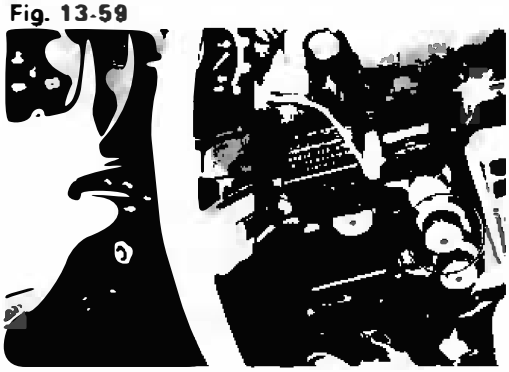


Fig. 13-59

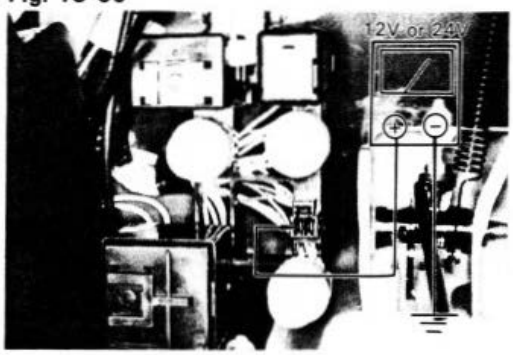


TAIL LIGHT CONTROL RELAY

ON-VEHICLE INSPECTION

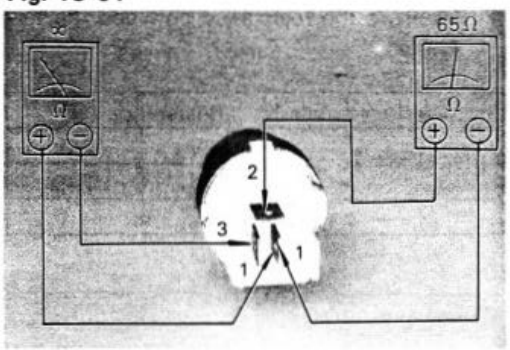
1. Turn on the switch, check to see that there is an operational noise.

Fig. 13-60



2. Battery voltage should be on terminal.

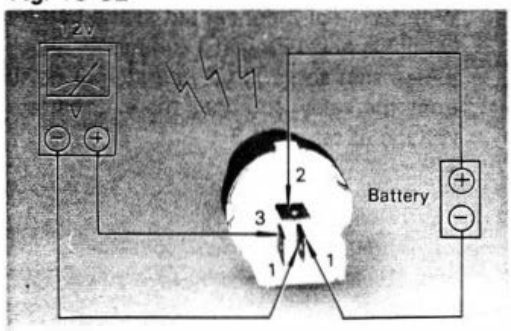
Fig. 13-61



3. Measure the resistance between the terminals.

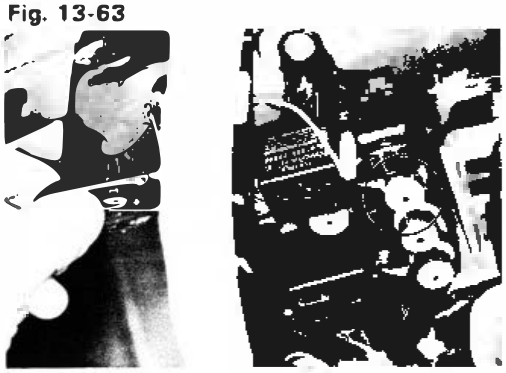
Between terminal	Resistance (Ω)	
1 — 2	12V	24V
	65	245
1 — 3	∞	

Fig. 13-62



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

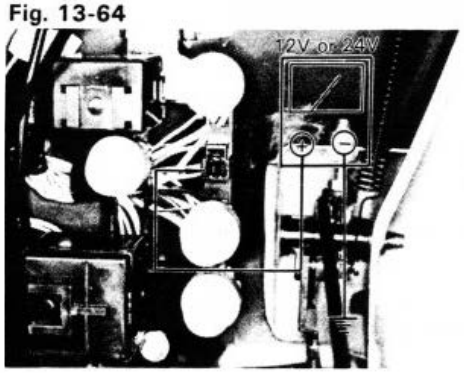


HEADLIGHT CONTROL RELAY

ON-VEHICLE INSPECTION

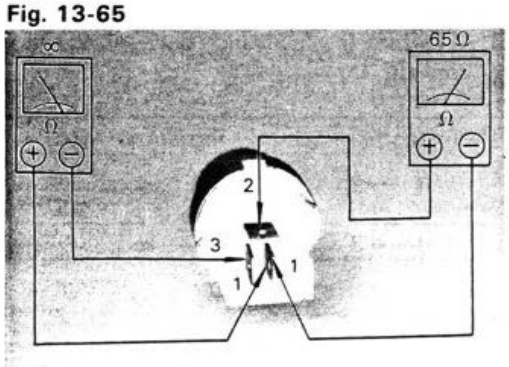
1. Turn on the switch, check to see that there is an operational noise

Fig. 13-64



2. Battery voltage should be on terminal 1

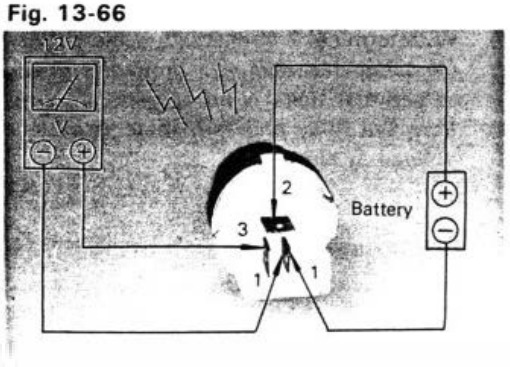
Fig. 13-65



3. Measure the resistance between the terminals

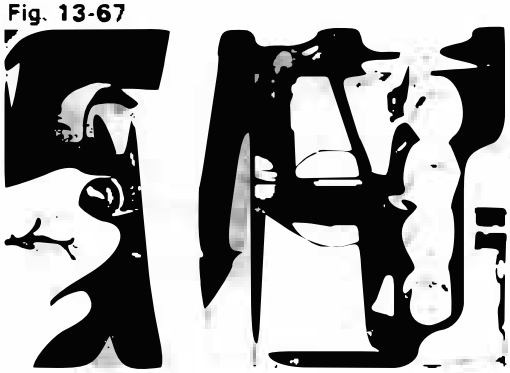
Between terminals	Resistance (Ω)	
	12V	24V
1 — 2	65	245
1 — 3	∞	

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

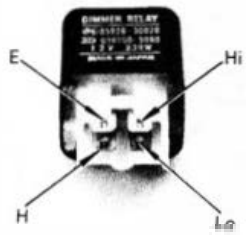
Fig. 13-67



HEADLIGHT DIMMER RELAY (Only Europe)

Turn on the dimmer switch check to see that there is an operating noise from the relay.

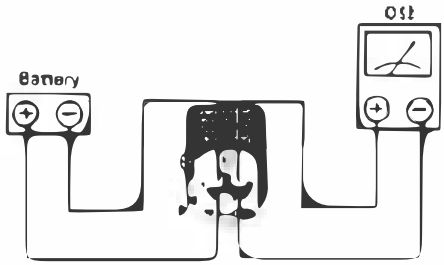
Fig. 13-68



2. Measure resistance between terminals.

Between Terminals	Resistance (Ω)	
	12V	24V
H—E	15	226
H—Hi	∞	∞
H—Lo	0	0

Fig. 13-69



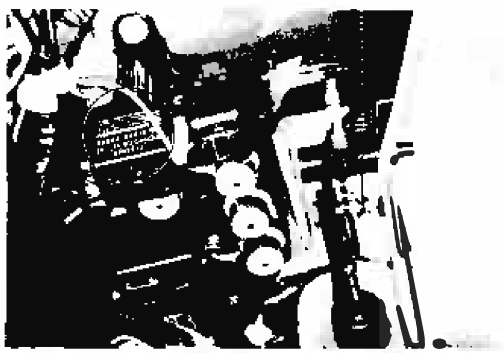
3 With terminal H connected to the battery (+) cable and terminal E grouded.
Check to see that there is an operating noise from the relay and that there is battery valtage at terminal Hi.

TURN SIGNAL & HAZARD WARNING LIGHT

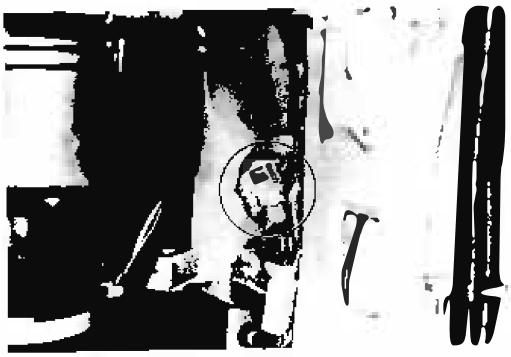
CIRCUIT DIAGRAM

Fig. 13-70

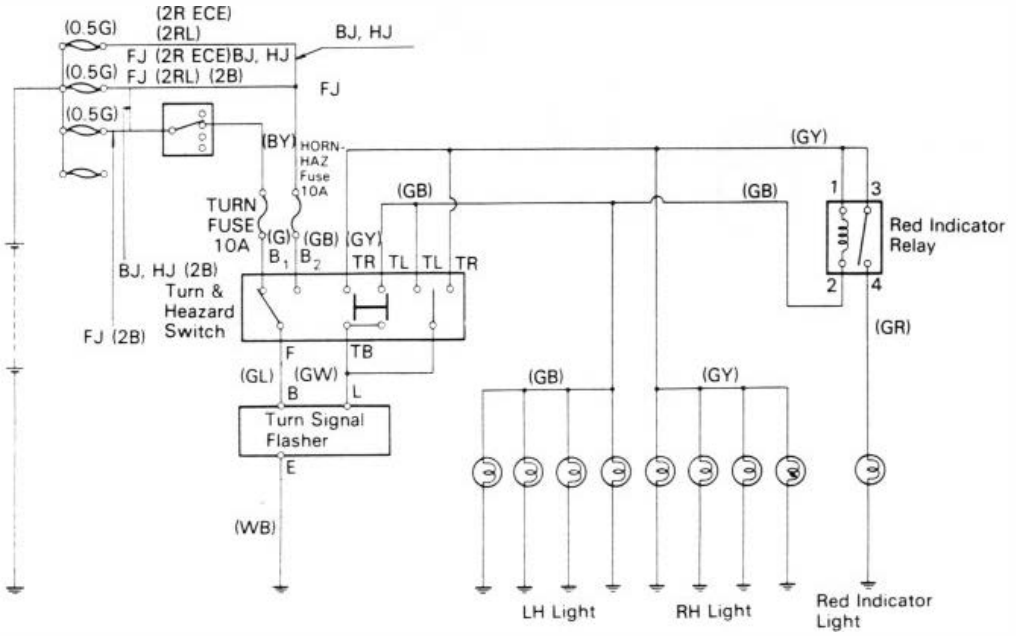
WITH 12V BATTERY



TURN SIGNAL FLASHER



RED INDICATOR LIGHT RELAY



Relay Block Side Terminal Position

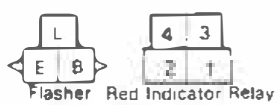
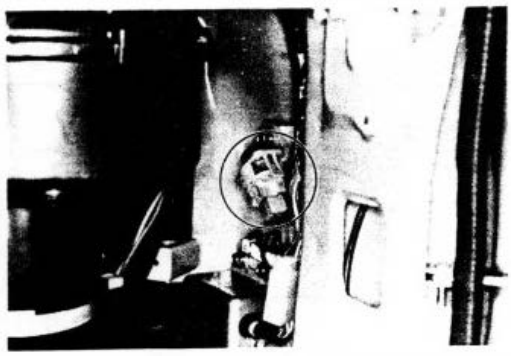


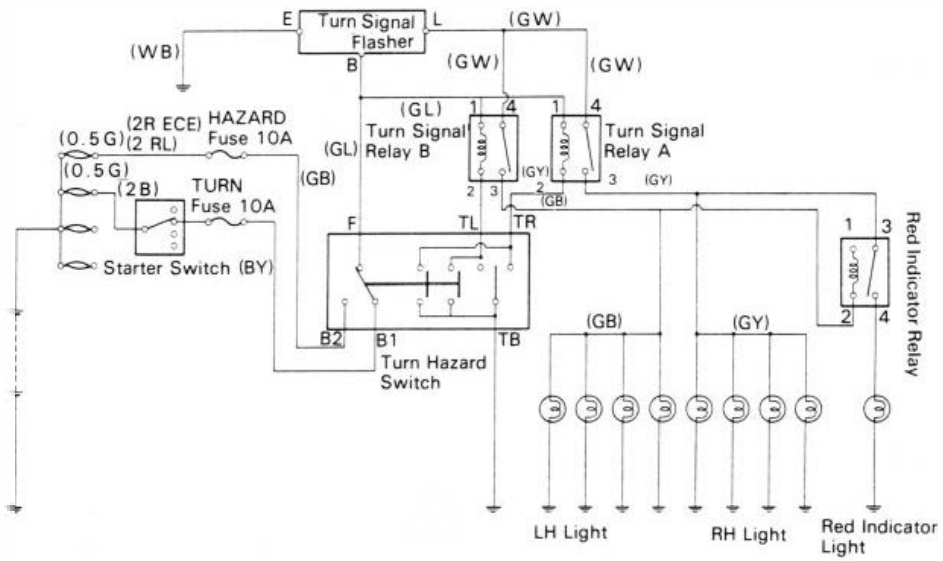
Fig. 13-71

WITH 24V BATTERY

TURN SIGNAL RELAY



RED INDICATOR LIGHT RELAY



Relay Block Side Terminal Position

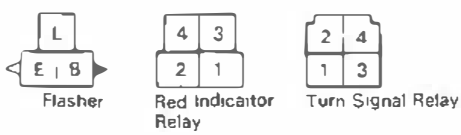
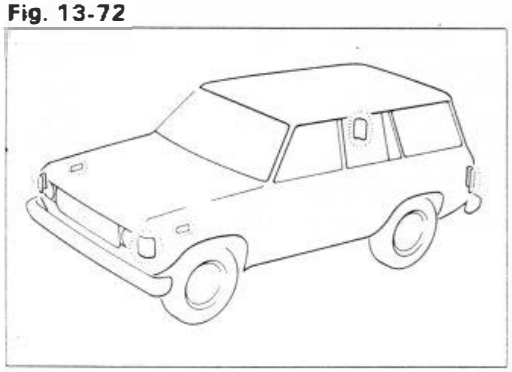
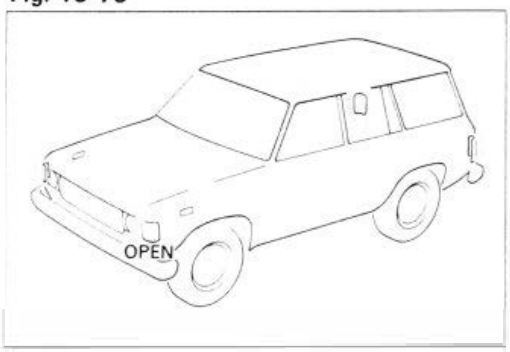


Fig. 13-72



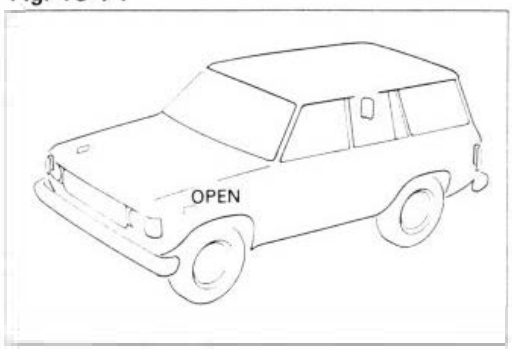
1. The turn signal lights should flash 70 — 100 times per minute.

Fig. 13-73



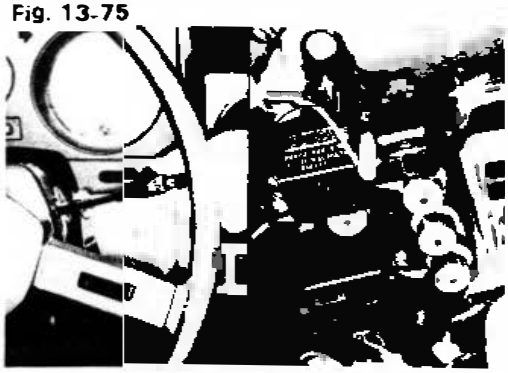
2. If one of the front or rear turn signal lights has an open circuit, the number of flashes should be more than 120 per minute.

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

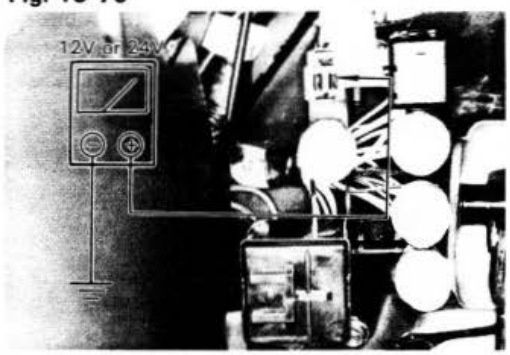


TURN SIGNAL FLASHER

INSPECTION

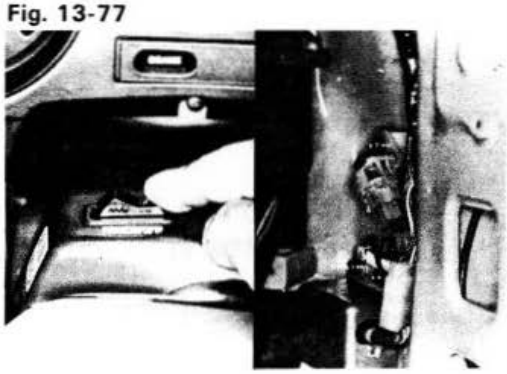
1 Turn on the switch, check to see that there is an operational noise

Fig. 13-76



2 Battery voltage should be on terminal B

Fig. 13-77

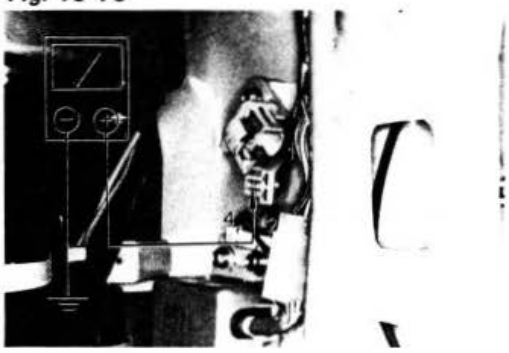


RED INDICATOR RELAY

INSPECTION

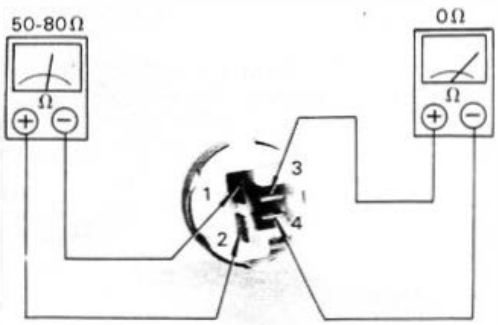
1 Turn on and off the hazard warning switch, check to see that there is an operational noise

Fig. 13-78



2 Battery voltage should be on terminal 1, 2 and 4

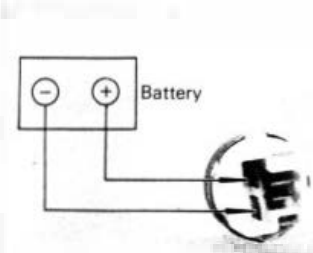
Fig. 13-79



3 Check the resistance between terminals If each resistance value as shown below, the relay is in good condi it o

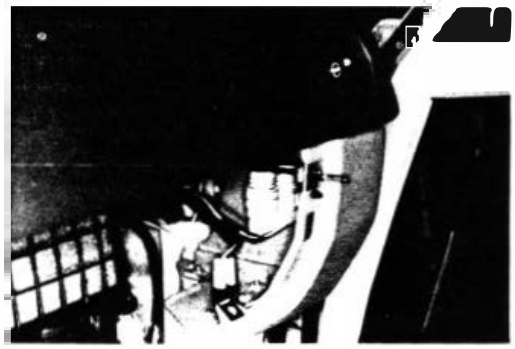
Be tween terminals	Resistance (Ω)
1 — 2	approx. 50–80
3 — 4	0

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

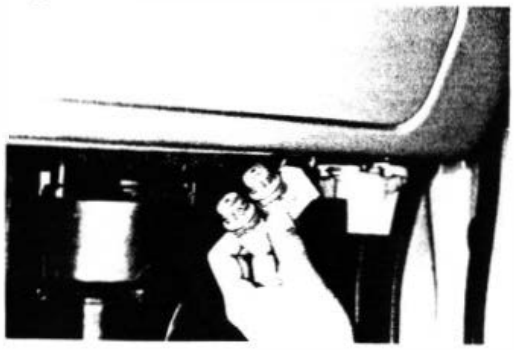
Fig. 13-81



TURN SIGNAL RELAY (With 24V Battery)

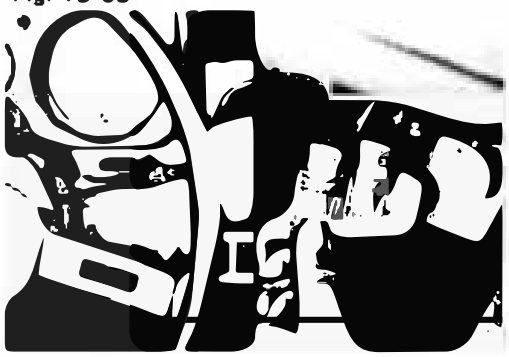
The relays were installed near the glove compartment.

Fig. 13-82



Remove the relays and bracket together.

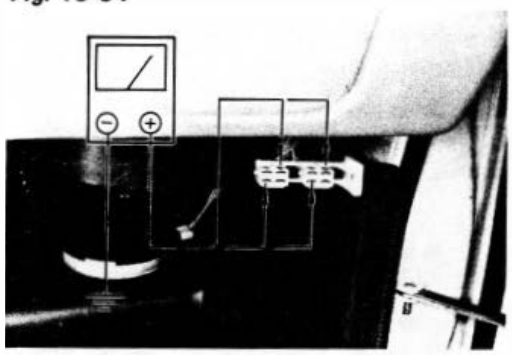
Fig. 13-83



INSPECTION

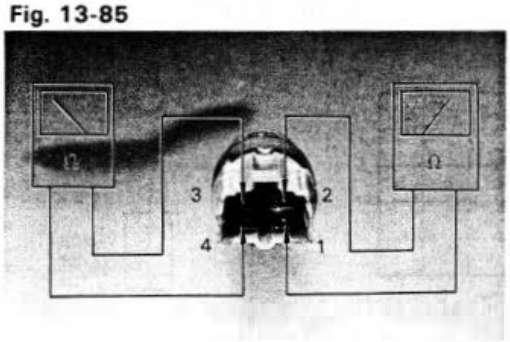
1. Turn on and off the switch, check to see that there is an operational noise

Fig. 13-84



2. Battery voltage should be on terminal 1 and 4.

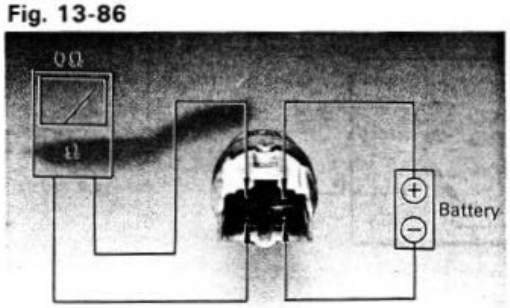
Fig. 13-85



3. Check the resistance between terminals

Between terminals	Resistance (Ω)	
	12V	24V
1 — 2	75	245
3 — 4	∞	∞

Fig. 13-86



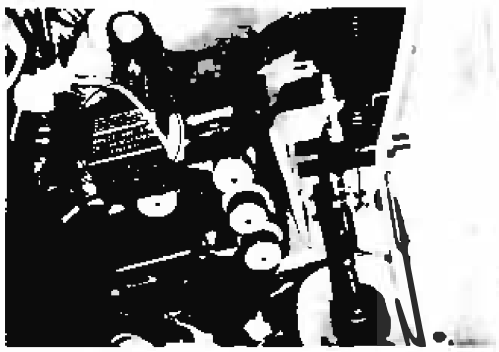
4. With terminal 2 connected to the battery (+) cable and terminal 1 cable, check to see that there is an operational noise from the relay

FRONT WIPER & WASHER

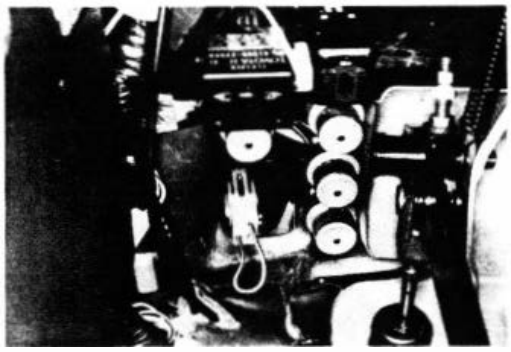
CIRCUIT DIAGRAM

Fig. 13-87

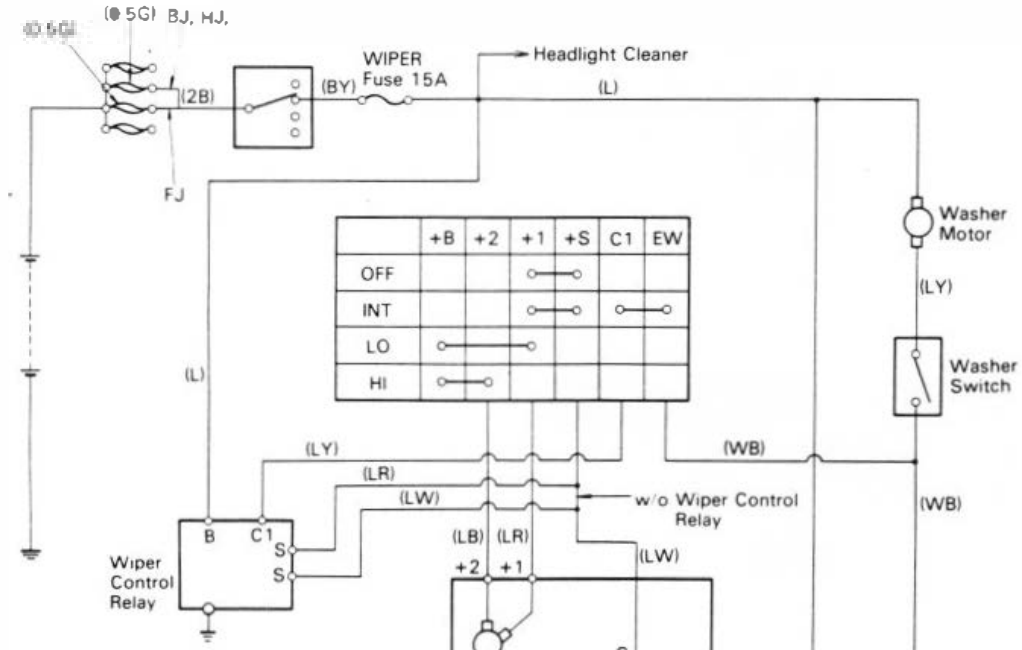
WITH 12V BATTERY



Wiper Control Relay



Without Relay



Wiring Side Terminal Position

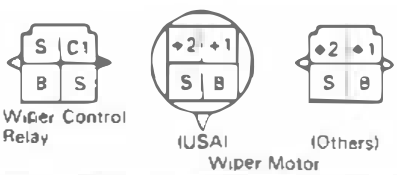
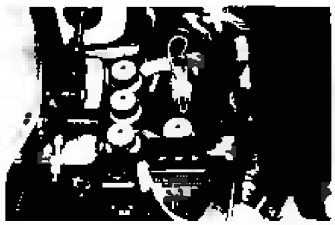


Fig. 13-88

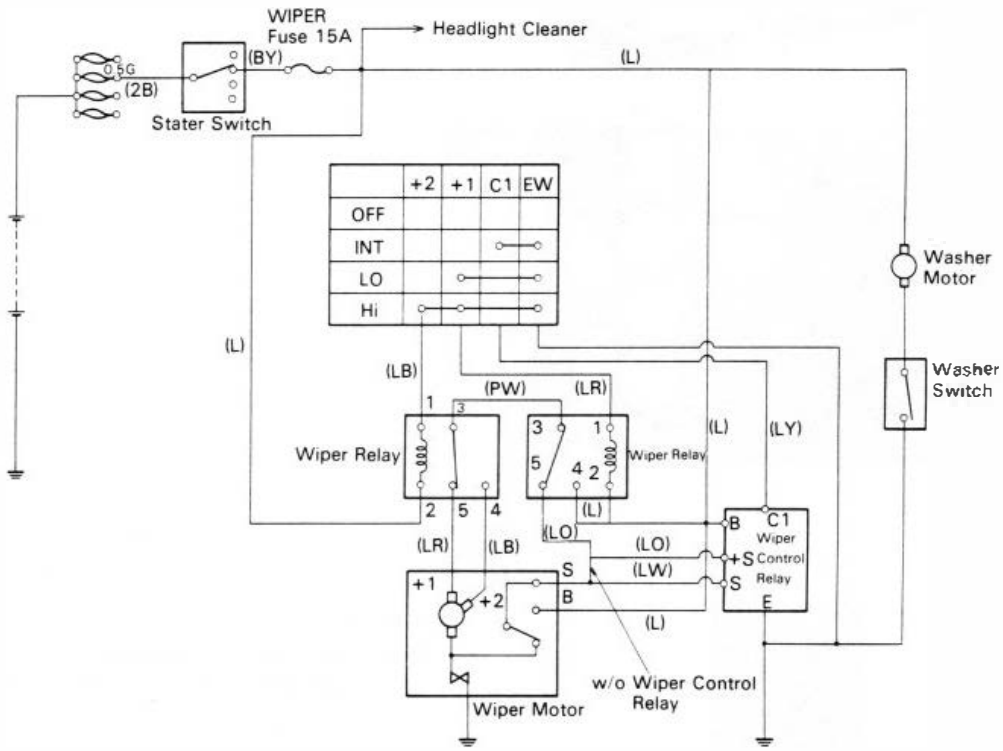
WITH 24V BATTERY

Wiper Control Relay



Without Relay

Wiper Relay



Wiring Side Terminal Position

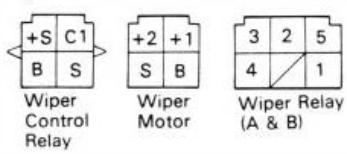
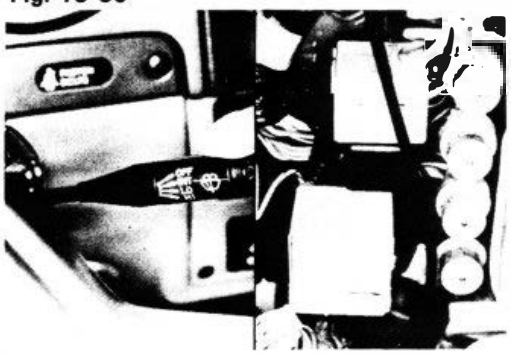


Fig. 13-89

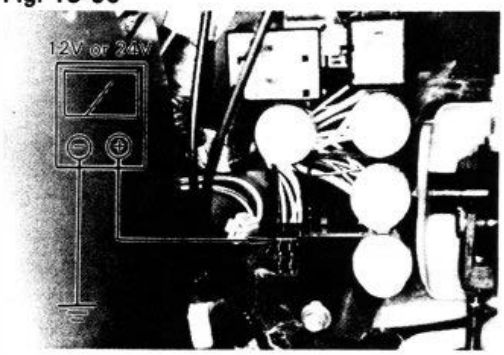


WIPER CONTROL RELAY

INSPECTION

1 Turn wiper switch to INT and verify wiper control relay noise

Fig. 13-90



2 Battery voltage should be on terminal B

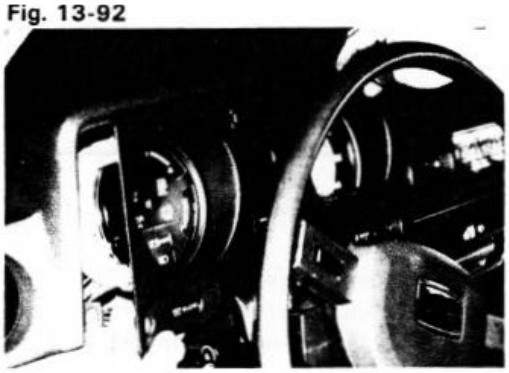
Fig. 13-91

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

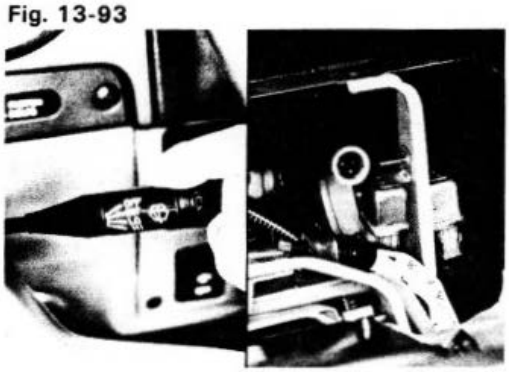


WIPER RELAY (for 24V)

Remove the combination meter.

– Note –
The relays were installed behind the combination meter.

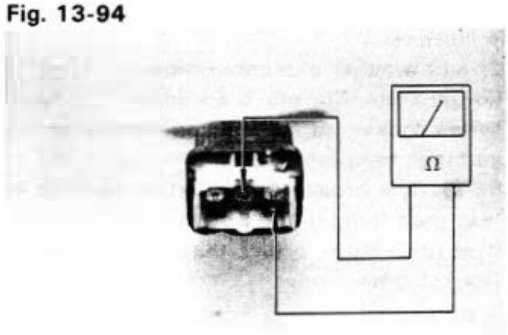
Fig. 13-93



INSPECTION

1. Turn on the switch, check that there is an operating noise.

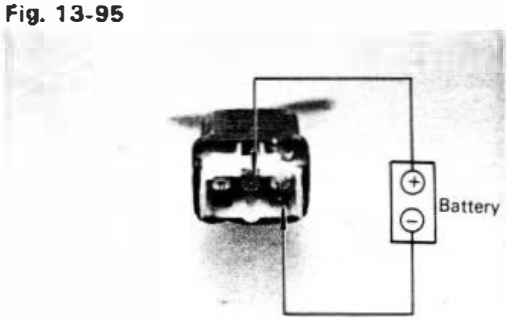
Fig. 13-94



2. Check continuity between terminals.

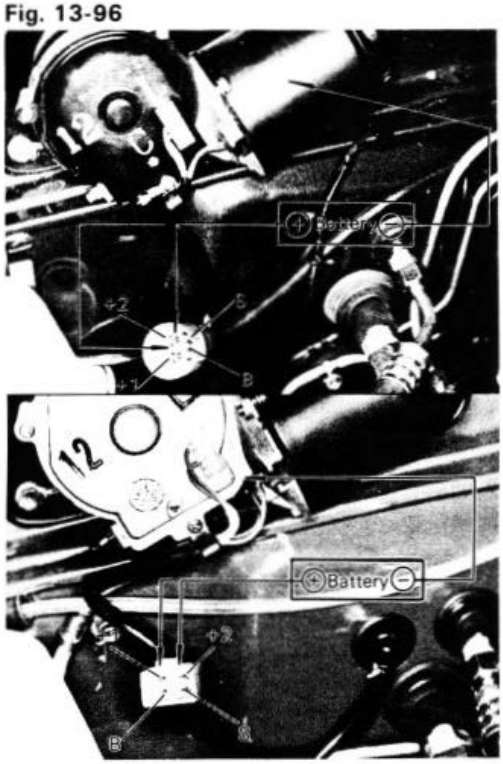
Between Terminals	Resistance (Ω)
1 — 2	240
3 — 4	∞
3 — 5	0

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

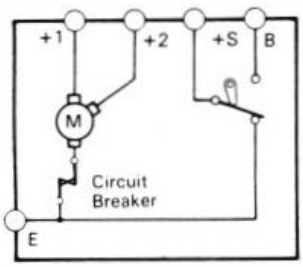


WIPER MOTOR & LINK

INSPECTION

With terminal +2 or +1 connected to the battery (+) terminal and motor body connected to the battery (—) terminal, confirm that the motor ratates smoothly

Fig. 13-97

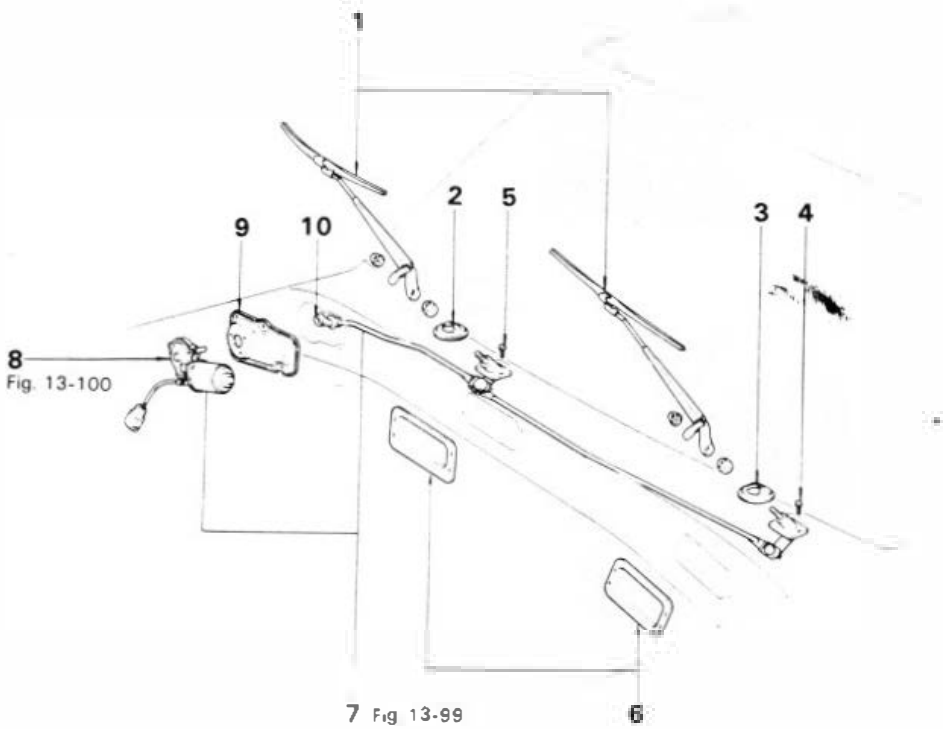


— Note —
Circuit breaker characteristics:
(Frigid Zone, Canada & Sweden)
When locked in low speed circuit at an ambient temperature of 20 — 30°C (68 — 86°F): The breaker should start opening in less than five minutes the 1st time tried. It should return in less than three minutes the 1st time tried.

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 togather.

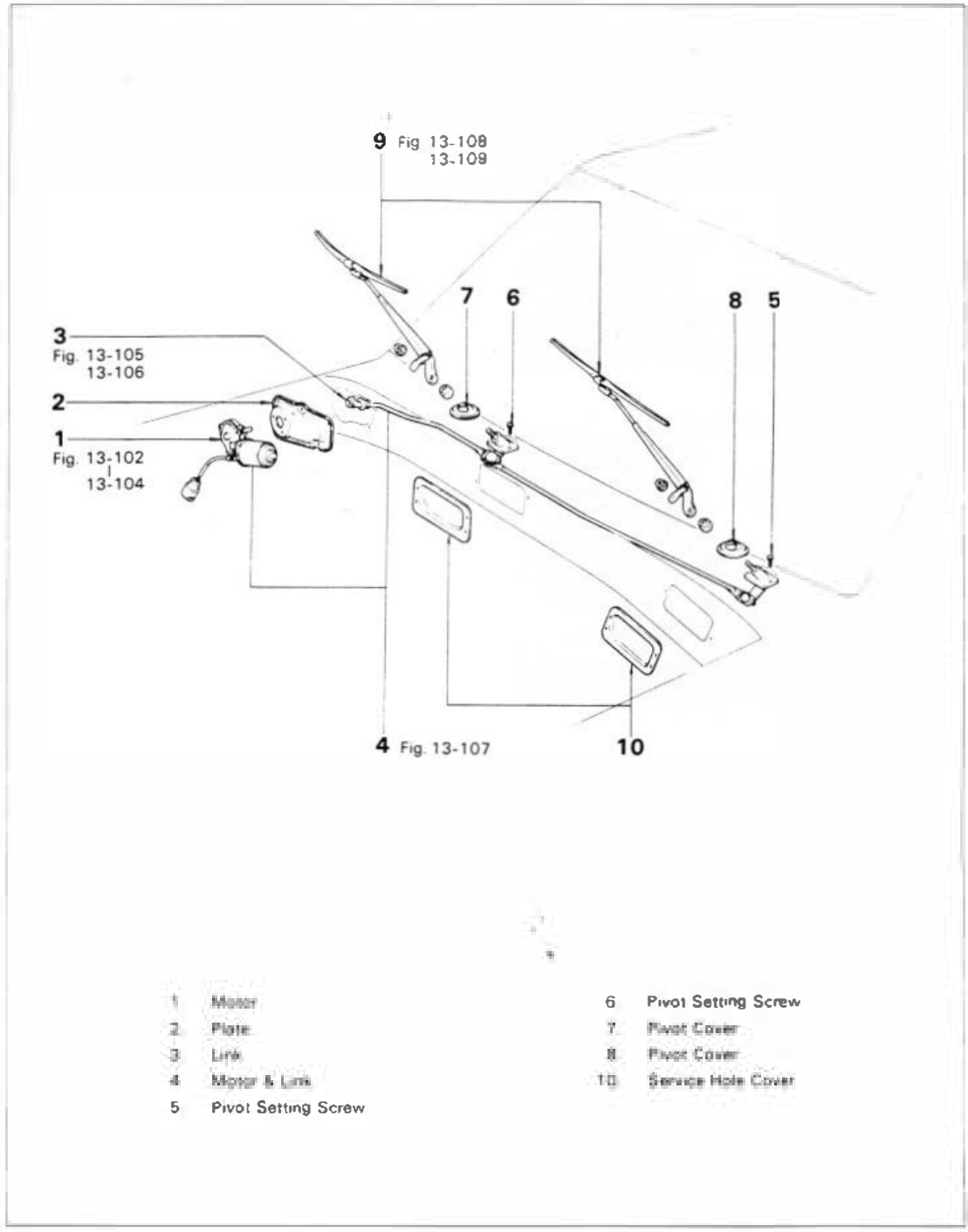
Fig. 13-100

Pry the link with screwdriver and disconnect the link from the motor

INSTALLATION

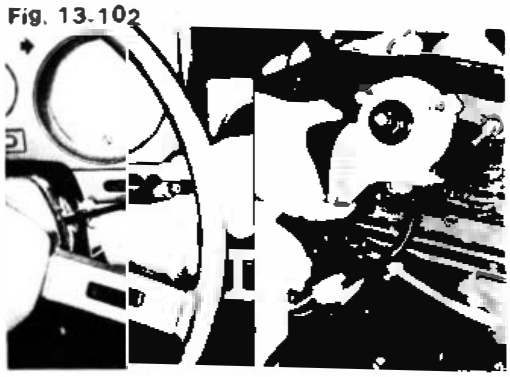
Install the parts in the numerical order shown in the figure

Fig. 13-101



1	Motor	6	Pivot Setting Screw
2	Plate	7	Pivot Cover
3	Link	8	Pivot Cover
4	Motor & Link	10	Service Hole Cover
5	Pivot Setting Screw		

Fig. 13-102



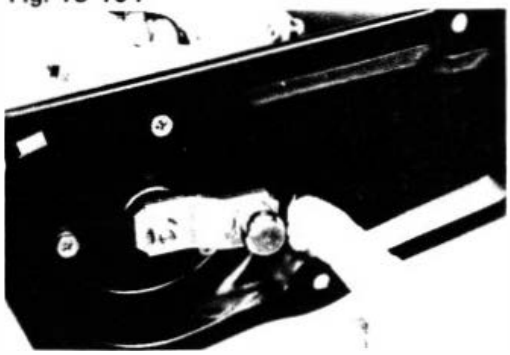
Before installing the motor, connect the motor link

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.

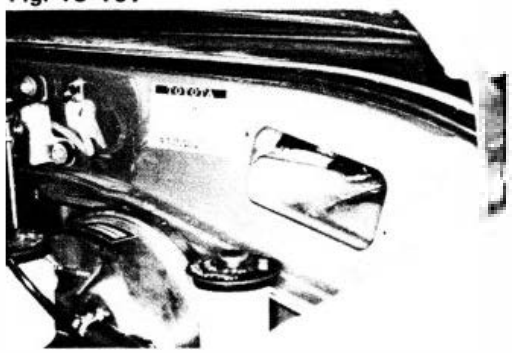
Fig. 13-105

Coat MP grease at the joint parts

Fig. 13-106

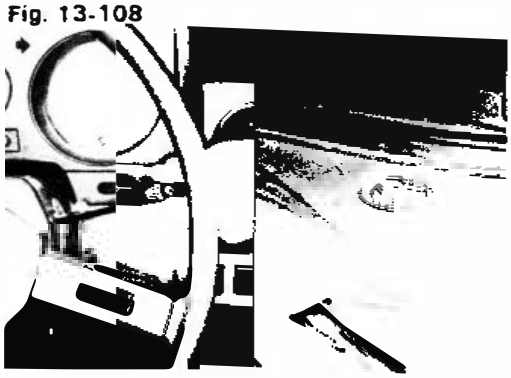
After connecting the motor and link, install the motor.

Fig. 13-107



Install the link under the reinforcement

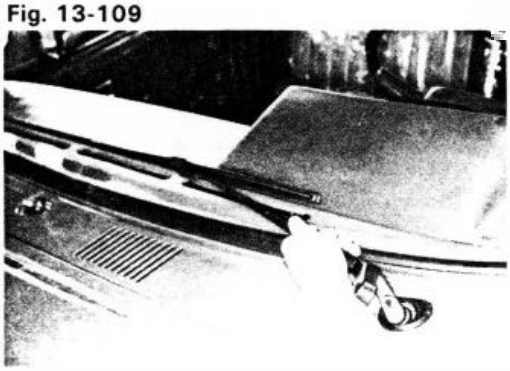
Fig. 13-108



Install the wiper arm.

1. Place the wire motor in the automatic stop position

Fig. 13-109

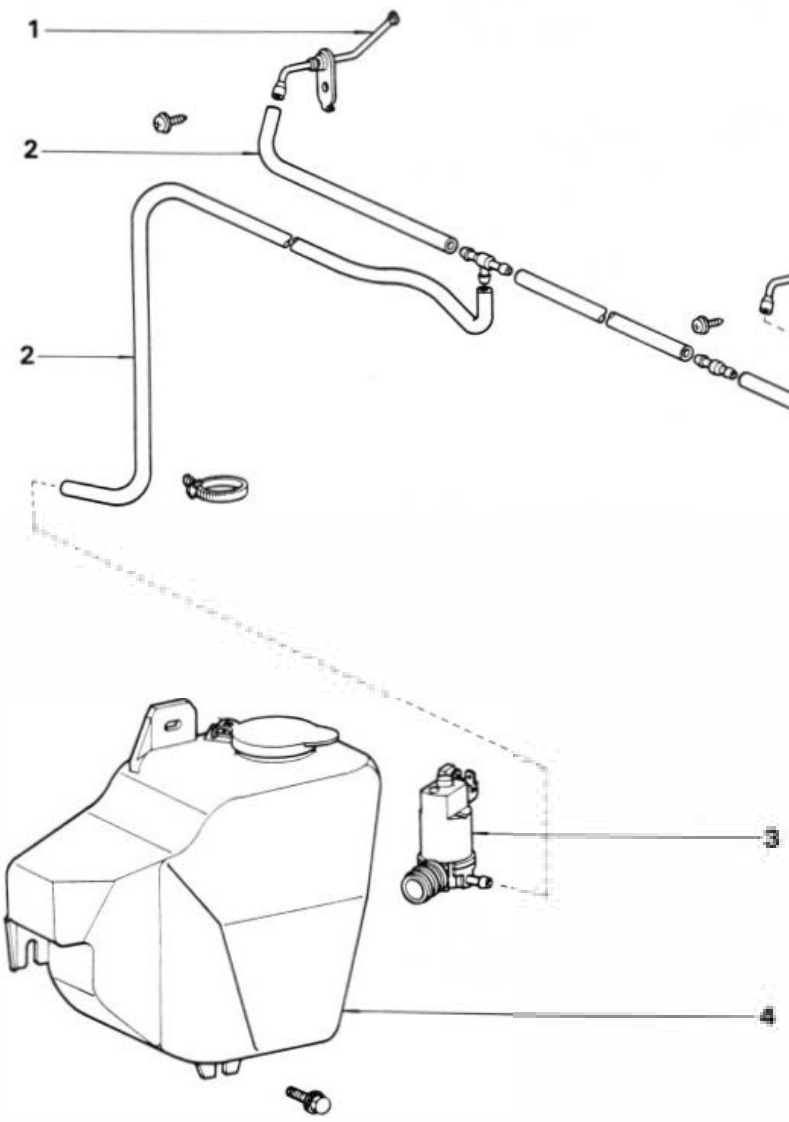


2. Install the wiper arm at the lower position

FRONT WASHER

COMPONENTS

Fig. 13-110

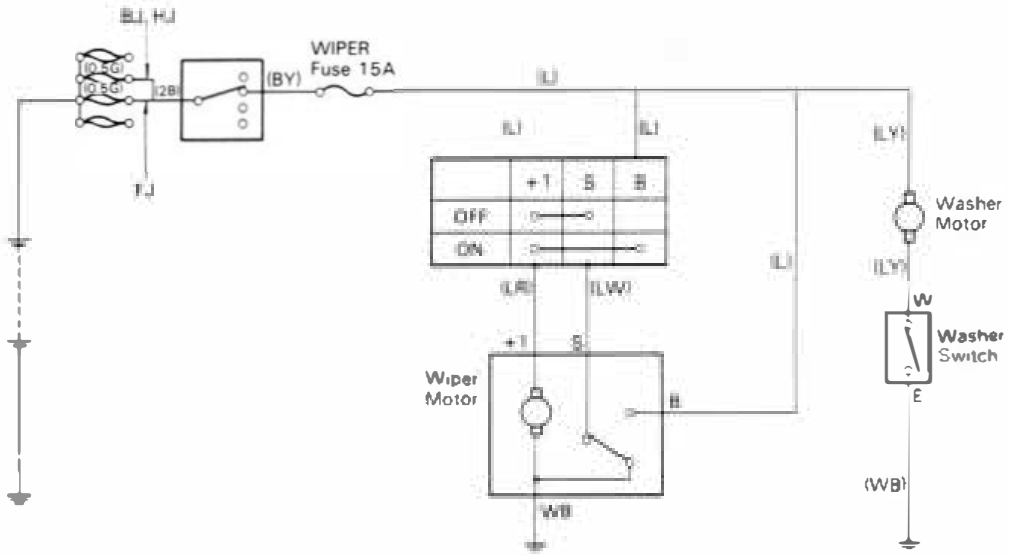


1. Washer Nozzle
2. Hose
3. Motor & Pump
4. Jar

REAR WIPER & WASHER

CIRCUIT DIAGRAM

Fig. 13-111



Wiring Side Terminal Position

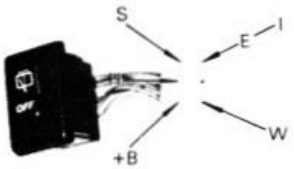
Fig. 13-112

REAR WIPER SWITCH

INSPECTION

1. Remove the switch.
2. Remove the center panel.
3. Disconnect the connector.

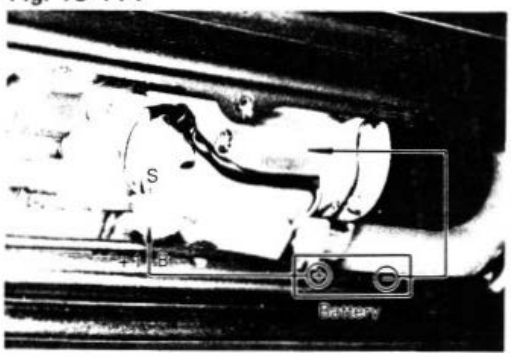
Fig. 13-113



4 Check the continuity between the terminals.

		S	+1	+B	E	W
Wiper	OFF	○—○				
	ON		●—●			
Washe					○—○	

Fig. 13-114



WIPER MOTOR

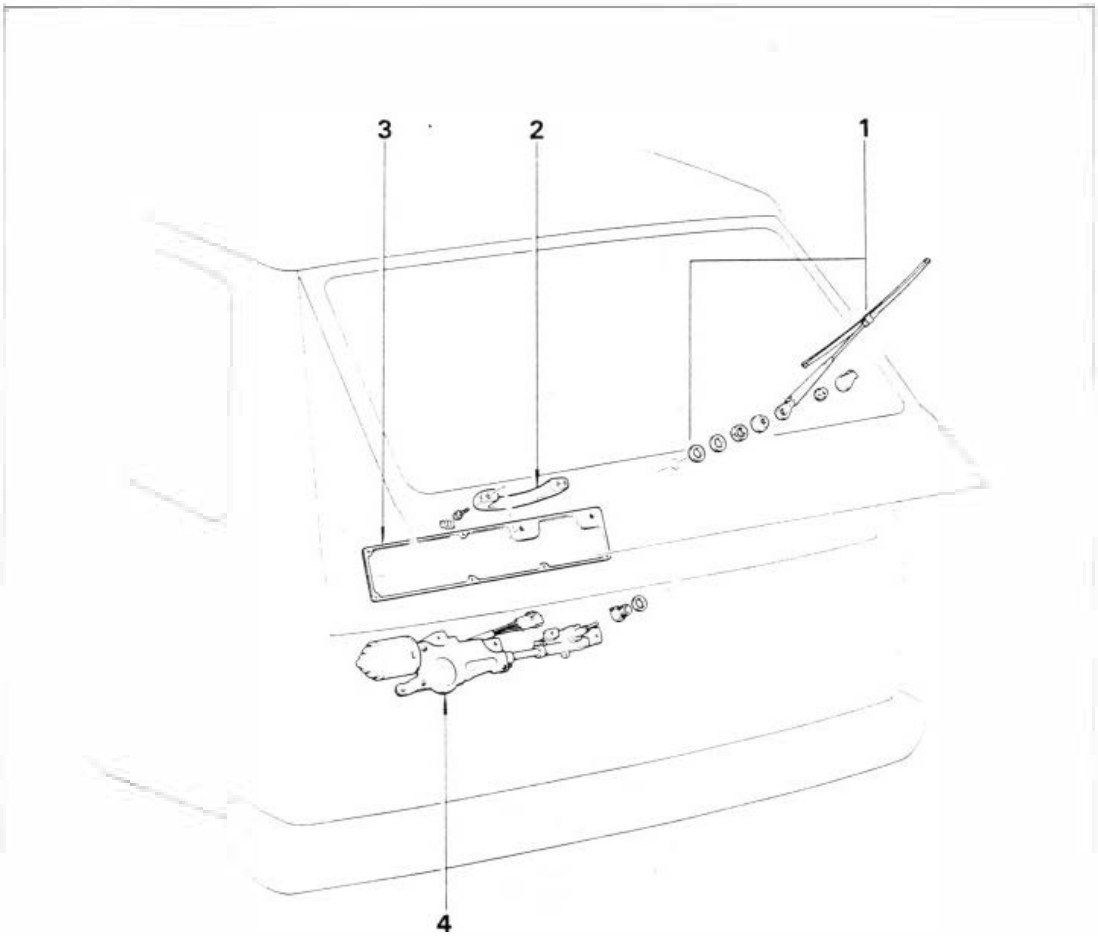
INSPECTION

With terminal (+1) connected to the battery (+) terminal and motor body connected to the battery (—) terminal, Comfirm that the motor rotates smoothly.

REMOVAL

Remove the parts in the numerical order shown in the figure

Fig. 13-115

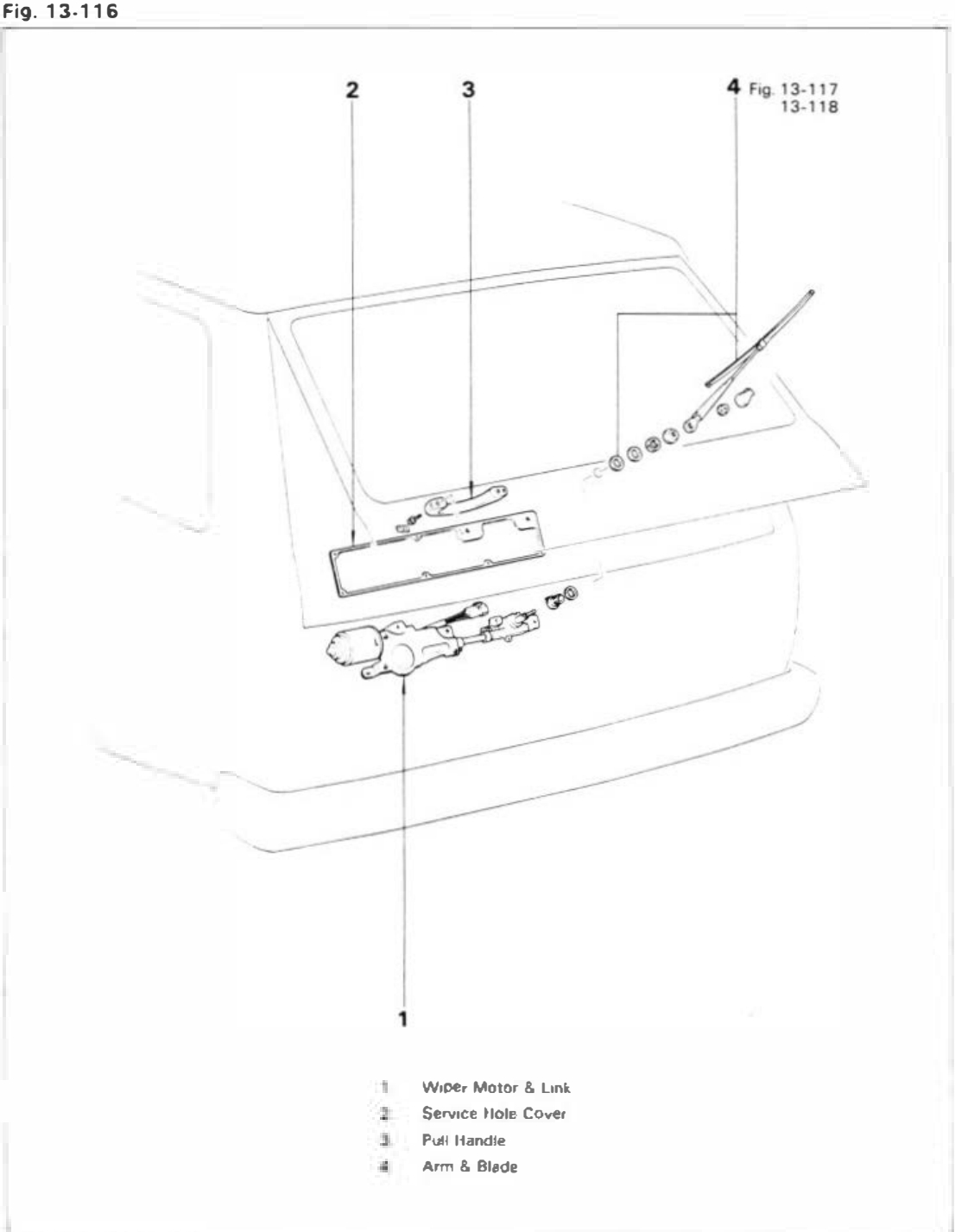


1. Arm & Blade
2. Pull Handle
3. Service Hole Cover
4. Wiper Motor & Link

INSTALLATION

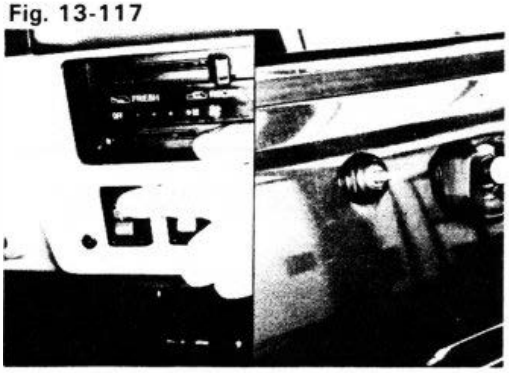
Install the parts in the numerical order shown in the figure.

Fig. 13-116



1. Wiper Motor & Link
2. Service Hole Cover
3. Pull Handle
4. Arm & Blade

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

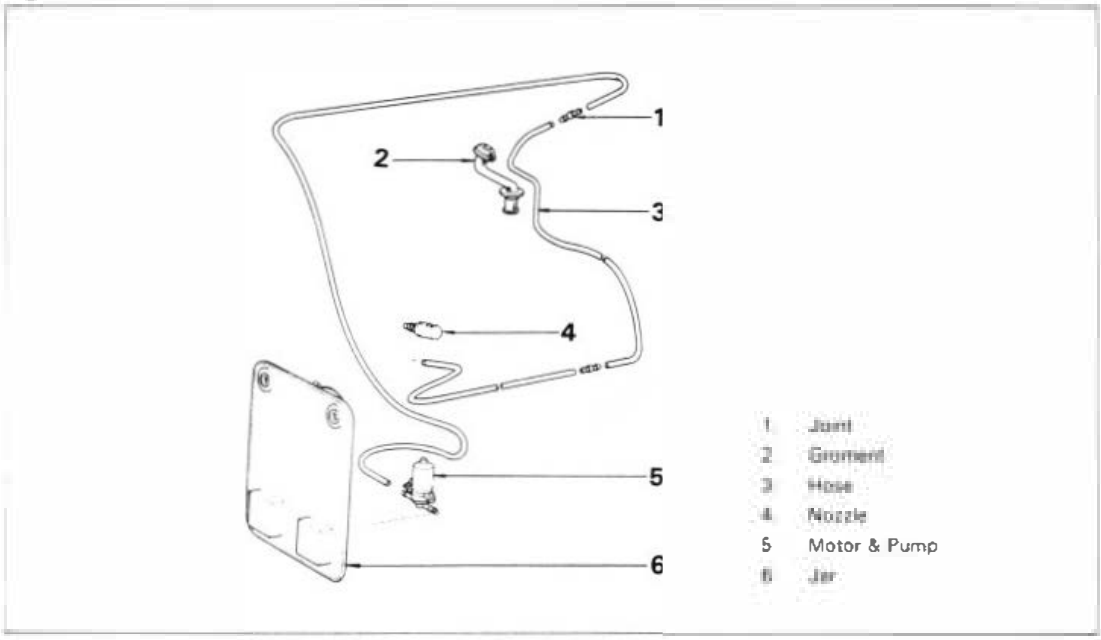
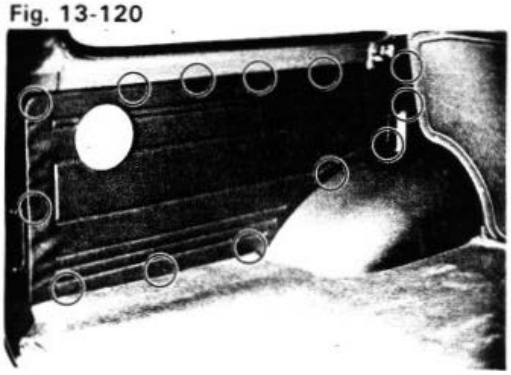


Fig. 13-120

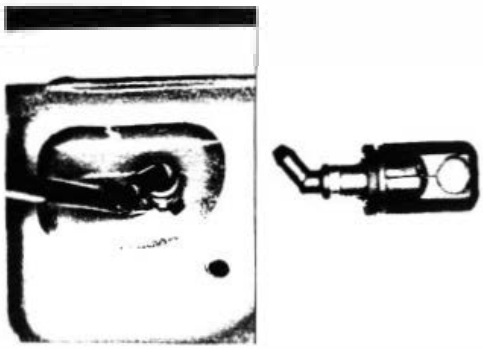


REMOVAL

The clips are located as shown in the figure

– Note –
The washer tank is installed behind the trim.

Fig. 13-121

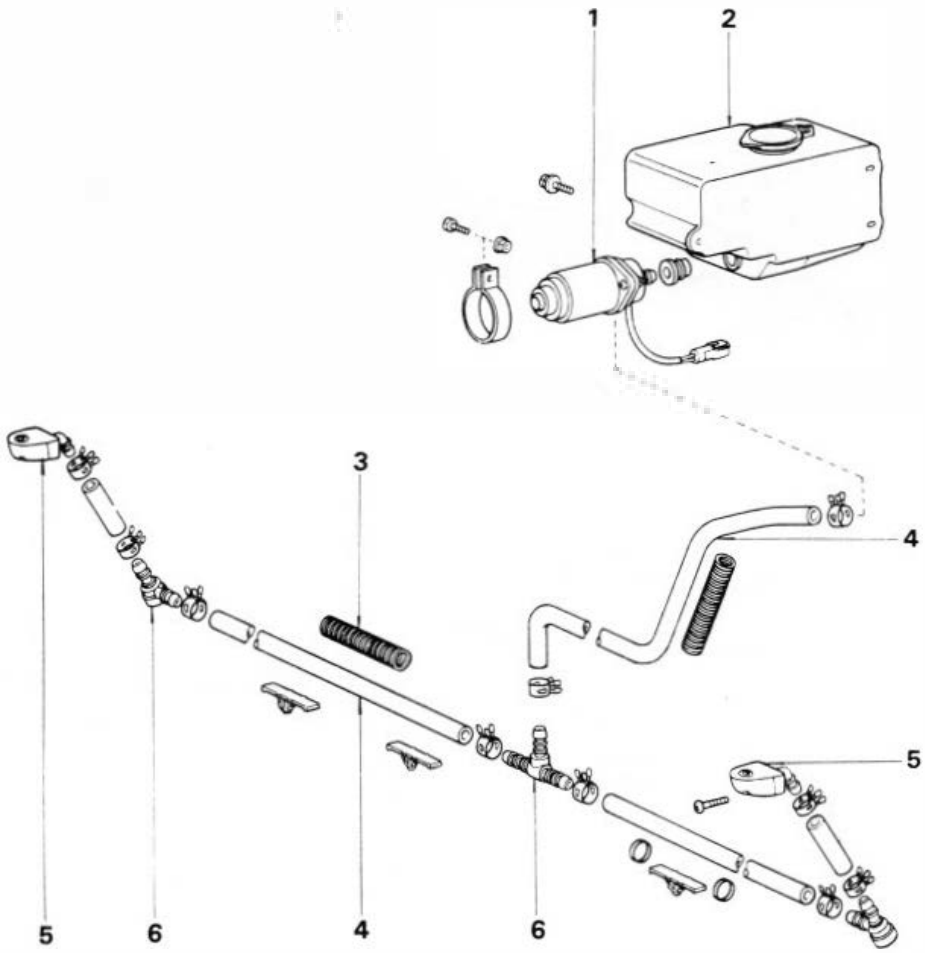


Push up one lock clip a screwdriver when remove the nozzle

HEADLIGHT CLEANER

COMPONENTS

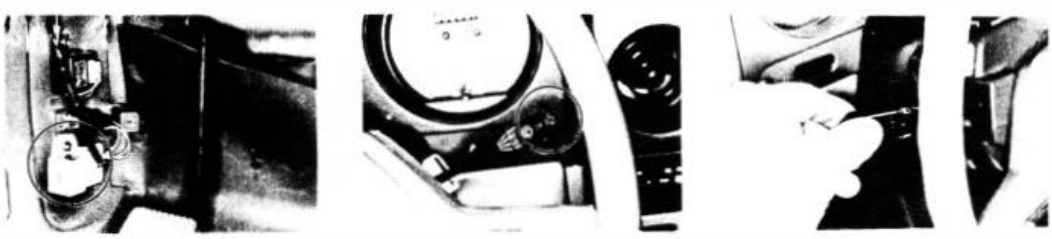
Fig. 13-122

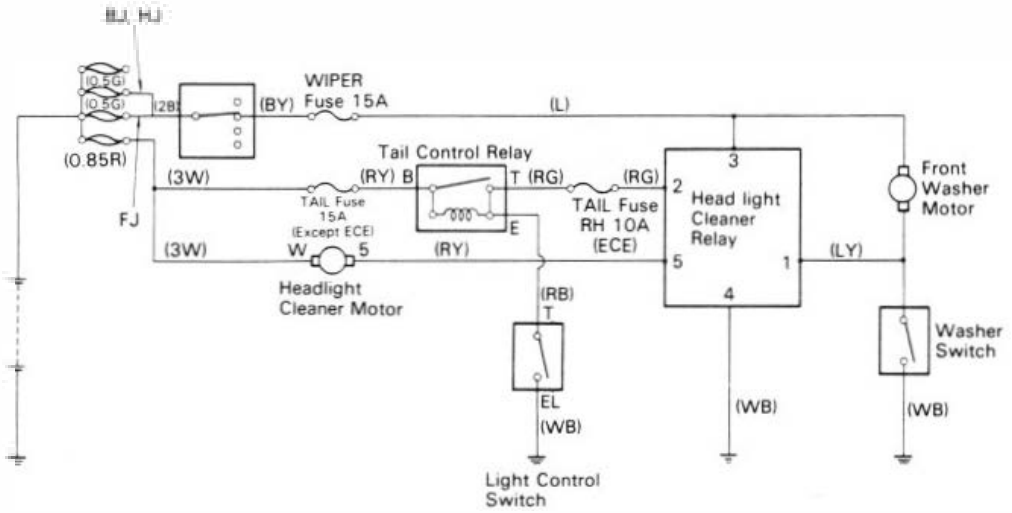


1. Washer Motor
2. Washer Jar
3. Hose Protector
4. Hose
5. Washer Nozzle
6. Hose Joint

CIRCUIT DIAGRAM

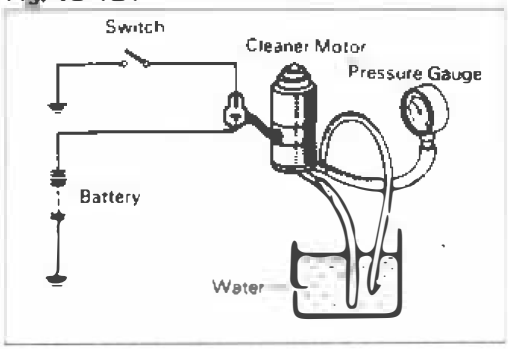
Fig. 13-123





Wiring Side Terminal Position

Fig. 13-124

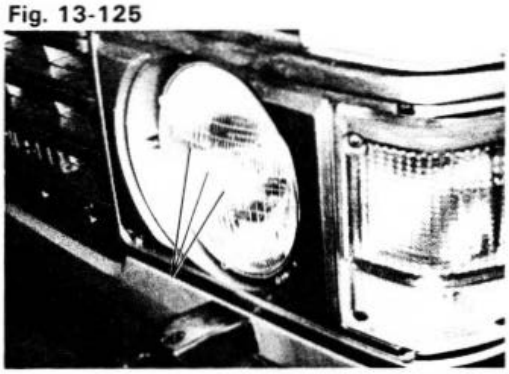


INSPECTION

Mount a pressure gauge to the outlet union, and check the motor discharge pressure.

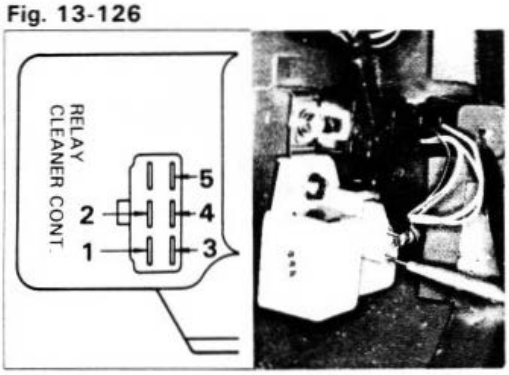
Discharge pressure:
1.8 kg/cm² Over
(26 psi)

Fig. 13-125



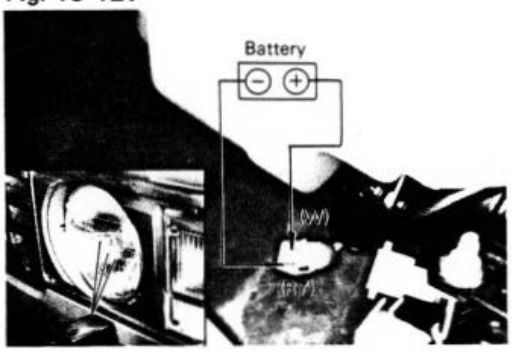
– Note –
If one nozzle starts spraying extremely faster than the other, replace the nozzle assembly.

Fig. 13-126



Battery voltage should be on terminals 3, 2 and 5.

Fig. 13-127



CLEANER MOTOR

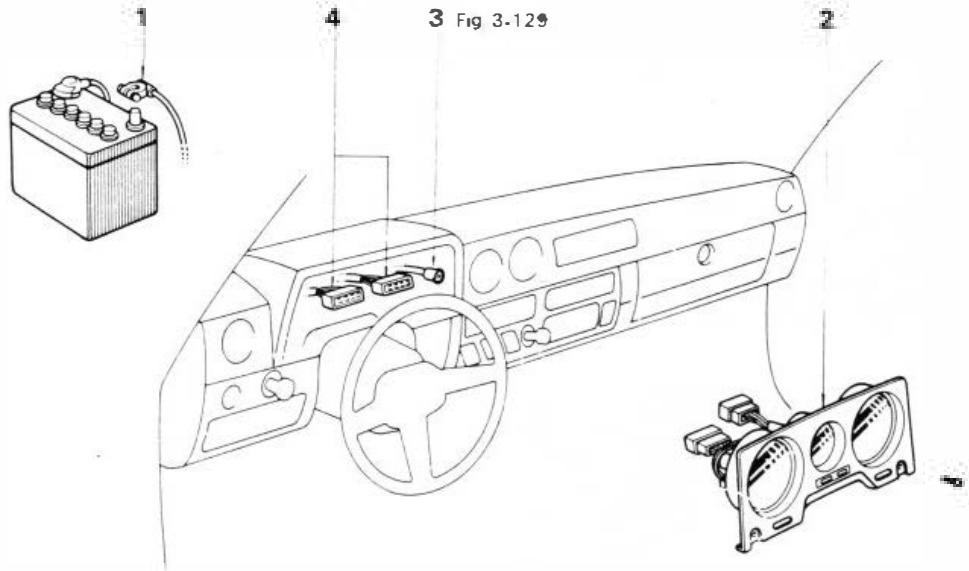
When connecting the battery voltage to the connector, the water is injectered from the nozzle.

SPEEDOMETER & COMBINATION METER

REMOVAL

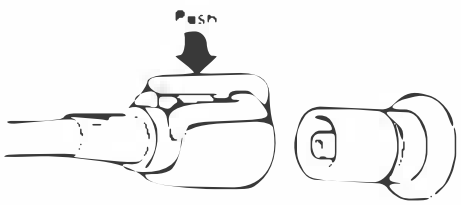
Remove the parts in the numerical order shown in the figure

Fig. 13-128



1 Battery Terminal
2 Combination Meter
3 Speedometer Cable
4 Connector

Fig. 13-129

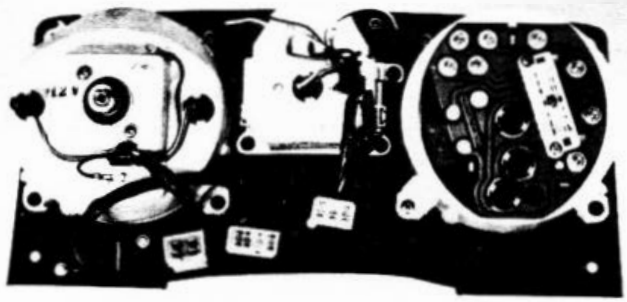


Before removing the combination meter, pull out the cable while pushing the lock lever

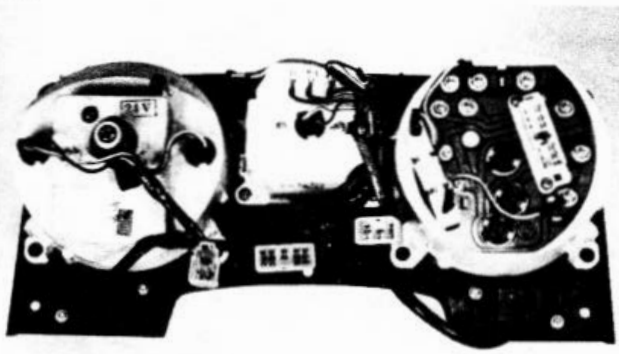
INSPECTION

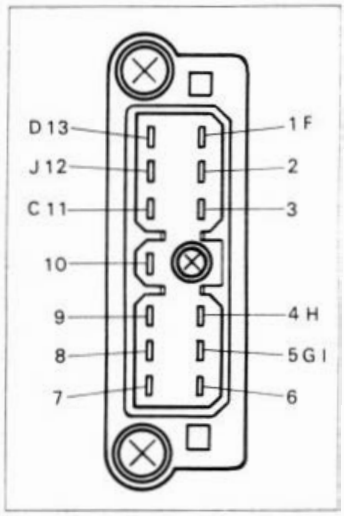
Fig. 13-130

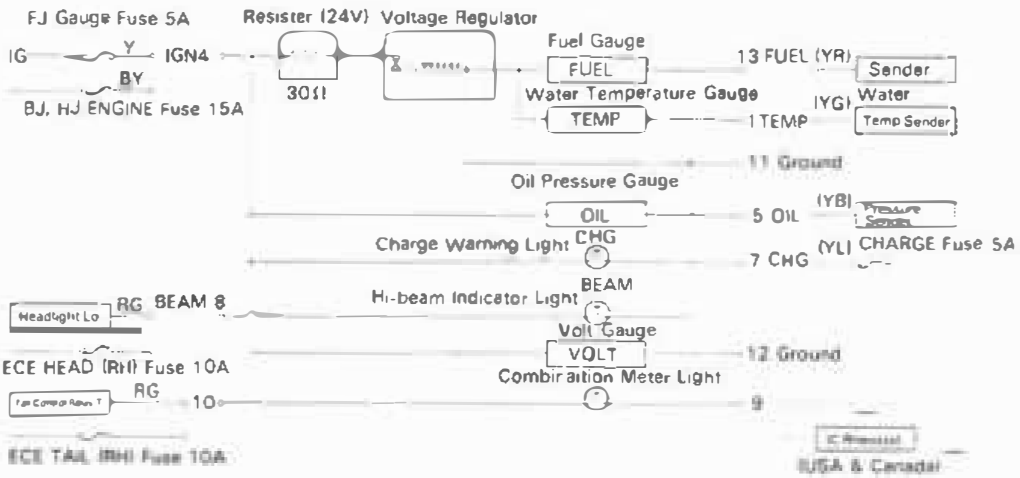
12V



24V



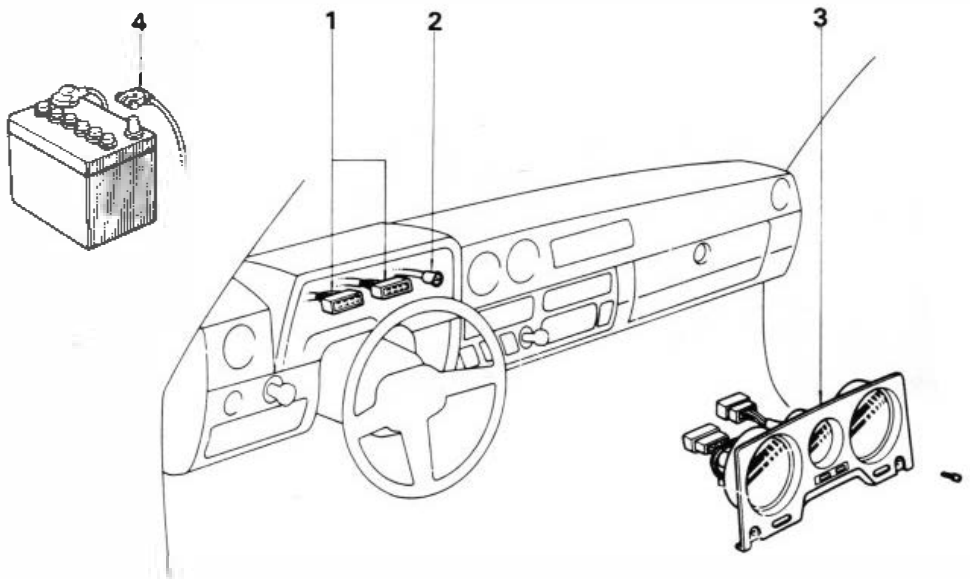




INSTALLATION

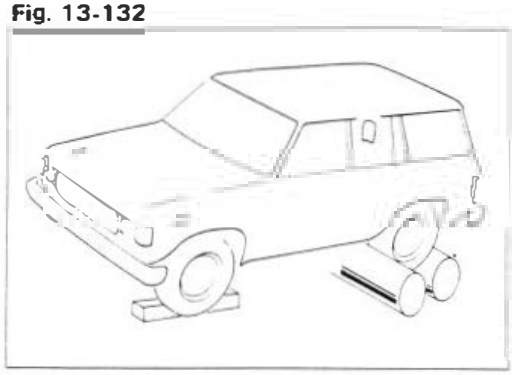
Install the parts in the numerical order shown in the figure

Fig. 12-131



1. Connector
2. Speedometer Cable
3. Combination Meter
4. Battery Terminal

Fig. 13-132



SPEEDOMETER

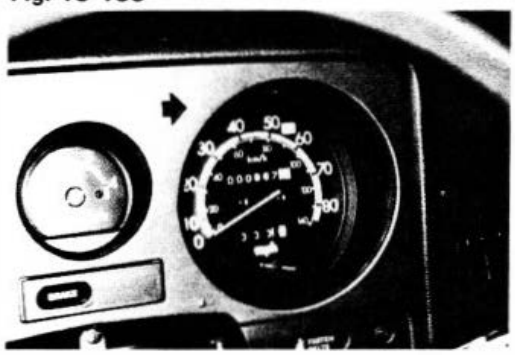
ON-VEHICLE INSPECTION

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 poiter 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

CURCUIT DIAGRAM

Fig. 13-134

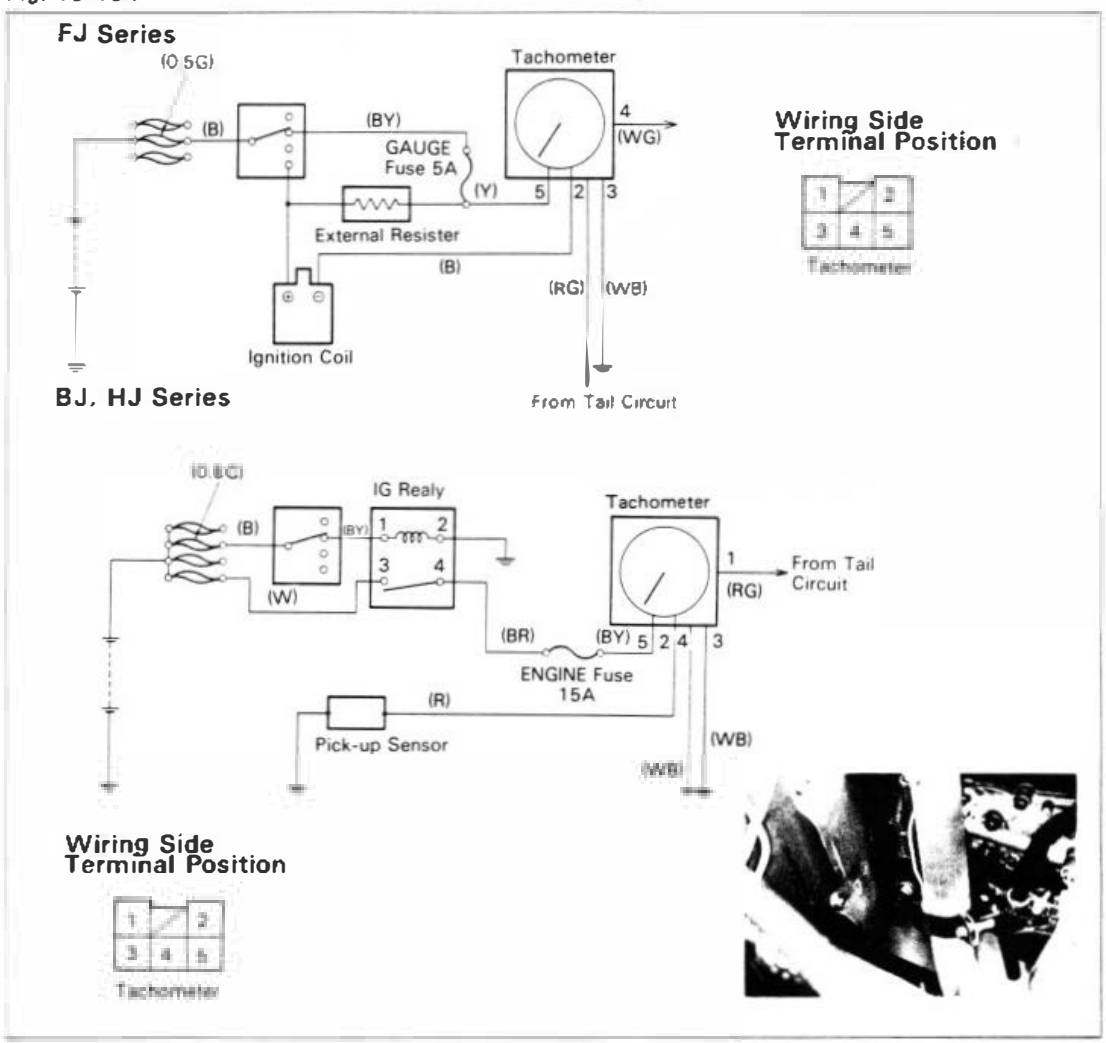
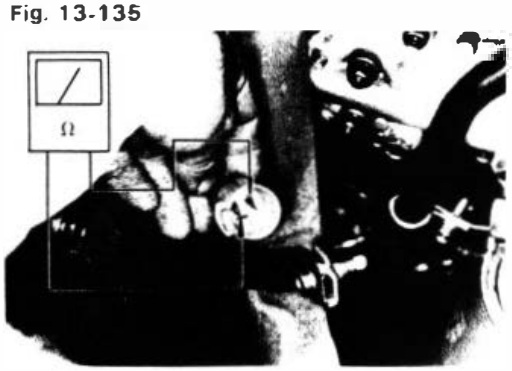


Fig. 13-135



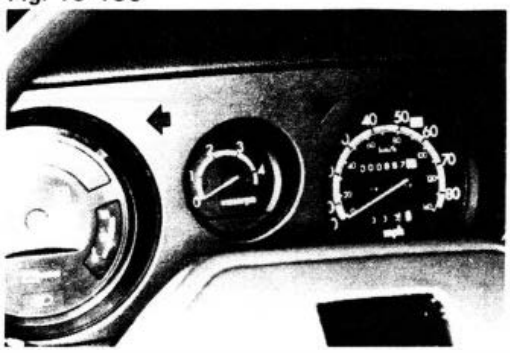
INSPECTION

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 —

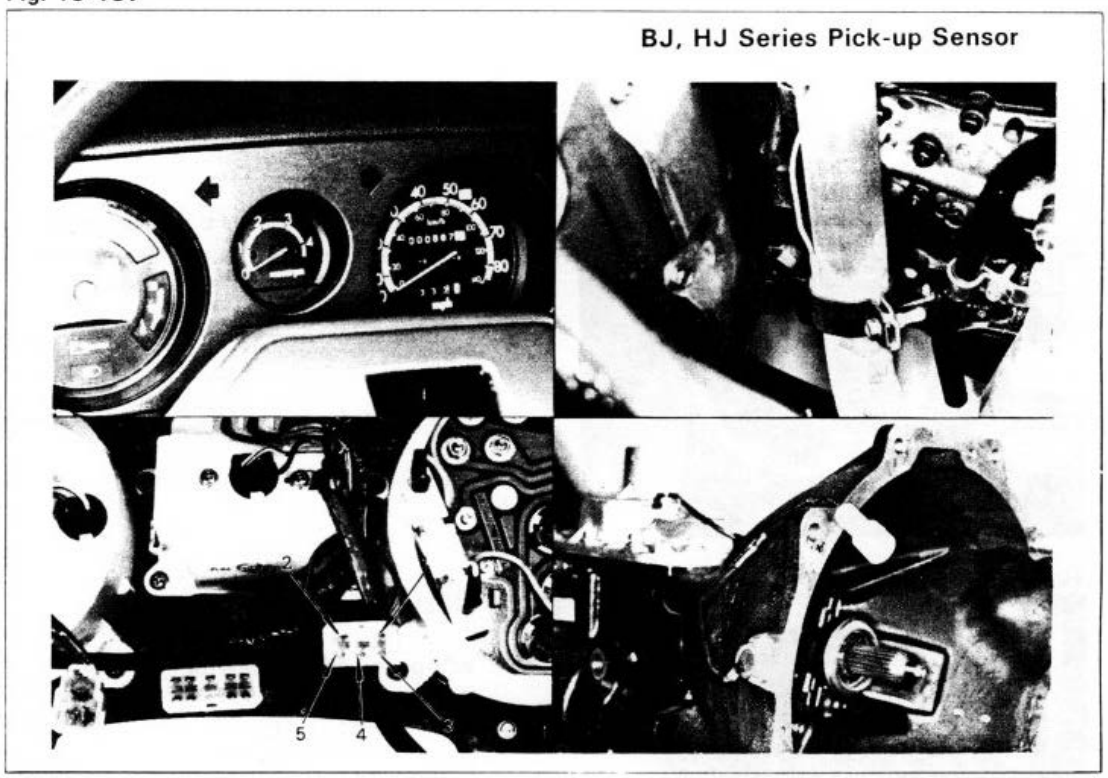
1. **Do not reverse battery connections as this tachometer is intended only for use in (−) gound vehicles. A reversed connection could damage the transistors and diodes contained inside.**
2. **In removing or installing the tachometer, be careful not to drop it or subject it to heavy shocks.**

Tachometer allowable range

rpm	1,000	2,000	3,000
20°C 13V	± 100	± 125	± 150

COMPONENTS

Fig. 13-137



VOLTAGE METER

CIRCUIT DIAGRAM

Fig. 13-138

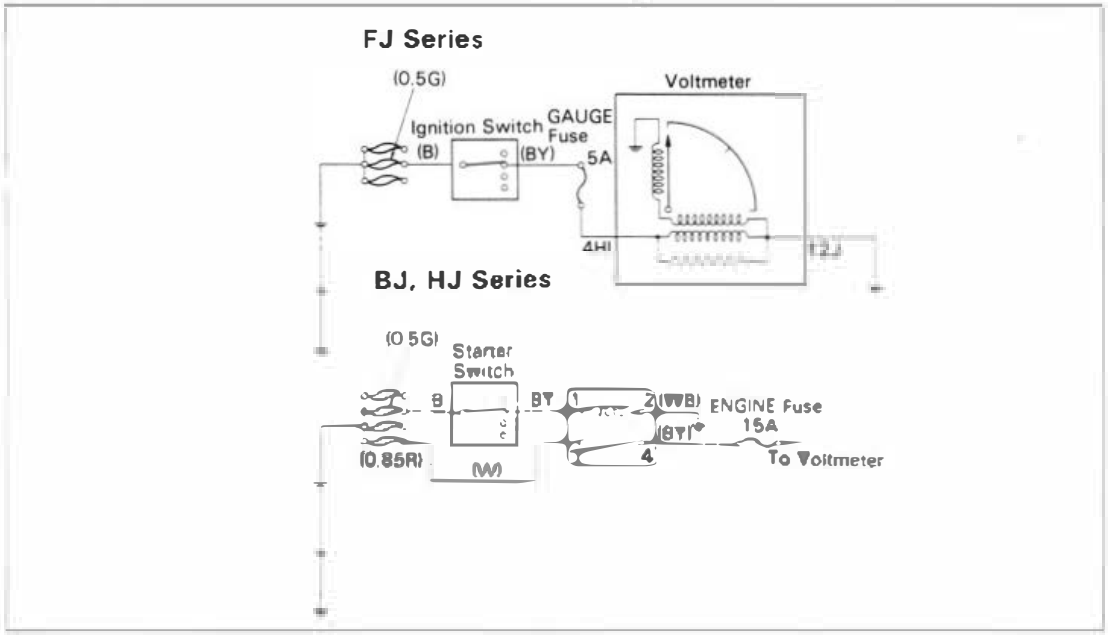
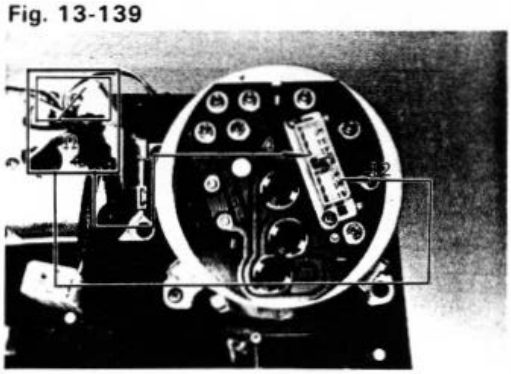


Fig. 13-139

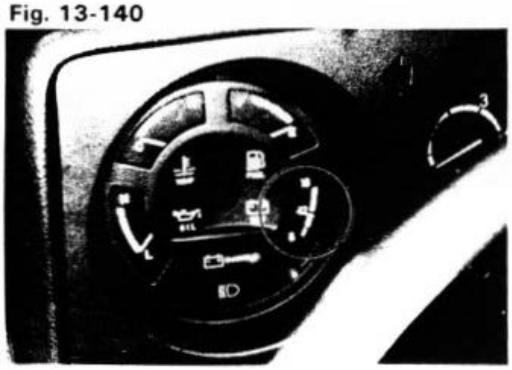


INSPECTION

Measure the resistance between terminals II each resistance value as shown in the table below. the relay is in good condition

Between terminals	Resistance (Ω)
1 – 4	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	± 0.3	+ 0.6 – 0.4

W/24V Battery

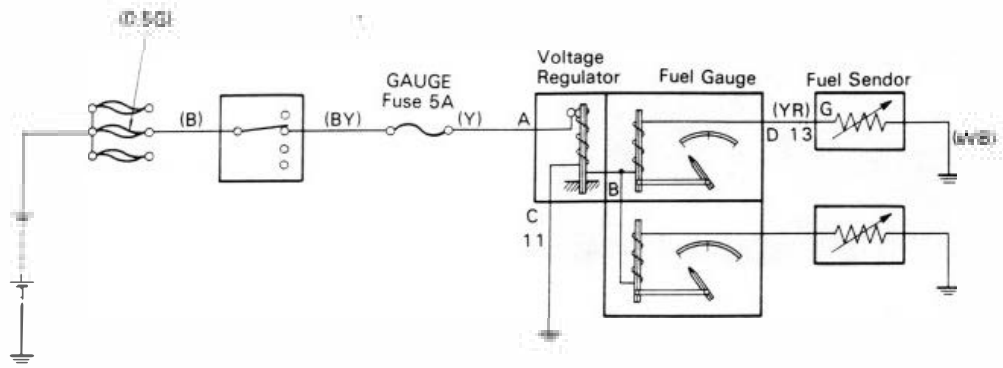
	20	24	28
Error	+ 0.8 – 1.2	± 0.6	+ 1.2 – 0.8

FUEL GAUGE

CIRCUIT DIAGRAM

Fig. 13-141

FJ Series



BJ, HJ Series

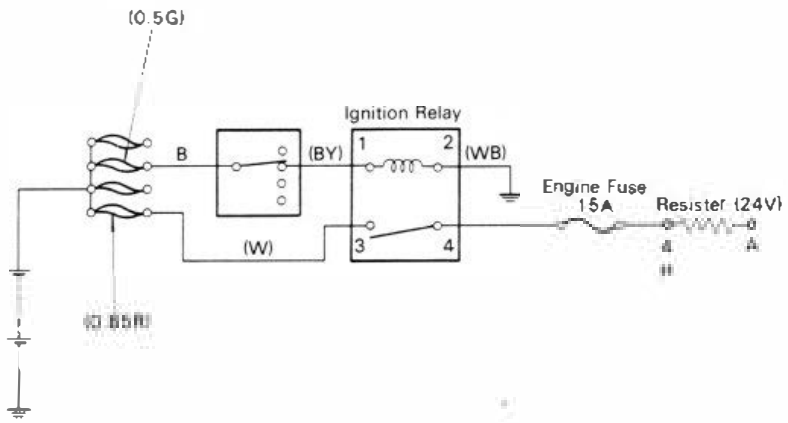
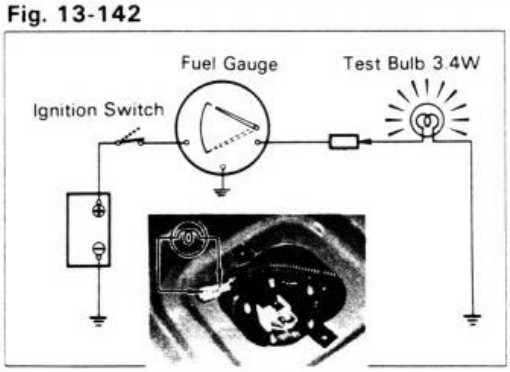


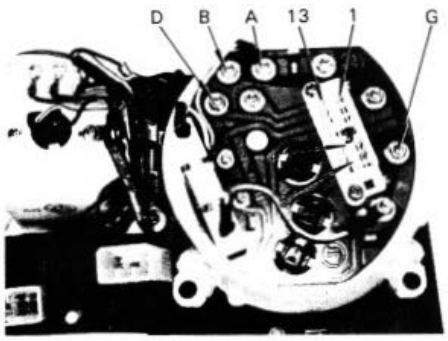
Fig. 13-142



ON-VEHICLE INSPECTION

1. Pull the connector out of the fuel sender gauge andground it through a 3.4W bulb
2. After the ignition switch is turned ON, the bulb should start flashing with in several seconds, and the gauge needle should vibrate.

Fig. 13-143



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)

Fig. 13-144

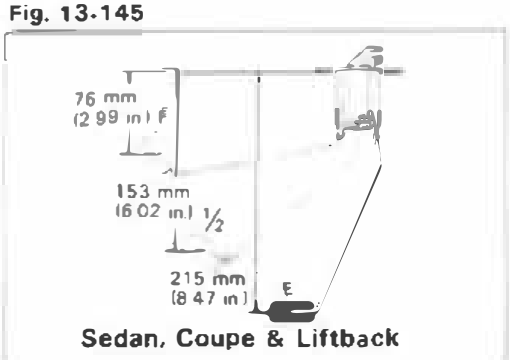
FUEL SENDER GAUGE

REMOVAL

Remove the following parts

1. Rear floor carpet
2. Rear floor wire harness protector
3. Connector
4. Fuel sender gauge

Fig. 13-145



Sedan, Coupe & Liftback

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

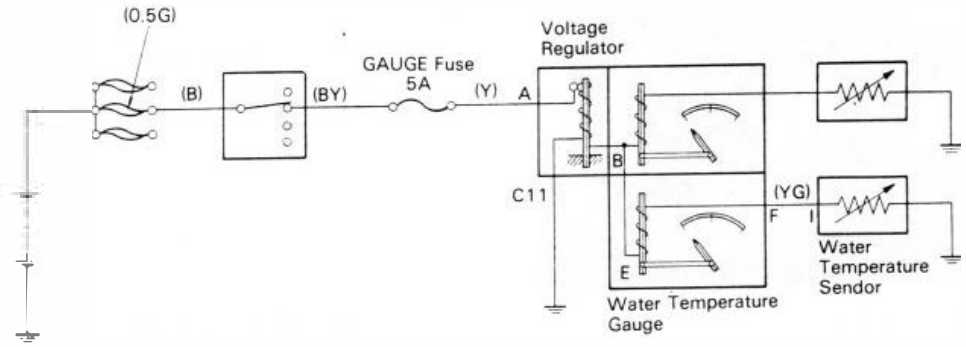
Float position	Resistance (Ω)
F	17±2.1
1/2	40±4.5
E	120±0.5

WATER TEMPERATURE GAUGE

CIRCIUT DIAGRAN

Fig. 13-146

FJ Series



BJ, HJ Series

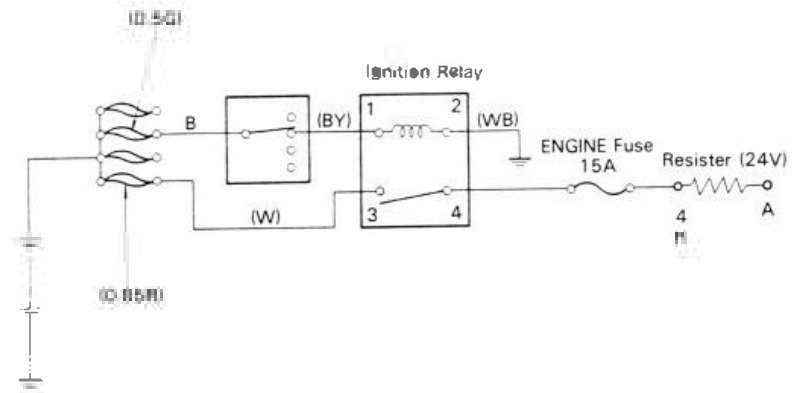
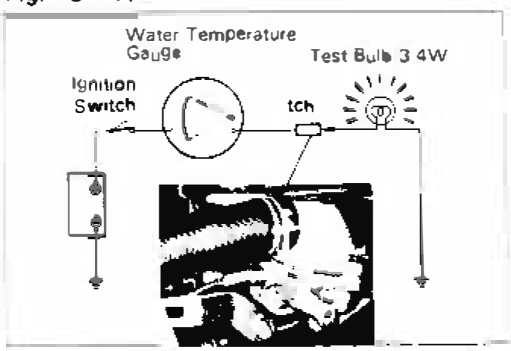


Fig. 13-147



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

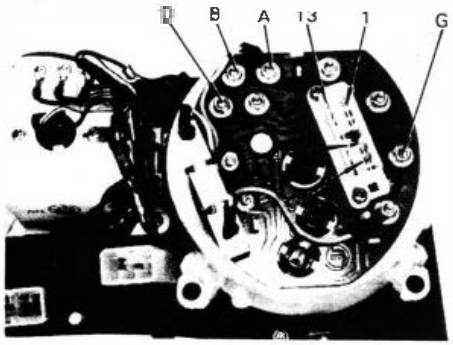
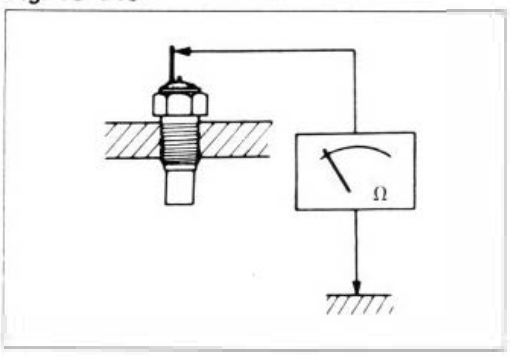


Fig. 13-149



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

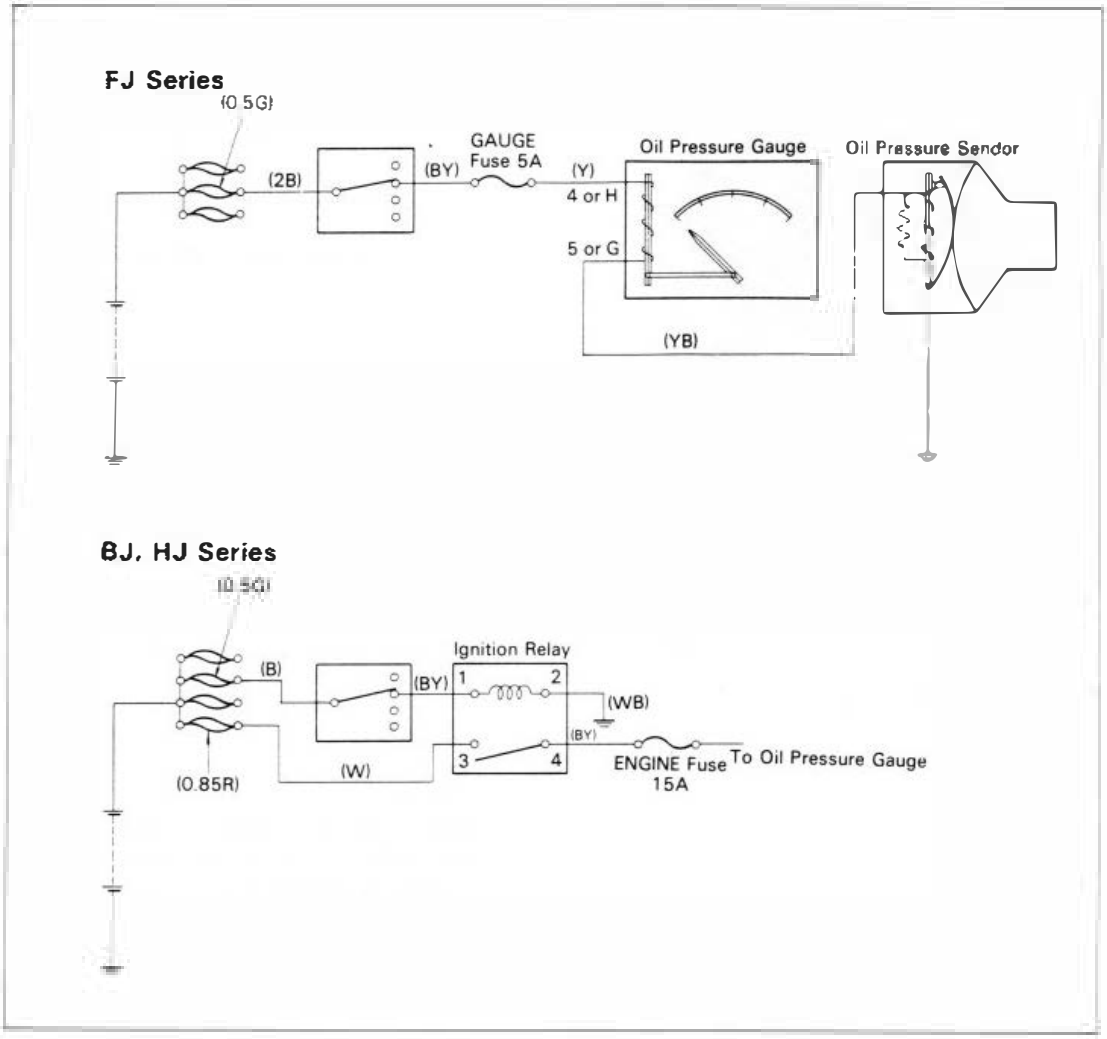
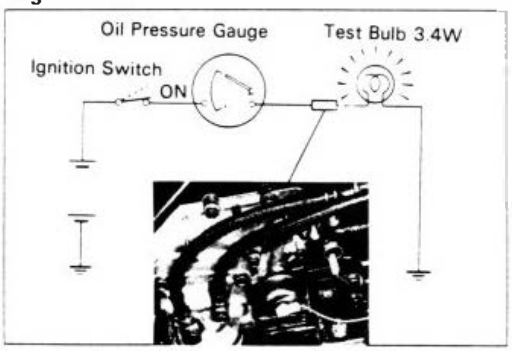


Fig. 13-151

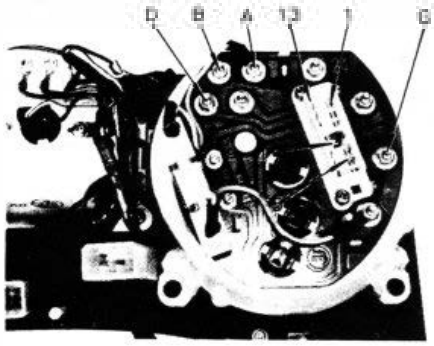


OIL PRESSURE RECEIVER GAUGE

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



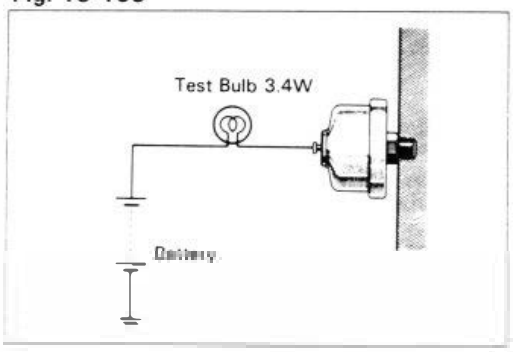
INSPECTION

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

Fig. 13-153



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 –

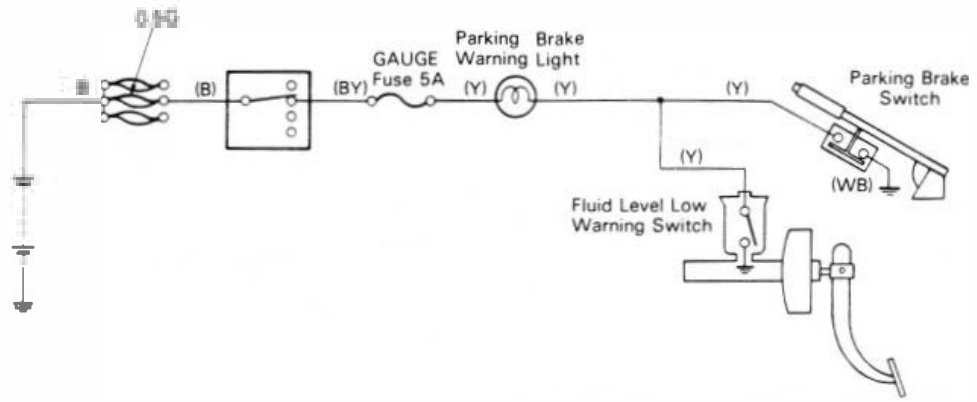
Even when the engine is stopped, the bulb may light for an instant when the battery voltage is applied, but this is normal.

BRAKE WARNING SYSTEM

CIRCIUT DIAGRAM

Fig. 13-154

FJ Series



BJ, HJ Series

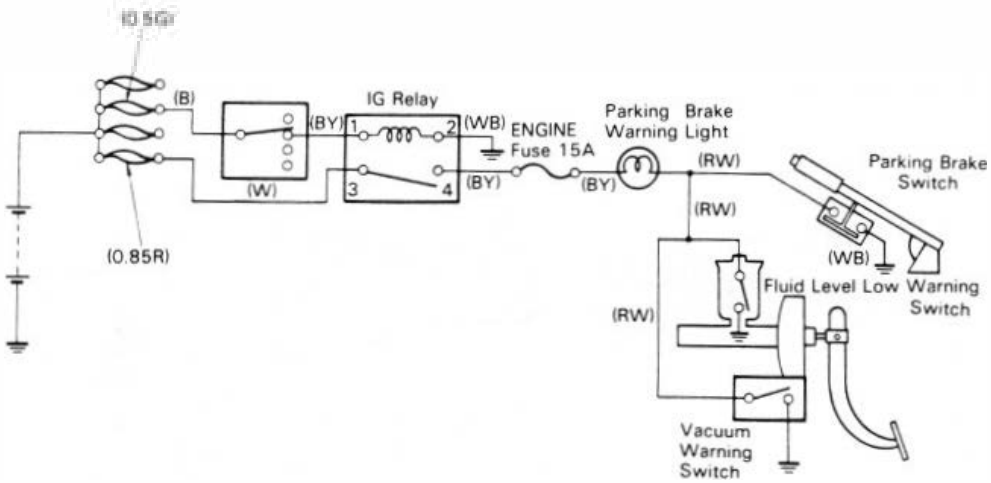
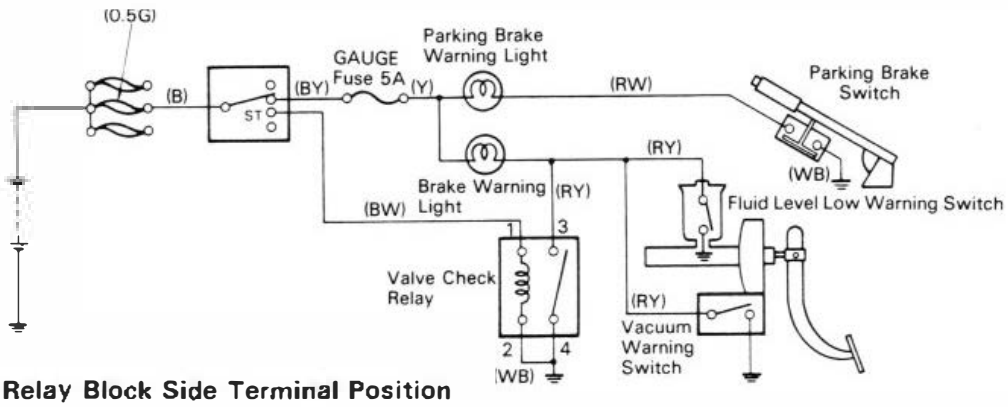


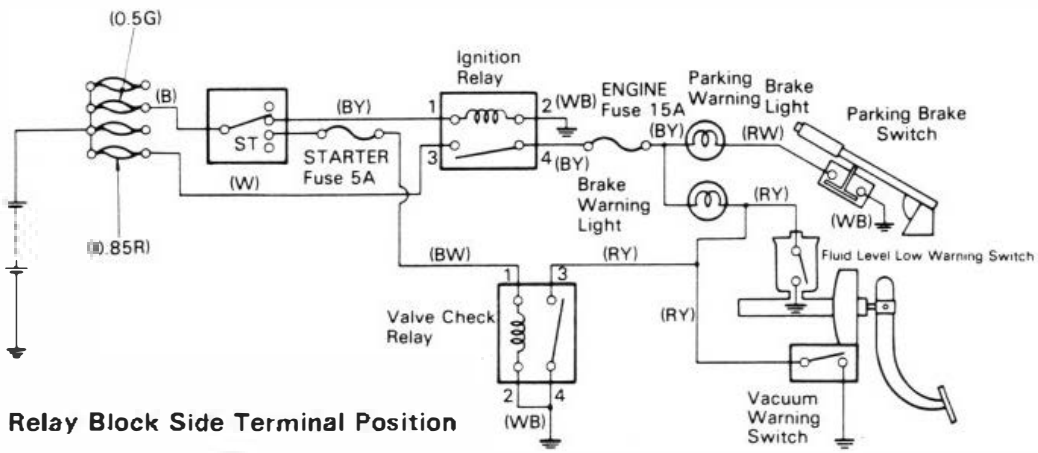
Fig. 13-155

FJ Series (ARL)



Relay Block Side Terminal Position

HJ Series (ARL)



Relay Block Side Terminal Position

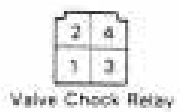
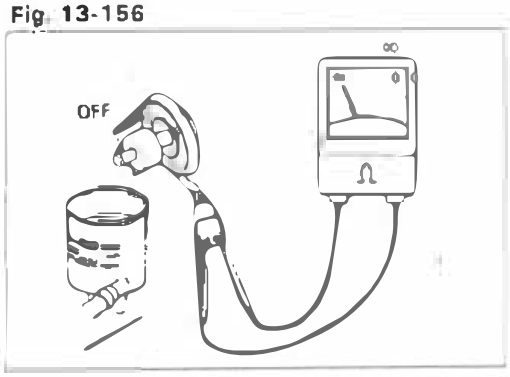


Fig. 13-156

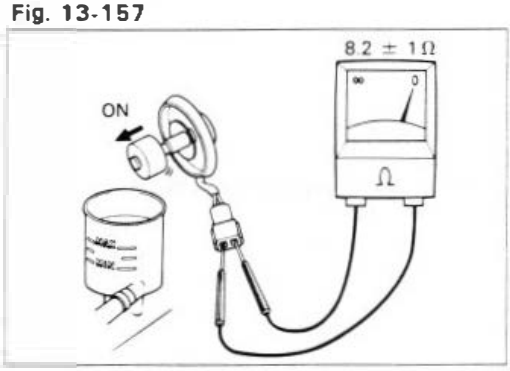


BRAKE FLUID LOW LEVEL WARNING SWITCH

ON-VEHICLE INSPECTION

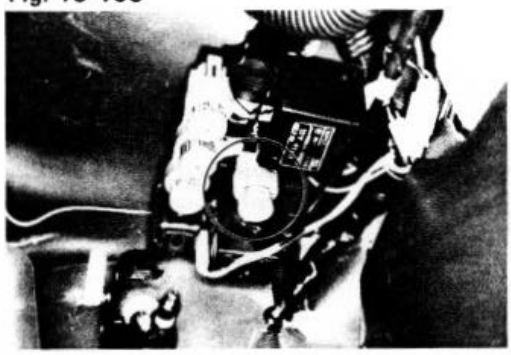
When the float is up, the lead switch should be OFF (∞)

Fig. 13-157



When the float is down, the lead switch should be ON (8.2 ± 1 Ω).

Fig. 13-158

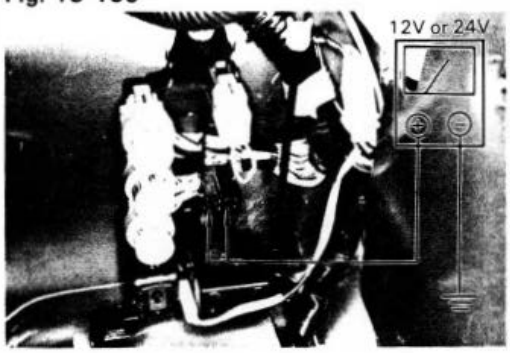


BULB CHECK RELAY

INSPECTION

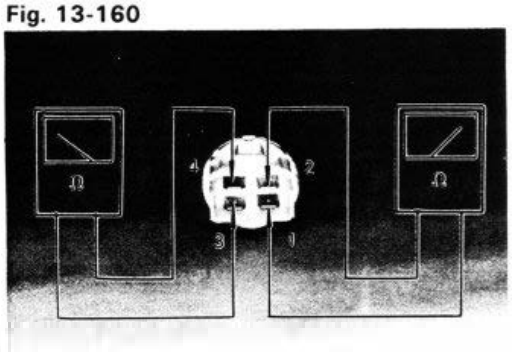
1. Remove the cowl side trim RH
2. Remove the rear fog light relay from the relay block No.1

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

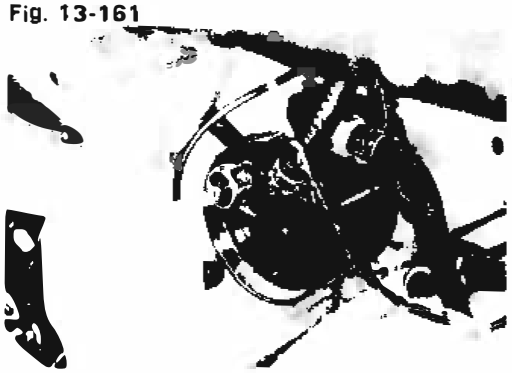
Fig. 13-160



3 Measure resistance between terminals

Between terminals	Resistance (Ω)	
1 — 3	12V	24
	approx 65	245
2 — 4	∞	∞

Fig. 13-161

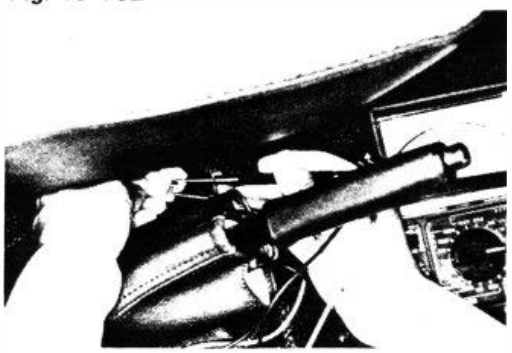


Vacuum Warning Switch

Check the continuity between terminals

With engine running	ON
With engine stopping	OFF

Fig. 13-162



Parking Brake Switch

Check the continuity between terminals

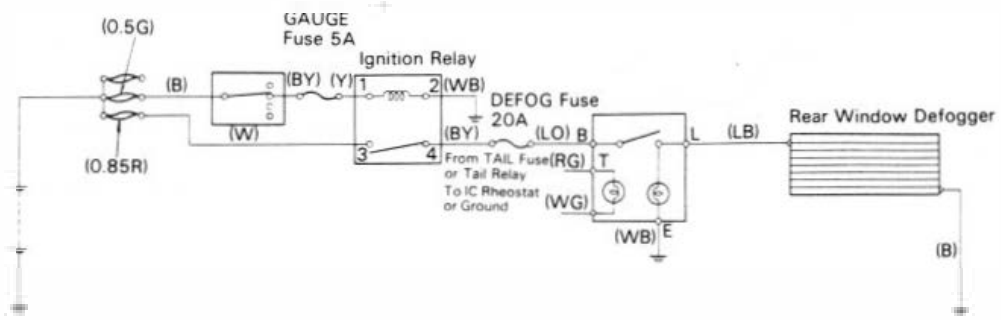
When pulling the lever	ON
When release the lever	OFF

REAR WINDOW DEFOGGER

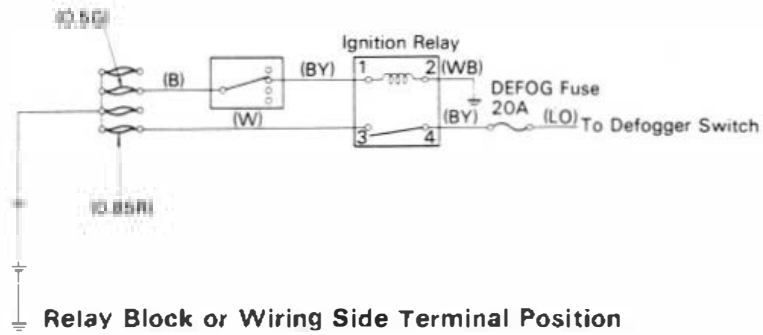
CIRCUIT DIAGRAM

Fig. 13-163

FJ Series



BJ, HJ Series



Relay Block or Wiring Side Terminal Position

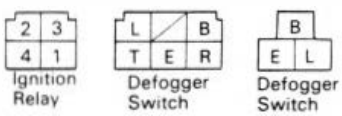
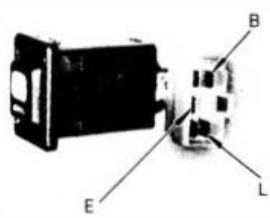


Fig. 13-164

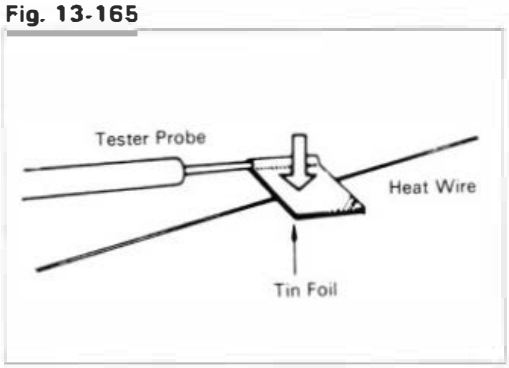


INSPECTION

1. Check the continuity between terminals If there is a continuity between terminals as shown in the table be low, the switch is in good condition.

Switch position \ Terminal	B	L	E
OFF		○	○
ON	○	○	○

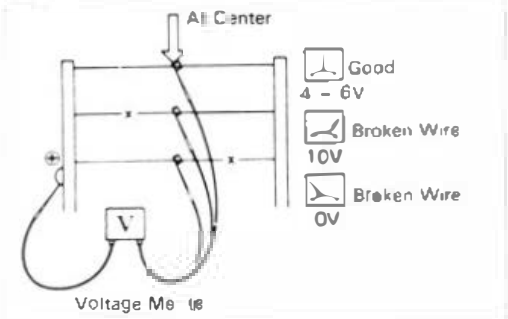
Fig. 13-165



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



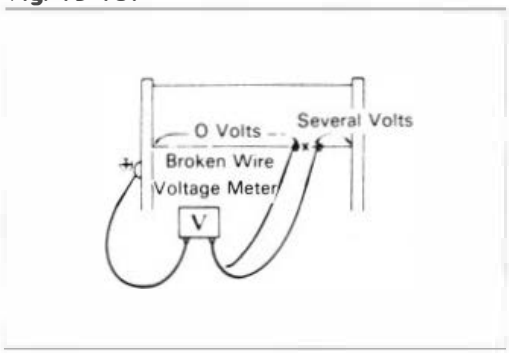
PRINTED HEAT WIRE

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

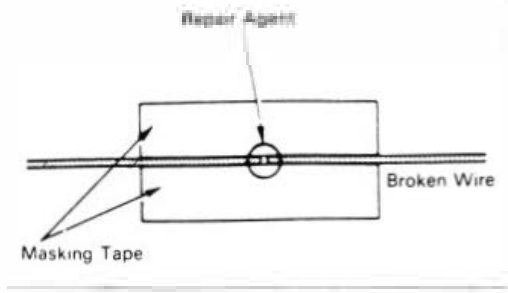
Fig. 13-167



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 (+) 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

Fig. 13-168



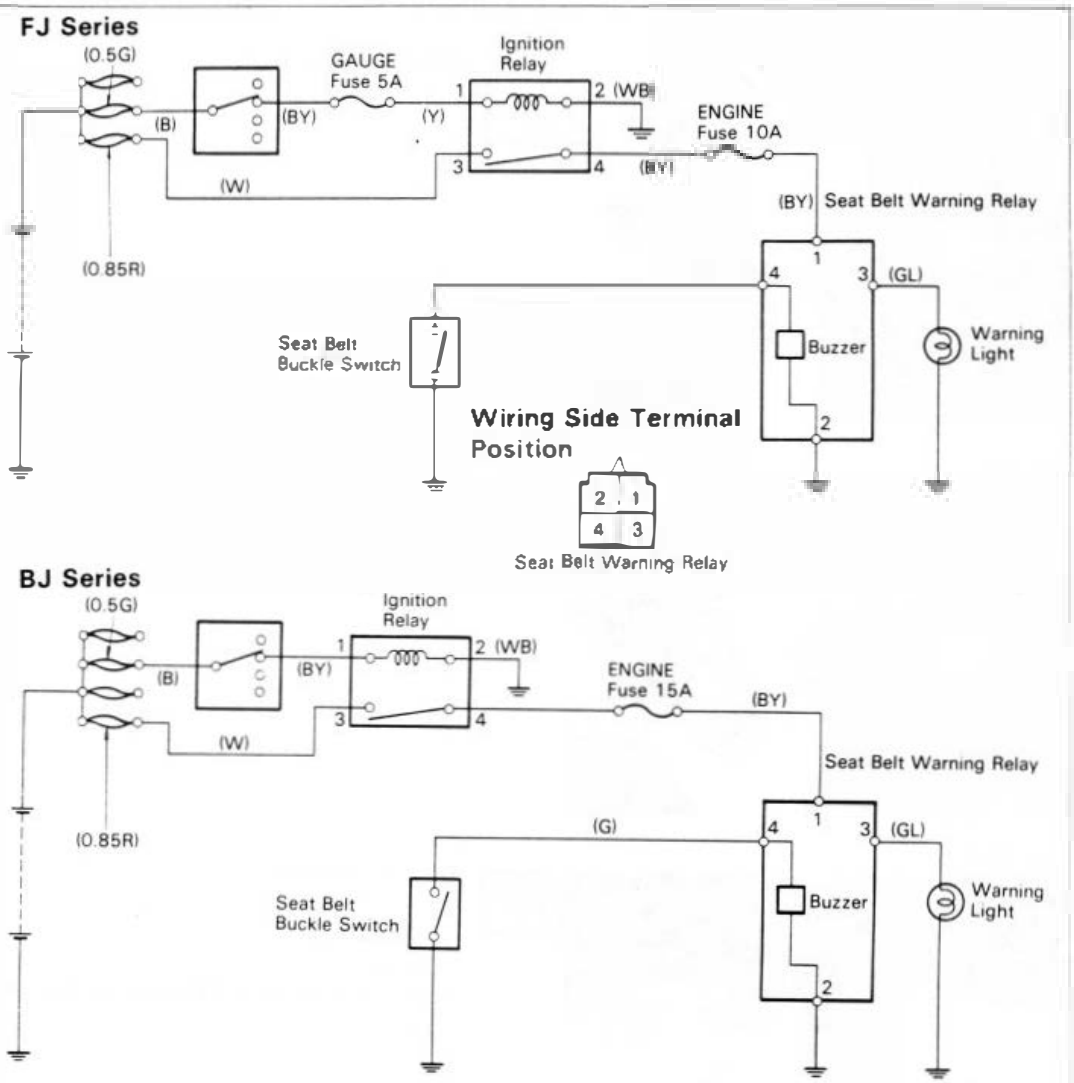
REPAIR

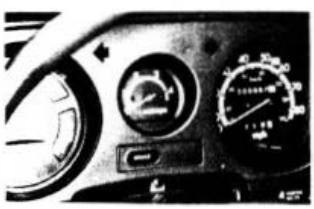
1. Preparatory materials
   (1) Fine pointed brush, size 0 or similar
   (2) White gasoline
   (3) Masking tape
   (4) Repair agent, Dupont Paste No. 4814
2. Repair method
   (1) Clean where the wire is broken
   (2) As illustrated, stick masking tape under the place that is to be repaired
   (3) Thoroughly mix the repair agent, dip a small amount on a fine brush, and paint it on the part to be repaired
   (4) After one of two minutes, peel off the masking tape
   (5) Allow to stand at least 24 hours after repairing before turning the defogger on

SEAT BELT WARNING

CIRCUIT DIAGRAM

Fig. 13-169





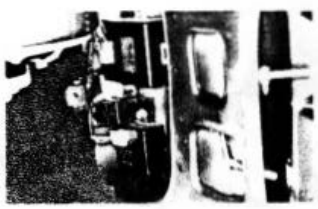
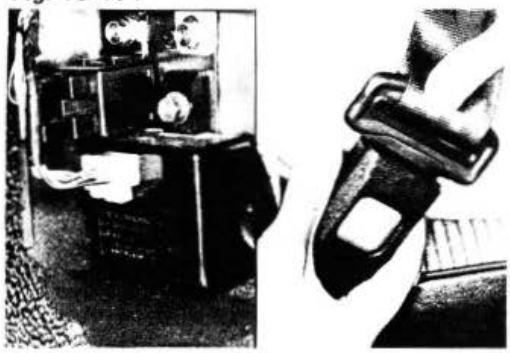


Fig. 13-170

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

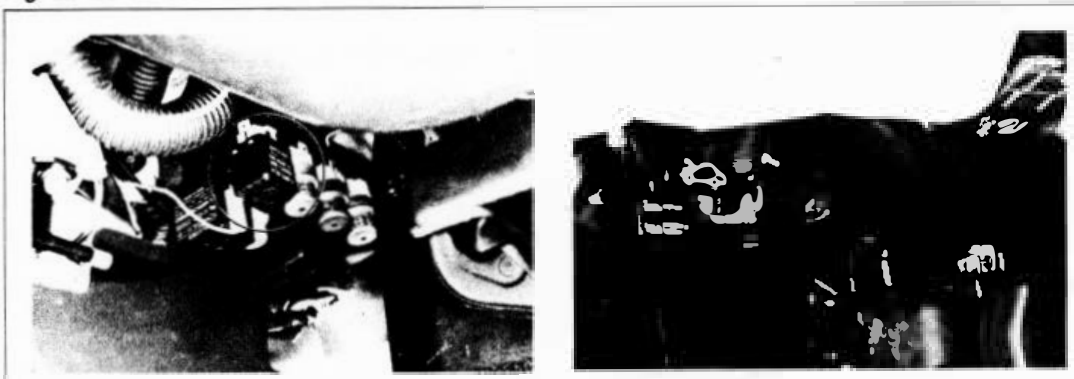
Warning Relay

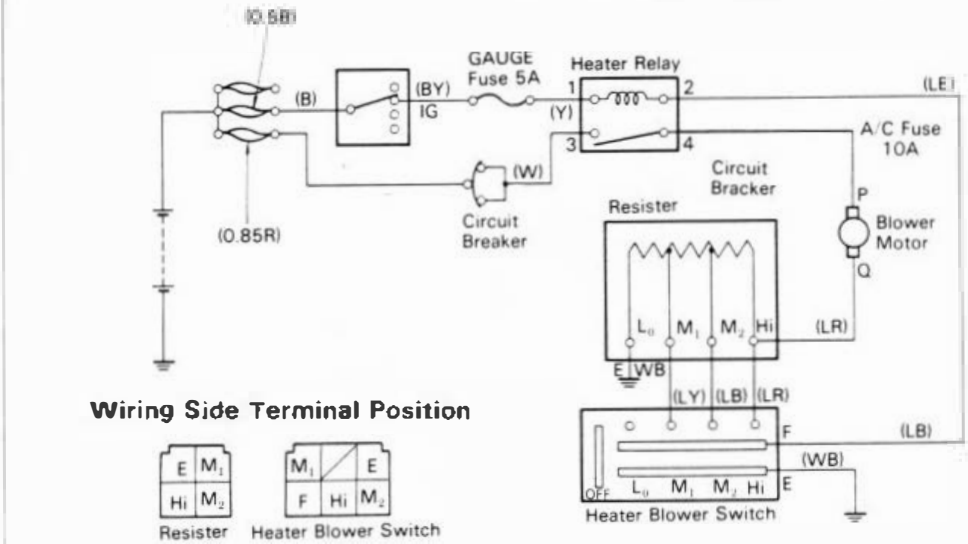
Battery voltage should be applied between 1 and 2 terminals.

HEATER

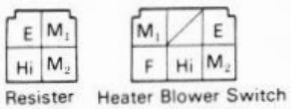
CIRCIUT DIAGRAM

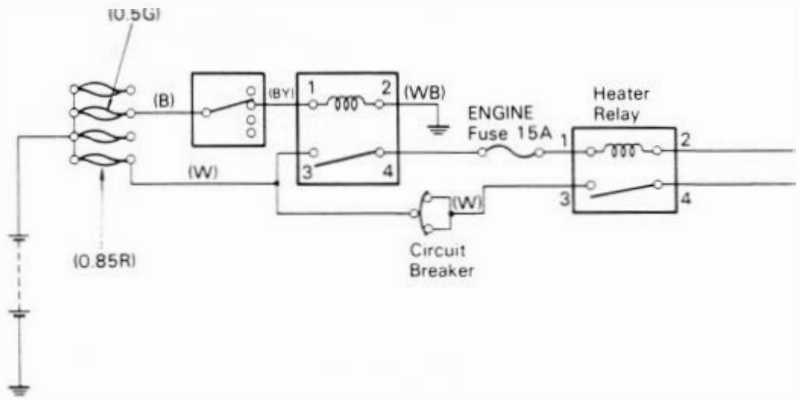
Fig. 13-174





Wiring Side Terminal Position



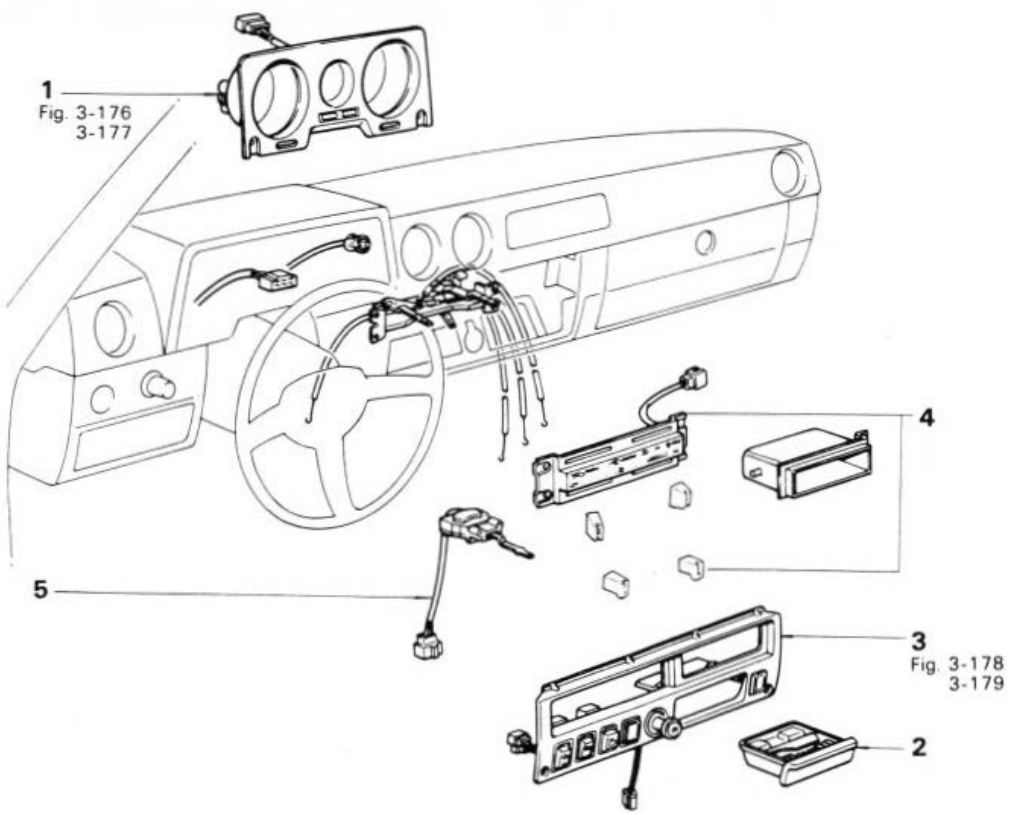


HEATER BLOWER SWITCH

REMOVAL

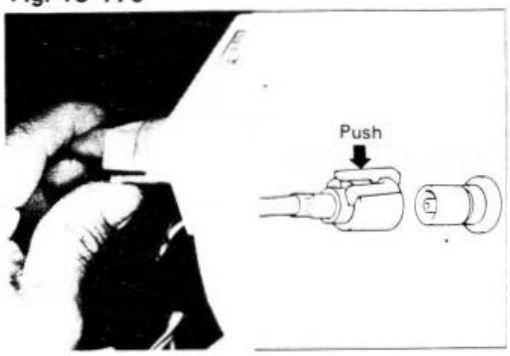
Remove the parts in the numerical order shown in the figure

Fig. 13-175



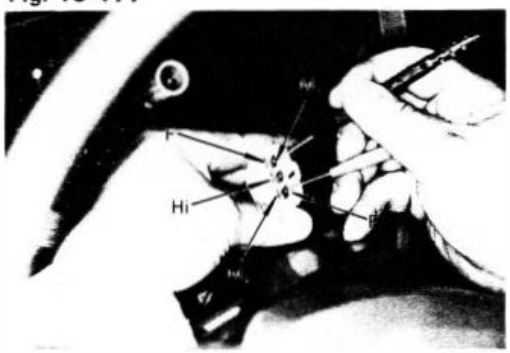
1. Combination Meter
2. Ash Receptacle
3. Center Cluster
4. Heater Control Panel
5. Switch

Fig. 13-176



Before removing the combination meter, pull out the cable while pushing the lock lever.

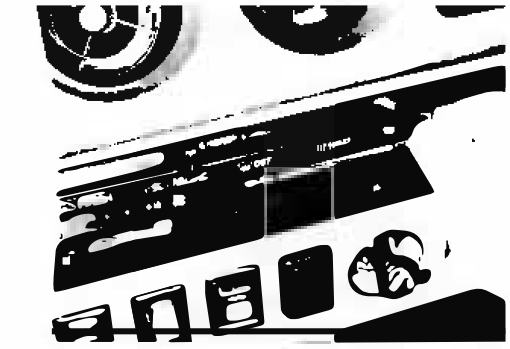
Fig. 13-177



Before removing the switch, check continuity between terminals.

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.

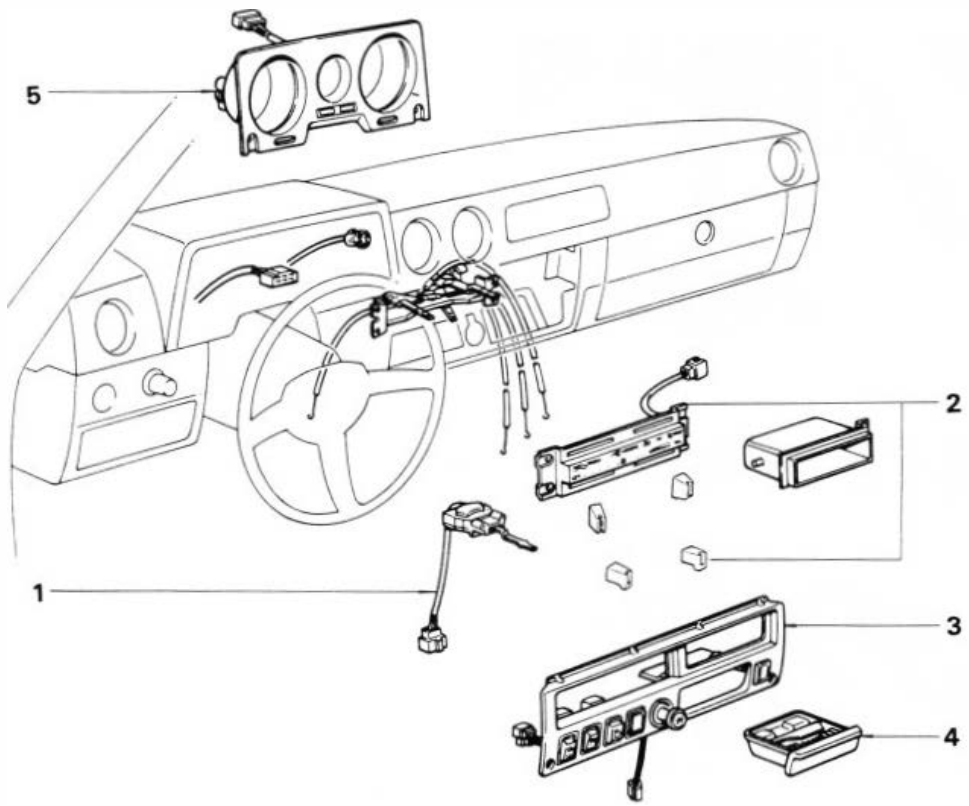
Fig. 13-179

Before removing the center panel, disconnect the connectors.

INSTALLATION

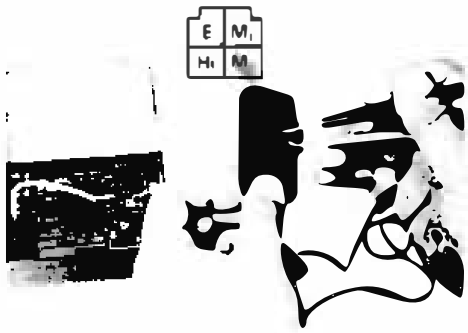
Install the parts in the numerical order shown in the figure

Fig. 13-180



1. Switch
2. Heater Control Panel
3. Center Cluster
4. Ash Receptacle
5. Combination Meter

Fig. 13-181

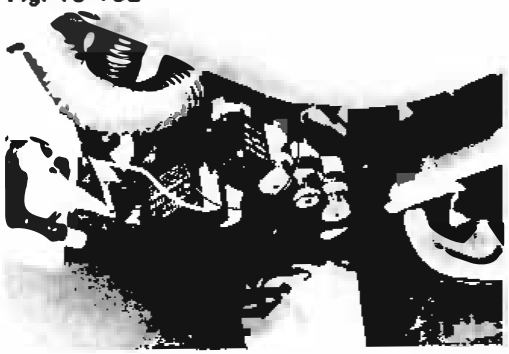


BLOWER RESISTOR

INSPECTION

Measure continuity between terminals

Fig. 13-182

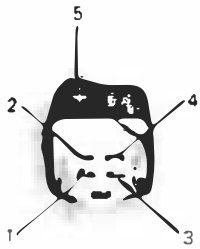


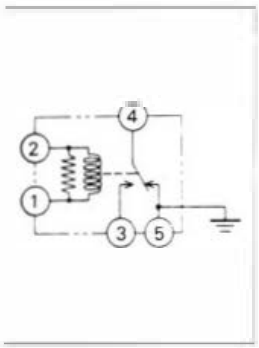
HEATER RELAY

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

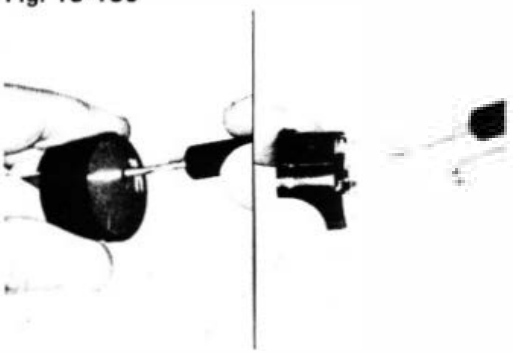
Between terminals \ Resistance	Resistance Ω	
	12V	24V
1 — 2	75 Ω	226 Ω
3 — 4	0	

Fig. 13-184

CIRCUIT BREAKER

Remove the circuit braker 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

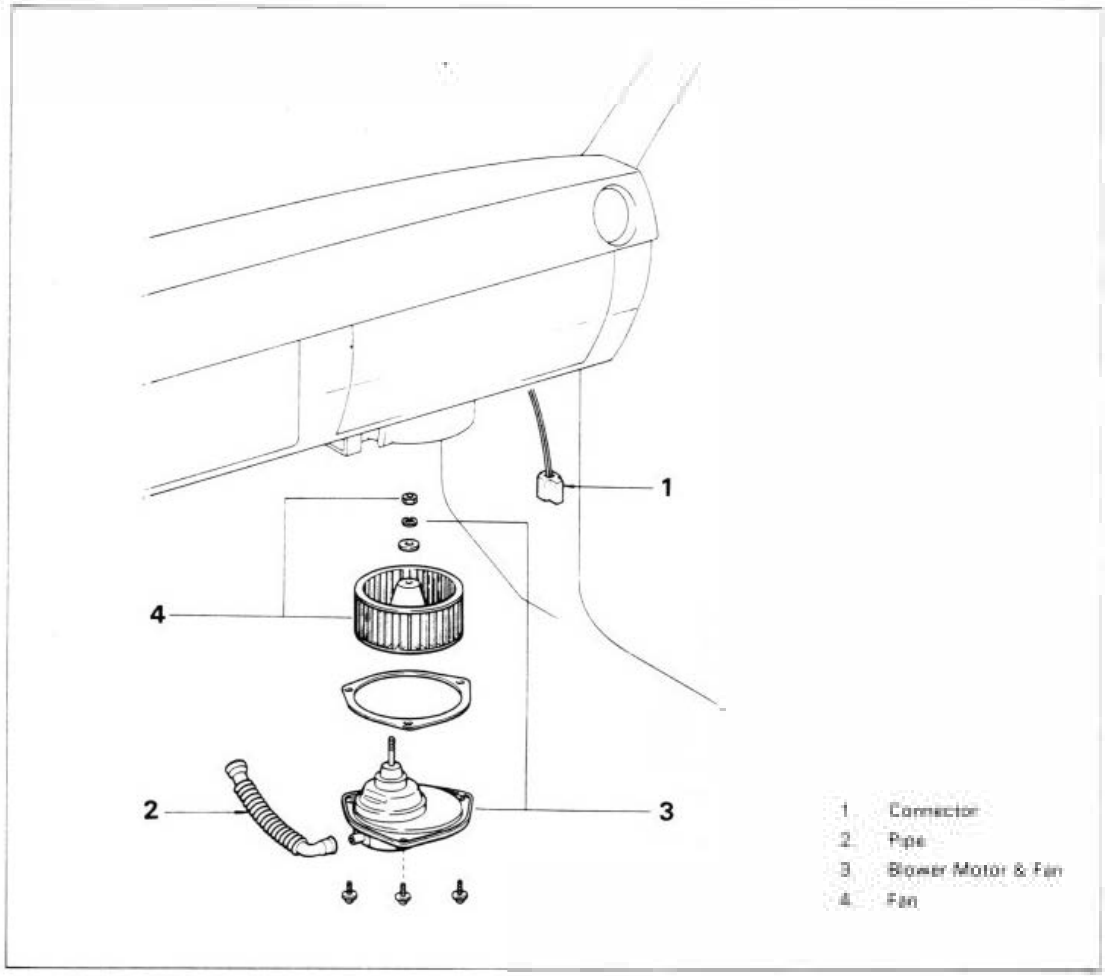
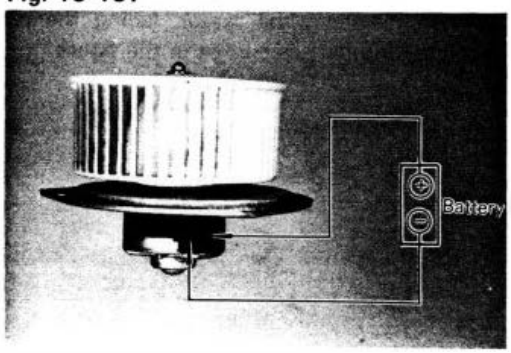


Fig. 13-187



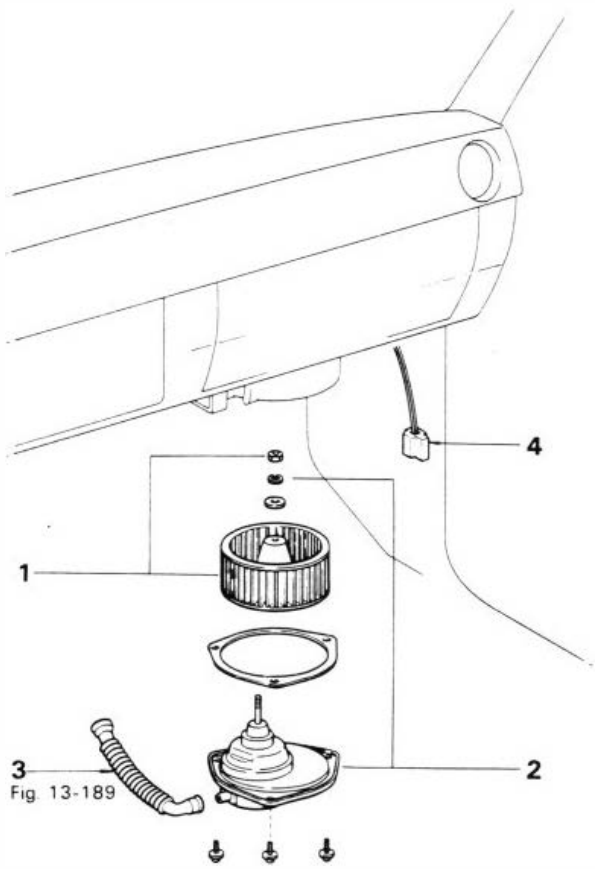
INSPECTION

Apply the battery voltage to the connector check to see that the motor rotates smoothly

INSTALLATION

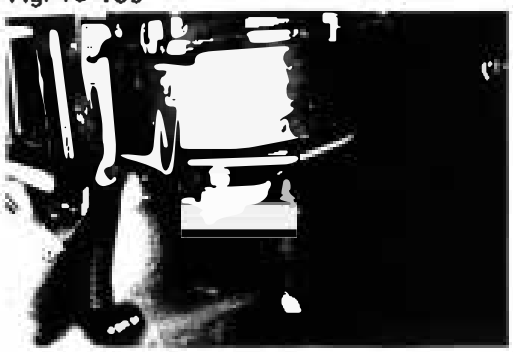
Install the parts in the numerical order shown in the figure.

Fig. 13-188



1. Fan
2. Blower Motor & Fan
3. Pipe
4. Connector

Fig. 13-189



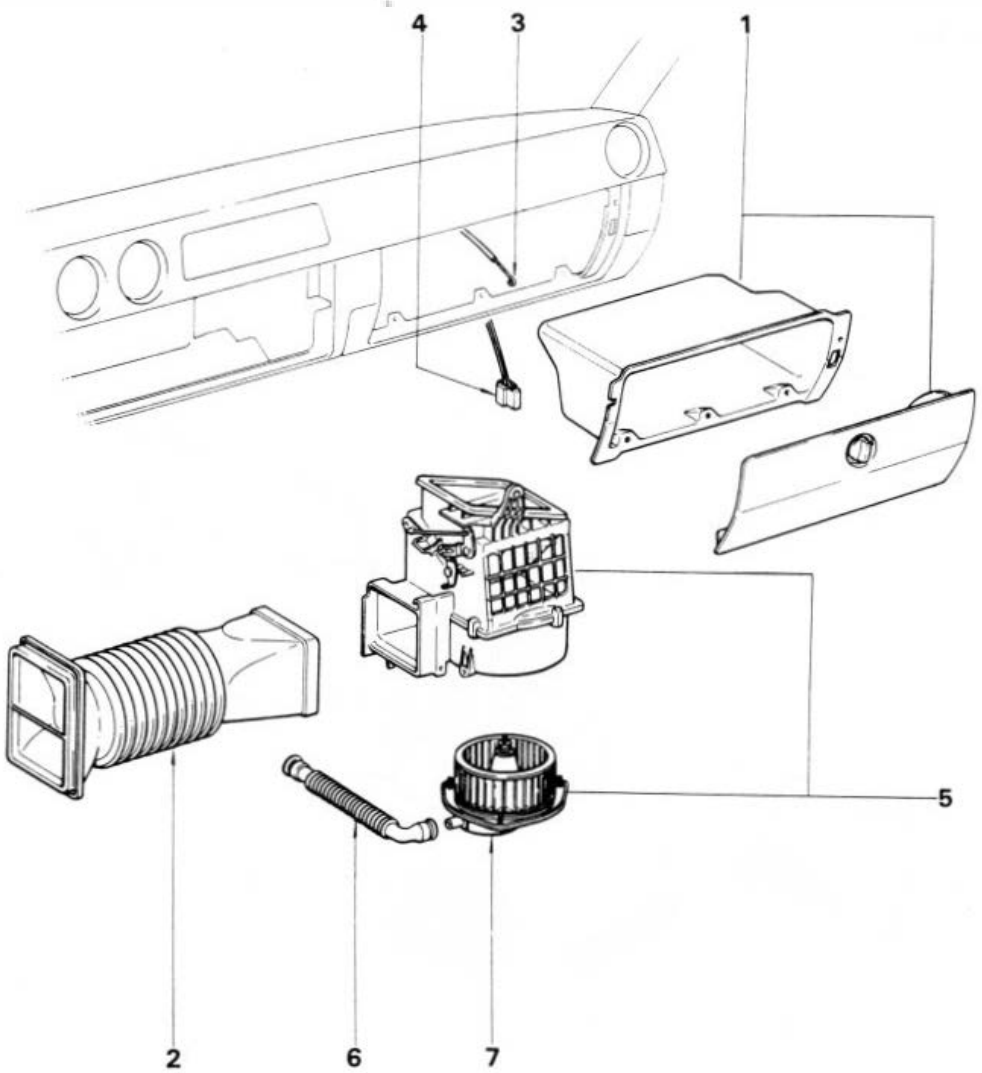
When installing the motor, facing the pipe connecting part as shown in the figure.

AIR INLET UNIT

REMOVAL

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

Fig. 13-190

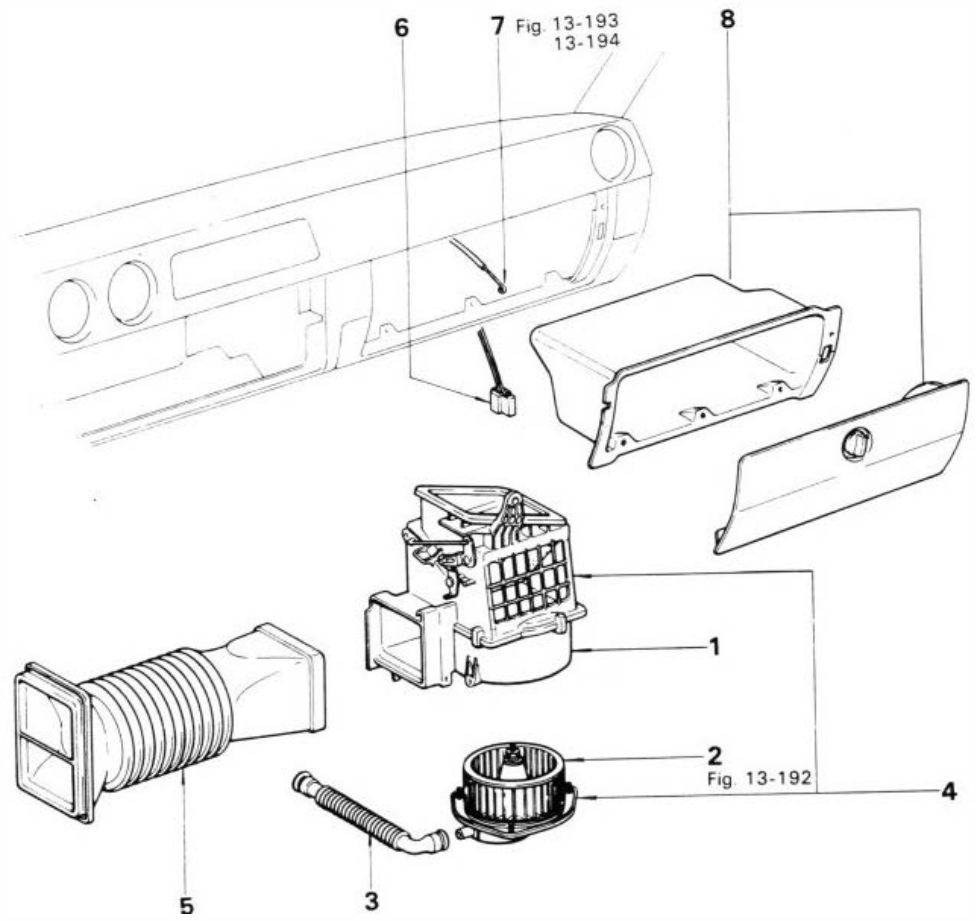


1. Glove Compartment
2. Duct
3. Control Wire
4. Connector
5. Air Inlet Unit
6. Pipe
7. Blower Motor

INSTALLATION

Install the parts in the numerical order shown in the figure

Fig. 13-191

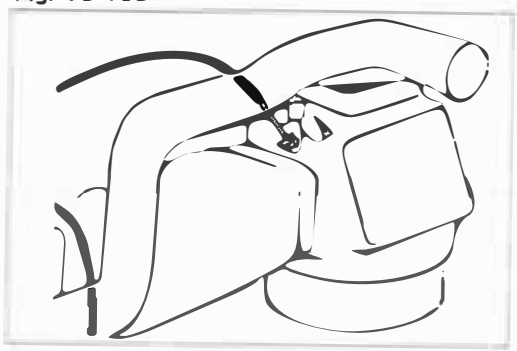


1 Air Inlet Unit
2 Blower Motor
3 Pipe
4 Inlet Unit & Blower Motor
5 Duct
6 Connector
7 Control Wire
8 Glove Compartment

Fig. 13-192

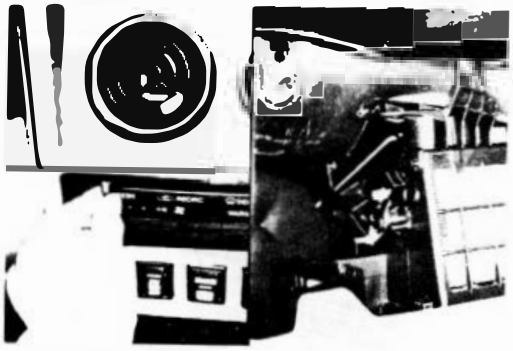
When installing the motor, install the pipe facing as shown in the figure

Fig. 13-193



Connect the control wire to the dumper lever

Fig. 13-194



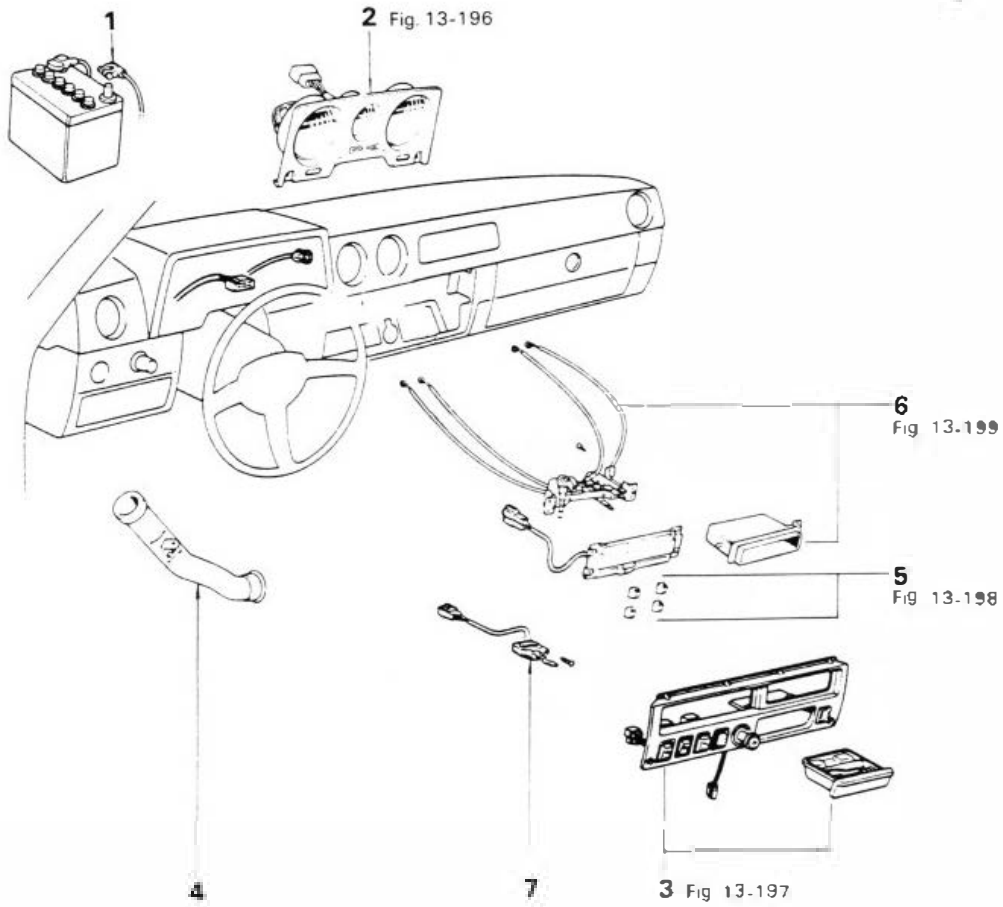
After connecting the control wire, check the lever stiffness and stroke

HEATER CONTROL

REMOVAL

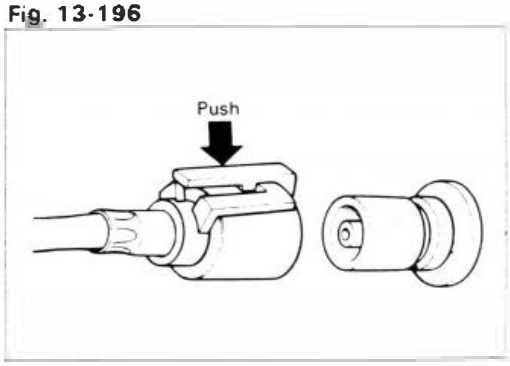
Remove the parts in the numerical order shown in the figure.

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.

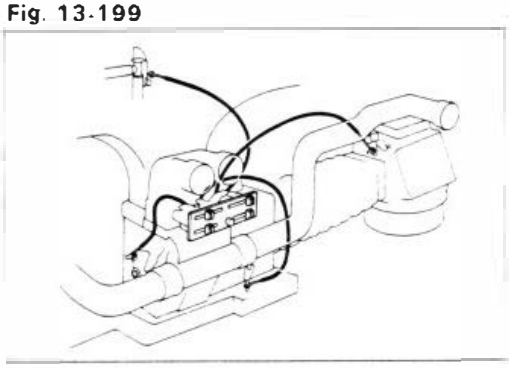
Fig. 13-197

Before removing the center panel, disconnect the connectors.

Fig. 13-198

Before removing the panel, pullout the control knobs.

Fig. 13-199

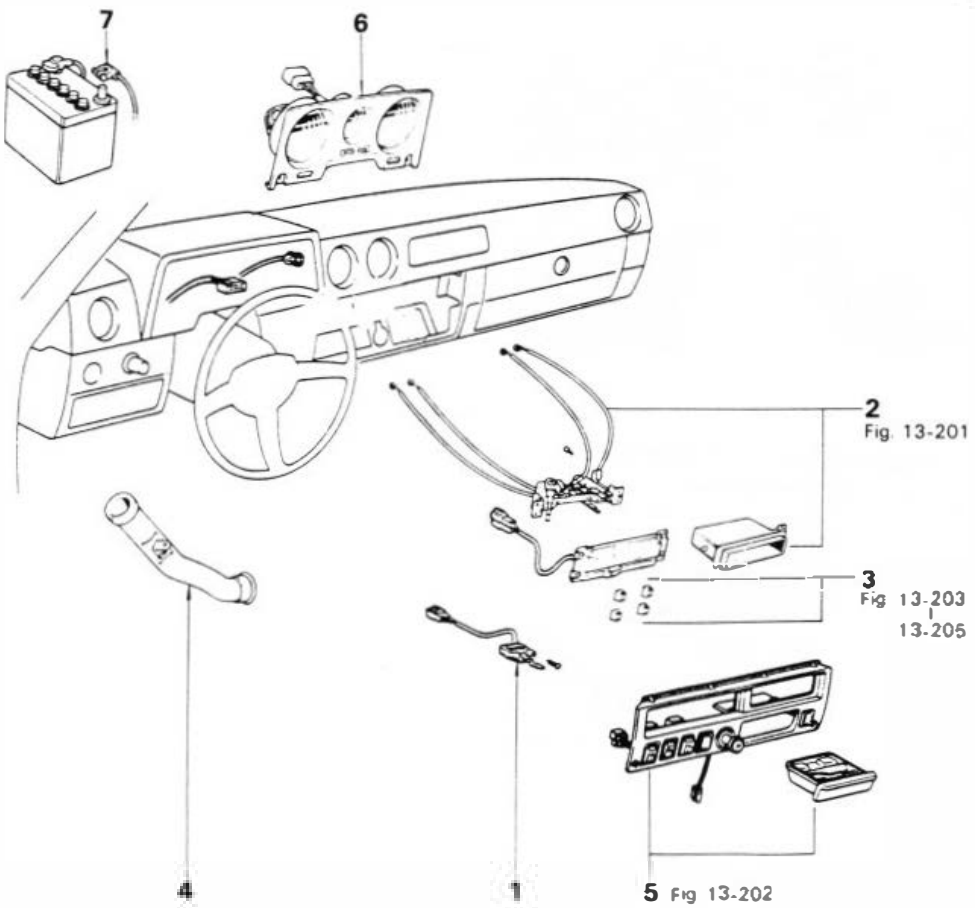


Disconnect the lore cables from their clamps

INSTALLATION

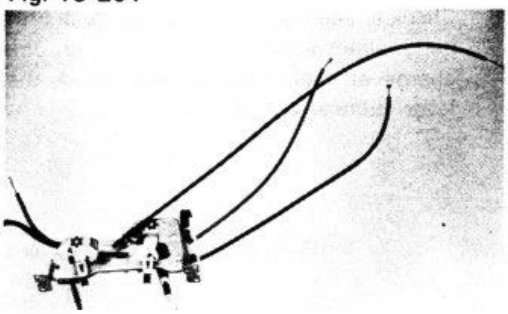
Install the parts in the numerical order shown in the figure.

Fig. 13-200



1. Blower Switch
2. Heater Control Panel
3. Knob
4. Duct
5. Center Cluster
6. Combination Meter
7. Battery Terminal

Fig. 13-201



Connect the cables as shown in the figure.

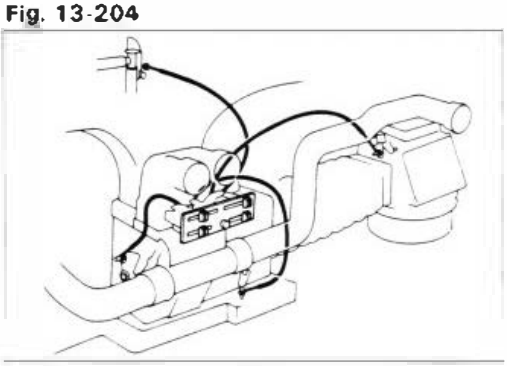
Fig. 13-202

Before installing the center panel, connect the connectors.

Fig. 13-203

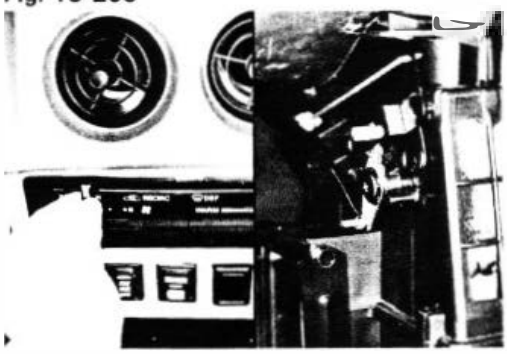
Install the knobs and retainer and make sure that the knobs are tight.

Fig. 13-204



Connect each cable to each control lever and clamp the cables.

Fig. 13-205



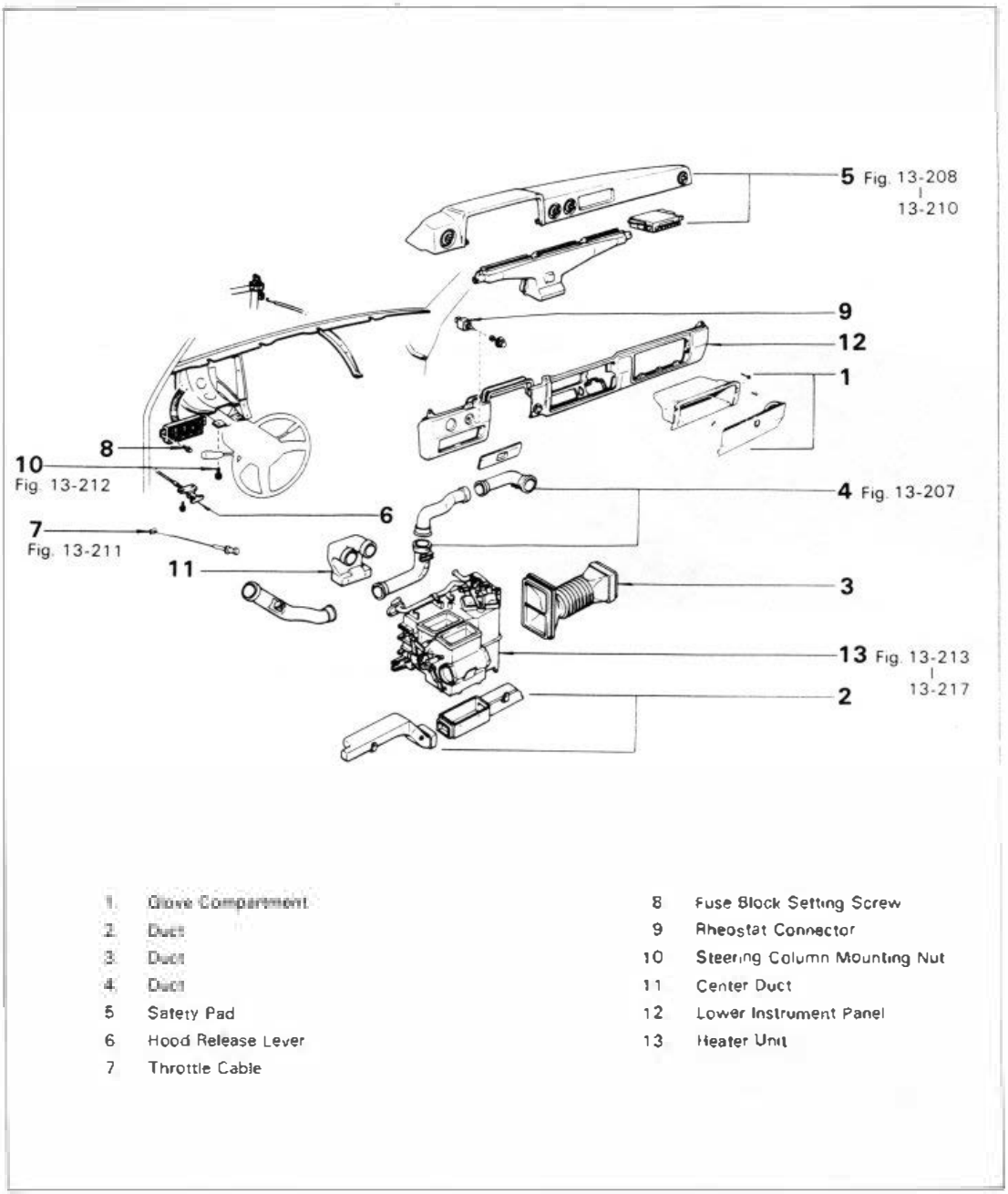
6 Check to see that the control lever is properly aligned by checking the air discharge at each position, and check the lever stiffness and stroke

HEATER UNIT

REMOVAL

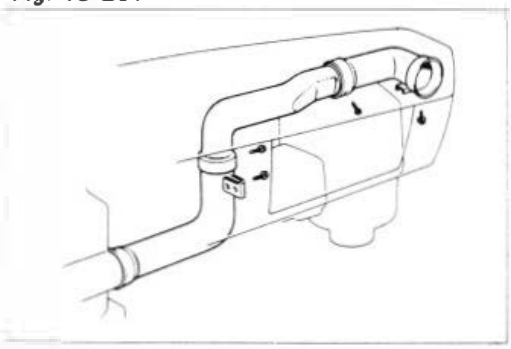
1. Remove the combination meter and heater control.
2. Remove the parts in the numerical order shown in the figure.

Fig. 13-206



1. Glove Compartment
2. Duct
3. Duct
4. Duct
5. Safety Pad
6. Hood Release Lever
7. Throttle Cable
8. Fuse Block Setting Screw
9. Rheostat Connector
10. Steering Column Mounting Nut
11. Center Duct
12. Lower Instrument Panel
13. Heater Unit

Fig. 13-207



Remove the ducts

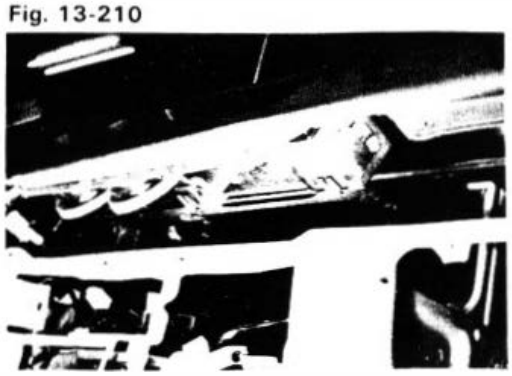
Fig. 13-208

Before removing the instrument panel, disconnect the connector wire

Fig. 13-209

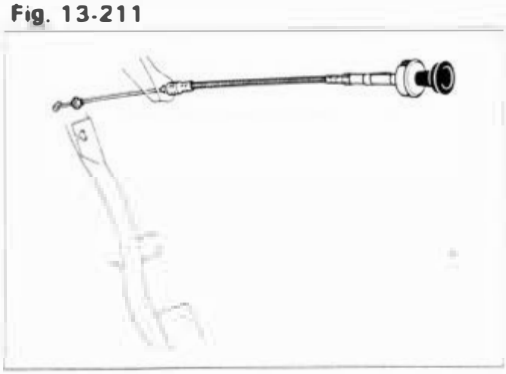
Remove the nuts

Fig. 13-210



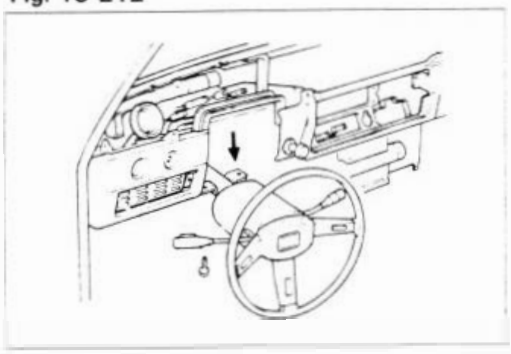
Remove the safety pad

Fig. 13-211



Disconnect the throttle cable

Fig. 13-212

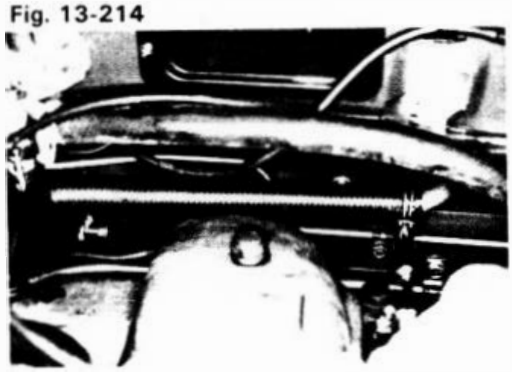


Remove the both side mounting nuts

Fig. 13-213

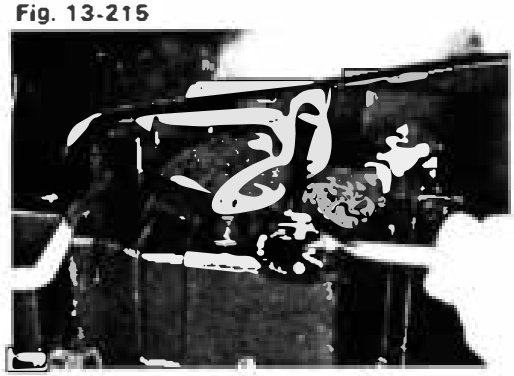
Before removing the unit, disconnect the connector

Fig. 13-214



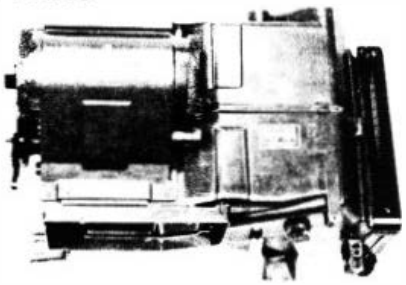
Before removing the unit, disconnect the hoses

Fig. 13-215



Remove the unit upper side mounting bolt

Fig. 13-216



Remove the unit lower side mounting bolts

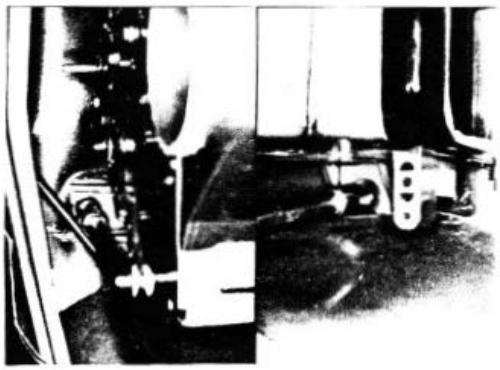
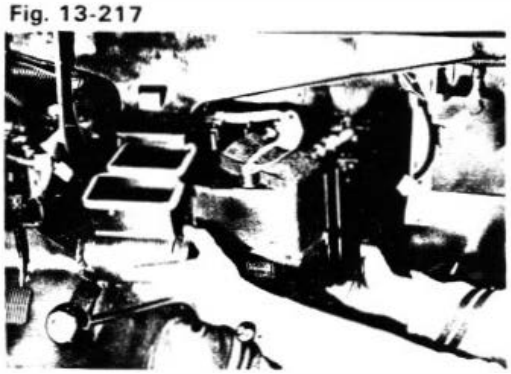


Fig. 13-217



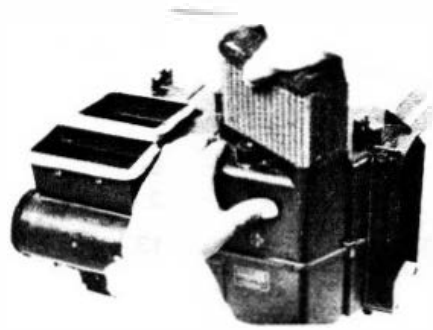
Remove the unit

Fig. 13-218

Replace The Radiator

1. Remove the pipes and radiator clamps

Fig. 13-219



2 Replace the radiator

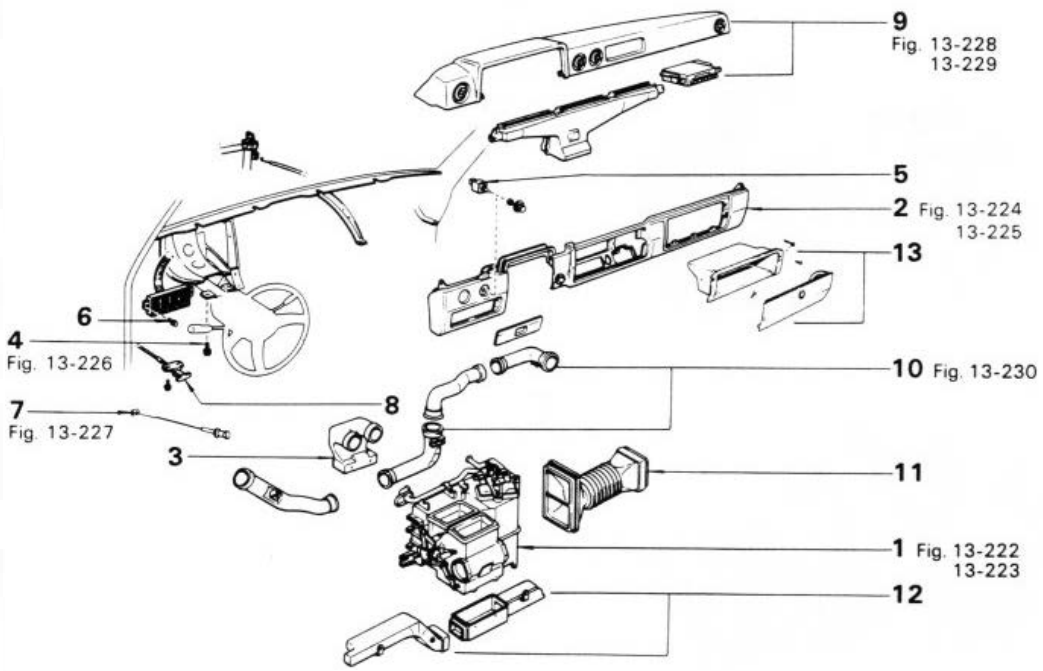
Fig. 13-220

3 Install the radiator and pipe clamps

INSTALLATION

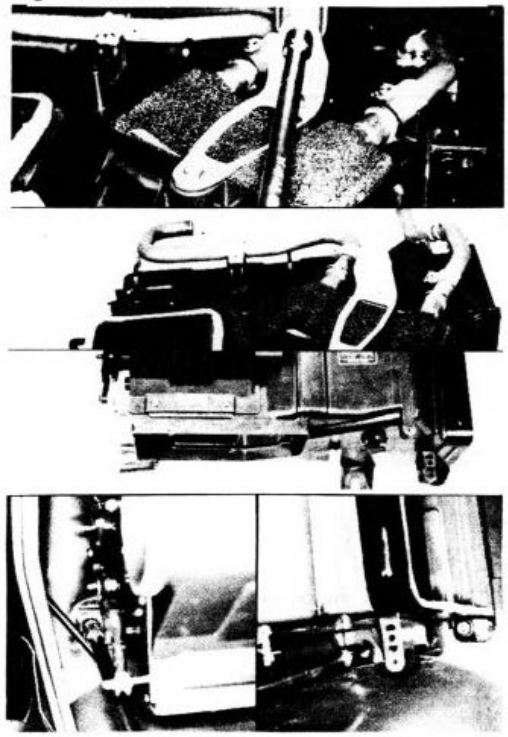
1. Install the parts in the numerical order shown in the figure.

Fig. 13-221



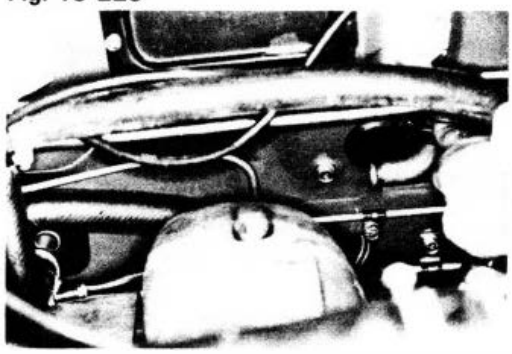
1. Heater Unit
2. [illegible]
3. Duct
4. Steering Column Mounting Nut
5. Rheostat Connector
6. Fuse Block Setting Screw
7. Throttle Cable
8. Hood Release Lever
9. Safety Pad
10. Duct
11. Duct
12. Duct
13. Glove Compartment

Fig. 13-222



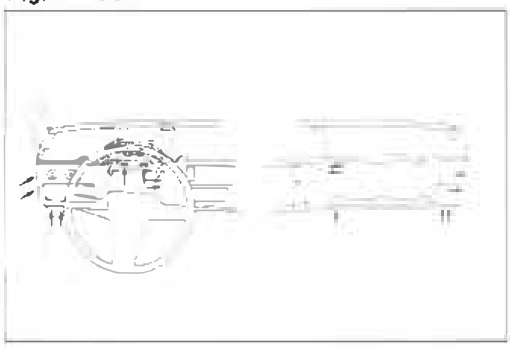
Install the mounting nut and bolts.

Fig. 13-223



Install the gromet from the engine conpartment.

Fig. 13-224



Install the instrument panel as shown in the figure.

Fig. 13-225

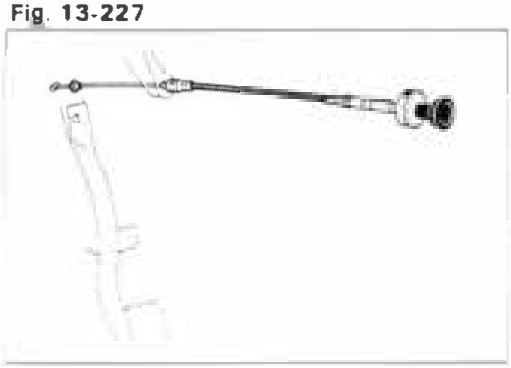
Connect the inspection light wire.

Fig. 13-226

Tighten the column upper bracket

Tightening torque: 1.9 – 3.1 kg-m (14 – 15 ft-lb)

Fig. 13-227

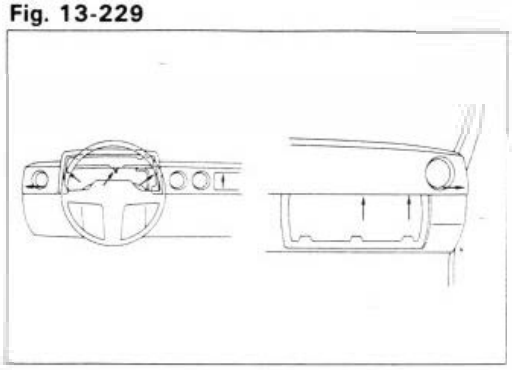


Connect the throttle cable

Fig. 13-228

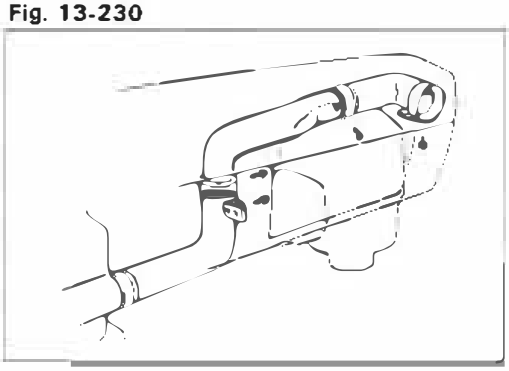
Install the safety pad

Fig. 13-229



Install the safety pad mounting bolts.

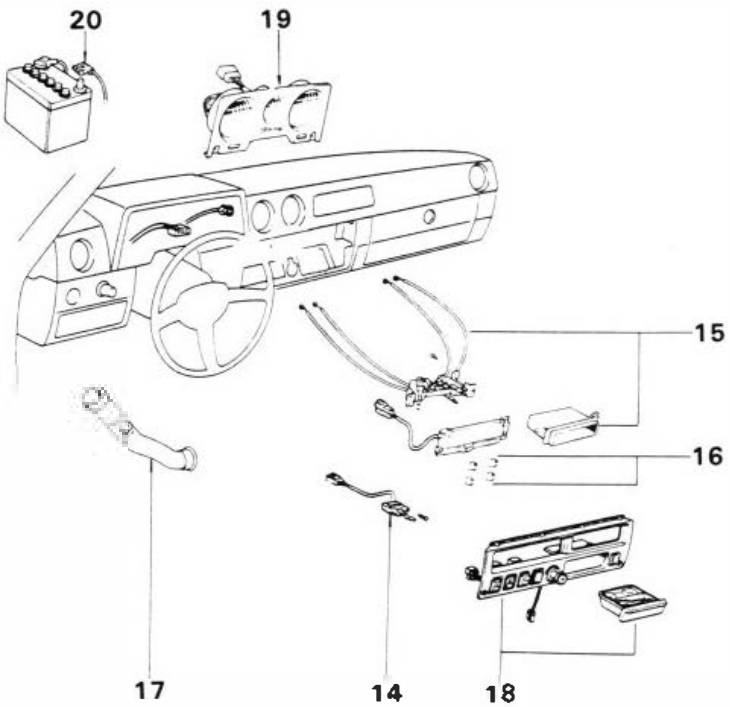
Fig. 13-230



Install the duct.

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

Fig. 13-231



14. Blower Switch
15. Heater Control Panel
16. Knob
17. Duct
18. Center Cluster
19. Combination Meter
20. Battery Terminal

Fig. 13-232

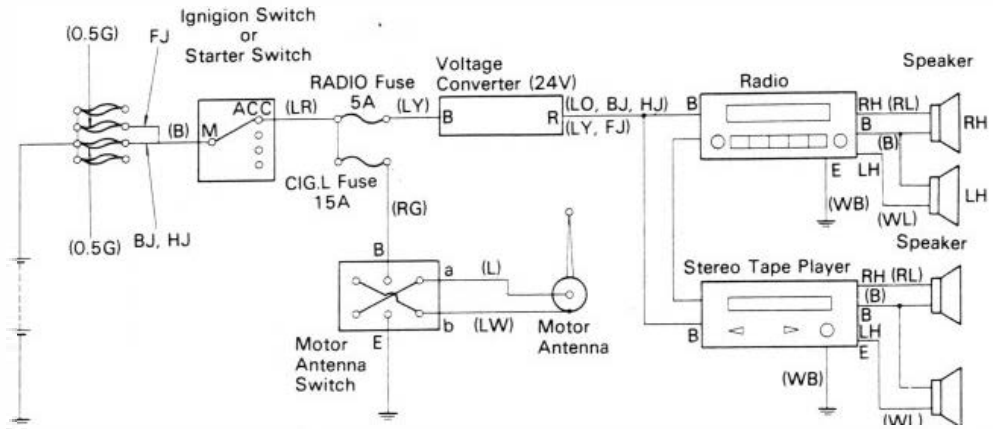
Install the heater control

SEE
HEATER CONTROL
INSTALLATION SECTION
Fig. 13-200 to 13-205

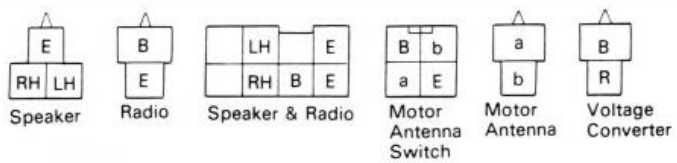
RADIO & STEREO TAPE PLAYER

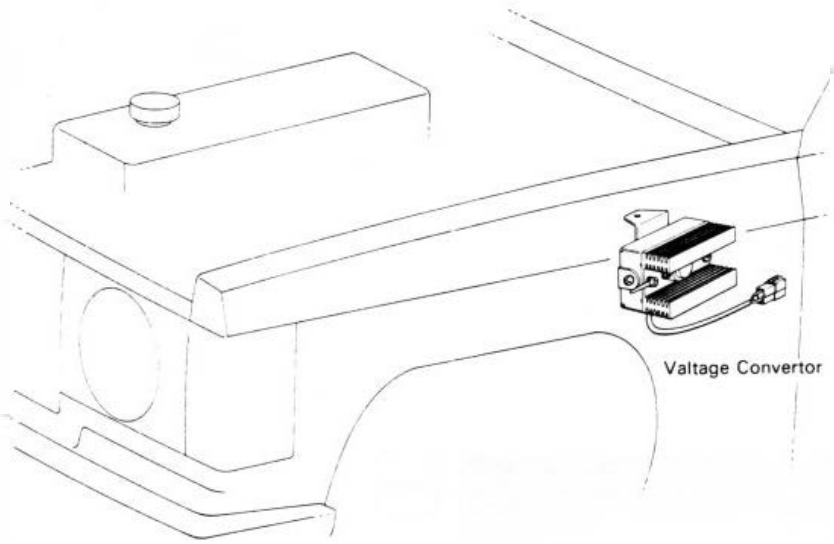
CIRCUIT DIAGRAM

Fig. 13-233



Wiring Side Terminal Position



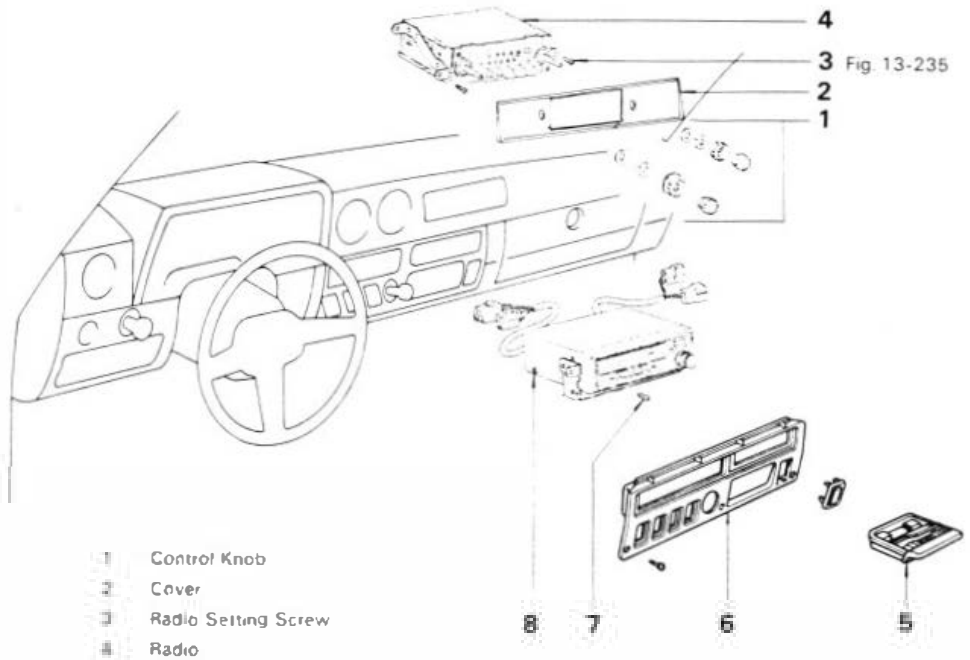


RADIO & STEREO TAPE PLAYER

REMOVAL

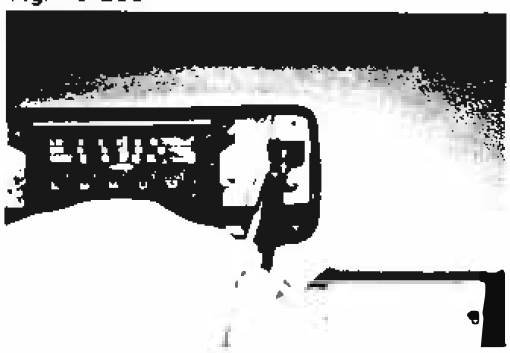
Remove the parts in the numerical order shown in the figure

Fig. 13-234



1. Control Knob
2. Cover
3. Radio Setting Screw
4. Radio
5. Ash Receptacle
6. Center Cluster
7. Screw
8. Stereo Tape Player

Fig. 13-235



Hold the screw with the magnet

INSTALLATION

Install the parts in the numerical order shown in the figure

Fig. 13-236

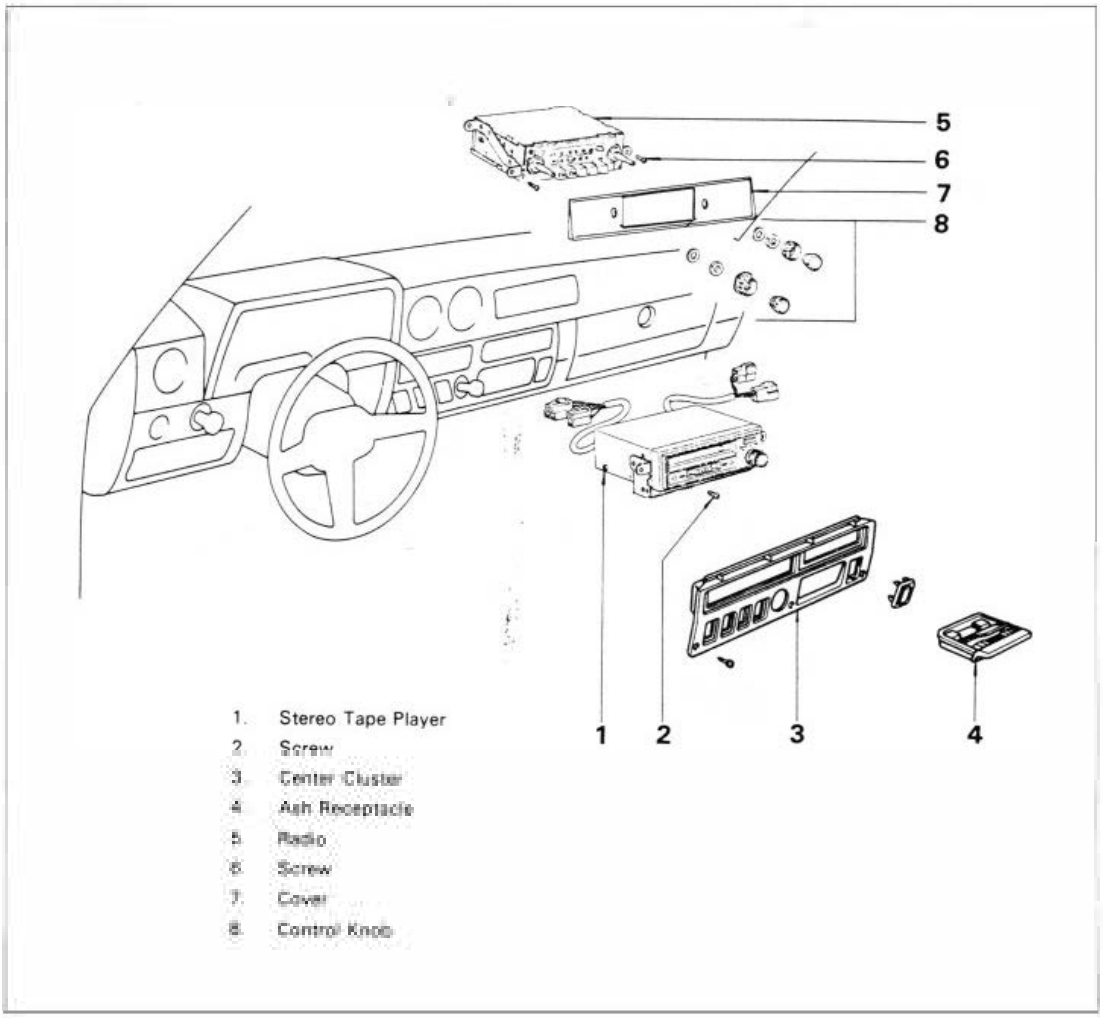
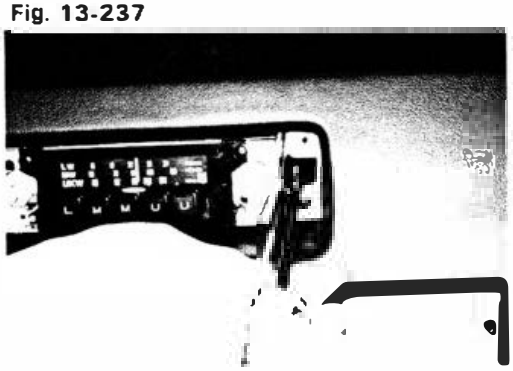


Fig. 13-237



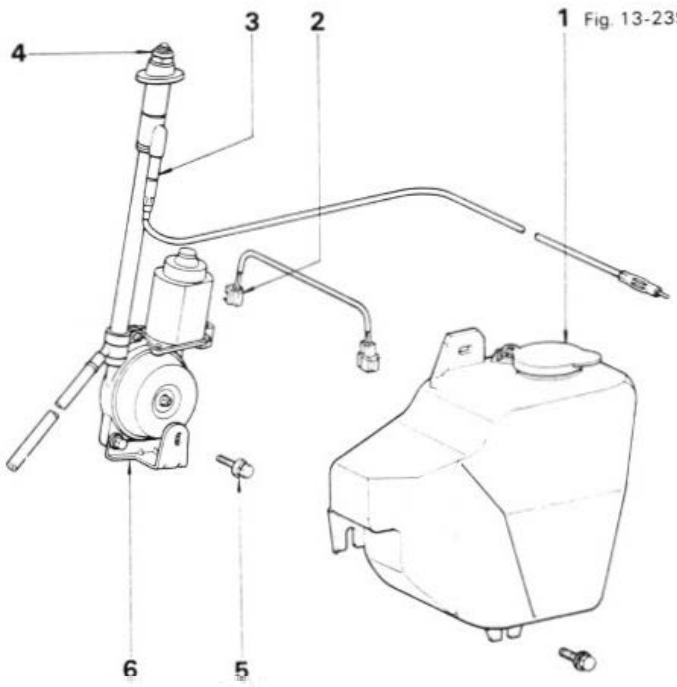
Screw in the screw while holding the it with magnet

ANTENNA

REMOVAL

Remove the parts in the numerical order shown in the figure

Fig. 13-238

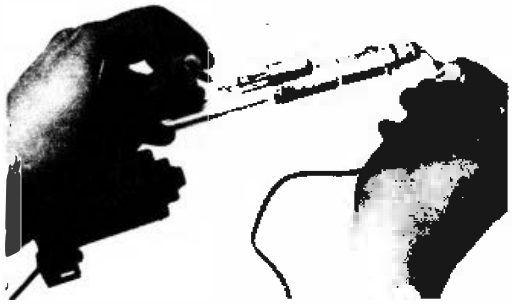


1 Washer Tank
2 Wiring Connector
3 Antenna Feeder Connector
4 Nut
5 Bolt
6 Antenna

Fig. 13-239

After removing the washer tank, lower bracket bolt

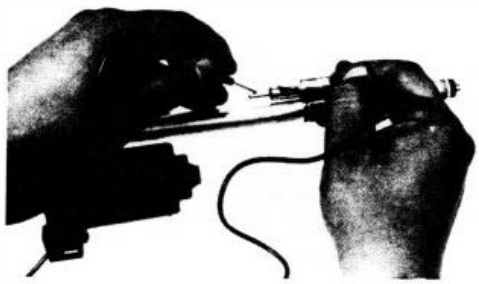
Fig. 13-240



INSPECTION

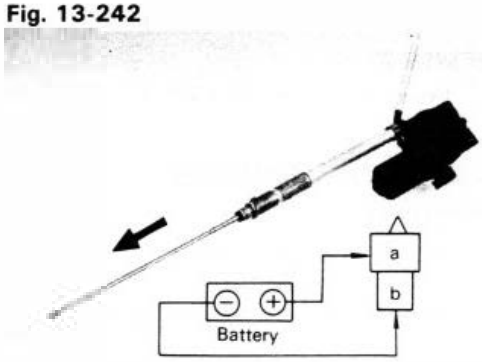
1 Check the continuity between antenna plug and pole tip.
If there is a continuity between both ends, the cord is good condition.

Fig. 13-241



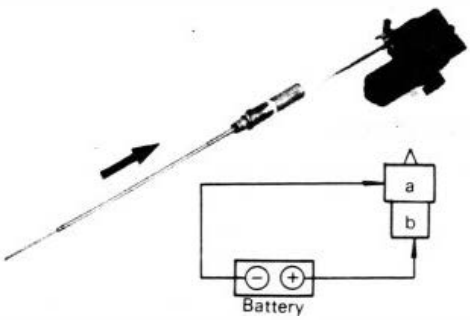
2 Check the continuity between connector core and body.
If there is not a continuity between both ends, the condition is good condition.

Fig. 13-242



3. The antenna pole should be extended when apply the battery voltage to the terminals.

Fig. 13-243

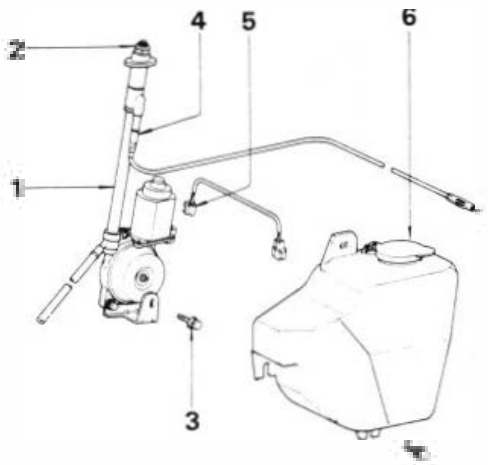


4. The antenna pole should be shortened when apply the battery voltage to the terminals.

INSTALLATION

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

Fig. 13-244



1 Antenna
2 Nut
3 Bolt
4 Antenna Feeder Connector
5 Wiring Connector
6 Washer Tank

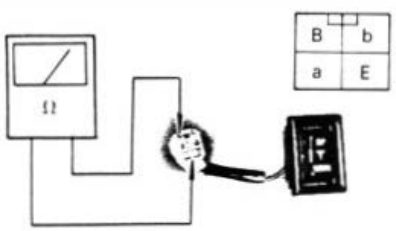
Fig. 13-245

ANTENNA SWITCH

REMOVAL

1 Remove the center panel.
2 Disconnect the connector.
3 Remove the switch by prying its.

Fig. 13-246

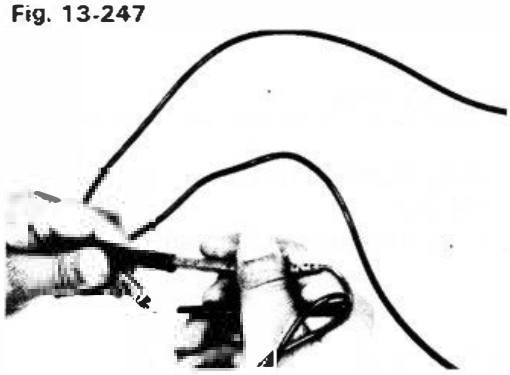


INSPECTION

Check the each terminals continuty.

Terminal / Position	B	E	a	b
UP	○	○	○	○
DOWN	○	○	○	○

Fig. 13-247

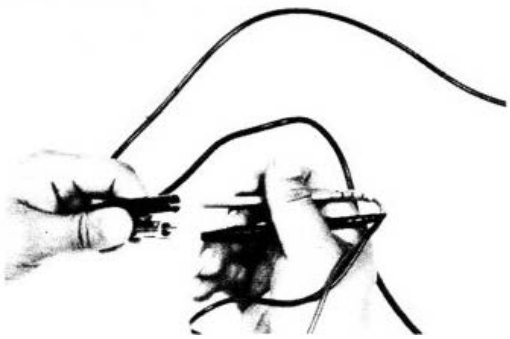


ANTENNA FEEDER

INSPECTION

1. Check the continuity between core cord
If there is a continuity between both ends, the core cord is good codition

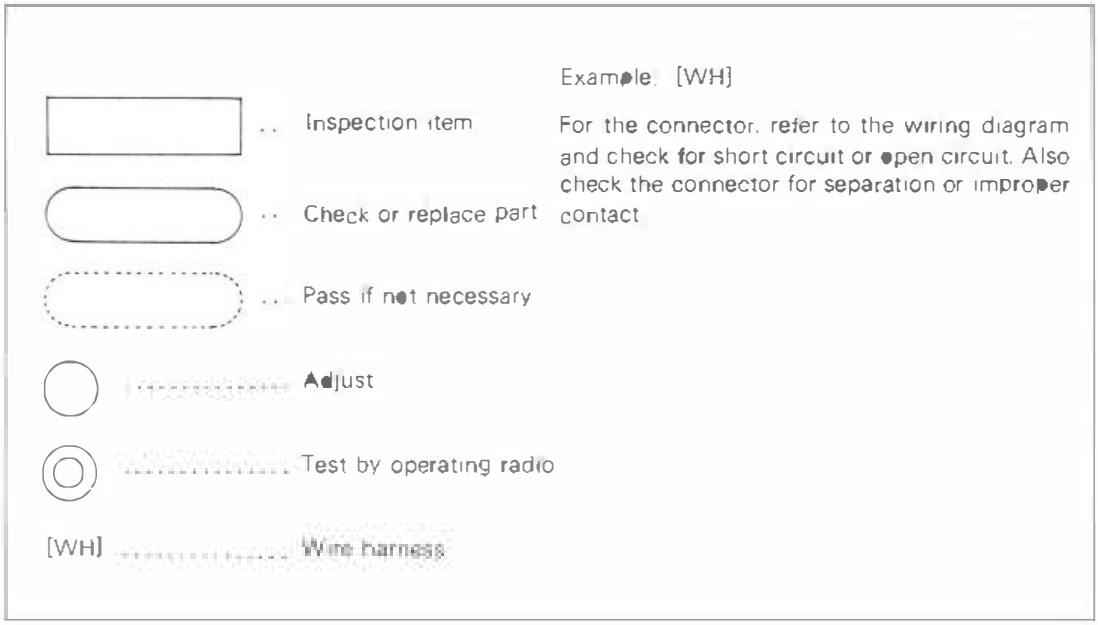
Fig. 13-248



2. Check the continuity between sealed cord
If there is a continuity between both ends, the sealed cord is good condition

TROUBLSHOOTING (RADIO)

1. Description of symbols



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 connecor
5. Defective radio

Fig. 13-249

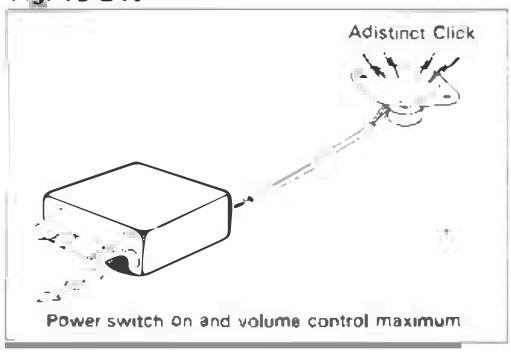


Fig. 13-250

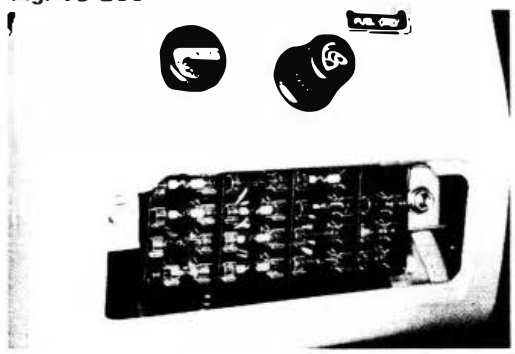


Fig. 13-251

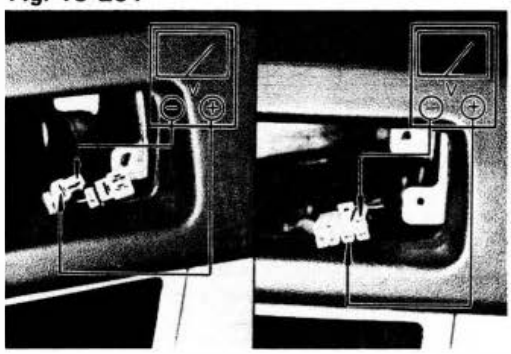
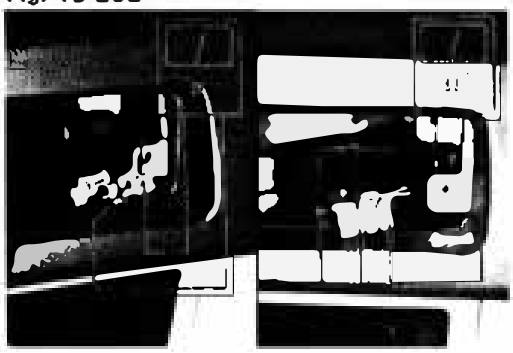
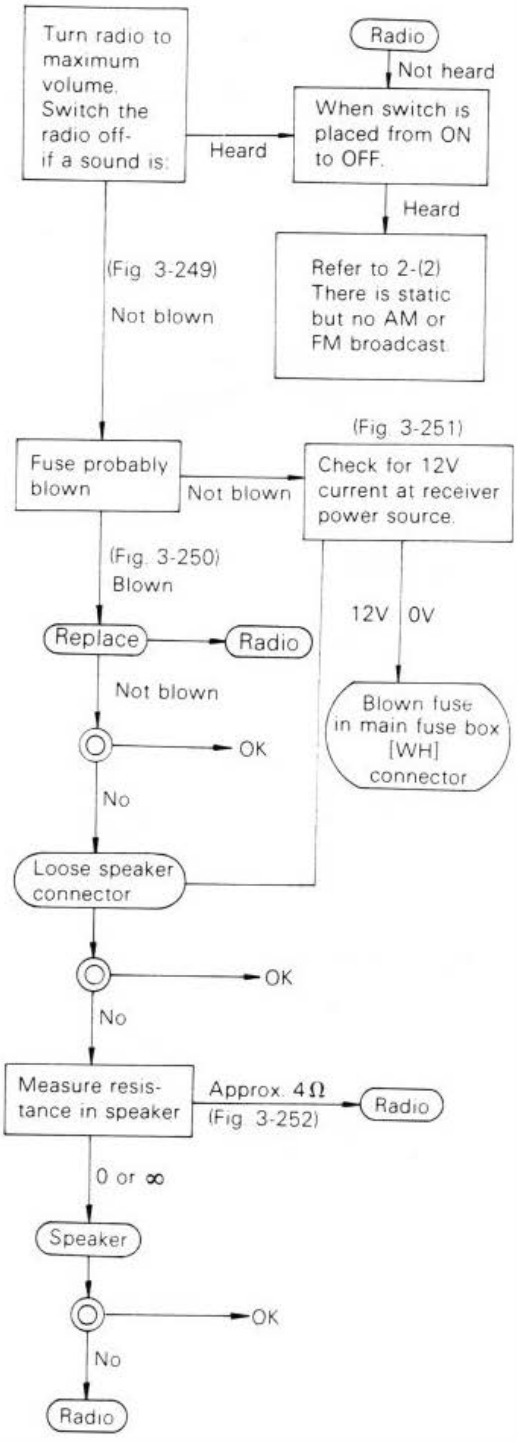


Fig. 13-252





— Reference —

A steady hum may come from the transistor, resistor, condenser and coils of a radio.

Fig. 13-253

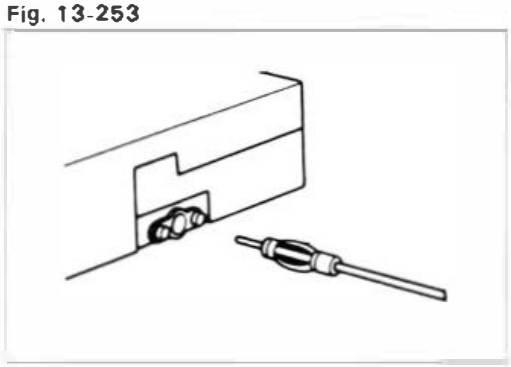


Fig. 13-254

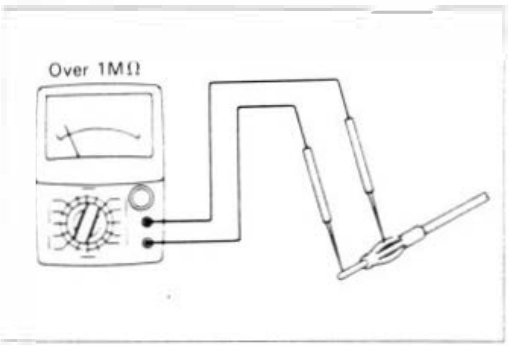
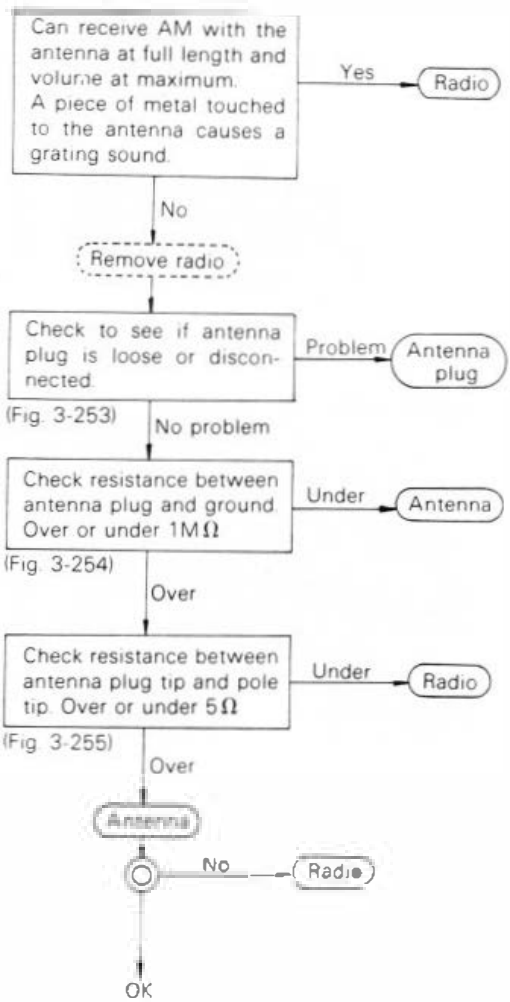


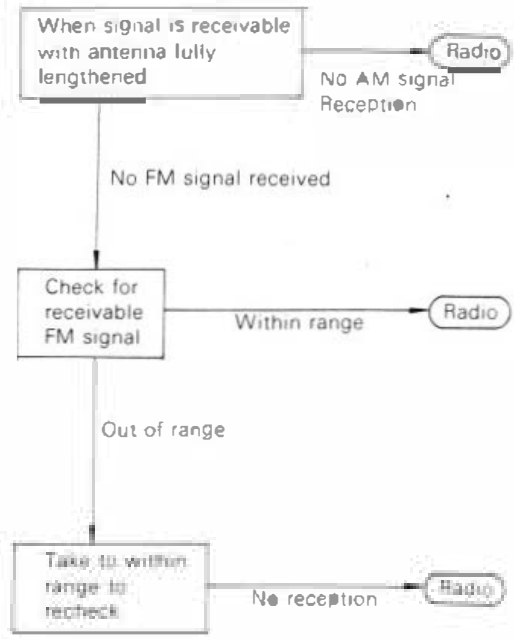
Fig. 13-255

(2) Only static — No AM or FM reception.

Cause:

1. **Disconnection or improper contact of antenna plug**
2. **Broken antenna wire**
3. **Defective antenna**





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 lineof sight so there are vall eys 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**

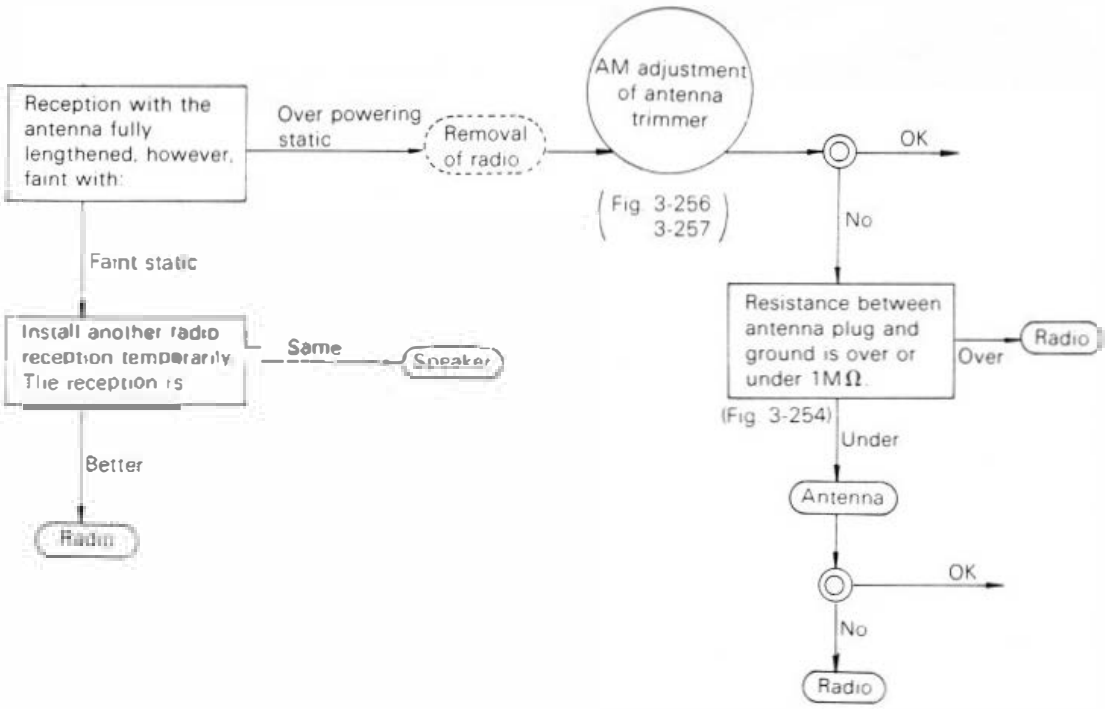
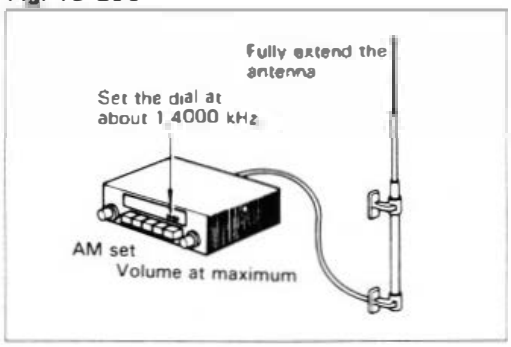


Fig. 13-256



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**

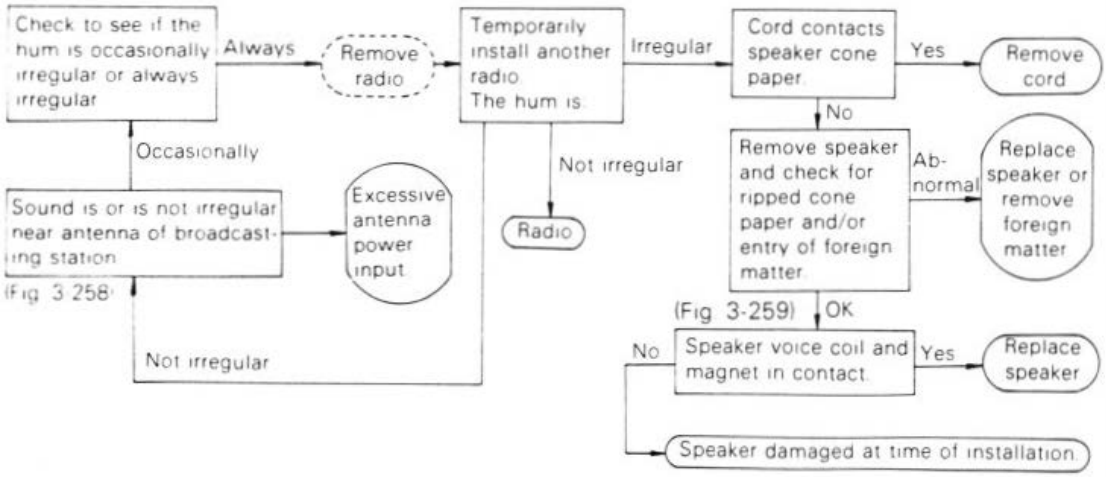
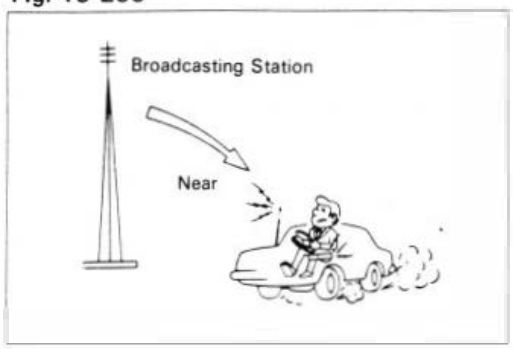


Fig. 13-258



– Reference –

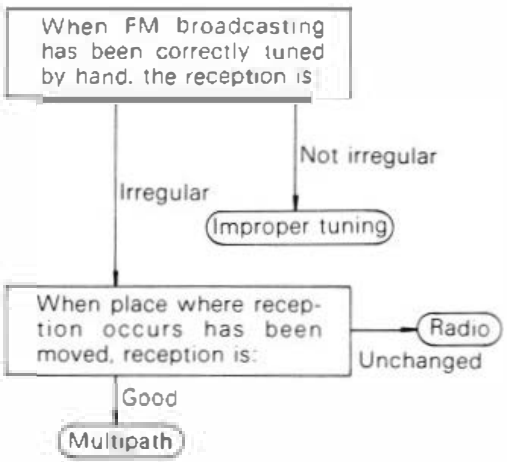
Near a broadcasting station the sound on any radio becomes irregular because of excessive signal power. This cannot be avoided in most cases.

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 buidings 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 areunnatural.
2. With FM, improper tuning results in irregular sound. Pay special attention to tuning.

SST & SERVICE SPECIFICATIONS

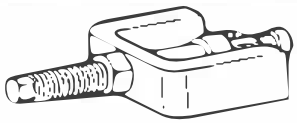
SST (SPECIAL SERVICE TOOLS)

CLUTCH

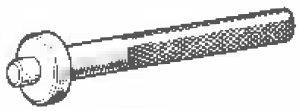
Clutch Master Cylinder

Illustration	Tool No.	Tool Name
	09751-36011	Brake Tube Union Nut 10 x 12 Wrench

Clutch Unit & Release Bearing

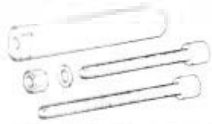
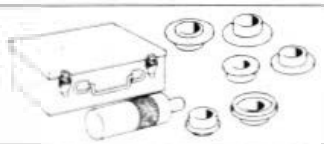
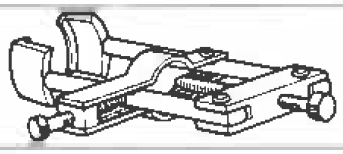
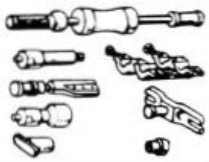
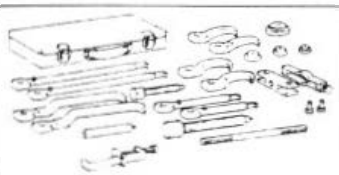
Illustration	Tool No.	Tool Name
	09301-00012	Diaphragm Aligner Tool Set
	09301-20020	Clutch Guide Tool
	09301-55022	Clutch Guide Tool
	09303-35011	Input Shaft Front Bearing Puller
	09303-55010	Input Shaft Front Bearing Puller
	09304-30012	Input Shaft Front Bearing Replacer

Clutch Unit & Release Bearing (Cont'd)

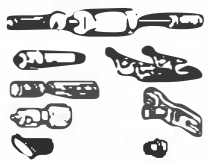
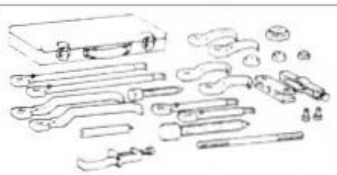
Illustration	Tool No.	Tool Name
	09304-47010	Input Shaft Front Bearing Replace
	09315-00021	Clutch Release Bearing Remover & Replacer

TRANSMISSION

4-Speed Transmission (H41 & H42)

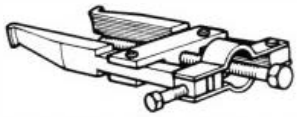
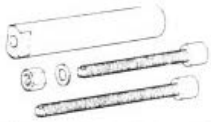
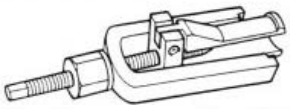
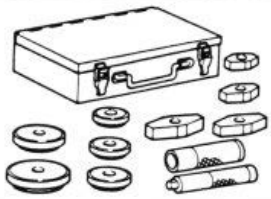
Illustration	Tool No.	Tool Name
	09305-55010	Transmission Gear Shift Lever Remover
	09309-36032	Transmission Bearing Replacer
	09316-60010	Transmission & Transfer Bearing Replacer
	09515-21010	Rear Axle Shaft Bearing Replacer
	09602-10010	Front Axle Inner Bearing Puller
	09905-00012	Snap Ring No.1 Expander
	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

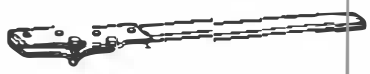
Transfer (H41 & H42)

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)

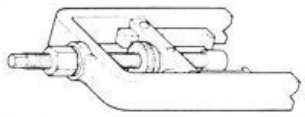
Illustration	Tool No.	Tool Name
	09950-20014	Universal Puller

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

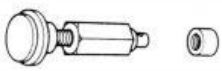
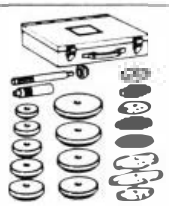
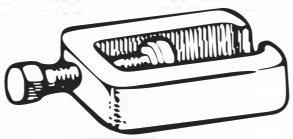
PROPELLER SHAFT

Rear Propeller Shaft

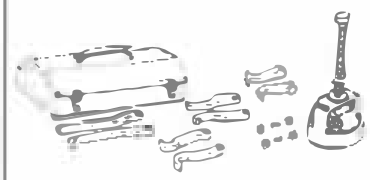
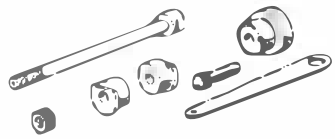
Illustration	Tool No.	Tool Name
	09332-25010	Universal Joint Bearing Remover & Replacer

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

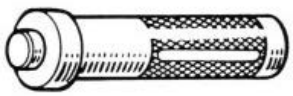
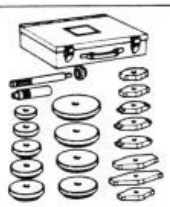
Illustration	Tool No.	Tool Name
	09905-00012	Snap Ring No.1 Expander

REAR AXLE & SUSPENSION

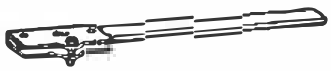
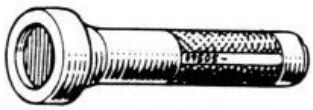
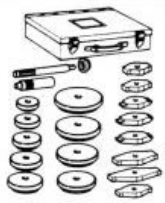
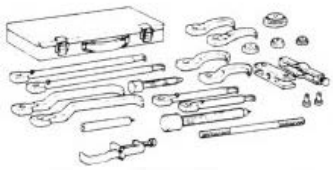
Rear Axle Shaft (Semi-floating Type)

Illustration	Tool No.	Tool Name
	09514-35011	Rear Wheel Bearing Puller
	09515-35010	Rear Wheel Bearing Replacer

Rear Axle Shaft (Full Floating Type)

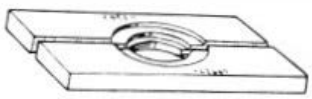
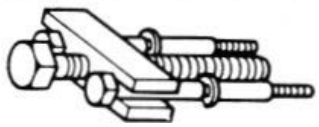
Illustration	Tool No.	Tool Name
	09308-00010	Oil Seal Puller
	09509-25011	Rear Axle Bearing Nut Wrench
	09517-36010	Rear Axle Shaft Oil Seal Replacer
	09608-35013	Axle Hub & Drive Pinion Bearing Tool Set

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

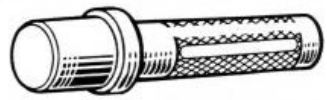
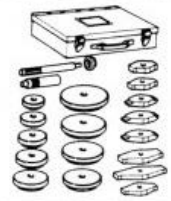
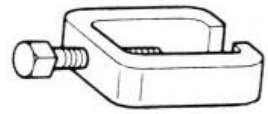
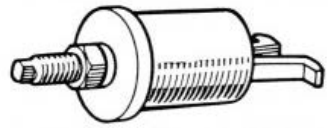
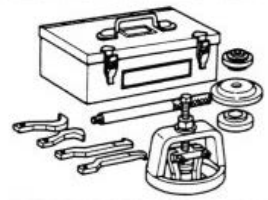
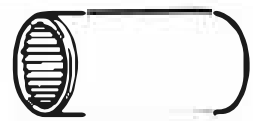
Tilt Type Steering Column & Main Shaft

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

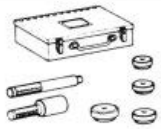
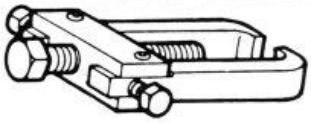
Steering Column & Main Shaft

Illustration	Tool No.	Tool Name
	09609-20010	Steering Wheel Puller
	09905-00012	Snap Ring No.1 Expander

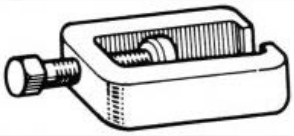
Steering Gear Housing

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

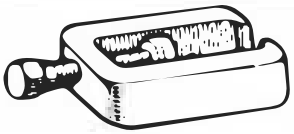
Steering Gear Housing (Cont'd)

Illustration	Tool No.	Tool Name
	09620-30010	Steering Gear Box Replacer Set
	09628-62011	Ball Joint Puller

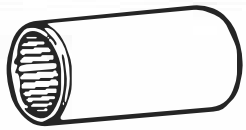
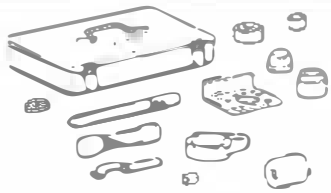
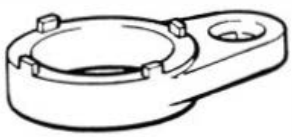
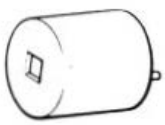
Steering Linkage

Illustration	Tool No.	Tool Name
	09611-20015 09611-22012	Tie Rod End Puller
	09628-62011	Ball Joint Puller

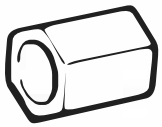
Power Steering

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

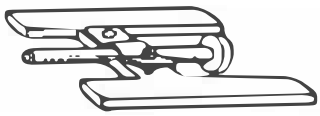
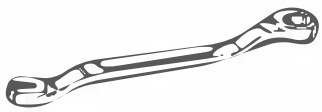
Adjusting

Illustration	Tool No.	Tool Name
	09704-10010	Brake Adjusting Tool

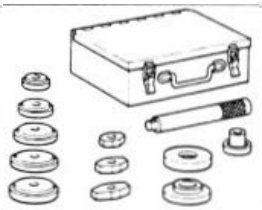
Brake Hose & Tube

Illustration	Tool No.	Tool Name
	09751-36011	Brake Tube Union Nut 10 x 12 Wrench

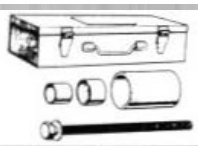
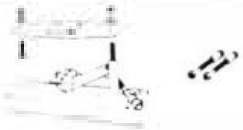
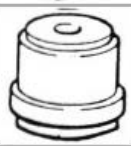
Master Cylinder

Illustration	Tool No.	Tool Name
	09737-00010	Brake Booster Push Rod Gauge
	09751-36011	Brake Tube Union Nut 10 x 12 Wrench

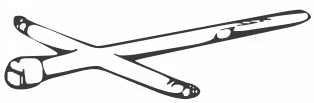
Brake Booster

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 Diaghragm 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

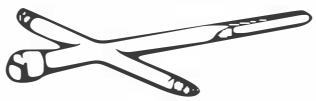
Front Brake (Drum Type) (Cont'd)

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

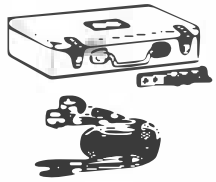
Rear Brake (Cont'd)

Illustration	Tool No.	Tool Name
	09751-36011	Brake Tube Union Nut 10 x 12 Wrench

P & B Valve (Proportioning & Bypass Valve)

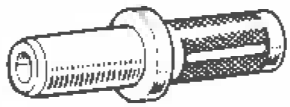
Illustration	Tool No.	Tool Name
	09751-36011	Brake Tube Union Nut 10 x 12 Wrench

LSPV (Load Sensing Proportioning Valve)

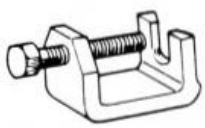
Illustration	Tool No.	Tool Name
	09709-29017	LSPV Gauge Set
	09751-36011	Brake Tube Union Nut 10 x 12 Wrench

FRONT WINCH

Power Take Off

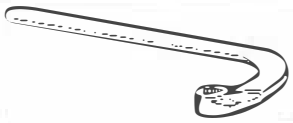
Illustration	Tool No.	Tool Name
	09325-12010	Transmission Oil Plug
	09330-00020	Companion Flange Holding Tool

Electric Winch

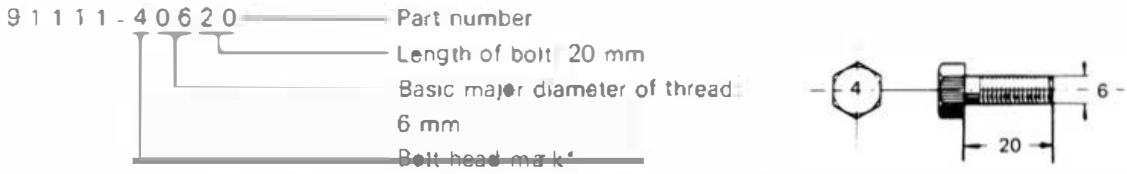
Illustration	Tool No.	Tool Name
	09550-55010	Differential Replacer Set
	09608-30021	Front Hub Bearing Replacer Set
	09611-12010	Tie Rod End Puller

BODY

Front Door

Illustration	Tool No.	Tool Name
	09812-22010	Door Hinge Set Bolt Wrench

STANDARD BOLT TIGHTENING TORQUE



* 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	(5 – 6)
	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	(5 – 6)
	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 Springseat	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	16.7 – 18.8
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
Bellcrank 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			3.0 – 5.0 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	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
Gear oil clearance				
	3rd	STD	0.065 – 0.115 mm	0.0026 – 0.0045 in
		Limit	0.115 mm	0.0045 in
	Reverse idle	Limit	0.16 mm	0.0063 in
Shiftfork to hub sleeve clearance		Limit	0.8 mm	0.031 in
Synchronizer ring to gear clearance				
		Limit	0.8 mm	0.031 in
Synchronizer ring dimension				
	1st	Limit	2.8 mm	0.110 in
	2nd	Limit	1.8 mm	0.071 in
Reverse idle gear shiftarm shoe thickness		Limit	8.1 mm	0.319 in
Reverse idle gear to gear shift arm shoe clearance		Limit	0.7 mm	0.028 in
Snap ring or washer thickness				
Input shaft bearing		Part No.		
		90520-36015	3.31 – 3.42 mm	0.1303 – 0.1346 in
		90520-36016	3.20 – 3.31 mm	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	0.0646 – 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			01 – 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		01 – 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)	
Snap 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.)	
Sn apring thic kness	Part No	Color	
	90520-29286	None	1475 — 1.525 mm	0.0581 — 0.0600 in
	90520-29287	Brown	1.525 — 1575 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-i n	Bias tir e	4 ± 2 mm	016 ± 008 in
	Radial tire	1 ± 2 mm	0.04 ± 008 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 bearı ng pr eload (starting load at hub bolt)		28 — 57 kg	62 — 12.6 lb
Steering knuckle bearing preload (rotating) at Knuckle arm en d		18 — 38 kg	4.0 — 84 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	05 mm	0020 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 ti re.

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	750–16–6PR LT	1.8 (180)	1.8 (180)	1.8 (180)	2.0 (196)	2.4 (235)	2.0 (196)
FJ45 HJ47 series	750–16–8PR LT	2.4 (235)	2.4 (235)	2.4 (235)	3.5 (345)	4.0 (395)	3.5 (340)
FJ60 BJ60 series	750–16–6PR 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	700–16–6PR LT	1.8 (26)	1.8 (26)	1.8 (26)	2.4 (34)	2.8 (40)	2.4 (34)
BJ42	750–16–6PR LT	1.8 (26)	1.8 (26)	1.8 (26)	2.0 (28)	2.4 (34)	2.0 (28)
series	205SR16 R	1.7 (24)	2.0 (28)	1.7 (24)	2.2 (31)	2.5 (35)	2.2 (31)
BJ46 series	700–16–6PR LT	1.8 (26)	1.8 (26)	1.8 (26)	2.6 (37)	3.0 (43)	2.6 (37)
	750–16–6PR LT	1.8 (26)	1.8 (26)	1.8 (26)	2.2 (31)	2.6 (37)	2.2 (31)
	205SR16 R	1.7 (24)	2.0 (28)	1.7 (24)	2.4 (34)	2.7 (38)	2.4 (34)
FJ45	700–16–8PR LT	2.4 (34)	2.4 (34)	4.25 (60)	4.25 (60)	4.25 (60)	4.25 (60)
BJ45	750–16–6PR LT	1.8 (26)	2.0 (28)	1.8 (26)	—	—	—
series	750–16–8PR LT	2.4 (34)	2.4 (34)	2.4 (34)	3.5 (50)	4.0 (57)	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	700–15–6PR LT	1.8 (26)	2.0 (28)	1.8 (26)	2.6 (37)	3.0 (43)	2.6 (37)
BJ40	700–16–6PR LT	1.8 (26)	1.8 (26)	1.8 (26)	2.4 (34)	2.8 (40)	2.4 (34)
BJ42	750–16–6PR LT	1.8 (26)	1.8 (26)	1.8 (26)	2.0 (28)	2.4 (34)	2.0 (28)
series	900–15–6PR	1.2 (17)	—	0.7 (10)	1.8 (26)	—	1.8 (26)
FJ43	700–15–16PR LT	1.8 (26)	2.0 (28)	1.8 (26)	2.8 (40)	3.25 (46)	2.8 (40)
BJ43	700–16–16PR LT	1.8 (26)	1.8 (26)	1.8 (26)	2.6 (37)	3.0 (43)	2.6 (37)
BJ46	750–16–6PR LT	1.8 (26)	1.8 (26)	1.8 (26)	2.2 (31)	2.6 (37)	2.2 (31)
series	900–15–6PR	1.2 (17)	—	0.7 (10)	2.0 (28)	—	2.0 (28)
FJ45	700–16–8PR LT	2.4 (34)	2.4 (34)	2.4 (34)	4.25 (60)	4.25 (60)	4.25 (60)
BJ45	750–16–6PR LT	1.8 (26)	2.0 (28)	1.8 (26)	—	—	—
HJ47	750–16–8PR LT	2.4 (34)	2.4 (34)	2.4 (34)	3.5 (50)	4.0 (57)	3.5 (50)
series	900–15–6PR LT	1.3 (19)	—	0.9 (13)	2.3 (33)	—	2.3 (33)
FJ60	700–15–6PR LT	1.8 (26)	2.2 (31)	1.8 (26)	3.25 (46)	3.25 (46)	3.25 (46)
BJ60	700–16–6PR LT	1.8 (26)	2.2 (31)	1.8 (26)	3.25 (46)	3.25 (46)	3.25 (46)
HJ60	750–16–6PR LT	1.8 (26)	1.8 (26)	1.8 (26)	2.6 (37)	3.0 (43)	2.6 (37)
series	900–15–6PR	1.4 (20)	—	1.2 (17)	2.3 (33)	—	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	35 – 52 in-lb
Drive pinion to ring gear backlash		0.15 – 0.20 mm	0.0059 – 0.0079 in
Pinion gear to side gear backlash		002 – 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	0.0039 in
	Lateral	0.10 mm	0.0039 in
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 – 00650 in
	41361-60020	1.70 – 1.80 mm	0.0669 – 0.0709 in
	41361-60030	1.85 – 195 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 – 01157 in
	90560-30192	2.95 – 2.97 mm	01161 – 01169 in
	90560-30199	2.98 – 300 mm	01173 – 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	00118 in
	90564-68003	0.35 mm	00138 in
	90564-68004	0.40 mm	00157 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	306 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	1.9 – 2.6 kg-cm	1.65 – 2.26 in-lb
	Reused bearing	0.9 – 1.3 kg-cm	0.78 – 1.13 in-lb
Total preload	at Starting	Add drive pinion bearing preload	
		0.4 – 0.6 kg-cm	0.35 – 0.52 in-lb
Drive pinion to ring gear backlash		0.15 – 0.20 mm	0.0059 – 0.0079 in
Pinion gear to sidegear 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	0.0039 in
	Lateral	0.10 mm	0.0039 in
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	289 – 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	01173 – 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) (withside gear pushed with 10 kg or 22 lb of pressure)	1903 – 1913 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

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
	45813-22050	17.989 – 17.996 mm	0.7082 – 0.7085 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
	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 thikness	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	3.5 – 6.5 kg-cm	3.0 – 5.6 in-lb
	w/ Sector shaft	8 – 11 kg-cm	6.9 – 9.5 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	Mark		
(for worm bearing preload)	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/cm² (1022 psi)	
Variation in vane pump discharge pressure (at 1,000 rpm and 3,000 rpm)		Less than 5 kg/cm² (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

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	24 mm	0.094 in
Blade			
Hight	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 PTO	2.5	2.6	2.2	API GL-4 or GL-5 SAE 90
	w/ PTO	3.1	3.3	2.7	
J30	w/o PTO	1.7	1.8	1.5	
	w/ PTO	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					
FJ,BJ,HJ6_series		500 cc	30.5 cu in		API GL-4 SAE 90
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					
Propeller shaft					Lithium base NLGI No.2
Steering link ends					Molybdenum disulphide lithium base NLGI No.2
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 lene 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 letters
   The first letter indicates the basic color for the wire, and the second letter indicates the spiral linecolor

B	= Black	O	= Orange	W	= White
G	= Green	R	= Red	Y	= Yellow
L	= Light Blue	Lg	= Light Green		

   Exemple RG. is for Red and Green line
2. Legend in the bracket [ ] of the wiring diagram shows thegrid location of mating connection
3. Broken lines in the wiring diagram are for varied models or optional equipment
4. The following abbreviations are sued in this wiring diagram

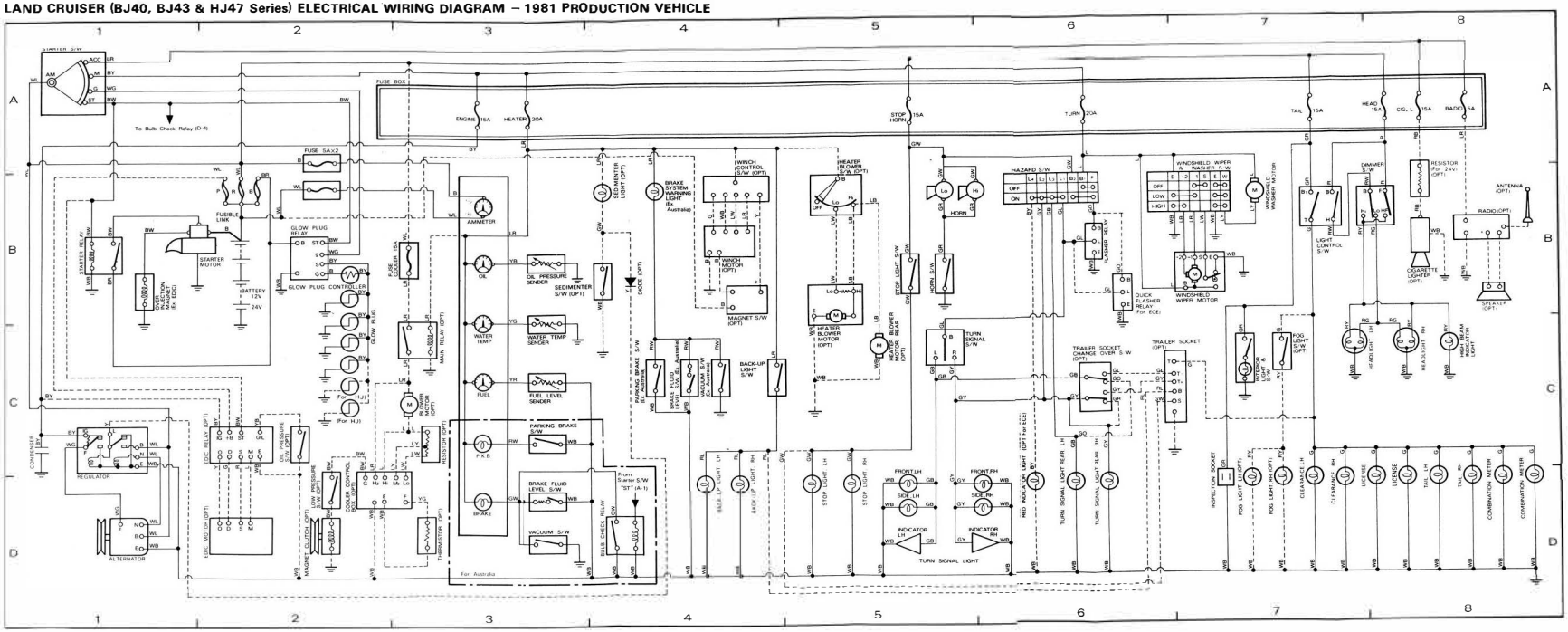
RHD	= Right Hand Drive Vehicles		S/W	= Switch
LHD	= Left Hand Drive Vehicles		A/T	= Automatic Transmission
VSV	= Vacuum Switching Valve			

LAND CRUISER (BJ40, BJ43 & HJ47 Series) ELECTRICAL WIRING DIAGRAM INDEX – 1981 PRODUCTION VEHICLE

GRID LOCATION	COMPONENTS
D-1	ALTERNATOR
B-3	AMMETER
B-8	ANTENNA (OPT)
B-2	BATTERY 12V or 24V
B-8	CIGARETTE LIGHTER (OPT)
C-1	CONDENSER
D-2	COOLER CONTROL BOX (OPT)
B-4	DIODE (OPT)
C-3	FUEL GAUGE
C-3	FUEL LEVEL SENDER
A-2 B-2	FUSE 5A X 2
A-2	FUSE BOX
B-3	FUSE COOLER 15A
B-2	FUSIBLE LINK
B-2 C-2	GLOWPLUG
B-2	GLOW PLUG CONTROLLER
B-6	HORN Hi
B-5	HORN Lo
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	COMBINATIONMETER 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
	MOTORS
C-3	BLOWER (OPT)

GRID LOCATION	COMPONENTS
D-2	EDIC (OPT)
B-5	HEATER BLOWER
C-5	HEATER BLOWER, REAR
B-1	STARTER
B-4	WINCH (OPT)
B-7	WINDSHIELD WASHER
B-7	WINDSHIELD WIPER
B-3	OIL PRESSURE GAUGE
B-3	OIL PRESSURE SENDER
B-1	OVER INJECTION MAGNET (Ex. EDIC)
B-8	RADIO (OPT)
C-1	REGULATOR
B-8	RESISTOR (For 24V OPT)
C-3	RESISTOR (OPT)
	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-8	SPEAKER (OPT)
	SWITCHES
C-4	BACK-UP LIGHT
C-4	BRAKE FLUIDLEVEL (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-6	HORN
C-7	INTERIORLIGHT
B-7	LIGHT CONTROL
D-2	LOW PRESSURE (OPT)
B-4	MAGNET (OPT)
C-2	OIL PRESSURE
C-4	PARKINGBRAKE (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	WINDSHIELDWASHER
B-7	WINDSHIELD WIPER
D-3	THERMISTOR (OPT)
C-6	TRAILER SOCKET (OPT)
C-3	WATERTEMP GAUGE
C-3	WATER TEMP SENDER

LAND CRUISER (BJ40, BJ43 & HJ47 Series) ELECTRICAL WIRING DIAGRAM – 1981 PRODUCTION VEHICLE

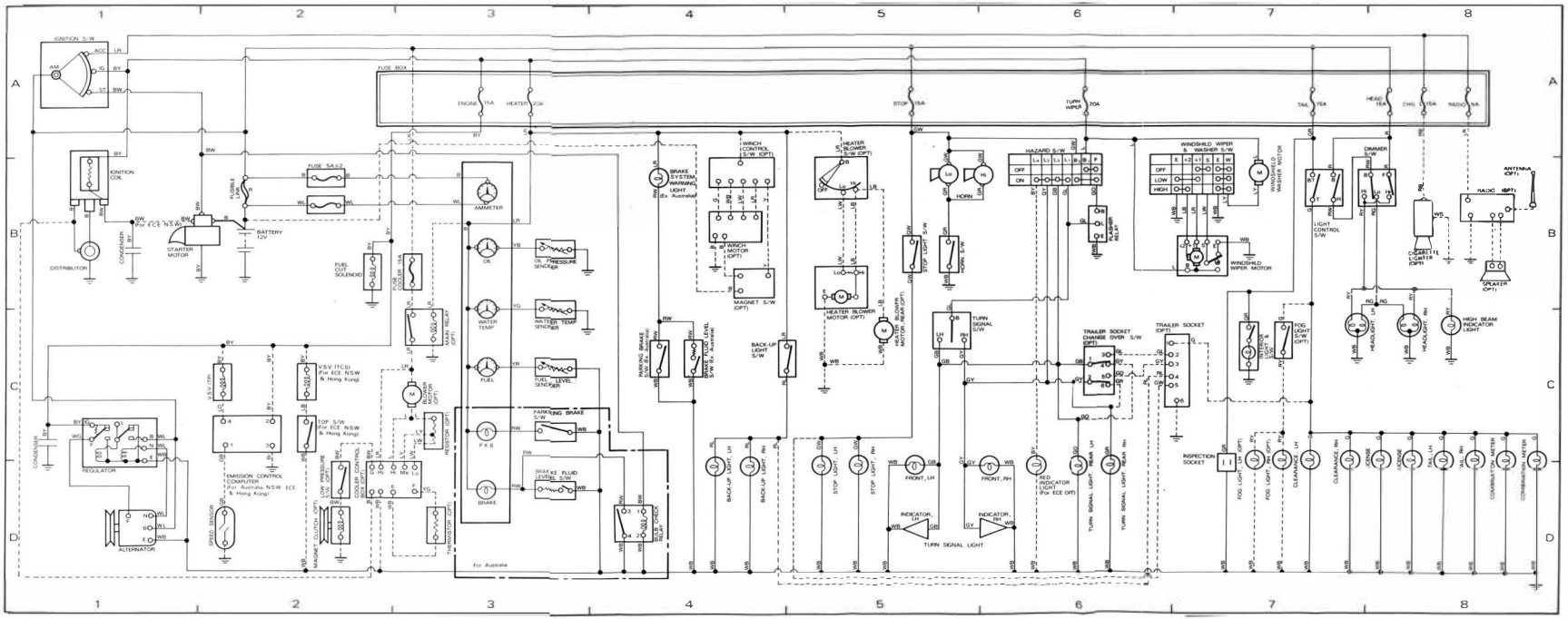


FJ40 & FJ43 Series

LAND CRUISER (FJ40 & FJ43 Series) ELECTRICAL WIRING DIAGRAM INDEX – 1981 PRODUCTION VEHICLE

GRID LOCATION	COMPONENTS
D-1	ALTERNATOR
B-3	AMMETER
B-8	ANTENNA (OPT)
B-2	BATTERY 12V
B-8	CIGARETTE LIGHTER (OPT)
B-1	CONDENSER
C-1	CONDENSER
D-2	COOLER CONTROL BOX (OPT)
B-1	DISTRIBUTOR
	EMISSION CONTROL SYSTEM: (For Australia, NSW, ECE & Hong Kong)
C-2	COMPUTER
D-2	SPEED SENSOR
C-2	TOP SWITCH (For ECE, NSW & Hong Kong)
C-2	VSV (TCS) (For ECE, NSW & HongKong)
C-2	VSV (TP)
B-2	FUEL CUT SOLENOID
C-3	FUEL GAUGE
C-3	FUEL LEVEL SENDER
B-2	FUSE 5A X 2
A-2	FUSE BOX
B-3	FUSE COOLER 15A
B-2	FUSIBLE LINK
B-6	HORN Hi
B-5	HORN Lo
B-1	IGNITION COIL
D-7	INSPECTION SOCKET
	LIGHTS:
D-4	BACK-UP, LH
D-4	BACK-UP, RH
D-3	BRAKE WARNING (For Australia)
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-6	HIGH BEAM INDICATOR
C-7	INTERIOR
D-7 D-8	LICENSE X 2
C-3	P.K.B (For Australia)
D-6	REO INDICATOR (For ECE 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-2	MAGNET CLUTCH (OPT)
	MOTORS:
C-3	BLOWER (OPT)
B-6	HEATER BLOWER (OPT)
C-5	HEATER BLOWER, REAR (OPT)
B-1	STARTER
B-4	WINCH (OPT)
B-7	WINDSHIELD WASHER
B-7	WINDSHIELD WIPER
B-3	OIL PRESSURE GAUGE
B-3	OIL PRESSURE SENDER
B-8	RADIO (OPT)
C-1	REGULATOR
C-3	RESISTOR (OPT)
	RELAYS:
D-4	BULB CHECK (For Australia)
B-6	FLASHER
C-3	MAIN (OPT)
B-8	SPEAKER (OPT)
	SWITCHES:
C-4	BACK-UP LIGHT
C-4	BRAKE FLUID LEVEL (Ex. Australia)
D-3	BRAKE FLUID LEVEL (For Australia)
B-7	DIMMER
C-7	FOG LIGHT (OPT)
A-6	HAZARD
A-5	HEATER BLOWER (OPT)
B-5	HORN
A-1	IGNITION
C-7	INTERIOR LIGHT
B-7	LIGHTCONTROL
D-2	LOW PRESSURE
B-4	MAGNET (OPT)
C-4	PARKING BRAKE (Ex. Australia)
C-3	PARKING BRAKE (For Australia)
B-5	STOP LIGHT
C-8	TRAILER SOCKET CHANG OVER (OPT)
C-5	TURN SIGNAL
A-4	WINCH CONTROL (OPT)
A-7	WINDSHIELD WASHER
A-7	WINDSHIELD WIPER
D-3	THERMISTOR (OPT)
C-7	TRAILER SOCKET (OPT)
B-3	WATER TEMP GAUGE
B-3	WATER TEMP SENDER

LAND CRUISER (FJ40 & FJ43 Series) ELECTRICAL WIRING DIAGRAM – 1981 PRODUCTION VEHICLE



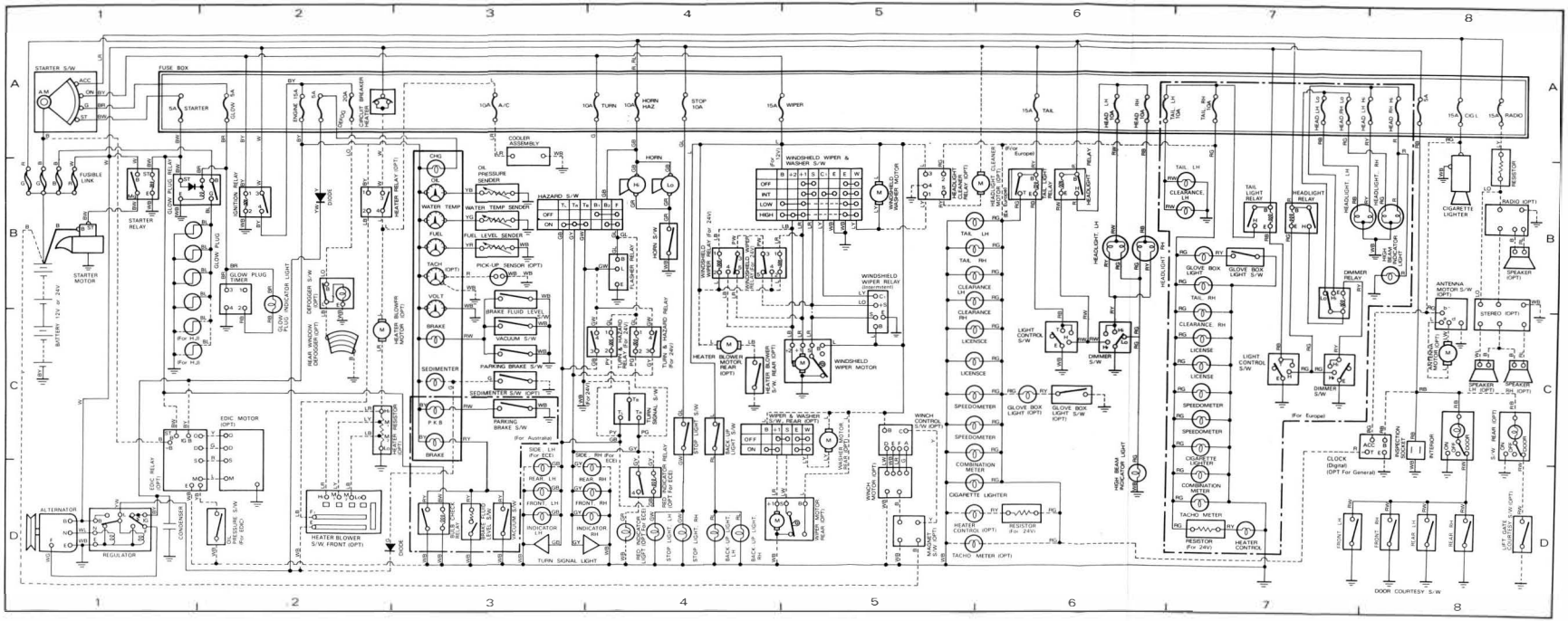
BJ60 & HJ60 Series

LAND CRUISER (BJ60 & HJ60 Series) ELECTRICAL WIRING DIAGRAM INDEX – 1981 PRODUCTION VEHICLE

GRID LOCATION	COMPONENTS
D-1	ALTERNATOR
C-1	BATTERY 12V or 24V
B-8	CIGARETTE LIGHTER
A-2	CIRCUIT BREAKER HEATER
C-8	CLOCK (Digital) (OPT For General)
D-1	CONDENSER
A-3	COOLER ASSEMBLY
B-2	DIODE
D-2	DIODE
B-3	FUEL GAUGE
B-3	FUEL LEVEL SENDER
A-1	FUSE BOX
B-1	FUSIBLE LINK
B-1	GLOW PLUG
B-2	GLOW PLUG TIMER
C-2	HEATER BLOWER RESISTOR (OPT)
B-4	HORN Hi
B-4	HORN Lo
C-8	INSPECTION SOCKET
	LIGHTS:
D-4	BACK-UP, LH
D-4	BACK-UP, RH
C-3	BRAKE WARNING
C-3	BRAKE WARNING (For Australia)
B-3	CHARGE WARNING
D-5	CIGARETTE LIGHTER
D-7	CIGARETTE LIGHTER (For Europe)
B-5	CLEARANCE, LH
B-7	CLEARANCE, LH (For Europe)
B-5	CLEARANCE, RH
C-7	CLEARANCE, RH (For Europe)
C-5	COMBINATION METER
D-7	COMBINATION METER (For Europe)
C-6	GLOW BOX (OPT)
B-7	GLOVE BOX (For Europe)
B-2	GLOVE PLUG INDICATOR
B-6	HEAD, LH
B-7	HEAD, LH (For Europe)
B-6	HEAD, RH
B-8	HEAD, RH (For Europe)
D-5	HEATER CONTROL (OPT)
D-7	HEATER CONTROL (For Europe)
D-6	HIGH BEAM INDICATOR
B-8	HIGH BEAM INDICATOR (For Europe)
C-8	INTERIOR
C-8	INTERIOR, REAR (OPT)
C-5	LICENSE x 2
C-7	LICENSE x 2 (For Europe)
C-3	P.K.B. (For Australia)
D-4	RED INDICATOR (OPT For ECE)
C-3	SEDIMENTER
C-5	SPEEDOMETER x 2
C-7	SPEEDOMETER x 2
D-4	STOP, LH
D-4	STOP, RH
D-5	TACHOMETER (OPT)
D-7	TACHOMETER (For Europe)
B-5	TAIL, LH
B-7	TAIL, LH (For Europe)
B-5	TAIL, RH
B-7	TAIL, RH (For Europe)
D-3	TURN SIGNAL, FRONT LH
D-4	TURN SIGNAL, FRONT RH
D-3	TURN SIGNAL, INDICATOR LH
D-4	TURN SIGNAL, INDICATOR RH
D-3	TURN SIGNAL, REAR LH
D-4	TURN SIGNAL, REAR RH
C-3	TURN SIGNAL, SIDE LH (For ECE)
C-4	TURN SIGNAL, SIDE RH (For ECE)
	MOTORS:
C-8	ANTENNA (OPT)
C-2	EDIC (OPT)
B-6	HEADLIGHT CLEANER (OPT)
C-2	HEATER BLOWER (OPT)
C-4	HEATER BLOWER, REAR (OPT)
B-1	STARTER
C-5	WASHER, REAR (OPT)

GRID LOCATION	COMPONENTS
D-5	WINCH (OPT)
B-5	WINDSHIELD WASHER
C-5	WINDSHIELD WIPER
D-5	WIPER, REAR (OPT)
B-3	OIL PRESSURE GAUGE
B-3	OIL PRESSURE SENDER
B-3	PICK-UP SENSOR (OPT)
B-8	RADIO (OPT)
C-2	REAR WINDOW DEFOGGER (OPT)
D-1	REGULATOR
A-8	RESISTOR (For 24V)
D-6	RESISTOR (For 24V)
	RELAYS:
D-3	BULB CHECK (For Australia)
B-7	DIMMER (For Europe)
D-1	EDIC (OPT)
B-4	FLASHER
B-2	GLOW PLUG INDICATOR
B-6	HEADLIGHT
A-7	HEADLIGHT (For Europe)
B-5	HEADLIGHT CLEANER (OPT)
B-2	HEATER (OPT)
B-2	IGNITION
D-4	RED INDICATOR (OPT For ECE)
B-1	STARTER
B-6	TAIL LIGHT
B-7	TAIL LIGHT (For Europe)
C-4	TURN & HAZARD (For 24V)
B-4	WINDSHIELD WIPER (For 24V)
B-5	WINDSHIELD WIPER (Intermittent)
B-8	SPEAKER (OPT)
C-8	SPEAKER, LH (OPT)
C-8	SPEAKER, RH (OPT)
B-8	STEREO (OPT)
	SWITCHES:
B-8	ANTENNA MOTOR (OPT)
C-4	BACK-UP LIGHT
B-3	BRAKE FLUID LEVEL
D-3	BRAKE FLUID LEVEL (For Australia)
B-2	DEFOGGER (OPT)
C-6	DIMMER
C-7	DIMMER (For Europe)
D-7	DOOR COURTESY, FRONT LH
D-8	DOOR COURTESY, FRONT RH
D-8	DOOR COURTESY, REAR LH
D-8	DOOR COURTESY, REAR RH
B-7	GLOVE BOX LIGHT (For Europe)
C-6	GLOVE BOX LIGHT (OPT)
B-1	HAZARD
D-2	HEATER BLOWER, FRONT (OPT)
C-4	HEATER BLOWER, REAR (OPT)
B-4	HORN
C-8	INTERIOR
C-8	INTERIOR, REAR (OPT)
D-8	LIFT GATE COURTESY (OPT)
C-6	LIGHT CONTROL
C-7	LIGHT CONTROL (For Europe)
D-5	MAGNET (OPT)
D-2	OIL PRESSURE (For EDIC)
C-3	PARKING BRAKE
C-3	PARKING BRAKE (For Australia)
C-3	SEDIMENTER (OPT)
A-1	STARTER
C-4	STOP LIGHT
C-4	TURN SIGNAL
C-3	VACUUM
D-3	VACUUM (For Australia)
C-4	WASHER, REAR (OPT)
C-5	WINCH CONTROL (OPT)
B-5	WINDSHIELD WASHER
B-5	WINDSHIELD WIPER
C-4	WIPER, REAR (OPT)
B-3	TACHOMETER (OPT)
B-3	VOLTMETER
B-3	WATER TEMP GAUGE
B-3	WATER TEMP SENDER

LAND CRUISER (BJ60 & HJ60 Series) ELECTRICAL WIRING DIAGRAM – 1981 PRODUCTION VEHICLE



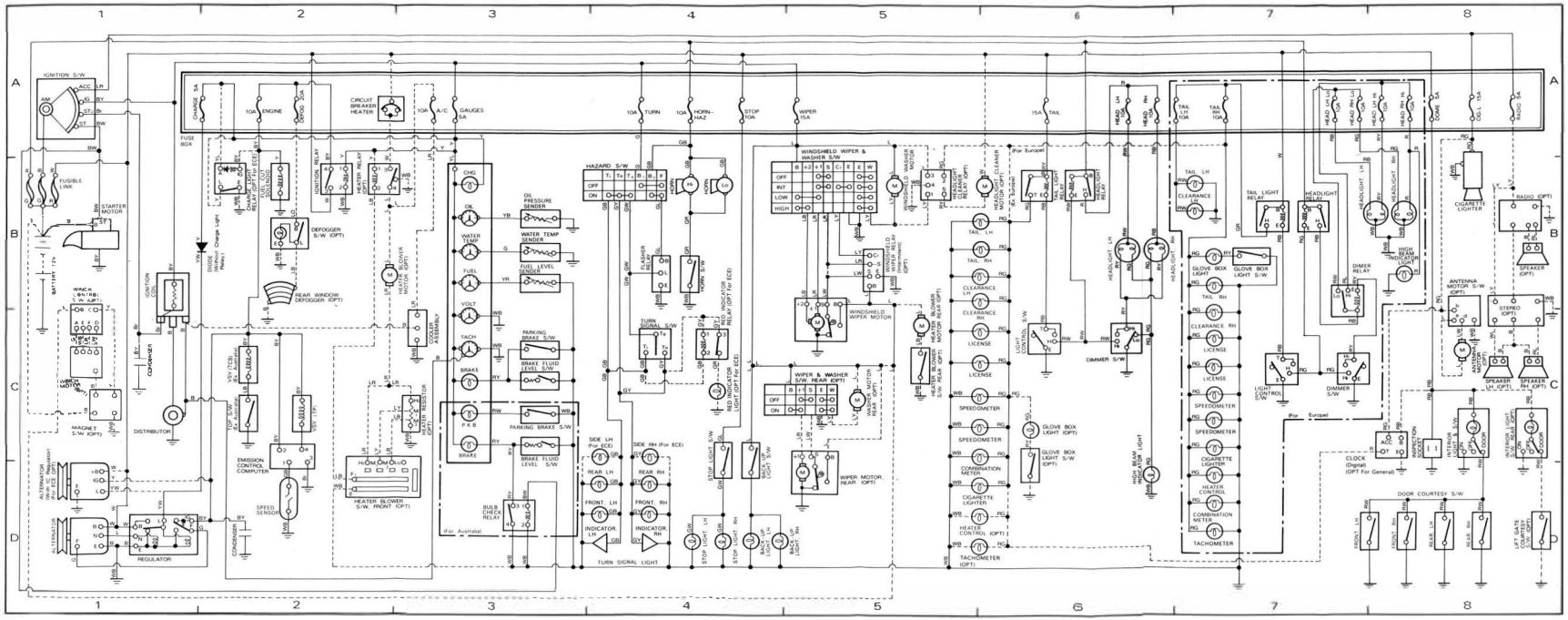
FJ60 Series

LAND CRUISER (FJ60 Series) ELECTRICAL
WIRING DIAGRAM INDEX – 1981 PRODUCTION VEHICLE

GRID LOCATION	COMPONENTS
D-1	ALTERNATOR
D-1	ALTERNATOR (With IC Regulator) (For ECE OPT)
B-1	BATTERY 12V
B-8	CIGARETTE LIGHTER
A-2	CIRCUIT BREAKER HEATER
C-8	CLOCK (Digital) (OPT For General)
C-1	CONDENSER
D-2	CONDENSER
C-3	COOLER ASSEMBLY
B-1	DIODE (Ex. Charge Light Relay)
C-1	DISTRIBUTOR
	EMISSIONCONTROL SYSTEM:
C-2	COMPUTER
C-2	VSV (TP)
C-2	VSV (TCS) (Ex. Australia)
D-2	SPEED SENSOR
C-2	TOP SWITCH (Ex. Australia)
B-2	FUEL CUT SOLENOID
B-3	FUEL GAUGE
B-3	FUEL LEVEL SENDER
A-1	FUSE BOX
B-1	FUSIBLE LINK
C-3	HEATER RESISTOR (OPT)
B-4	HORN Hi
B-4	HORN Lo
B-1	IGNITION COIL
C-8	INSPECTION SOCKET
	LIGHTS:
D-4	BACK-UP, LH
D-4	BACK-UP, RH
C-3	BRAKE WARNING
C-3	BRAKE WARNING (For Australia)
B-3	CHARGE WARNING
D-5	CIGARETTE LIGHTER
C-7	CIGARETTELIGHTER (For Europe)
B-5	CLEARANCE, LH
B-7	CLEARANCE, LH (For Europe)
B-5	CLEARANCE, RH
C-7	CLEARANCE, RH (For Europe)
C-5	COMBINATION METER
D-7	COMBINATION METER (For Europe)
C-6	GLOVE BOX (OPT)
B-7	GLOVE BOX (For Europe)
B-6	HEAD, LH
B-8	HEAD, LH (For Europe)
B-6	HEAD, RH
B-8	HEAD, RH (For Europe)
D-5	HEATER CONTROL (OPT)
D-7	HEATER CONTROL (For Europe)
D-6	HIGH BEAM IND ICATOR
B-8	HIGH BEAM INDICATOR (For Europe)
C-8	INTERIOR
C-8	INTERIOR, REAR (OPT)
C-5	LICENSE x 2
C-7	LICENSE x 2 (For Europe)
C-3	P.K.B. (For Australia)
C-4	RED INDICATOR (OPT For ECE)
C-5	SPEEDOMETER x 2
C-7	SPEEDOMETER (For Europe)
D-4	STOP, LH
D-4	STOP, RH
C-5	TACHOMETER (OPT)
D-7	TACHOMETER (For Europe)
B-5	TAIL, LH
B-7	TAIL, LH (For Europe)
B-5	TAIL, RH
B-7	TAIL, RH (For Europe)
D-4	TURN SIGNAL, FRONT LH
D-4	TURN SIGNAL, FRONT RH
D-4	TURN SIGNAL, INDICATOR LH
D-4	TURN SIGNAL, INDICATOR RH
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)

GRID LOCATION	COMPONENTS
	MOTORS:
C-8	ANTENNA (OPT)
B-8	HEADLIGHT CLEANER (OPT)
B-2	HEATER BLOWER (OPT)
C-5	HEATER BLOWER, REAR (OPT)
B-1	STARTER
C-5	WASHER, REAR (OPT)
C-1	WINCH (OPT)
B-5	WINDSHIELDWASHER
B-5	WINDSHIELD WIPER
C-5	WIPER, REAR (OPT)
B-3	OIL PRESSURE GAUGE
B-3	OIL PRESSURE SENDER
D-8	RADIO (OPT)
B-2	REAR WINDOW DEFOGGER (OPT)
D-1	REGULATOR
	RELAYS:
D-3	BULB CHECK (For Australia)
B-2	CHARGE LIGHT (OPT For ECE)
B-7	DIMMER (For Europe)
B-4	FLASHER
B-6	HEADLIGHT
B-7	HEADLIGHT (For Europe)
B-5	HEADLIGHT CLEANER (OPT)
B-2	HEATER(OPT)
B-2	IGNITION
C-4	RED INDICATOR (OPT For ECE)
B-6	TAIL LIGHT
B-7	TAIL LIGHT (For Europe)
B-5	WINDSHIELD WIPER (Intermittent) (OPT)
B-8	SPEAKER (OPT)
C-8	SPEAKER, LH (OPT)
C-8	SPEAKER, RH (OPT)
B-8	STEREO (OPT)
	SWITCHES:
B-8	ANTENNAMOTOR (OPT)
C-4	BACK-UPLIGHT
C-3	BRAKE FLUID LEVEL
C-3	BRAKE FLUID LEVEL (For Australia)
B-2	DEFOGGER (OPT)
C-6	DIMMER
C-7	DIMMER (For Europe)
D-8	DOOR COURTESY, FRONT LH
D-8	DOOR COURTESY, FRONTRH
D-8	DOOR COURTESY, REAR LH
D-8	DOORCOURTESY, REAR RH
B-7	GLOVE BOX LIGHT (For Europe)
C-6	GLOVE BOX LIGHT (OPT)
B-4	HAZARD
D-3	HEATER BLOWER, FRONT (OPT)
C-5	HEATER BLOWER, REAR (OPT)
B-4	HORN
A-1	IGNITION
C-8	INTERIOR
C-8	INTERIOR, REAR (OPT)
D-8	LIFT GATE COURTESY (OPT)
C-6	LIGHT CONTROL
C-7	LIGHT CONTROL (For Europe)
C-1	MAGNET (OPT)
C-3	PARKING BRAKE
C-3	PARKING BRAKE (For Australia)
C-4	STOP LIGHT
C-4	TURN SIGNAL
C-5	WASHER, REAR (OPT)
B-1	WINCH CONTROL (OPT)
A-5	WINDSHIELD WASHER
A-5	WINDSHIELD WIPER
C-5	WIPER, REAR (OPT)
C-3	TACHOMETER
B-3	VOLTMETER
B-3	WATER TEMP GAUGE
B-3	WATER TEMP SENDER

LAND CRUISER (FJ60 Series) ELECTRICAL WIRING DIAGRAM – 1981 PRODUCTION VEHICLE



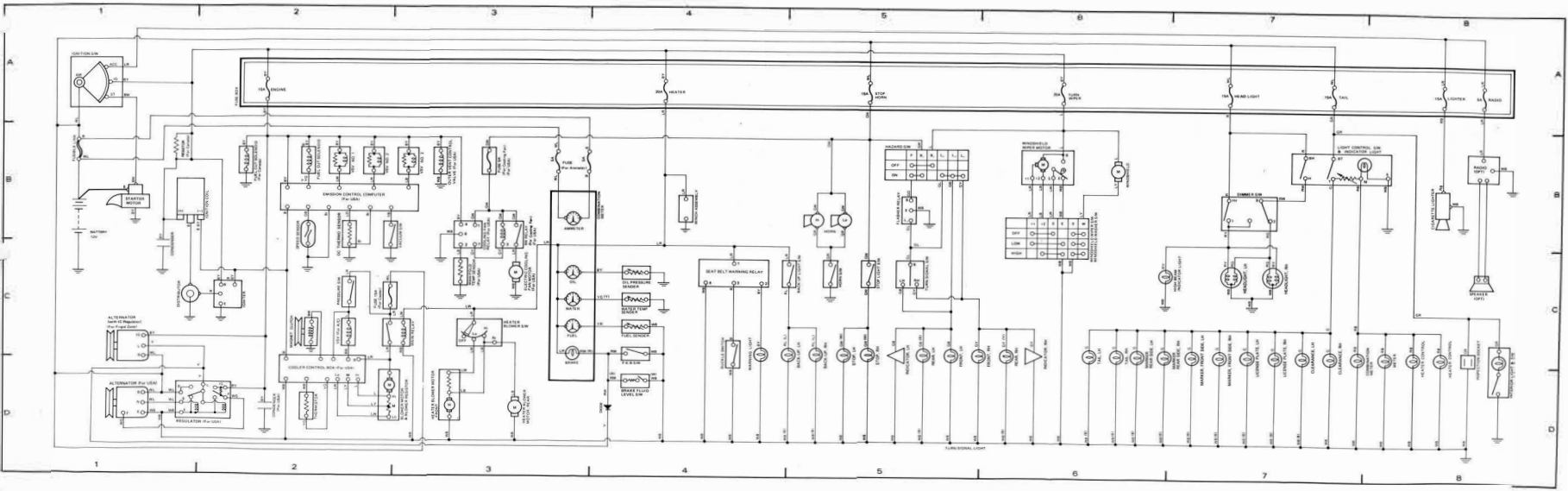
FJ40 Series
(For USA & CANADA)

LAND CRUISER (FJ40 Series) ELECTRICAL WIRING DIAGRAM INDEX (For USA & CANADA) – 1981 Model

GRID LOCATION	COMPONENTS
D-1	ALTERNATOR (For USA)
C-1	ALTERNATOR (With IC Regulator) (For Canada Frigid Zone)
C-1	ALTERNATOR (With IC Regulator) (For USA Frigid Zone)
B-3	AMMETER
B-1	BATTERY 12V
B-8	CIGARETTE LIGHTER
B-3	COMBINATION METER
C-1	CONDENSER
D-2	CONDENSER (For USA)
	COOLER SYSTEM: (For USA)
D-2	ASSEMBLY
D-2	CONTROL BOX
C-2	FUSE 15A
C-2	MAGNET CLUTCH
C-2	MAIN RELAY
C-2	PRESSURE SWITCH
D-2	THERMISTOR
C-2	VSV
D-4	DIODE
C-1	DISTRIBUTOR
	EMISSION CONTROL SYSTEM: (For USA)
B-2	EMISSION CONTROL COMPUTER
B-2	FUEL CUT SOLENOID
B-2	OC THERMO SENSOR
B-3	OUTER VENT CONTROL VALVE
B-2	SPEED SENSOR
B-2	VACUUM SWITCH
B-2	VSV NO.1 (AI)
B-2	VSV NO.2 (CCo)
B-3	VSV NO.3 (EGR)
B-2	FUEL CUT SOLENOID (For Canada)
C-3	FUEL GAUGE
C-4	FUEL SENDER
B-3	FUSE (For Ammeter) (5A x 2)
B-3	FUSE 5A (For Cooling Fan) (For USA)
A-2	FUSE BOX
B-1	FUSIBLE LINK
B-5	HORN, HIGH
B-5	HORN, LOW
C-2	IGNITER
B-2	IGNITION COIL (For Canada)
B-1	IGNITION COIL (For USA)
C-8	INSPECTION SOCKET
	LIGHTS:
C-5	BACK-UP LH
C-5	BACK-UP RH
C-3	BRAKE WARNING
C-7	CLEARANCE LH
C-7	CLEARANCE RH
C-8	COMBINATION METER
C-7	HEAD LH
C-7	HEAD RH
C-8	HEATER CONTROL
C-7	HIGH BEAM INDICATOR
D-8	INTERIOR
C-7	LICENSE PLATE LH
C-7	LICENSE PLATE LH (For USA)
C-7	LICENSE PLATE RH
C-7	LICENSE PLATE RH (For USA)

GRID LOCATION	COMPONENTS
B-7	LIGHT CONTROL INDICATOR
C-7	MARKER, FRONT SIDE LH
C-7	MARKER, FRONT SIDE RH
C-6	MARKER, REAR SIDE LH
C-7	MARKER, REAR SIDE RH
C-8	METER
C-5	STOP LH
C-5	STOP RH
C-6	TAIL LH
C-6	TAIL RH
C-5	TURN SIGNAL, FRONT LH
C-6	TURN SIGNAL, FRONT RH
C-6	TURN SIGNAL, INDICATOR LH
C-6	TURN SIGNAL, INDICATOR RH
C-5	TURN SIGNAL, REAR LH
C-6	TURN SIGNAL, REAR RH
C-3	MANIFOLD TEMP SENSOR (For USA)
	MOTORS:
C-3	ELECTRIC COOLING FAN (For USA)
D-3	HEATER BLOWER, FRONT
D-3	HEATER BLOWER, REAR
B-1	STARTER (For Canada)
B-1	STARTER (For USA)
B-8	WINDSHIELD WASHER
B-6	WINDSHIELD WIPER
C-3	OIL PRESSURE GAUGE
C-4	OIL PRESSURE SENDER
B-8	RADIO (OPT)
D-1	REGULATOR (For USA)
B-1	RESISTOR (For Ignition Coil) (For Canada)
	RELAYS:
B-3	COOLING FAN (For USA)
B-5	FLASHER
B-3	M4 (For Cooling Fan) (For USA)
	SEAT BELT SYSTEM
C-4	BUCKLE SWITCH
C-4	WARNING LIGHT
C-4	WARNING RELAY (For Canada)
C-4	WARNING RELAY (For USA)
C-8	SPEAKER (OPT)
	SWITCHES:
C-5	BACK UP LIGHT
D-4	BRAKE FLUID LEVEL (For Canada)
D-4	BRAKE FLUID LEVEL (For USA)
B-7	DIMMER
B-5	HAZARD
C-3	HEATER BLOWER
C-5	HORN
A-1	IGNITION
D-8	INTERIOR LIGHT
B-7	LIGHT CONTROL
C-4	PARKING BRAKE
C-5	STOP LIGHT
C-5	TURN SIGNAL
B-6	WINDSHIELD WASHER
B-6	WINDSHIELD WIPER
C-3	WATER TEMPERATURE GAUGE
C-4	WATER TEMPERATURE SENDER
B-8	WINCH ASSEMBLY

LAND CRUISER (FJ40 Series) ELECTRICAL WIRING DIAGRAM (For USA & CANADA) – 1981 Model



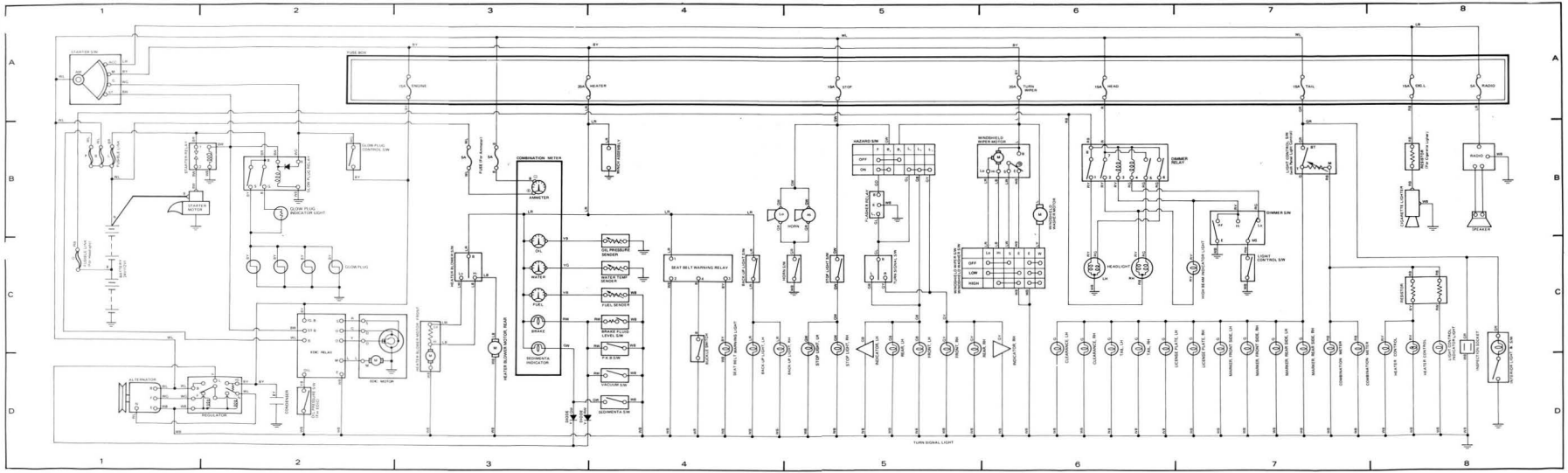
BJ40 Series
(For USA & CANADA)

LAND CRUISER (BJ40 Series) ELECTRICAL WIRING DIAGRAM INDEX (For USA & CANADA) – 1981 Model

GRID LOCATION	COMPONENTS
D-1	ALTERNATOR
B-3	AMMETER
C-1	BATTERY 24V (12V x 2)
B-8	CIGARETTE LIGHTER
B-3	COMBINATION METER
D-2	CONDENSER
D-3	DIODE
D-3	DIODE (For Sedimental
C-3	FUEL GAUGE
C-4	FUEL SENDER
B-3	FUSE (For Ammeter) (5A x 2)
A-2	FUSE BOX
B-1	FUSIBLE LINK
C-1	FUSIBLE LINK (For Headlight)
C-2	GLOW PLUG
B-5	HORN, HIGH
B-5	HORN, LOW
C-8	INSPECTION SOCKET
	LIGHTS;
C-4	BACK-UP LH
C-4	BACK-UP RH
C-3	BRAKE WARNING
C-8	CLEARANCE LH
C-8	CLEARANCE RH
C-7	COMBINATION METER
C-8	
B-2	GLOW PLUG INDICATOR
C-6	HEAD LH
C-6	HEAD RH
C-8	HEATER CONTROL
C-7	HIGH BEAM INDICATOR
C-8	INTERIOR
C-7	LICENSE PLATE LH
C-7	LICENSE PLATE RH
C-6	LIGHT CONTROL INDICATOR
C-7	MARKER, FRONT SIDE LH
C-7	MARKER, FRONT SIDE RH
C-7	MARKER, REAR SIDE LH
C-7	MARKER, REAR SIDE RH
C-3	SEDIMENTA INDICATOR
C-5	STOP LH
C-5	STOP RH
C-6	TAIL LH
C-6	TAIL RH
C-5	TURN SIGNAL, FRONT LH
C-5	TURN SIGNAL, FRONT RH
C-5	TURN SIGNAL, INDICATOR LH
C-6	TURN SIGNAL, INDICATOR RH
C-5	TURN SIGNAL, REAR LH
C-6	TURN SIGNAL, REAR RH
	MOTORS;
C-2	EDIC
C-3	HEATER BLOWER, FRONT
C-3	HEATER BLOWER, REAR

GRID LOCATION	COMPONENTS
B-1	STARTER
B-6	WINDSHIELD WASHER
B-6	WINDSHIELD WIPER
C-3	OIL PRESSURE GAUGE
C-4	OIL PRESSURE SENDER
B-8	RADIO
D-1	REGULATOR
B-8	RESISTOR (For Cigarette Lighter)
C-8	RESISTOR (For Heater Control Light)
C-8	RESISTOR (For Light Control Indicator Light)
	RELAYS;
B-6	DIMMER
C-2	EDIC
B-6	FLASHER
B-2	GLOW PLUG
B-1	STARTER
	SEAT BELT SYSTEM;
C-4	BUCKLE SWITCH
C-4	WARNING LIGHT
C-4	WARNING RELAY
B-8	SPEAKER
	SWITCHES;
C-4	BACK-UP LIGHT
C-4	BRAKE FLUID LEVEL
B-7	DIMMER
B-2	GLOW PLUG CONTROL
B-5	HAZARD
C-3	HEATER BLOWER
C-5	HORN
C-8	INTERIOR LIGHT
C-7	LIGHT CONTROL
B-7	LIGHT CONTROL (With Panel Light Control)
D-2	OIL PRESSURE (For EDIC)
C-4	PARKING BRAKE
D-4	SEDIMENTA
A-1	STARTER
C-5	STOP LIGHT
C-5	TURN SIGNAL
D-4	VACUUM
C-6	WINDSHIELD WASHER
C-6	WINDSHIELD WIPER
C-3	WATER TEMPERATURE GAUGE
C-4	WATER TEMPERATURE SENDER
B-4	WINCH ASSEMBLY

LAND CRUISER (BJ40 Series) ELECTRICAL WIRING DIAGRAM (For USA & CANADA) – **1981 Model**



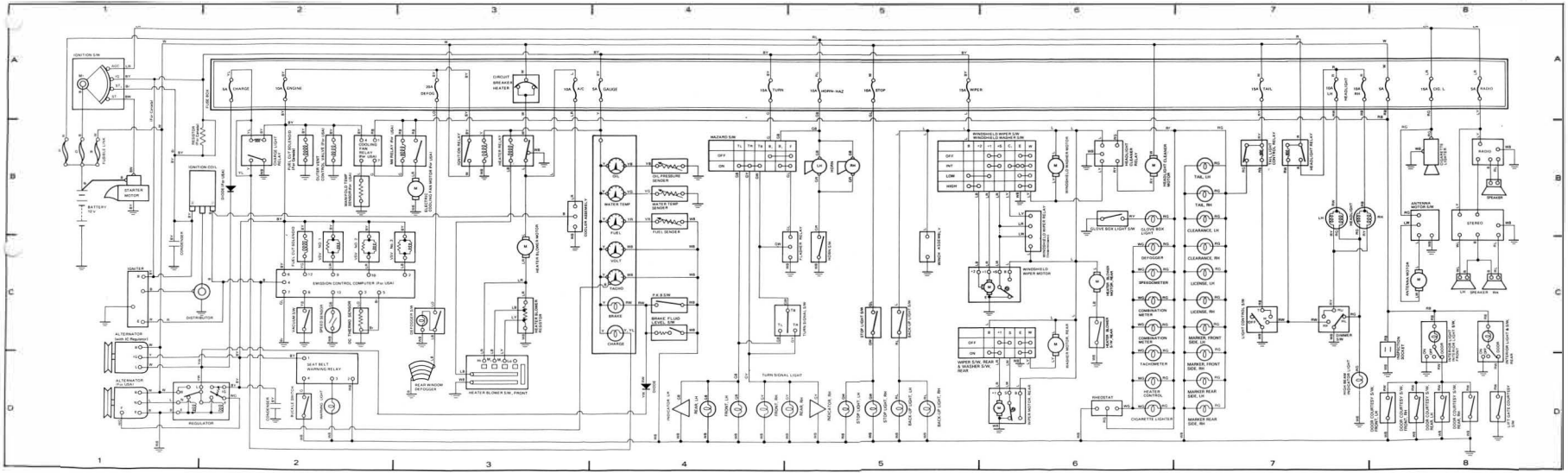
FJ60 Series
(For USA & CANADA)

LAND CRUISER (FJ60 Series) ELECTRICAL WIRING DIAGRAM INDEX (For USA & CANADA) – 1981 Model

GRID LOCATION	COMPONENTS
D-1	ALTERNATOR (For USA)
C-1	ALTERNATOR (With IC Regulator) (For Canada)
C-1	ALTERNATOR (With IC Regulator) (For USA)
B-1	BATTERY 12V
B-8	CIGARETTE LIGHTER
A-3	CIRCUIT BREAKER, HEATER
C-1	CONDENSER
D-2	
B-3	COOLER ASSEMBLY
D-4	DIODE (For Canada)
B-2	DIODE (For USA)
D-4	
C-1	DISTRIBUTOR
	EMISSION CONTROL SYSTEM (For USA)
C-2	EMISSION CONTROL COMPUTER
C-2	FUEL CUT SOLENOID
C-2	OC THERMO SENSOR
C-2	SPEED SENSOR
C-2	VACUUM SWITCH
C-2	VSV NO.1
C-2	VSV NO.2
C-2	VSV NO.3
B-2	FUEL CUT SOLENOID (For Canada)
B-4	FUEL GAUGE
B-4	FUEL SENDER
A-1	FUSE BOX
B-1	FUSIBLE LINK
C-3	HEATER BLOWER RESISTOR
B-5	HORN LH
B-5	HORN RH
B-1	IGNITION COIL (For USA)
B-1	IGNITION COIL (With Resistor) (For Canada)
C-8	INSPECTION SOCKET
	LIGHTS:
D-5	BACK-UP LH
D-5	BACK-UP RH
C-4	BRAKE WARNING
D-6	CIGARETTE LIGHTER
B-1	CLEARANCE LH
B-1	CLEARANCE RH
C-6	COMBINATION METER
B-6	DEFOGGER
C-4	DISCHARGE WARNING
B-6	GLOVE BOX
B-1	HEAD LH
B-8	HEAD RH
D-6	HEATER CONTROL
D-8	HIGH BEAM INDICATOR
C-6	INTERIOR, FRONT
C-8	INTERIOR, REAR
C-6	INTERIOR, REAR (With Rear Wiper)
C-7	LICENSE PLATE LH
C-7	LICENSE PALTE RH
C-7	MARKER, FRONT SIDE LH
C-7	MARKER, FRONT SIDE RH
D-1	MARKER, REAR SIDE LH
D-1	MARKER, REAR SIDE RH
C-6	SPEEDOMETER (For Canada)
C-6	SPEEDOMETER (For USA)
D-5	STOP LH
D-5	STOP RH
C-4	TACHOMETER
B-1	TAIL LH
B-1	TAIL RH
D-4	TURN SIGNAL, FRONT LH
D-4	TURN SIGNAL, FRONT RH
D-4	TURN SIGNAL, INDICATOR LH
D-5	TURN SIGNAL, INDICATOR RH
D-4	TURN SIGNAL, REAR LH
D-4	TURN SIGNAL, REAR RH
B-2	MANIFOLD TEMP SENSOR (For USA)
C-8	MOTORS: ANTENNA

GRID LOCATION	COMPONENTS
B-3	ELECTRIC COOLING FAN (For USA)
B-6	HEADLIGHT CLEANER
B-3	HEATER BLOWER
C-6	HEATER BLOWER, REAR
B-1	STARTER
C-6	WASHER, REAR
B-6	WINDSHIELD WASHER
C-6	WINDSHIELD WIPER
D-6	WIPER, REAR
B-4	OIL PRESSURE GAUGE
B-4	OIL PRESSURE SENDER (For Canada)
B-4	OIL PRESSURE SENDER (For USA)
B-2	OUTER VENT CONTROL VALVE (For USA)
B-6	RADIO
D-3	REAR WINDOW DEFOGGER
D-1	REGULATOR
	RELAY BLOCK
D-6	RHEOSTAT
	RELAYS:
B-2	CHARGE LIGHT (For Canada)
B-2	CHARGE LIGHT (For USA)
B-3	COOLING FAN (For USA)
B-5	FLASHER
B-7	HEADLIGHT
B-6	HEADLIGHT CLEANER
B-3	HEATER
B-3	IGNITION
B-3	M4 (For USA)
B-7	TAIL LIGHT CONTROL
B-6	WINDSHIELD WIPER (Intermittent)
	SEAT BELT SYSTEM:
D-3	BUCKLE SWITCH
D-2	WARNING LIGHT
D-2	WARNING RELAY
C-8	SPEAKER LH
C-8	SPEAKER RH
B-8	STEREO
	SWITCHES:
B-8	ANTENNA MOTOR
C-5	BACK-UP LIGHT
C-4	BRAKE FLUID LEVEL
C-3	DEFOGGER
C-7	DIMMER
D-8	DOOR COURTESY, FRONT LH
D-8	DOOR COURTESY, FRONT RH
D-8	DOOR COURTESY, REAR LH
D-8	DOOR COURTESY, REAR RH
B-6	GLOVE BOX LIGHT
B-4	HAZARD
D-3	HEATER BLOWER, FRONT
C-6	HEATER BLOWER, REAR
B-5	HORN
A-1	IGNITION
C-8	INTERIOR LIGHT, FRONT
C-8	INTERIOR LIGHT, REAR
C-8	INTERIOR LIGHT, REAR (With Rear Wiper)
D-8	LIFT GATE COURTESY
D-8	LIFT GATE COURTESY (With Rear Wiper)
C-7	LIGHT CONTROL
C-4	P.K.B.
C-5	STOP LIGHT
C-5	TURN SIGNAL
C-6	WASHER, REAR
B-6	WINDSHIELD WASHER
B-6	WINDSHIELD WIPER
C-6	WIPER, REAR
C-4	TACHOMETER
B-4	VOLT METER
B-4	WATER TEMPERATURE GAUGE
B-4	WATER TEMPERATURE SENDER
B-8	WINCH ASSEMBLY

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
C-1	ALTERNATOR (With IC Regulator)
C-1	BATTERY 12V
B-8	CIGARETTE LIGHTER
A-3	CIRCUIT BREAKER, HEATER
B-3	COOLER ASSEMBLY
D-4	DIODE
B-3	FUEL GAUGE
B-4	FUEL SENDER
A-1	FUSE BOX
B-1	FUSIBLE LINK
C-2	GLOW PLUG
C-2	GLOW PLUG TIMER
C-3	HEATER BLOWER RESISTOR
B-5	HORN HIGH
B-5	HORN LOW
D-8	INSPECTION SOCKET
	LIGHTS;
D-5	BACK-UP LH
D-5	BACK-UP RH
C-3	BRAKE WARNING
D-6	CIGARETTE LIGHTER
B-7	CLEARANCE LH
C-7	CLEARANCE RH
C-8	COMBINATION METER
C-8	DEFOGGER
C-3	DISCHARGE WARNING
B-8	GLOVE BOX
C-2	GLOW PLUG INDICATOR
B-7	HEAD LH
B-8	HEAD RH
D-6	HEATER CONTROL
D-7	HIGH BEAM INDICATOR
C-8	INTERIOR, FRONT
C-8	INTERIOR, REAR
C-7	LICENSE PLATE LH
C-7	LICENSE PLATE RH
C-7	MARKER, FRONT SIDE LH
D-7	MARKER, FRONT SIDE RH
D-7	MARKER, REAR SIDE LH
D-7	MARKER, REAR SIDE RH
C-3	SEDIMENTAINDICATOR
C-8	SPEEDOMETER
D-5	STOP LH
D-5	STOP RH
D-6	TACHOMETER
B-7	TAIL LH
B-7	TAIL RH
D-4	TURN SIGNAL, FRONTLH
D-4	TURN SIGNAL, FRONTRH
D-4	TURN SIGNAL, INDICATOR LH
D-5	TURN SIGNAL, INDICATORRH
D-4	TURN SIGNAL, REARLH
D-4	TURN SIGNAL, REAR RH
	MOTORS;
C-8	ANTENNA
D-2	EDIC (OPT)
B-6	HEADLIGHT CLEANER
C-3	HEATER BLOWER
C-5	HEATER BLOWER, REAR
B-1	STARTER
C-5	WASHER, REAR
B-6	WINDSHIELD WASHER
C-6	WINDSHIELD WIPER
D-6	WIPER, REAR

GRID LOCATION	COMPONENTS
B-3	OIL PRESSURE GAUGE
B-4	OIL PRESSURE SENDER
C-4	PICK-UP SENSOR
B-8	RADIO
C-3	REAR WINDOW DEFOGGER
–	RELAY BLOCK
D-6	RHEOSTAT (With IC Regulator)
	RELAYS;
B-3	CHARGE LIGHT
D-1	EDIC (OPT)
C-4	FLASHER
B-2	GLOW PLUG
B-7	HEADLIGHT
B-6	HEADLIGHT CLEANER
B-3	HEATER
B-2	IGNITION
B-1	STARTER
B-7	TAIL LIGHTCONTROL
B-6	WINDSHIELD WIPER (Intermittent)
	SEAT BELT SYSTEM;
D-2	BUCKLE SWITCH
D-2	WARNING LIGHT
D-2	WARNING RELAY
C-8	SPEAKER LH
C-8	SPEAKER RH
B-8	STEREO
	SWITCHES;
B-8	ANTENNA MOTOR
C-5	BACK-UP LIGHT
C-4	BRAKE FLUID LEVEL
B-3	DEFOGGER
C-7	DIMMER
D-8	DOOR COURTESY, FRONT LH
D-8	DOOR COURTESY, FRONT RH
D-8	DOOR COURTESY, REAR LH
D-8	DOOR COURTESY, REAR RH
B-8	GLOVE BOX LIGHT
B-4	HAZARD
D-3	HEATER BLOWER, FRONT
C-5	HEATER BLOWER, REAR
C-5	HORN
C-8	INTERIOR LIGHT, FRONT
C-8	INTERIOR LIGHT, REAR
C-5	INTERIOR LIGHT, REAR (With Rear Wiper)
D-8	LIFT GATE COURTESY
C-7	LIGHT CONTROL
D-1	OIL PRESSURE (for EDIC)
C-4	P, R, S
C-4	SEDIMENTA
A-1	STARTER
C-5	STOP LIGHT
C-4	TURN SIGNAL
C-4	VACUUM
C-6	WASHER, REAR
B-6	WINDSHIELD WASHER
B-6	WINDSHIELD WIPER
C-6	WIPER, REAR
C-3	TACHOMETER
C-3	VOLT METER
B-3	WATER TEMPERATURE GAUGE
B-4	WATER TEMPERATURE SENDER
C-6	WINCH ASSEMBLY

LAND CRUISER (BJ60 Series) ELECTRICAL WIRING DIAGRAM (For USA & CANADA) – 1981 Model