TOYOTA COROLLA FR REPAIR MANUAL FOR CHASSIS & BODY

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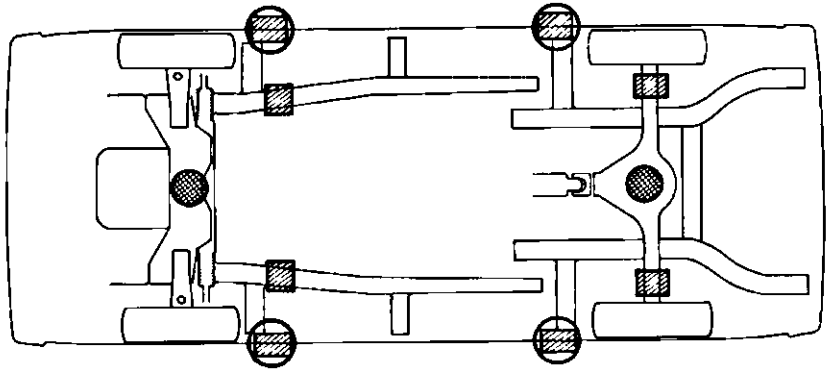
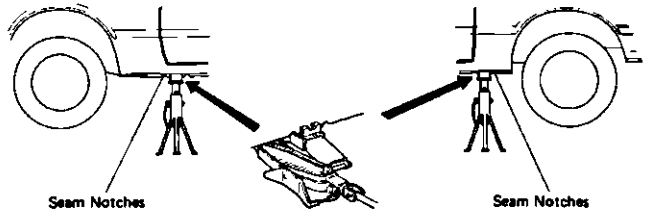


Front



JACK POSITION

Front . Center of front suspension crossmember
Rear . . . . Center of rear axle housing

PANTOGRAPH JACK POSITION

SUPPORT POSITION

Safety stand . . . . .

CLUTCH

	Page
TROUBLESHOOTING	CL-2
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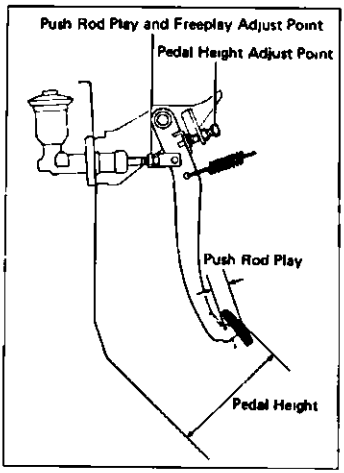
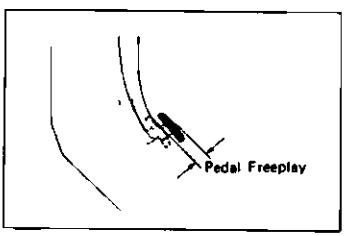
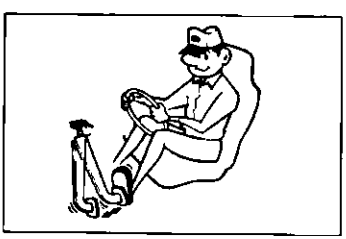
C

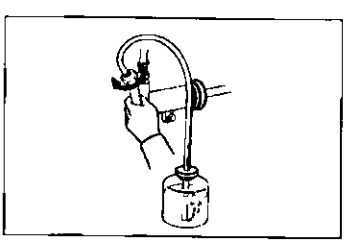
TROUBLESHOOTING

Problem	Possible cause	Remedy	Page
Hard to shift or will not shift	Clutch pedal freeplay excessive	Adjust pedal freeplay	CL 3
	Clutch release cylinder faulty	Repair release cylinder	CL 6
	Clutch master cylinder faulty	Repair master cylinder	CL-4
	Clutch disc out of true / ning greasy or broken	Inspect clutch disc	CL 8
	Splines on input shaft or clutch disc dirty or burred	Repair as necessary	CL 7
	Clutch pressure plate faulty	Replace clutch cover	CL 9
Transmission jumps out of gear	Clutch pilot bearing worn	Replace pilot bearing	CL 9
Clutch slips	Clutch pedal freeplay insufficient	Adjust pedal freeplay	CL 3
	Clutch disc lining oily or worn out	Inspect clutch disc	CL 8
	Pressure plate faulty	Replace clutch cover	CL 9
	Release fork binds	Inspect release fork	CL 7
Clutch grabs/chatters	Clutch disc lining oily or worn out	Inspect clutch disc	CL-8
	Pressure plate faulty	Replace clutch cover	CL 9
	Clutch diaphragm spring bending	Align clutch diaphragm	CL 11
	Engine mounts loose	Repair as necessary	
Clutch pedal spongy	Air in clutch lines	Bleed clutch system	CL 3
	Clutch release cylinder faulty	Repair release cylinder	CL 6
	Clutch master cylinder faulty	Repair master cylinder	CL-4
Clutch noisy	Loose part inside housing	Repa r as necessary	
	Release bearing worn or dirty	Replace release bearing	CL 10
	Pilot bearing worn	Replace pilot bearing	CL 9
	Release fork or linkage sticks	Repa r as necessary	









CHECK AND ADJUSTMENT OF CLUTCH PEDAL

1. **CHECK THAT PEDAL HEIGHT IS CORRECT**

   Pedal height from asphalt sheet
   LHD 161 – 171 mm (6.34 – 6.73 in.)
   RHD 162 – 172 mm (6.38 – 6.77 in.)

2. **IF NECESSARY, ADJUST PEDAL HEIGHT**
   (a) Remove the instrument lower finish panel and air duct.
   (b) Loosen the lock nut and turn the stopper bolt until the height is correct. Tighten the lock nut.

3. **CHECK THAT PEDAL FREEPLAY AND PUSH ROD PLAY ARE CORRECT**

   (Pedal Freeplay)

   Push in on the pedal until the beginning of clutch resistance is felt.

   Pedal freeplay: 13 – 23 mm (0.51 – 0.91 in.)

   Push rod play at pedal top.
   1.0 – 5.0 mm (0.039 – 0.197 in.)

4. **IF NECESSARY, ADJUST PEDAL FREEPLAY AND PUSH ROD PLAY**
   (a) Loosen the lock nut and turn the push rod until the freeplay and push rod play are correct.
   (b) Tighten the lock nut.
   (c) After adjusting the pedal freeplay, check the pedal height.
   (d) Install the air duct and instrument lower finish panel.

BLEEDING OF CLUTCH SYSTEM

NOTE: If any work is done on the clutch system or if air is suspected in the clutch lines, bleed the system of air.

CAUTION: DO NOT let brake fluid remain on a painted surface. Wash it off immediately.

1. **FILL CLUTCH RESERVOIR WITH BRAKE FLUID**

   Check the reservoir frequently. Add fluid if necessary.

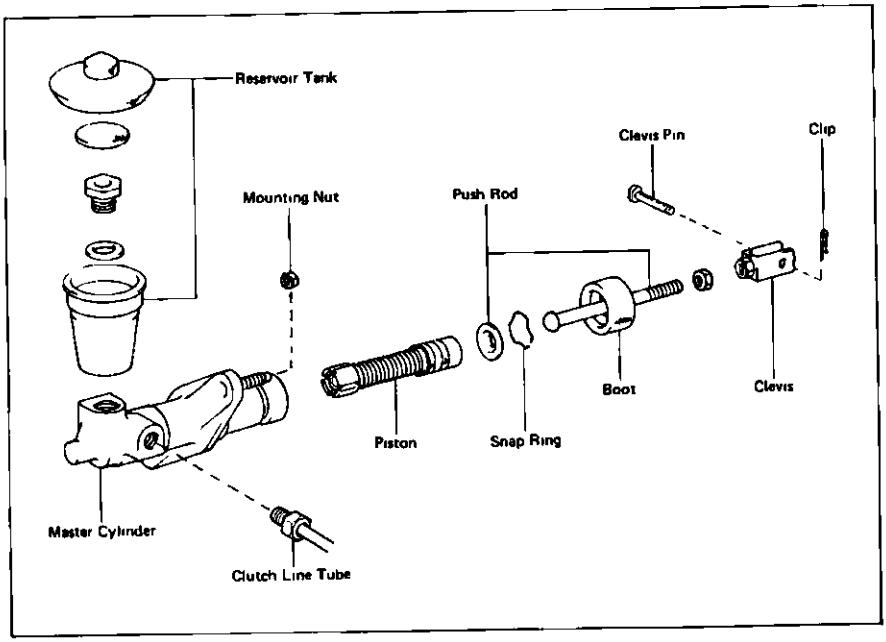
2. **CONNECT VINYL TUBE TO BLEEDER PLUG**

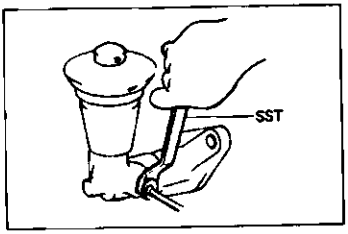
   Insert the other end of the tube in a half full container of brake fluid.

3. **BLEED CLUTCH LINE**
   (a) Slowly pump the clutch pedal several times.
   (b) While depressing the pedal, loosen the bleeder plug until the fluid starts to run out. Then close the bleeder plug.
   (c) Repeat this procedure until there are no more air bubbles in the fluid.

CLUTCH MASTER CYLINDER

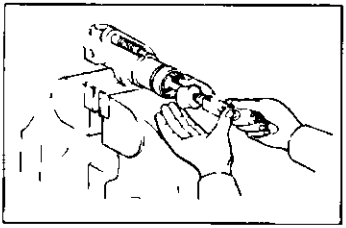
COMPONENTS





REMOVAL OF MASTER CYLINDER

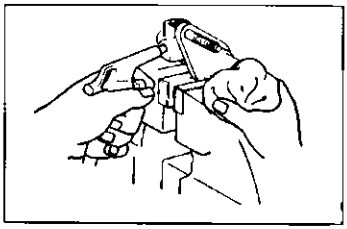
1. DRAW OUT FLUID WITH SYRINGE
2. DISCONNECT CLUTCH LINE TUBE
   Using SST, disconnect the tube
   SST 09751 36011
3. REMOVE INSTRUMENT LOWER FINISH PANEL AND AIR DUCT
4. REMOVE PEDAL RETURN SPRING
5. REMOVE CLEVIS PIN
   Remove the clip and clevis pin
6. REMOVE MOUNTING NUTS AND PULL OUT MASTER CYLINDER



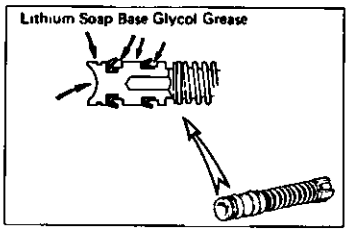
DISASSEMBLY OF MASTER CYLINDER

(See page CL-4)

1. REMOVE RESERVOIR TANK
2. REMOVE PUSH ROD
   (a) Pull back the boot and, using a screwdriver, remove the snap ring.
   (b) Pull out the push rod



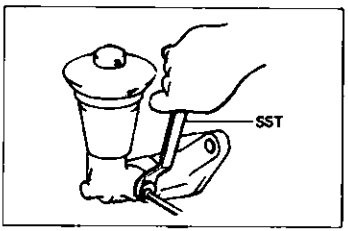
3. REMOVE PISTON
   Using compressed air, remove the piston from the cylinder



ASSEMBLY OF MASTER CYLINDER

(See page CL-4)

1. COAT PARTS WITH LITHIUM SOAP BASE GLYCOL GREASE, AS SHOWN
2. INSERT PISTON INTO CYLINDER
3. INSTALL PUSH ROD ASSEMBLY WITH SNAP RING
4. INSTALL RESERVOIR TANK



INSTALLATION OF MASTER CYLINDER

(See page CL-4)

1 INSTALL MASTER CYLINDER WITH MOUNTING NUTS

2. CONNECT CLUTCH LINE TUBE
   Using SST, connect the tube
   SST 09751 36011

3. CONNECT CLEVIS, AND INSTALL CLEVIS PIN AND CLIP
   Secure the clevis pin with the clip

4. INSTALL PEDAL RETURN SPRING

5. FILL CLUTCH RESERVOIR WITH BRAKE FLUID AND BLEED CLUTCH SYSTEM (See page CL-3)

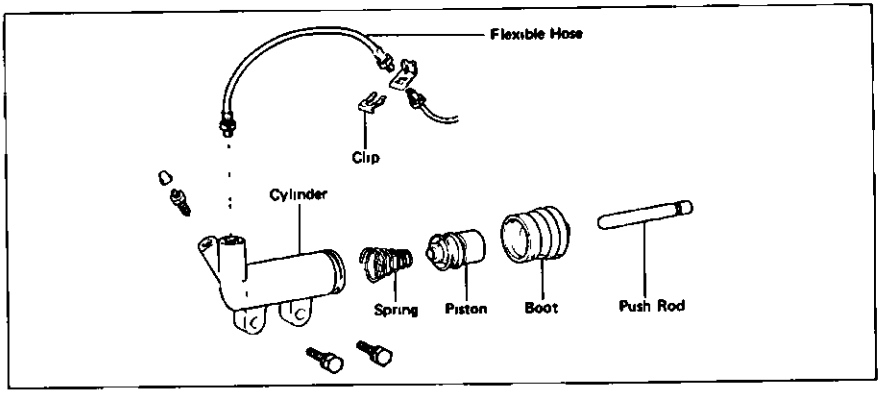
6 CHECK FOR LEAKS

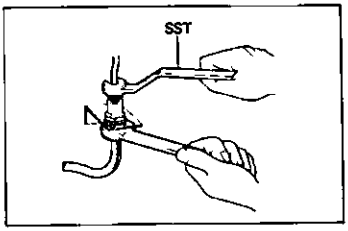
7 CHECK AND ADJUST CLUTCH PEDAL (See page CL-3)

8. INSTALL INSTRUMENT LOWER FINISH PANEL AND AIR DUCT

CLUTCH RELEASE CYLINDER

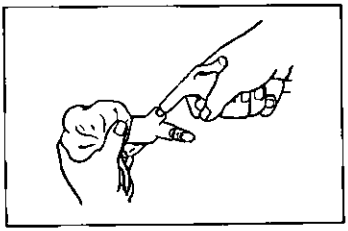
COMPONENTS





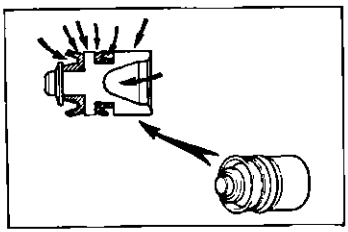
REMOVAL OF RELEASE CYLINDER

1. DISCONNECT FLEXIBLE HOSE
   Using SST, disconnect the union
   SST 09751 36011
2. REMOVE TWO BOLTS AND PULL OUT RELEASE CYLINDER



DISASSEMBLY OF RELEASE CYLINDER

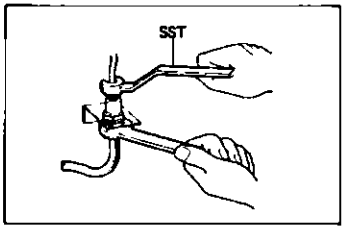
1. PULL OUT PUSH ROD
2. REMOVE BOOT
3. REMOVE PISTON
   Using compressed air, remove the piston and spring from the cylinder



ASSEMBLY OF RELEASE CYLINDER

(See page CL-6)

1. COAT PISTON WITH LITHIUM SOAP BASE GLYCOL GREASE, AS SHOWN
2. INSERT SPRING AND PISTON INTO CYLINDER
3. INSTALL BOOT AND INSERT PUSH ROD



INSTALLATION OF RELEASE CYLINDER

(See page CL-6)

1. INSTALL RELEASE CYLINDER WITH TWO BOLTS
2. CAREFULLY CONNECT FLEXIBLE HOSE

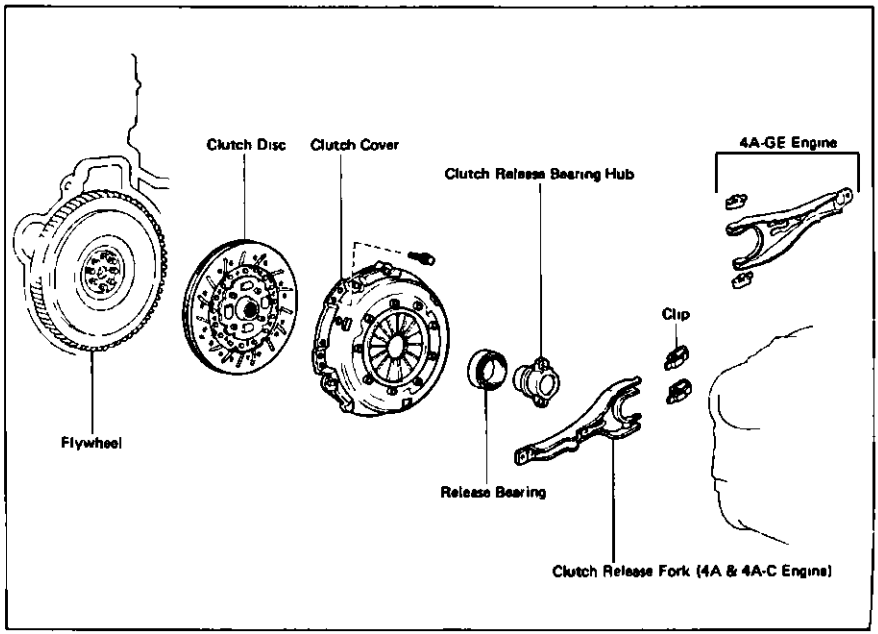
   Using SST, connect the union

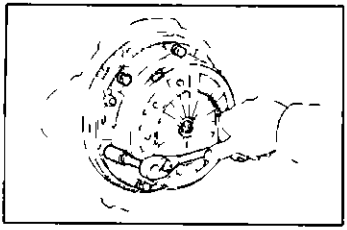
   SST 09751-36011

   Torque: Union nut 155 kg-cm (11 ft-lb)
   Flexible hose 235 kg-cm (17 ft-lb)
3. FILL CLUTCH RESERVOIR WITH BRAKE FLUID AND BLEED CLUTCH SYSTEM
   (See page CL-3)
4. CHECK FOR LEAKS

CLUTCH UNIT

COMPONENTS





REMOVAL OF CLUTCH UNIT

(See page CL-7)

1. **REMOVE TRANSMISSION** **(See page MT-3, 4)**

   NOTE Do not drain the transmission oil

2. **REMOVE CLUTCH COVER AND DISC**

   (a) Loosen the set bolts one turn at a time until the spring tension is released

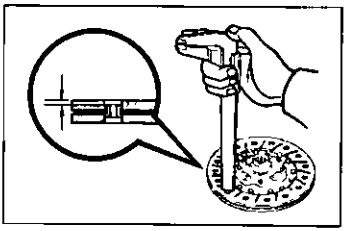
   (b) Remove the set bolts and pull off the clutch assembly



3. **REMOVE BEARING, HUB AND FORK FROM TRANSMISSION**

   (a) Remove the retaining clip and pull off the bearing and hub

   (b) Remove the fork and boot



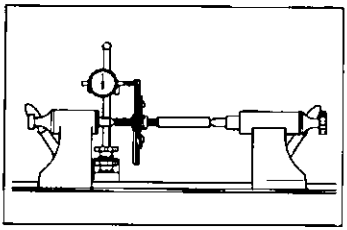
INSPECTION OF CLUTCH PARTS

1. **INSPECT CLUTCH DISC FOR WEAR OR DAMAGE**

   Using calipers, measure the rivet head depth

   Minimum rivet depth: 0.3 mm (0.012 in.)

   If a problem is found, replace the clutch disc

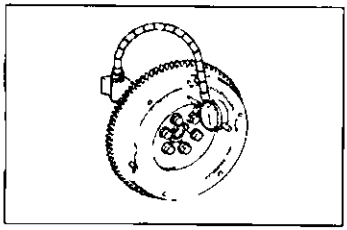


2. **INSPECT CLUTCH DISC RUNOUT**

   Using a dial indicator, check the disc runout

   Maximum runout: 0.8 mm (0.031 in.)

   If runout is excessive, replace the disc

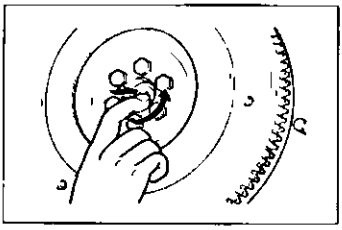


3. **INSPECT FLYWHEEL RUNOUT**

   Using a dial indicator, check the flywheel runout

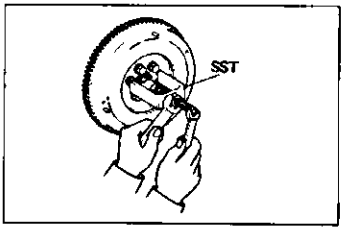
   Maximum runout: 0.2 mm (0.008 in.)

   If runout is excessive, repair or replace the flywheel



4. INSPECT PILOT BEARING

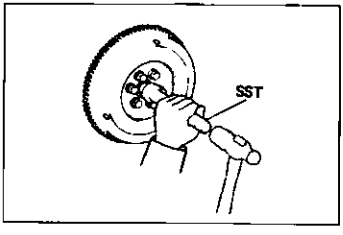
Turn the bearing by hand while applying force in the axial direction.



5. IF NECESSARY, REPLACE PILOT BEARING

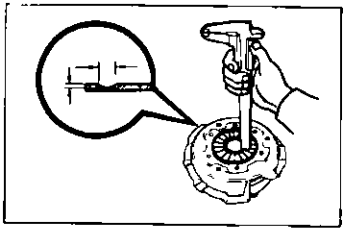
(a) Using SST, remove the pilot bearing

SST 09303 35011



(b) Using SST, install the pilot bearing

SST 09304 30012

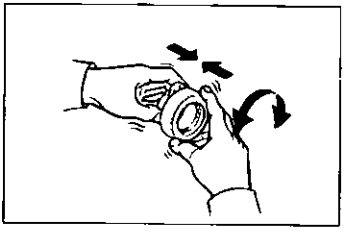


6. INSPECT DIAPHRAGM SPRING FOR WEAR

Using calipers, measure the diaphragm spring for depth and width of wear

Limit: Depth 0.6 mm (0.024 in.)
Width 5.0 mm (0.197 in.)

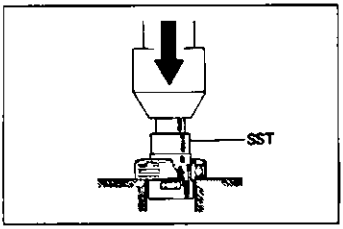
If necessary, replace the clutch cover



7. INSPECT RELEASE BEARING

Turn the bearing by hand while applying force in the axial direction

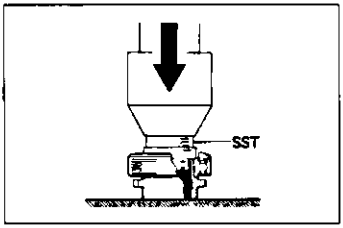
NOTE The bearing is permanently lubricated and requires no cleaning or lubrication.



8. **IF NECESSARY, REPLACE RELEASE BEARING**

(a) Using a press and SST, press the release bearing from the hub

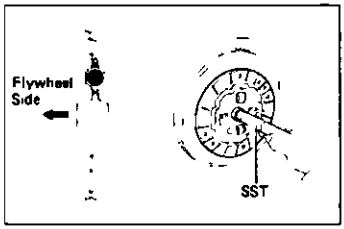
SST 09315-00010



(b) Using a press and SST, press a new release bearing into the hub.

SST 09315-00010

(c) After installing the bearing, check that there is no drag on the bearing when it is turned under pressure



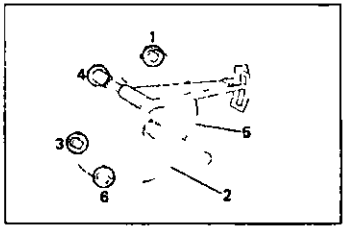
INSTALLATION OF CLUTCH UNIT

(See page CL-7)

1. **INSTALL DISC ON FLYWHEEL**

Using SST, install the disc on the flywheel

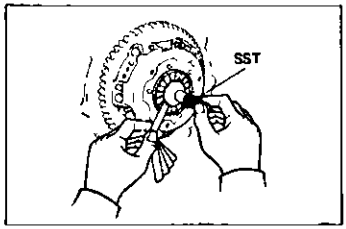
SST 09301-36010



2. **INSTALL CLUTCH COVER**

Tighten the bolts evenly and gradually Make several passes around the cover until it is snug Torque the bolts

Torque: 195 kg-cm (14 ft-lb)

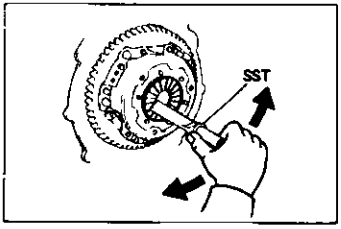


3. **CHECK DIAPHRAGM SPRING TIP ALIGNMENT**

Using a feeler gauge and SST, measure the gap between the spring tips and the tool

SST 09301-00013

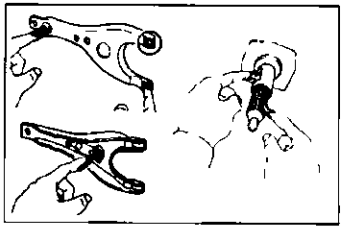
Maximum non-alignment: 0.5 mm (0.020 in.)



4. **IF NECESSARY, ADJUST SPRINGS**

Using SST, bend the springs until alignment is correct

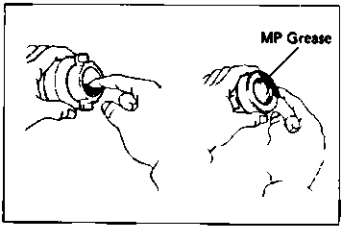
SST 09301-00013



5. **APPLY MOLYBDENUM DISULPHIDE LITHIUM BASE GREASE (NLGI NO. 2) OR MP GREASE**

(a) Apply molybdenum disulphide lithium base grease to the following parts

- Release fork and hub contact point
- Release fork and push rod contact point
- Release fork pivot point
- Clutch disc spline
- Release bearing hub inside groove



(b) Apply MP grease to the front of the release bearing



6. **INSTALL BOOT, FORK, HUB AND BEARING ON TRANSMISSION**

7. **INSTALL TRANSMISSION** (See pages MT-22, 23)

MANUAL TRANSMISSION

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Removal of Transmission	MT 3
Components	MT-5
Disassembly of Transmission	MT-7
Inspection of Transmission Components	MT 10
Assembly of Transmission	MT-15
Installation of Transmission	MT-22

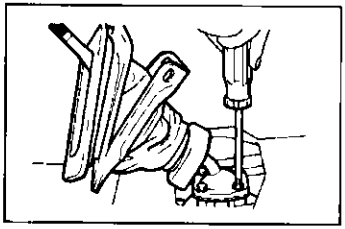
TROUBLESHOOTING

Problem	Possible cause	Remedy	Page
Hard to shift or will not shift	Splines on input shaft dirty or burred	Repair as necessary	MT 3
	Transmission faulty	Disassemble and inspect transmission	MT 3
Transmission jumps out of gear	Transmission faulty	Disassemble and inspect transmission	MT 3

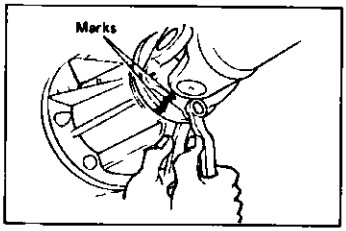
T50 TRANSMISSION

REMOVAL OF TRANSMISSION

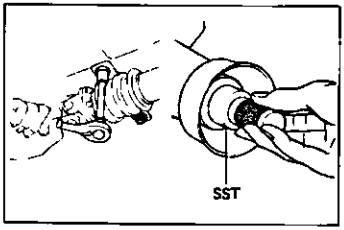
1. REMOVE NEGATIVE BATTERY TERMINAL WIRE
2. TURN DISTRIBUTOR
   (a) Loosen the bolt
   (b) Turn the distributor so it does not strike against the dash panel



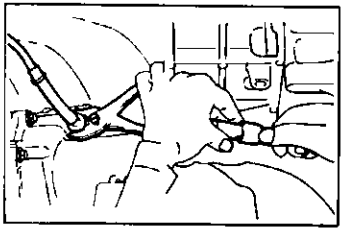
3. REMOVE CONSOLE BOX
4. REMOVE SHIFT LEVER FROM INSIDE OF VEHICLE
5. RAISE VEHICLE AND DRAIN TRANSMISSION OIL
   CAUTION: Be sure the vehicle is securely supported.



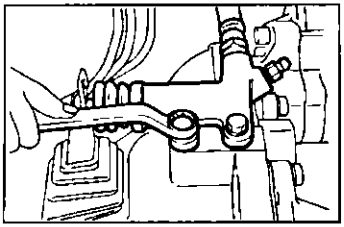
6. DISCONNECT PROPELLER SHAFT FLANGE FROM FLANGE ON DIFFERENTIAL
   (a) Place matchmarks on the flanges
   (b) Remove the four bolts and nuts.



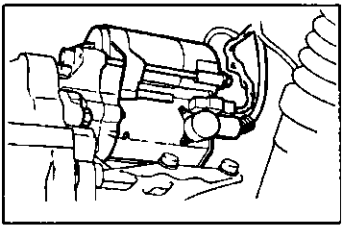
7. REMOVE CENTER SUPPORT BEARING FROM BODY (3-Joint Type)
8. REMOVE PROPELLER SHAFT
   (a) Pull the yoke from the transmission
   (b) Insert SST in the transmission to prevent oil leakage.
   SST 09325 12010
9. REMOVE EXHAUST PIPE CLAMP BOLT



10 REMOVE SPEEDOMETER CABLE
11. DISCONNECT BACK UP LIGHT SWITCH CONNECTOR



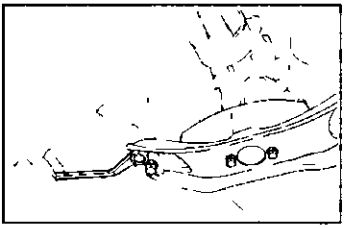
12. REMOVE CLUTCH RELEASE CYLINDER



13. REMOVE STARTER

(a) Disconnect the two wires from the starter.

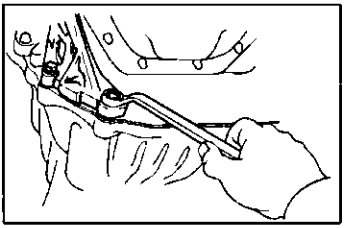
(b) Remove the two bolts and the starter.



14. JACK UP TRANSMISSION SLIGHTLY

Raise the transmission enough to remove the weight from the rear support

15. REMOVE ENGINE REAR MOUNTING

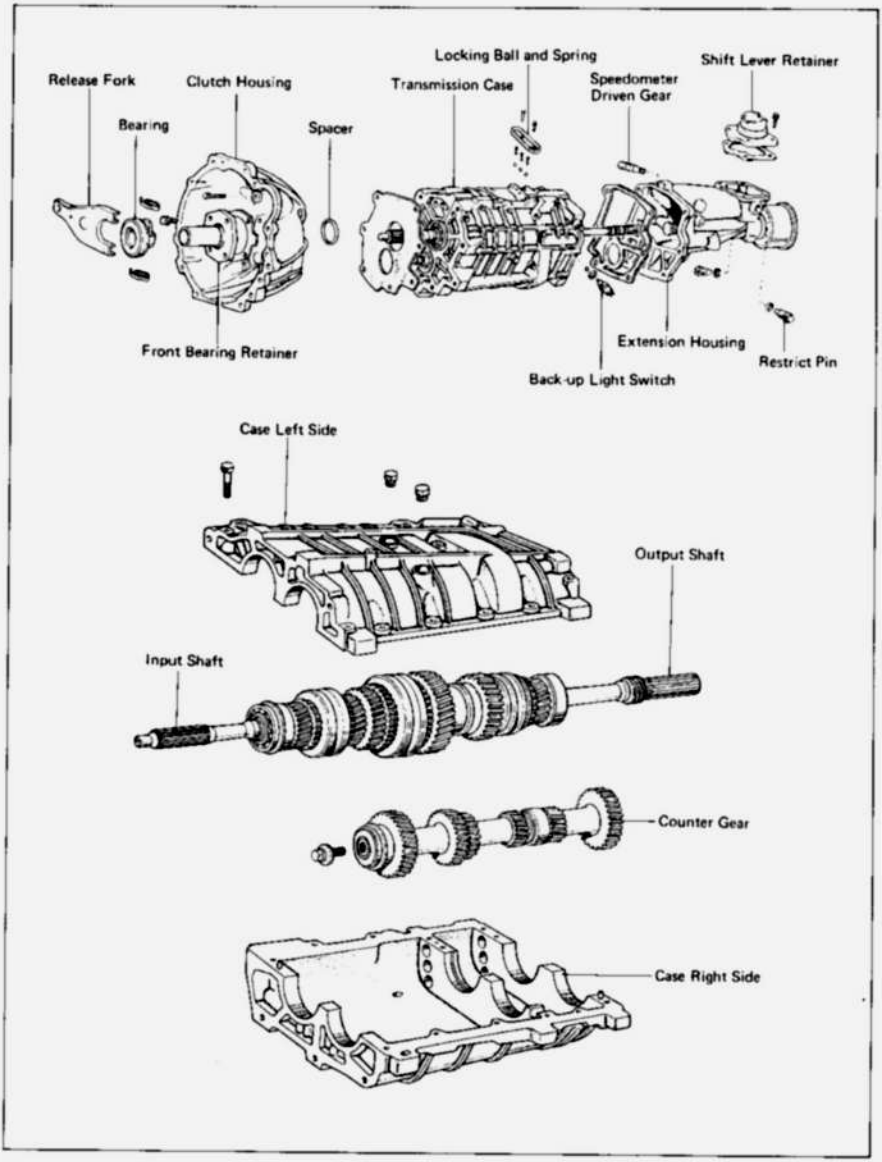


16. REMOVE STIFFENER PLATE AND TRANSMISSION BOLTS

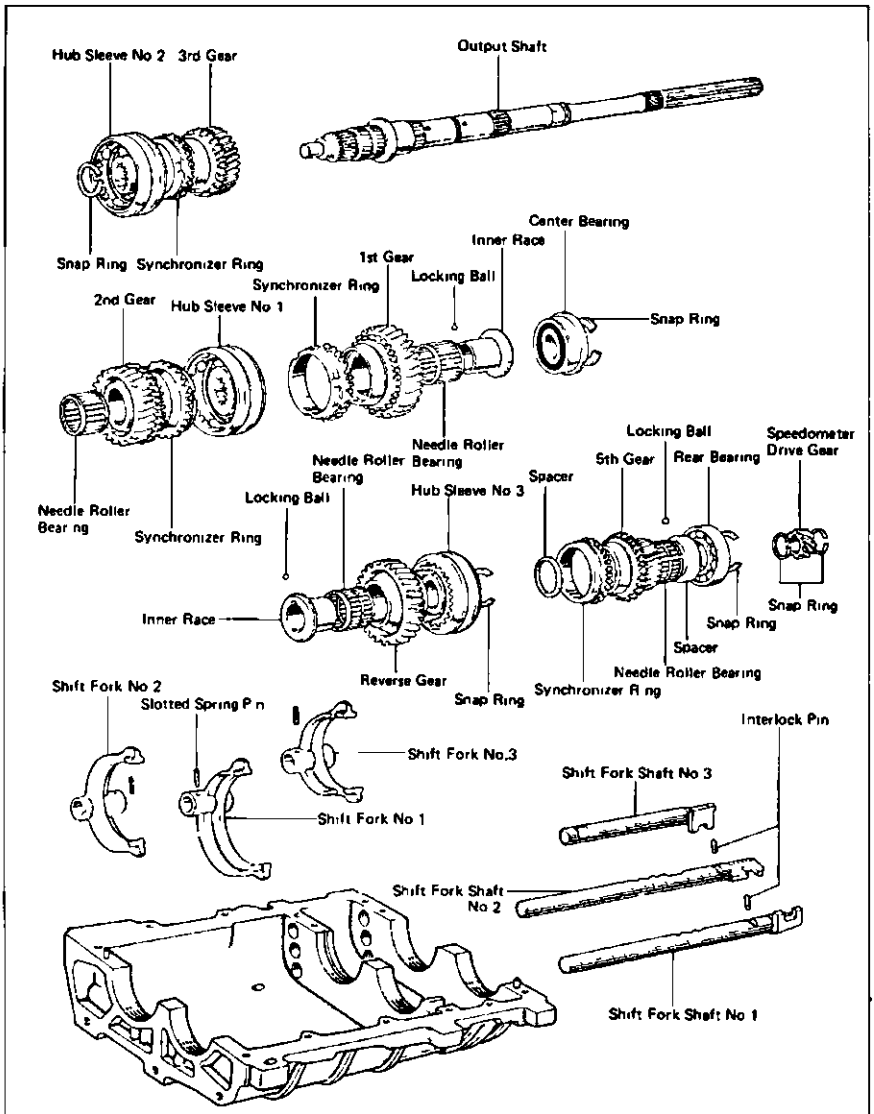
17. REMOVE TRANSMISSION ASSEMBLY

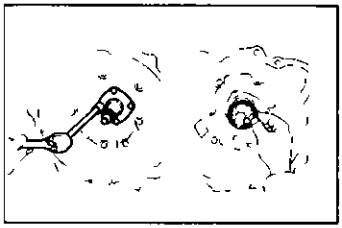
Pull out the transmission down and toward the rear

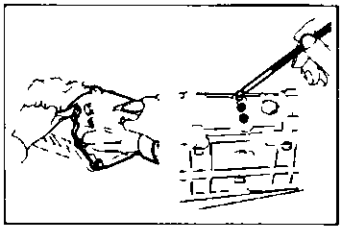
COMPONENTS

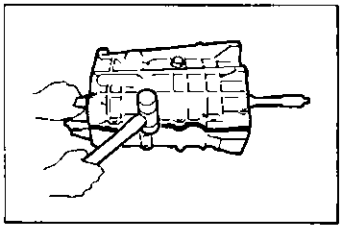

Release Fork
Clutch Housing
Bearing
Spacer
Locking Ball and Spring
Transmission Case
Speedometer Driven Gear
Shift Lever Retainer
Front Bearing Retainer
Extension Housing
Restrict Pin
Back-up Light Switch
Case Left Side
Output Shaft
Input Shaft
Counter Gear
Case Right Side

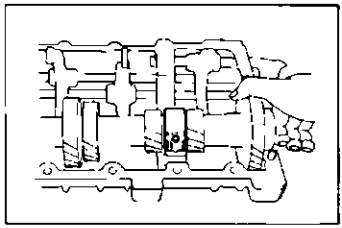
COMPONENTS (Cont'd)

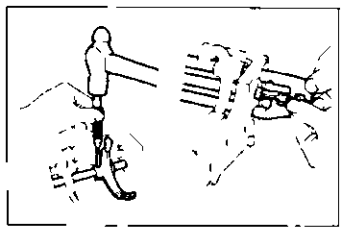












DISASSEMBLY OF TRANSMISSION

(See page MT-5, 6)

1. REMOVE BACK UP LIGHT SWITCH, SPEEDOMETER DRIVEN GEAR, SHIFT LEVER RETAINER, RESTRICT PINS, CLUTCH RELEASE BEARING AND FORK

2. REMOVE CLUTCH HOUSING FROM TRANSMISSION CASE
   (a) Remove the front bearing retainer
   (b) Remove the spacer
   (c) Remove the clutch housing

3. REMOVE EXTENSION HOUSING
   Remove the six bolts and pull off the extension housing

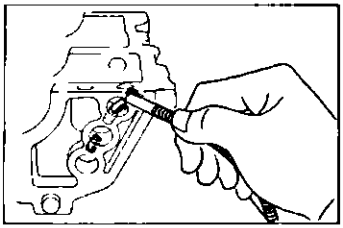
4. REMOVE LOCKING BALLS AND SPRINGS
   (a) Remove the case cover.
   (b) Using a magnetic finger, remove the three locking balls and springs

5. REMOVE LEFT CASE FROM RIGHT CASE
   Separate the left case from the right case by tapping the projection with a plastic hammer

6. REMOVE INPUT AND OUTPUT SHAFT FROM RIGHT CASE

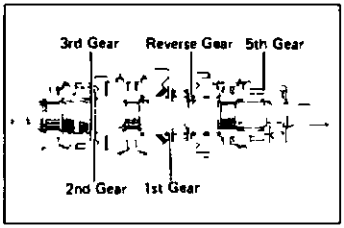
7 REMOVE COUNTER GEAR FROM RIGHT CASE

8 REMOVE SLOTTED SPRING PIN FROM SHIFT FORK AND FORK SHAFT
   (a) Using a punch and hammer, drive out the pin in the shift fork No 1 through the hole in the case
   (b) Drive out the pin in the shift fork No 2 and No 3
   (c) Pull out the fork shaft No 1, 2 and 3 by setting each to the neutral position



9. REMOVE INTERLOCK PIN

Remove the two interlock pins

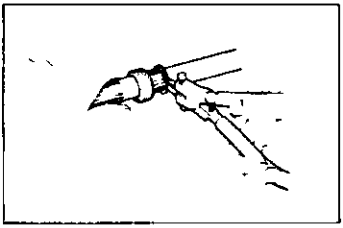


10. MEASURE EACH GEAR THRUST CLEARANCE ON OUTPUT SHAFT

Using feeler gauges, check the thrust clearance of each gear

Gear thrust clearance mm (in.)

Gear	STD	Limit
1st	0.150 – 0.275 (0.0059 – 0.0108)	0.5 (0.020)
2nd	0.150 – 0.250 (0.0059 – 0.0098)	0.5 (0.020)
3rd	0.150 – 0.300 (0.0059 – 0.0118)	0.6 (0.024)
5th	0.100 – 0.930 (0.0039 – 0.0366)	1.0 (0.039)
Reverse	0.200 – 0.325 (0.0079 – 0.0128)	0.6 (0.024)

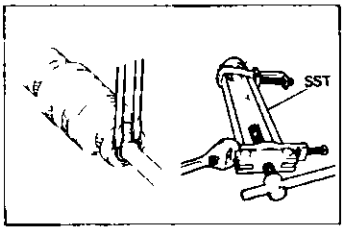


11. REMOVE SPEEDOMETER DRIVE GEAR

(a) Using snap ring pliers, remove the snap ring.

(b) Remove the speedometer drive gear from the output shaft

(c) Remove the other snap ring.

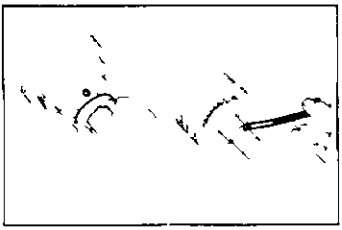


12 REMOVE SNAP RING, REAR BEARING, SPACER, NEEDLE ROLLER BEARING, FIFTH GEAR, SYNCHRONIZER RING, SPACER AND LOCKING BALL

(a) Remove the snap ring with two screwdrivers and a hammer

(b) Using SST, remove the rear bearing

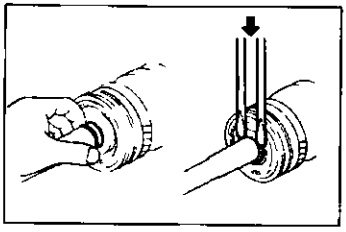
SST 09950-20014



(c) Remove the spacer for the rear bearing

(d) Remove the 5th gear, synchronizer ring and needle roller bearing

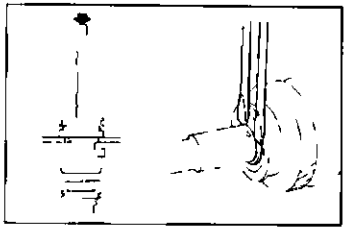
(e) Using a magnetic finger, remove the locking ball



(f) Remove the spacer for the needle roller bearing

13. REMOVE HUB SLEEVE NO 3 ASSEMBLY, REVERSE GEAR, NEEDLE ROLLER BEARING, INNER RACE, LOCKING BALL AND SNAP RING

(a) Using two screwdrivers and a hammer, remove the snap ring

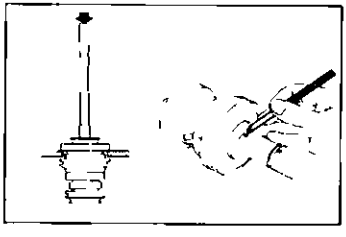


(b) Support the reverse gear, and remove the gear and hub together by pressing down the output shaft

(c) Remove the bearing and inner race

(d) Using a magnetic finger, remove the locking ball.

(e) Using two screwdrivers and a hammer, remove the snap ring

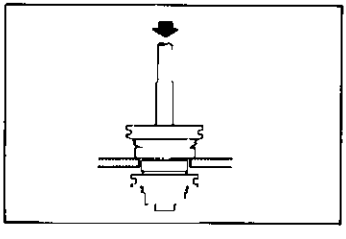


14. REMOVE CENTER BEARING, FIRST GEAR, SYNCHRONIZER RING, NEEDLE ROLLER BEARING, INNER RACE AND LOCKING BALL

(a) Support the 1st gear, and remove the gear and the bearing together by pressing down the output shaft.

(b) Remove the synchronizer ring.

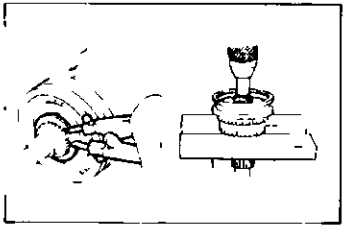
(c) Remove the locking ball



15 REMOVE NO. 1 HUB SLEEVE ASSEMBLY, SYNCHRONIZER RING, SECOND GEAR AND NEEDLE ROLLER BEARING

(a) Support the 2nd gear and remove it and the hub together by pressing down the output shaft

(b) Remove the needle roller bearing

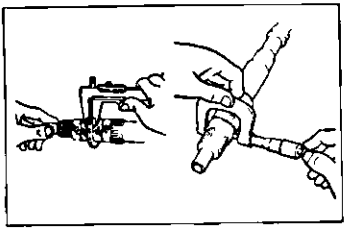


16. REMOVE SNAP RING

Using snap ring pliers, remove the snap ring

17. REMOVE NO 2 HUB SLEEVE ASSEMBLY, SYNCHRONIZER RING AND THIRD GEAR

Support the 3rd gear, and remove it and the hub together by pressing down the output shaft



INSPECTION OF TRANSMISSION COMPONENTS

1. INSPECT OUTPUT SHAFT AND INNER RACES

(a) Inspect the output shaft and inner races for wear or damage

(b) Using calipers, measure the thickness of the output shaft flange

Minimum thickness: 4.0 mm (0.157 in.)

(c) Using a micrometer, measure the outer diameter of the shaft bushing surface

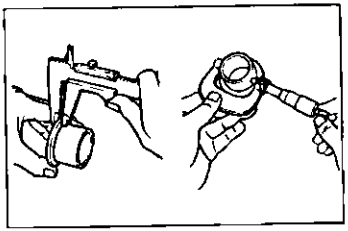
Minimum diameter: 37.8 mm (1.488 in.)

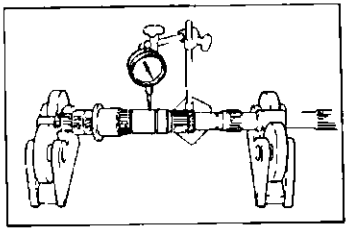
(d) Using calipers, measure the thickness of each race flange

Minimum all gear race: 3.8 mm (0.150 in.)

(e) Using a micrometer, measure the outer diameter of each race

Minimum 1st and reverse gear race diameter: 36.85 mm (1.4508 in.)





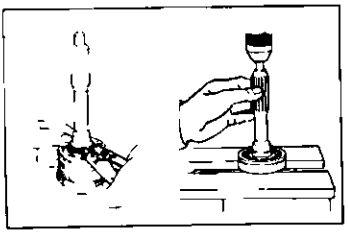
(f) Using a dial indicator, check the shaft runout

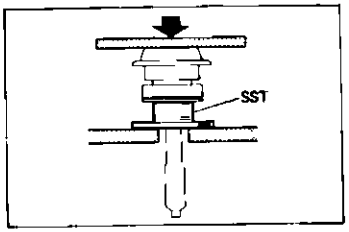
Maximum runout: 0.06 mm (0.0024 in.)

2. IF NECESSARY, REPLACE INPUT SHAFT BEARING

(a) Using snap ring pliers, remove the snap rings

(b) Using a press, remove the bearing.

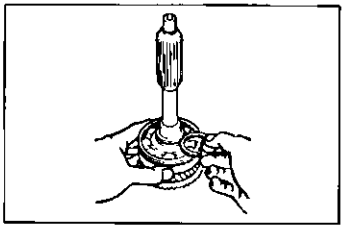




(c) Using a press and SST, install the new bearing

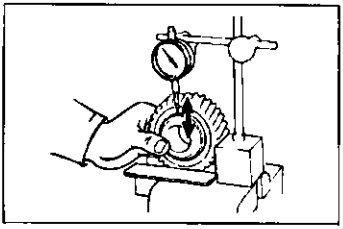
SST 09316-60010

NOTE Make sure the outer race snap ring groove is positioned toward the front



(d) Select a snap ring that will allow minimum axial play and install it on the shaft.

Mark	Thickness	mm (in.)
A	2.35 – 2.40	(0.0925 – 0.0945)
B	2.40 – 2.45	(0.0945 – 0.0965)
C	2.45 – 2.50	(0.0965 – 0.0984)
D	2.50 – 2.55	(0.0984 – 0.1004)
E	2.55 – 2.60	(0.1004 – 0.1024)

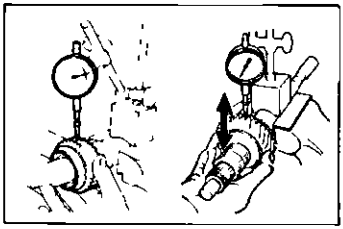


3. CHECK OIL CLEARANCE OF FIRST, FIFTH AND REVERSE GEARS

Using a dial indicator, measure the oil clearance between the gear and inner race with the needle roller bearing installed

Standard clearance:

1st gear	0.009 – 0.060 mm (0.0004 – 0.0024 in.)
5th gear	0.010 – 0.050 mm (0.0004 – 0.0020 in.)
Reverse gear	0.070 – 0.120 mm (0.0028 – 0.0047 in.)
Maximum clearance	0.150 mm (0.0059 in.)



4. CHECK OIL CLEARANCE OF SECOND AND THIRD GEARS

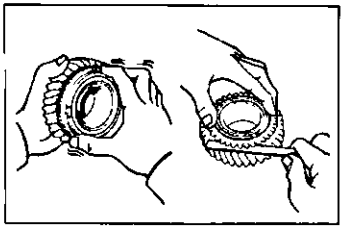
Using a dial indicator, measure the oil clearance between the gear and output shaft

Standard clearance.

2nd gear	0.009 – 0.060 mm (0.0004 – 0.0024 in.)
3rd gear	0.060 – 0.101 mm (0.0024 – 0.0040 in.)

Maximum clearance

2nd gear	0.150 mm (0.0059 in.)
3rd gear	0.200 mm (0.0079 in.)

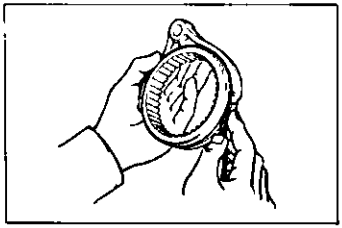


5. INSPECT SYNCHRONIZER RINGS

(a) Turn the ring and push it in to check the braking action

(b) Measure the clearance between the synchronizer ring back and the gear spline end

Standard clearance: 1.0 – 2.0 mm (0.039 – 0.079 in.)
Minimum clearance. 0.8 mm (0.031 in.)

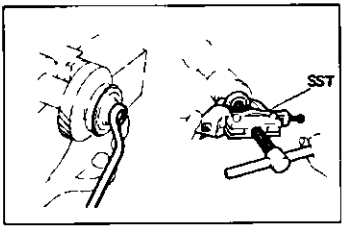


6. INSPECT SHIFT FORK AND HUB SLEEVE

(a) Check the contact surfaces for wear or damage

(b) Measure the clearance between the hub sleeve and the shift fork

Maximum clearance: 0.8 mm (0.031 in.)



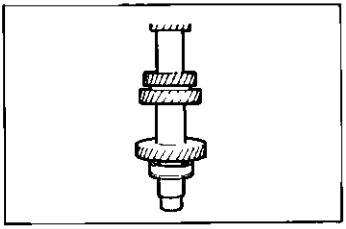
7. **IF NECESSARY, REPLACE COUNTER GEAR FRONT BEARING**

(a) Loosen the bolt and remove it and the lock plate

(b) Using snap ring pliers, remove the snap ring.

(c) Using SST, remove the front bearing

SST 09950-20014

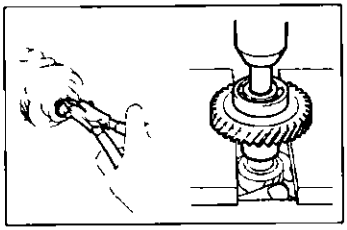


(d) Using a socket wrench, support the front bearing inner race, and press in the counter shaft

(e) Install the snap ring

(f) Install the lock plate and tighten the bolt

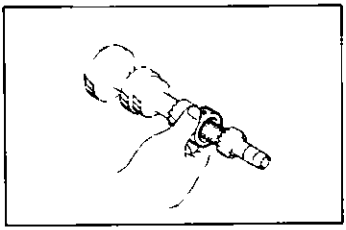
Torque: 375 kg-cm (27 ft-lb)



8 **IF NECESSARY, REPLACE REAR BEARING, FIFTH GEAR, REVERSE GEAR AND CENTER BEARING**

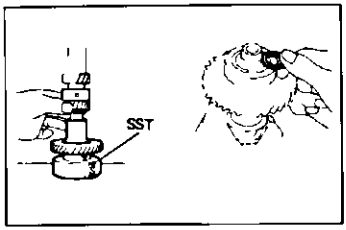
(a) Using snap ring pliers, remove the snap ring.

(b) Using a press and 12 mm socket wrench, press out the rear bearing and 5th gear.



(c) Remove the reverse gear and center bearing.

(d) Install the center bearing and reverse gear



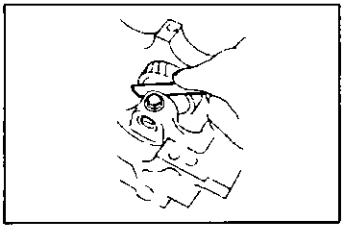
(e) Using a press and SST, install the rear bearing and 5th gear

SST 09515 20010

NOTE Lift the reverse gear to the upper side, and press in the bearing and 5th gear

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

Mark	Thickness	mm (in.)
1	2.00 – 2.05	(0.0787 – 0.0807)
2	1.80 – 1.85	(0.0709 – 0.0728)
3	1.60 – 1.65	(0.0630 – 0.0650)

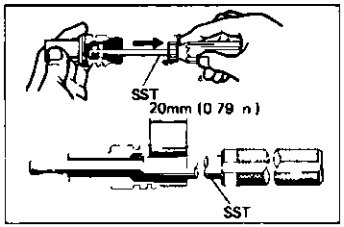


9 **INSPECT REVERSE IDLER GEAR**

(a) Before removing the reverse idler gear, measure the thrust clearance

Standard clearance: 0.05 – 0.50 mm (0.0020 – 0.0197 in.)
Maximum clearance: 1.0 mm (0.039 in.)

(b) Check the idler gear and shaft for wear or damage.



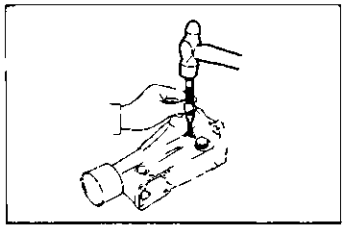
10. **IF NECESSARY REPLACE OIL SEAL**

(a) Using SST, remove the seal

SST 09921-00010

(b) Using SST, install a new seal

SST 09201-60011



11. **IF NECESSARY, REPLACE REVERSE RESTRICT PIN**

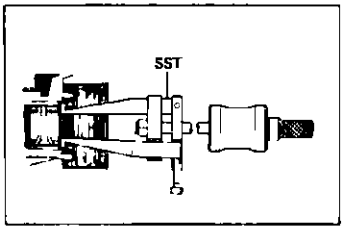
(a) Remove the plug with a hexagon wrench

(b) Drive out the slotted spring pin with a pin punch and remove the reverse restrict pin

(c) Apply liquid sealer to the plug

(d) Tighten the plug

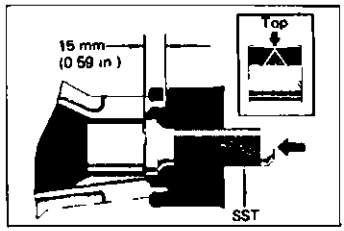
Torque. 130 kg-cm (9 ft lb)



12. **IF NECESSARY, REPLACE OIL SEAL AND BUSHING**

(a) Using SST, remove the oil seal

SST 09308 00010
09308 10010 with output shaft installed



(b) Heat the extension housing end to 80 – 100°C (176 – 212°F) in an oil bath

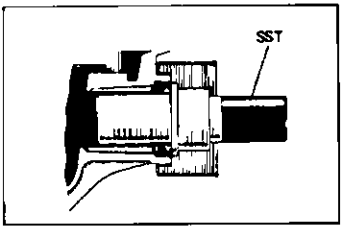
(c) Using SST, remove the bushing

SST 09307 12010

(d) Using SST, install the new bushing

SST 09307 12010

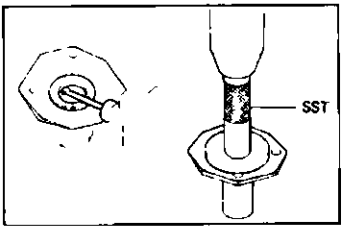
NOTE The bushing oil hole is positioned upward



(e) Using SST, drive in the new oil seal

SST 09325-12010

(f) Apply MP grease to the oil seal



13. IF NECESSARY, REPLACE FRONT BEARING OIL SEAL

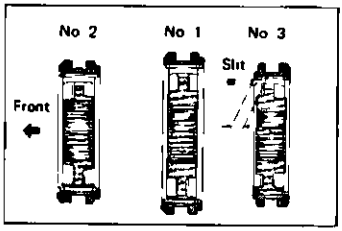
(a) Using a screwdriver, pry out the oil seal

(b) Using SST, press in the new oil seal.

SST 09223-22010

Oil seal depth: **2.5 mm (0.098 in.)**

(c) Apply MP grease to the oil seal



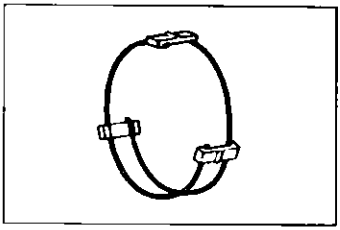
ASSEMBLY OF TRANSMISSION

(See page MT-5, 6)

1. ASSEMBLE EACH CLUTCH HUB AND SLEEVE

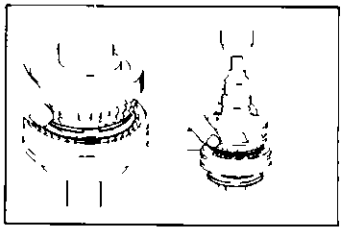
(a) Install the clutch hub and shifting keys to the hub sleeve

NOTE Be careful not to install them backwards



(b) Install the shifting key springs under the keys

NOTE Install the key springs positioned so that their ends overlap.



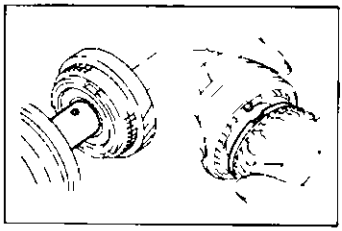
2. INSTALL SECOND GEAR AND CLUTCH HUB NO 1

(a) Apply MP grease to the shaft

(b) Install the needle roller bearing

(c) Place the synchronizer ring on the gear and align the ring slots with the shifting keys

(d) Using a press, install the 2nd gear and clutch hub No 1



3. INSTALL LOCKING BALL AND FIRST GEAR ASSEMBLY

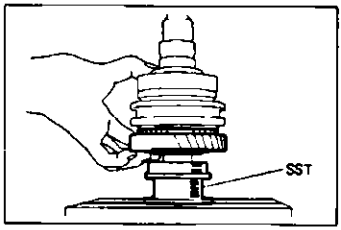
(a) Install the locking ball in the shaft

(b) Apply MP grease to the bearing

(c) Assemble the 1st gear, synchronizer ring, needle roller bearing and bearing inner race

(d) Fit the inner race groove securely over the locking ball

(e) Install the assembly on the output shaft with the synchronizer ring slots aligned with the shifting keys



4. INSTALL CENTER BEARING

Using a press and SST, install the center bearing on the output shaft

SST 09316-60010

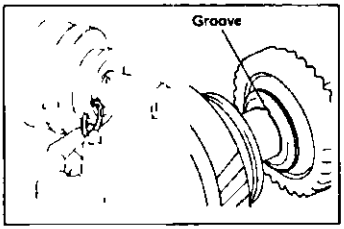
CAUTION Support the 1st gear and inner race by hand.

NOTE The flange should be positioned toward the rear

5. INSTALL SNAP RING

Select a snap ring, which will allow 0–0.1 mm (0 – 0.004 in.) axial play and install it on the shaft.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
a	2.70 – 2.75 (0.1063–0.1083)	g	2.95 – 3.00 (0.1161–0.1181)
b	2.75 – 2.80 (0.1083–0.1102)	h	3.00 – 3.05 (0.1181–0.1201)
d	2.80 – 2.85 (0.1102–0.1122)	j	3.05 – 3.10 (0.1201 – 0.1220)
e	2.85 – 2.90 (0.1122–0.1142)	k	3.10 – 3.15 (0.1220–0.1240)
f	2.90 – 2.95 (0.1142–0.1161)	l	3.15 – 3.20 (0.1240–0.1260)

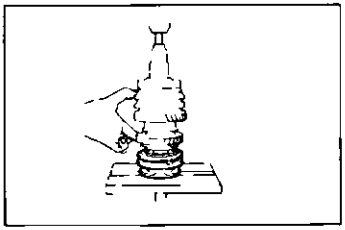


6. INSTALL LOCKING BALL AND REVERSE GEAR

(a) Install the locking ball in the shaft

(b) Place the inner race and roller bearing in reverse gear

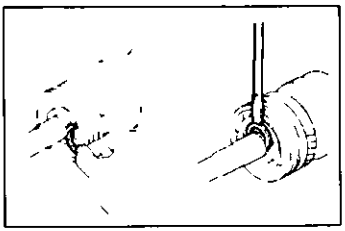
(c) Fit the inner race groove securely over the locking ball when installing the reverse gear on the output shaft



7. INSTALL CLUTCH HUB NO. 3

Using a press, install the clutch hub on the output shaft

CAUTION Support the reverse gear by hand.



8 INSTALL SNAP RING

Select a snap ring which will allow 0 – 0.1 mm (0 – 0.004 in.) axial play

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
A	2.60 – 2.65 (0.1024 – 0.1043)	J	3.00 – 3.05 (0.1181 – 0.1201)
B	2.65 – 2.70 (0.1043 – 0.1063)	K	3.05 – 3.10 (0.1201 – 0.1220)
C	2.70 – 2.75 (0.1063 – 0.1083)	L	3.10 – 3.15 (0.1220 – 0.1240)
D	2.75 – 2.80 (0.1083 – 0.1102)	M	3.15 – 3.20 (0.1240 – 0.1260)
E	2.80 – 2.85 (0.1102 – 0.1122)	N	3.20 – 3.25 (0.1260 – 0.1280)
F	2.85 – 2.90 (0.1122 – 0.1142)	P	3.25 – 3.30 (0.1280 – 0.1299)
G	2.90 – 2.95 (0.1142 – 0.1161)	Q	3.30 – 3.35 (0.1299 – 0.1319)
H	2.95 – 3.00 (0.1161 – 0.1181)		

9. INSTALL FIFTH GEAR AND SPACER

(a) Install the spacer for the needle roller bearing

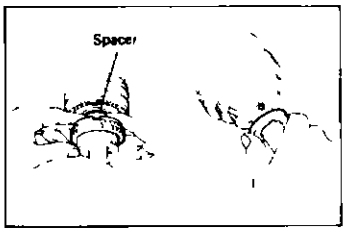
(b) Place the synchronizer ring on the gear

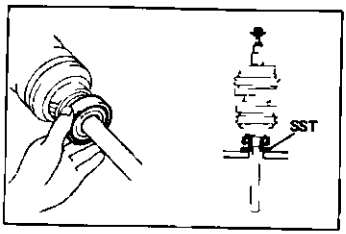
(c) Place the roller bearing in the gear

(d) Install the 5th gear on the output shaft with the synchronizer ring slots aligned with the shifting keys

(e) Install the locking ball in the shaft

(f) Fit the spacer groove securely over the locking ball when installing the spacer on the shaft





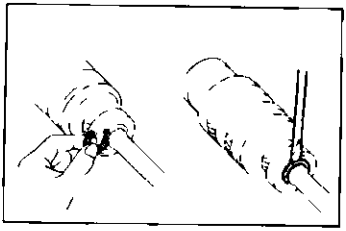
10 INSTALL REAR BEARING

Using a press and SST, install the rear bearing on the out put shaft

SST 09515 20010

CAUTION: Support the 5th gear and inner race by hand.

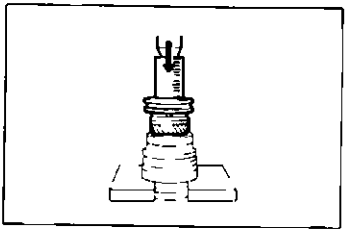
NOTE The ball shield should be positioned toward the rear



11. INSTALL SNAP RING

Select a snap ring which will allow 0 – 0 1 mm (0 – 0 004 in.) axial play

Mark	Thickness	mm (in.)
1	2 35 – 2 40	(0 0925 – 0 0945)
2	2 40 – 2 45	(0 0945 – 0 0965)
3	2 45 – 2 50	(0 0965 – 0 0984)
4	2 50 – 2 55	(0 0984 – 0 1004)
5	2 55 – 2 60	(0 1004 – 0 1024)
6	2 60 – 2 65	(0 1024 – 0 1043)
7	2 65 – 2 70	(0 1043 – 0 1063)



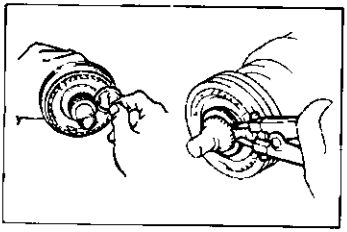
12. INSTALL THIRD GEAR, SYNCHRONIZER RING AND CLUTCH HUB NO 2

(a) Apply MP grease to the shaft

(b) Install the gear and the synchronizer ring on the shaft.

(c) Install clutch hub No 2 on the shaft and align the ring slots with keys

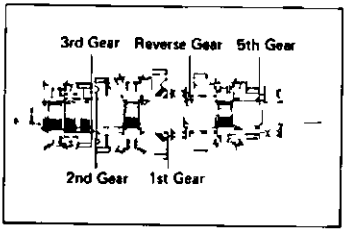
(d) Using a press and collar, press in clutch hub No 2



13. INSTALL SNAP RING

Select a snap ring which will allow 0 – 0.1 mm (0 – 0 004 in.) axial play

Mark	Thickness	mm (in.)
0	1.95 – 2 00	(0 0768 – 0 0787)
1	2 00 – 2 05	(0 0787 – 0 0807)
2	2 05 – 2 10	(0 0807 – 0 0827)
3	2 10 – 2 15	(0 0827 – 0 0846)
4	2 15 – 2 20	(0 0846 – 0 0866)

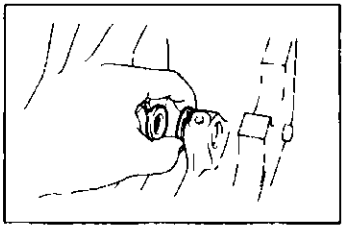


14. MEASURE ALL GEAR THRUST CLEARANCES ON OUTPUT SHAFT

Using a feeler gauge, measure all gear thrust clearances on the output shaft

Gear thrust clearance mm (in.)

Gear	STD	Limit
1st	0 150 – 0 275 (0 0059 – 0 0108)	0 5 (0 020)
2nd	0 150 – 0 250 (0 0059 – 0 0098)	0 5 (0 020)
3rd	0 150 – 0 300 (0 0059 – 0 0118)	0 6 (0 024)
5th	0 100 – 0 930 (0 0039 – 0 0368)	1 0 (0 039)
Reverse	0 200 – 0 325 (0 0079 – 0 0128)	0 6 (0 024)



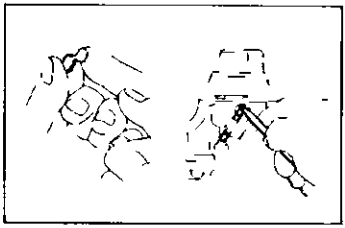
15. INSTALL SPEEDOMETER DRIVE GEAR AND SNAP RINGS

16. INSTALL REVERSE IDLER GEAR AND SHAFT

(a) Fit the projected part of the thrust washer into the case slot

(b) Install the reverse idler gear and shaft. Torque the bolt.

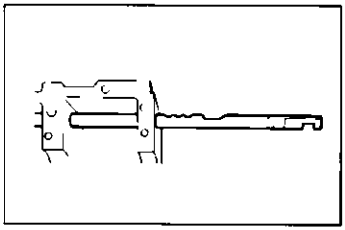
Torque: 155 kg-cm (11 ft lb)



17. INSTALL INTERLOCK PIN

(a) Apply MP grease to prevent the pins from shifting

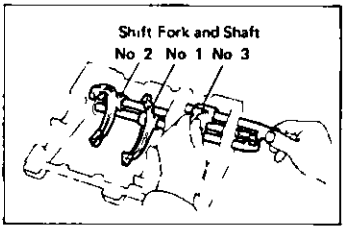
(b) Install two interlock pins in the case



18. INSTALL SHIFT FORK AND SHAFT

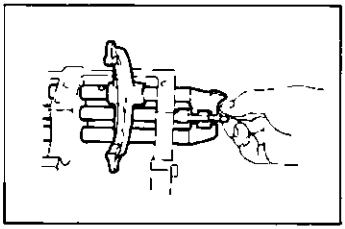
(a) Assemble the shaft with their locking ball grooves positioned toward the top of case

(b) Insert each shaft through each fork and push in up to the neutral position



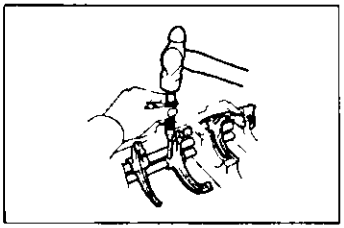
(c) Install the fork shafts and forks in the following order.

- Fork shaft No. 2 and shift fork No. 2
- Fork shaft No. 1 and shift fork No. 1
- Fork shaft No. 3 and shift fork No. 3

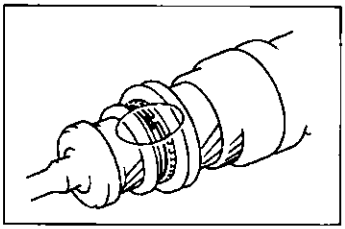


(d) Shift the fork shaft No. 2 to the 3rd speed position

(e) Fork shaft No. 1 and No. 3 should not move



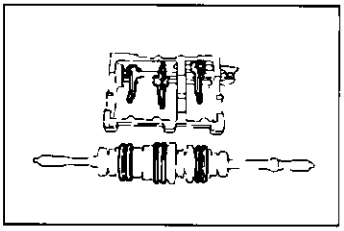
(f) Align the shaft and fork pin holes, and drive in the slotted spring pins with a pin punch



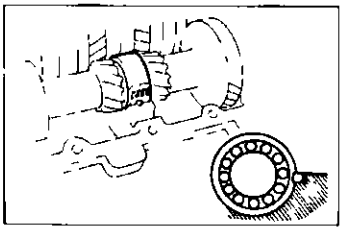
19. INSTALL INPUT SHAFT AND OUTPUT SHAFT

(a) Apply MP grease to the needle roller bearing

(b) Place the synchronizer ring on the gear and align the ring slots with the shifting keys

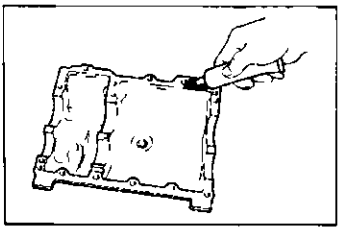


(c) Set the forks and hubs to the neutral position and assemble the input and output shaft to the case



20. INSTALL COUNTER GEAR

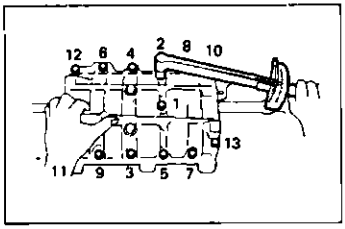
Fit the locking pin into the case groove



21 INSTALL LEFT CASE

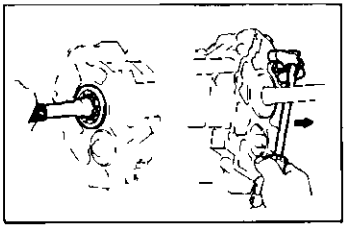
(a) Clean the case joining surfaces and the places where the bearings fit in

(b) Apply liquid sealer to the case joining surface



(c) Apply liquid sealer to the bolt threads and tighten the bolts equally, a little at a time, in the numerical order shown so as to complete the tightening in 3 to 4 passes

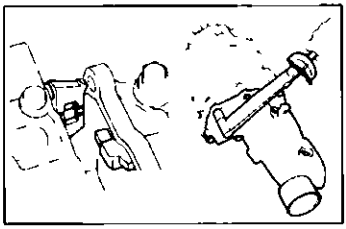
Torque: 200 kg-cm (14 ft-lb)



22. AFTER ASSEMBLING CASE, CHECK FOLLOWING ITEMS.

(a) Turn the input shaft and output shaft and check to see that they turn smoothly

(b) Check to see that shifting can be made smoothly to all positions



23. INSTALL EXTENSION HOUSING

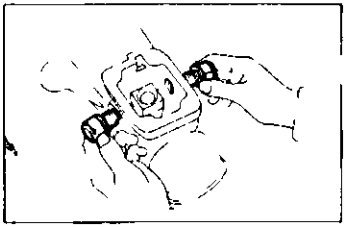
(a) Apply liquid sealer to both surfaces of the gasket.

(b) Engage the end of the shift and select levers into No 2 fork shaft

CAUTION: Be careful not to damage the oil seal in the extension housing

(c) Bolt on the extension housing, and torque the bolts

Torque: 375 kg-cm (27 ft-lb)

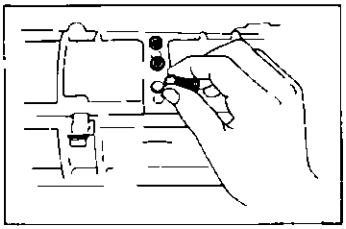


24. INSTALL RESTRICT PINS

(a) Install the restrict pins as shown

(b) Torque the restrict pins

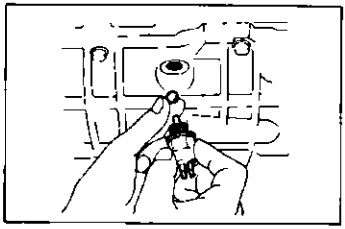
Torque: 400 kg-cm (29 ft-lb)



25. INSTALL LOCKING BALLS, SPRINGS AND CASE COVER

(a) Insert the locking balls and springs into each hole

(b) Install the case cover over the gasket



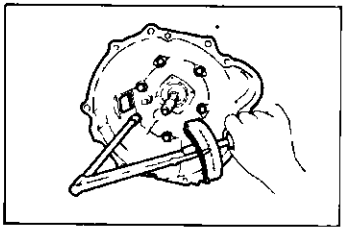
26. INSTALL BACK-UP LIGHT SWITCH

27. INSTALL SHIFT LEVER RETAINER

Install the shift lever retainer and torque the four bolts

Torque 130 kg-cm (9 ft-lb)

28. INSTALL SPEEDOMETER DRIVEN GEAR



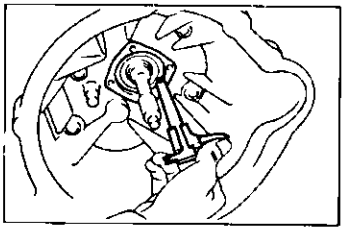
29. INSTALL CLUTCH HOUSING

(a) Apply liquid sealer to the joining surface

(b) Install the clutch housing.

(c) Install and torque the seven bolts

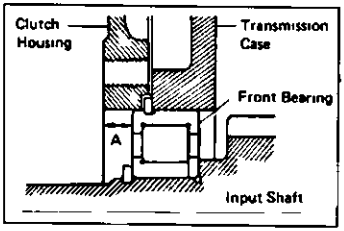
Torque. 375 kg-cm (27 ft-lb)



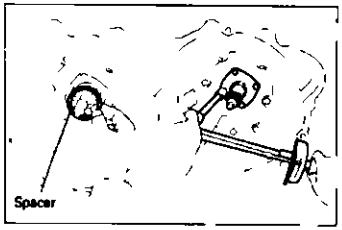
30. SELECT FRONT BEARING RETAINER SPACER

Measure dimension "A" between the input bearing tip and clutch housing front bearing retainer surface, and refer to the table below to select a spacer of the proper thickness

NOTE Insure that the bearing snap ring is securely depressed onto the transmission case when measuring



Dimension A mm (in.)	Spacer thickness mm (in.)
7.70 – 7.80 (0.3031 – 0.3071)	1.825 – 1.875 (0.0719 – 0.0738)
7.81 – 7.91 (0.3075 – 0.3114)	1.935 – 1.985 (0.0762 – 0.0781)
7.92 – 8.02 (0.3118 – 0.3157)	2.045 – 2.095 (0.0805 – 0.0825)
8.03 – 8.13 (0.3161 – 0.3201)	2.155 – 2.205 (0.0848 – 0.0868)
8.14 – 8.24 (0.3205 – 0.3244)	2.265 2.315 (0.0892 – 0.0911)
8.25 – 8.35 (0.3248 – 0.3287)	2.375 – 2.425 (0.0935 – 0.0955)



31. INSTALL SPACER AND FRONT BEARING RETAINER

(a) Install the spacer on the input shaft bearing

(b) Apply MP grease to the oil seal lip

(c) Install the front bearing retainer.

CAUTION. Do not damage the oil seal lip with the spline of the input shaft

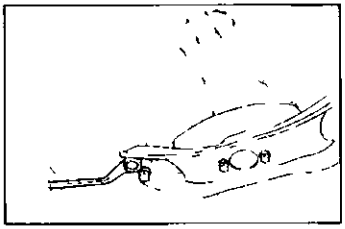
(d) Install and torque the four bolts

Torque: 185 kg-cm (13 ft-lb)

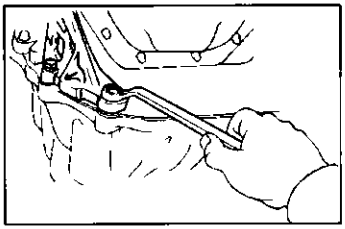
32. INSTALL CLUTCH RELEASE FORK AND BEARING

INSTALLATION OF TRANSMISSION

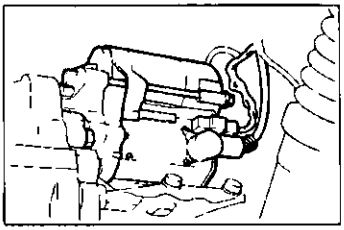
1. **PLACE TRANSMISSION AT INSTALLATION POSITION, AND INSTALL TRANSMISSION MOUNT BOLTS**
   (a) Align the input shaft spline with the clutch disc, and push the transmission fully into position.
   (b) Install the two set bolts of the upper transmission, and troque the bolts
   Torque. 730 kg-cm (53 ft-lb)



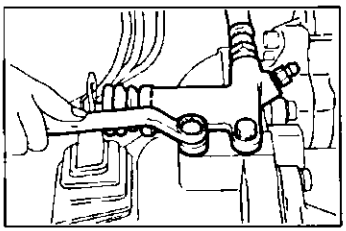
2. **INSTALL ENGINE REAR MOUNTING**
   Install and torque the eight bolts.
   Torque: 530 kg-cm (38 ft-lb)



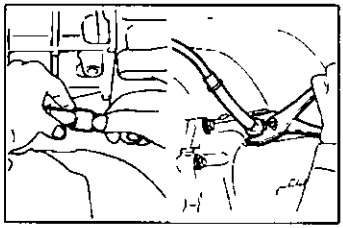
3. **INSTALL TRANSMISSION BOLTS AND STIFFENER PLATE**
   Install and torque the bolts
   Torque: 375 kg-cm (27 ft-lb)
4. **INSTALL EXHAUST PIPE BRACKET**
   Install and torque the bolt
   Torque. 375 kg-cm (27 ft-lb)



5. **INSTALL STARTER**
   Install the starter, and torque the bolts.
   Torque. 300 – 450 kg cm (22 – 32 ft-lb)

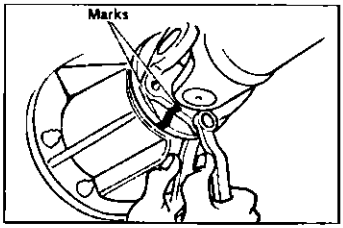


6. **INSTALL CLUTCH RELEASE CYLINDER**



7 CONNECT BACK-UP LIGHT SWITCH CONNECTOR

8. INSTALL SPEEDOMETER CABLE



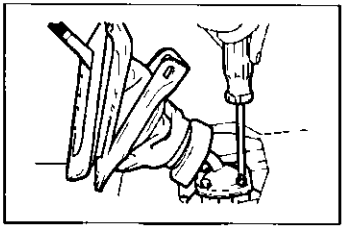
9. INSERT YOKE IN TRANSMISSION

10. CONNECT PROPELLER SHAFT FLANGE TO COMPANION FLANGE ON DIFFERENTIAL
    (a) Align the marks on the flanges and connect the flanges with four bolts and nuts
    (b) Torque the bolts and nuts
    Torque: 350 kg-cm (25 ft lb)

11. CONNECT CENTER SUPPORT BEARING TO BODY (3-Joint Type)

12. FILL WITH TRANSMISSION OIL
    Oil type · API service GL-4 or GL 5
    SAE 90 or 75W 90
    Capacity · 1.7 liters (1 8 US qts, 1 5 Imp qts)

13 CONNECT NEGATIVE BATTERY TERMINAL WIRE



14. INSTALL SHIFT LEVER

15 INSTALL CONSOLE BOX

16. ADJUST IGNITION TIMING (For 4A Engine)
    (a) Connect a timing light to the engine
    (b) Start the engine and run it at idle
    (c) Using a timing light, slowly turn the distributor until the timing mark on the crankshaft pulley is aligned with the 5° mark Tighten the distributor bolt
    Ignition timing: 5° BTDC at idle (900 rpm max.)

17. PERFORM ROAD TEST
    Check for abnormal noise and smooth operation

PROPELLER SHAFT

	Page
TROUBLESHOOTING	PR-2
PROPELLER SHAFT	PR-2

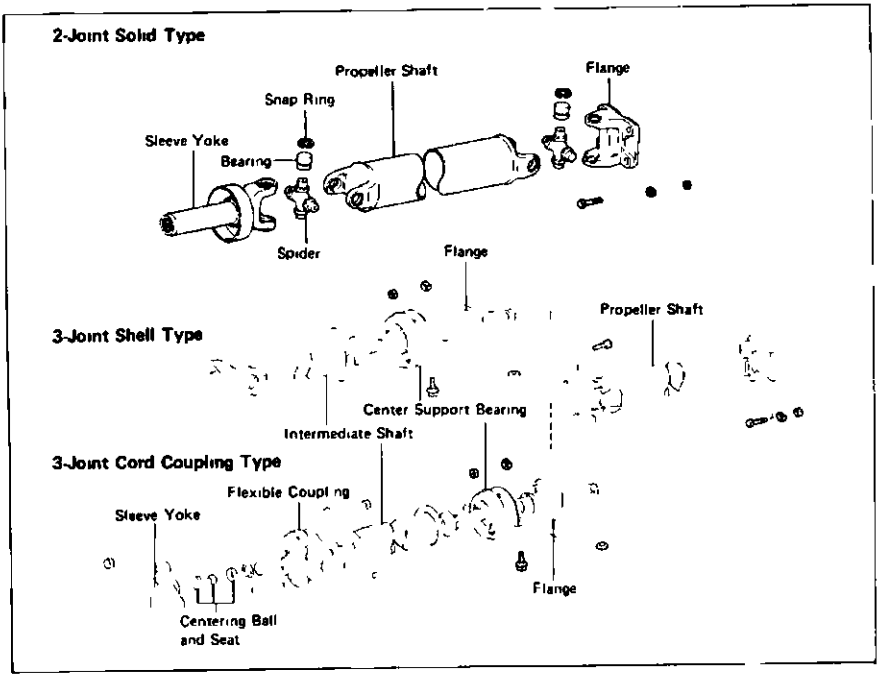
P

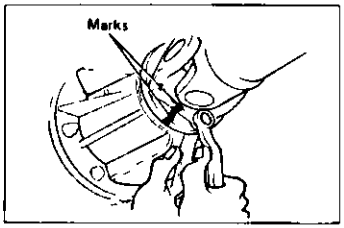
TROUBLESHOOTING

Problem	Possible cause	Remedy	Page
Noise	Sleeve yoke spline worn	Replace sleeve yoke	PR 5
	Center bearing worn	Replace center bearing	PR 3
	Spider bearing worn or stuck	Replace spider bearing (For shell type replace intermediate shaft and propeller shaft)	PR 5
Vibration	Propeller shaft runout	Replace propeller shaft	PR 3
	Propeller shaft imbalance	Balance propeller shaft	
	Transmission extension housing rear bushing worn	Replace bushing	MT 13
	Sleeve yoke spline stuck	Replace sleeve yoke (For shell type replace intermediate shaft and propeller shaft)	PR 5

PROPELLER SHAFT

COMPONENTS





REMOVAL OF PROPELLER SHAFT

(See page PR-2)

Precautions

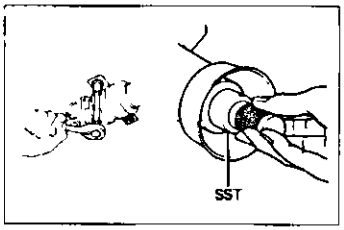
Be careful not to grip the propeller shaft tube too tightly in the vise as this will cause deformation

1. **DISCONNECT PROPELLER SHAFT FLANGE FROM FLANGE ON DIFFERENTIAL**
   (a) Place matchmarks on the flanges
   (b) Remove the four bolts and nuts

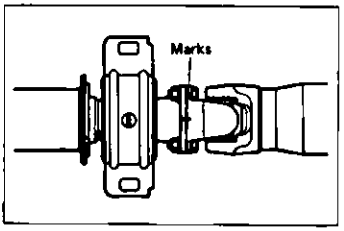
2. **REMOVE CENTER SUPPORT BEARING FROM BODY (3-Joint Type)**

3. **REMOVE PROPELLER SHAFT**
   (a) Pull the sleeve yoke from the transmission
   (b) Insert SST in the transmission to prevent oil leakage

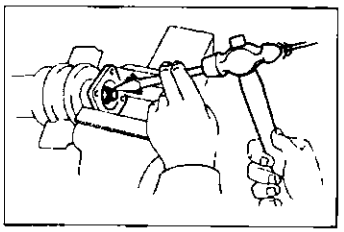
   SST 09325-12010 (M/T)
   09325-20010 (A/T)



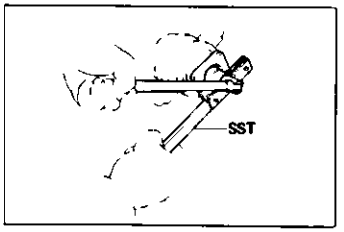
DISASSEMBLY OF PROPELLER SHAFT (3-Joint Type)



1. **SEPARATE PROPELLER SHAFT AND INTERMEDIATE SHAFT**
   (a) Place matchmarks on the flanges
   (b) Remove the four bolts and nuts

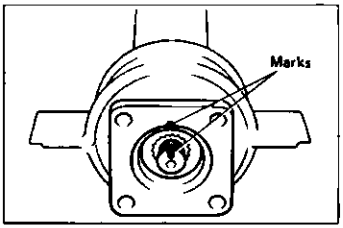


2. **REMOVE CENTER SUPPORT BEARING FROM INTERMEDIATE SHAFT**
   (a) Using a hammer and chisel, loosen the staked part of the nut

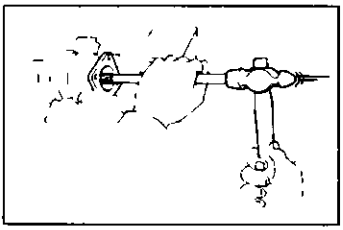


   (b) Using SST to hold the flange, remove the nut

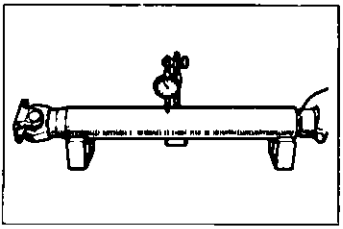
   SST 09330 00020



(c) Place matchmarks on the flange and shaft



(d) Clamp the flange in a vise and tap off the shaft

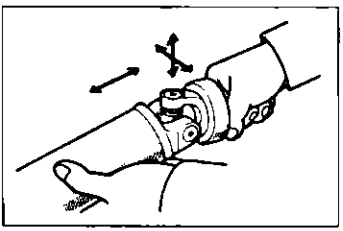


INSPECTION OF PROPELLER SHAFT COMPONENTS

1. **INSPECT PROPELLER AND INTERMEDIATE SHAFTS FOR DAMAGE OR RUNOUT**

   If shaft runout is greater than maximum, replace the shaft

   Maximum runout: 0.8 mm (0.031 in.)



2. **INSPECT SPIDER BEARINGS**

   (a) Inspect the spider bearings for wear or damage.

   (b) Check the spider bearing axial play by wriggling the yoke while holding the shaft tightly

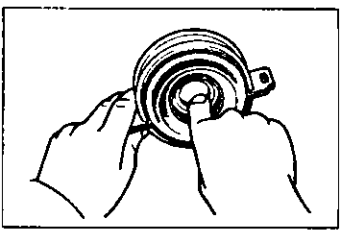
   Bearing axial play:

   Solid type Less than 0.05 mm (0.0020 in.)

   If necessary, replace the spider bearing

   Shell type 0 mm (0 in.)

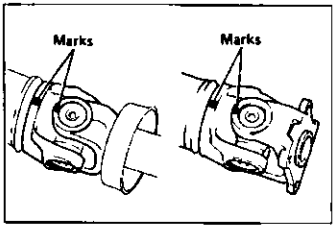
   If necessary, replace the propeller shaft



3. **INSPECT CENTER SUPPORT BEARING FOR WEAR OR DAMAGE**

   Check that the bearing turns freely

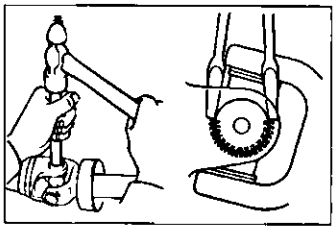
   If the bearing is damaged, worn, or does not turn freely, replace it



REPLACEMENT OF SPIDER BEARING (Solid Type)

1. **PLACE MATCHMARKS ON SHAFT AND FLANGE OR SLEEVE YOKE**

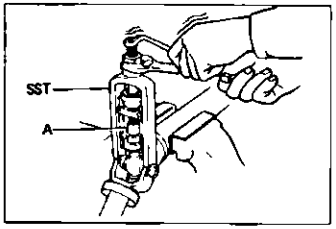
NOTE The shell type cannot be disassembled If necessary, replace the propeller shaft



2. **REMOVE SNAP RINGS**

(a) Slightly tap in the bearing outer races.

(b) Using two screwdrivers, remove the four snap rings from the grooves

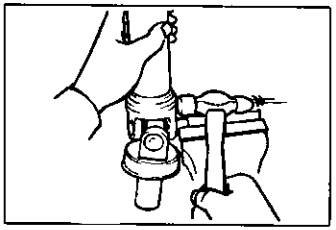


3. **REMOVE SPIDER BEARINGS**

(a) Using SST, push out the bearing from the propeller shaft

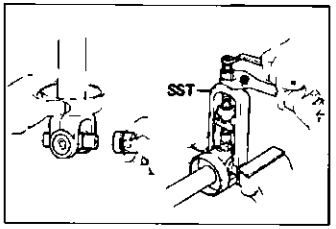
SST 09332 25010

NOTE Sufficiently raise the part indicated by A so that it does not come into contact with the bearing



(b) Clamp the bearing outer race in a vise and tap off the propeller shaft with a hammer

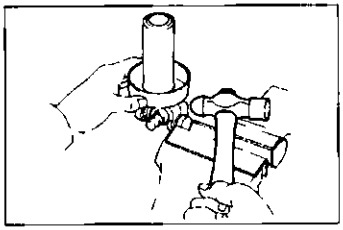
NOTE Remove the bearing on the opposite side in the same procedure



(c) Install the two removed bearing outer races to the spider.

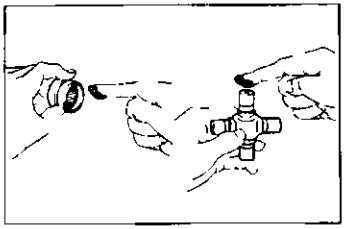
(d) Using SST, push out the bearing from the yoke

SST 09332 25010



(e) Clamp the bearing outer race in a vise and tap off the yoke with a hammer

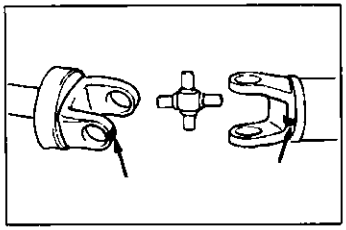
NOTE Remove the bearing on the opposite side in the same procedure



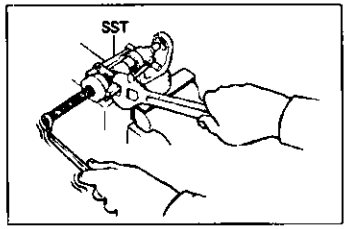
4. INSTALL SPIDER BEARINGS

(a) Apply MP grease to the spider and bearings.

NOTE: Be careful not to apply too much grease



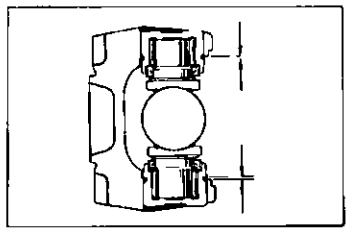
(b) Align the marks on the yoke and shaft



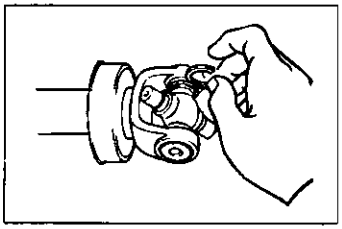
(c) Fit the new spider in the yoke

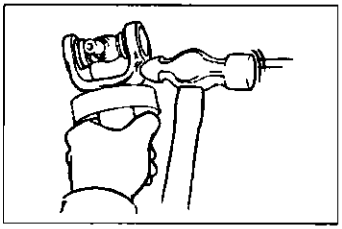
(d) Using SST, install the new bearings on the spider

SST 09332 25010



(e) Adjust both bearings so that the snap ring grooves are at maximum and equal widths.





5. **INSTALL SNAP RINGS**

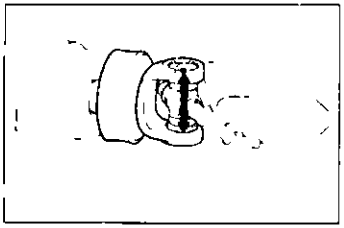
(a) Install two snap rings with the same thickness which will allow 0 – 0.05 mm (0–0.0020 in.) axial play

NOTE Do not reuse the snap rings

Snap ring sizes

Color	Thickness mm (in.)
None	2.375 – 2.425 (0.0935 – 0.0955)
Brown	2.425 – 2.475 (0.0955 – 0.0974)
Blue	2.475 – 2.525 (0.0974 – 0.0994)
None	2.525 – 2.575 (0.0994 – 0.1014)

(b) Using a hammer, tap the yoke until there is no clearance between the bearing outer race and snap ring



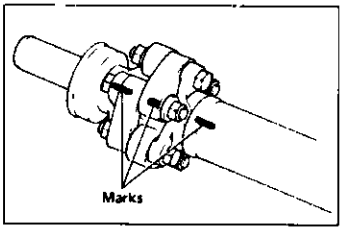
6. **CHECK SPIDER BEARING**

(a) Check that the spider bearing moves smoothly

(b) Check the spider bearing axial play

Bearing axial play: Less than 0.05 mm (0.0020 in.)

NOTE Install new spider bearings in the shaft side using the procedure described above

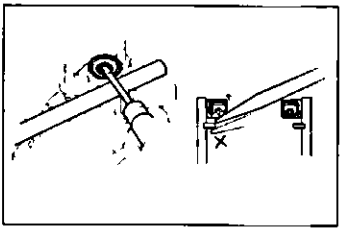


REPLACEMENT OF FLEXIBLE COUPLING (Cord Coupling Type)

1 **SEPARATE SLEEVE YOKE, FLEXIBLE COUPLING AND INTERMEDIATE SHAFT**

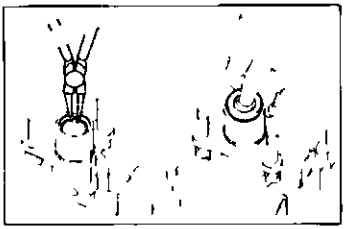
(a) Place matchmarks on the sleeve yoke, flexible coupling and intermediate shaft

(b) Remove the six bolts and nuts



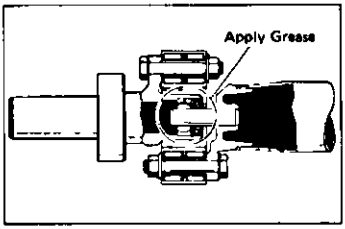
2. **REMOVE CENTERING SEAL**

Insert a screwdriver between the snap ring and centering seal, and pry off the seal



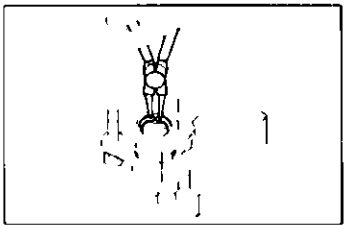
3. **REMOVE SNAP RING**

4. **REMOVE CENTERING BALL AND SEAT**



5. **INSTALL CENTERING BALL AND SEAT**

Apply molybdenum disulphide lithium base grease to the areas indicated in the figure

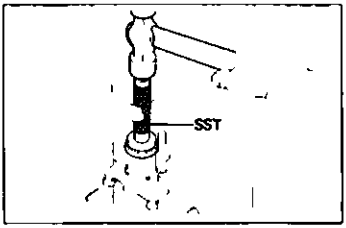


6. **INSTALL SNAP RING**

Select a snap ring with a thickness which will allow 0–0.05 mm (0–0.0020 in.) axial play

Snap ring sizes

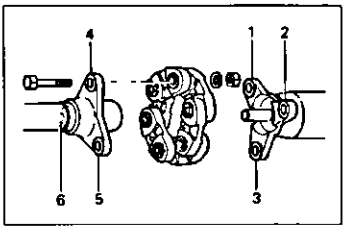
Thickness	mm (in.)
1.40 – 1.44	0.0551 – 0.0567
1.43 – 1.47	0.0563 – 0.0579
1.46 – 1.50	0.0575 – 0.0591
1.49 – 1.53	0.0587 – 0.0602
1.52 – 1.56	0.0598 – 0.0614



7. **INSTALL CENTERING SEAL**

Using SST, install the new centering seal.

SST 09608-30021



8. **INSTALL FLEXIBLE COUPLING**

(a) Align the marks on the sleeve yoke, flexible coupling and intermediate shaft

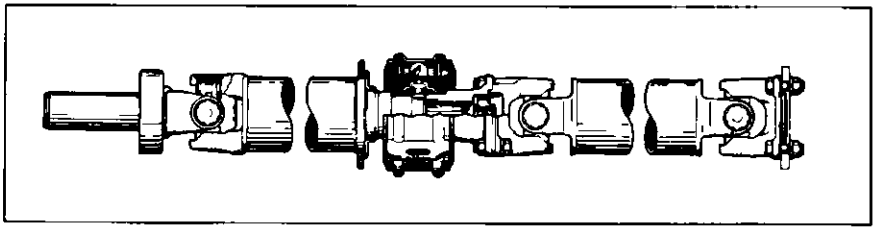
(b) Torque the bolts and nuts

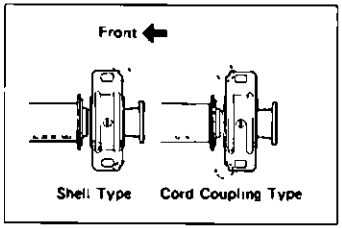
Torque: 900 kg-cm (65 ft-lb)

NOTE: First tighten the three bolts on the intermediate shaft side and then evenly tighten the three bolts on the sleeve flange side

ASSEMBLY OF PROPELLER SHAFT (3-Joint Type)

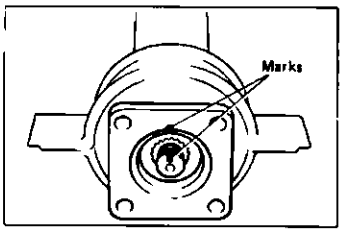
NOTE: When replacing the flange or propeller shaft, install the new parts facing as shown in the illustration





1 INSTALL CENTER SUPPORT BEARING ON INTERMEDIATE SHAFT

NOTE Install the center support bearing with the cut out toward the rear (Shell Type) or the front (Cord Coupling Type)

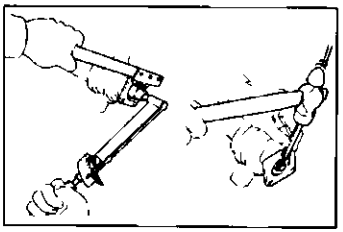


2. INSTALL FLANGE ON INTERMEDIATE SHAFT

(a) Coat the splines of the intermediate shaft with MP grease

(b) Place the flange on the shaft and align the marks

NOTE If replacing either the center flange or intermediate shaft, reassemble them so that the front yoke of the intermediate shaft and the rear yoke of the propeller shaft are facing in the same direction.



(c) Using SST to hold the flange, press the bearing into position by tightening down a new nut

SST 09330 00020

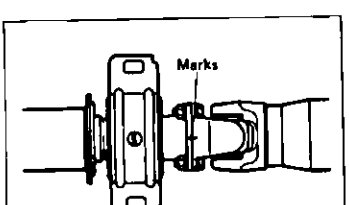
Torque: 1,700 – 2,000 kg-cm (123 – 144 ft-lb)

(d) Loosen the nut.

(e) Torque the nut again

Torque: 300 kg-cm (22 ft-lb)

(f) Using a hammer and punch, stake the nut



3. INSTALL PROPELLER SHAFT

(a) Align the marks on the flanges and connect the flanges with four bolts and nuts

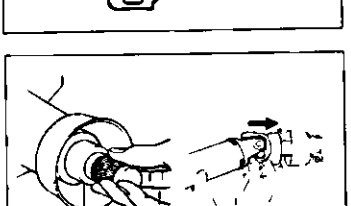
NOTE If replacing either the center flange or intermediate shaft, reassemble them so that the front yoke of the intermediate shaft and the rear yoke of the propeller shaft are facing in the same direction.

(b) Torque the bolts and nuts

Torque: 350 kg-cm (25 ft-lb)

INSTALLATION OF PROPELLER SHAFT

(See page PR-2)

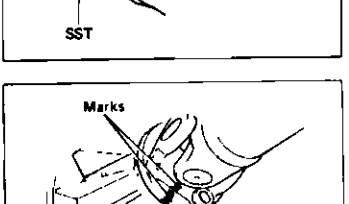


1. INSERT YOKE IN TRANSMISSION

(a) Remove SST

(b) Push the yoke into the transmission

SST 09325 12010 (M/T)
09325 20010 (A/T)

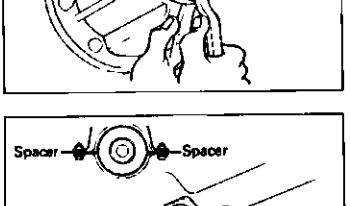


2. CONNECT PROPELLER SHAFT FLANGE TO COMPANION FLANGE ON DIFFERENTIAL

(a) Align the marks on the flanges and connect the flanges with four bolts and nuts

(b) Torque the bolts and nuts.

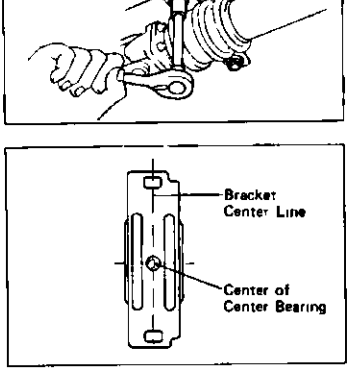
Torque: 350 kg-cm (25 ft-lb)



3. CONNECT CENTER SUPPORT BEARING TO BODY (3-Joint Type)

(a) Place a height spacer between the body and center support bearing, and install the two mounting bolts finger tight

NOTE Some vehicles do not have a spacer
In this case, it is not necessary to insert one



(b) Check that the bearing bracket is at right angles to the propeller shaft Adjust the bracket if necessary

(c) Check that the center line of the center bearing is set to the center line of the bracket when the vehicle is in a no load condition Adjust the bracket if necessary

(d) Torque the mounting bolts

Torque. 375 kg-cm (27 ft-lb)

FRONT AXLE AND SUSPENSION

	Page
TROUBLESHOOTING	FA-2
FRONT WHEEL ALIGNMENT	FA-3
FRONT AXLE HUB	FA-6
FRONT AXLE SHOCK ABSORBER	FA-10
FRONT SUSPENSION	FA-14
Ball Joint	FA-14
Lower Arm	FA 15
Strut Bar	FA-18
Stabilizer Bar	FA 19

FA

TROUBLESHOOTING

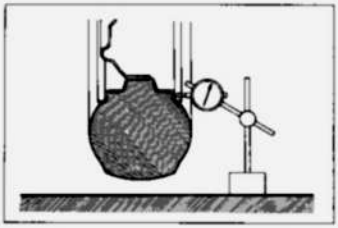
Problem	Possible cause	Remedy	Page
Wanders/pulls	Tires worn or improperly inflated	Replace tire or inflate tires to proper pressure	FA 3
	Alignment incorrect	Check front end alignment	FA 3
	Wheel bearing adjusted too tight	Adjust wheel bearing	FA-8
	Front or rear suspension parts loose or broken	Tighten or replace suspension part	
	Steering linkage loosen or worn	Tighten or replace steering linkage	SR 3
	Steering gear out of adjustment or broken	Adjust or repair steering gear	SR 11, 33
Bottoming	Vehicle overloaded	Reduce load	
	Springs weak	Replace spring	FA 11
Sways/pitches	Tires improperly inflated	Inflate t res to proper pressure	FA 3
	Stabilizer bar bent or broken	Inspect stabilizer bar	FA 19
Front wheel shimmy	T res worn or improperly inflated	Replace t re or inflate tires to proper pressure	FA 3
	Wheels out of balance	Balance wheels	
	Al gnment incorrect	Check front end alignment	FA 3
	Wheel bearings worn or improperly adjusted	Replace or adjust wheel bear ngs	FA 6, 8
	Ball joints or bushings worn	Inspect ball joints and bushings	FA 14
	Steering linkage loose or worn	T ghten or replace steering linkage	SR 3
	Steering gear out of adjustment or broken	Adjust or repair steering gear	SR 11,33
Abnormal tire wear	T res improperly inflated	Inflate tires to proper pressure	FA 3
	Al gnment incorrect	Check toe in	FA 3
	Suspension parts worn	Replace suspension parts	

FRONT WHEEL ALIGNMENT

1. MAKE FOLLOWING CHECKS AND CORRECT ANY PROBLEMS

(a) Check the tires for size, wear, and proper inflation.

Correct tire pressure: 1.7 kg/cm² (24 psi)



(b) Check the wheel runout.

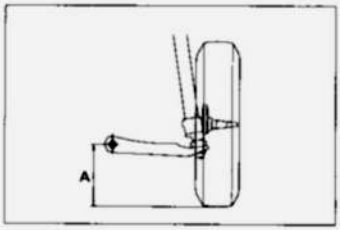
Lateral runout: Less than 1.0 mm (0.039 in.)

(c) Check the front wheel bearings for looseness.

(d) Check the front suspension for looseness.

(e) Check the steering linkage for looseness.

(f) Check that the front absorbers work properly by using the standard bounce test.

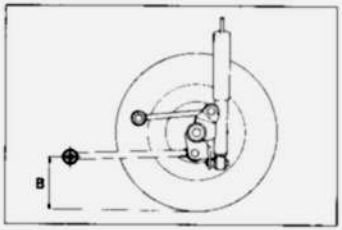


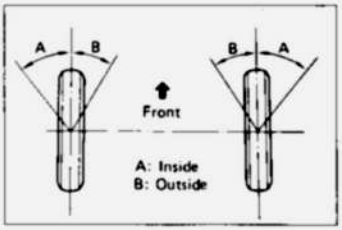
2. MEASURE VEHICLE HEIGHT

Vehicle height mm (in.)

Tire	Front A	Rear B
165 SR13	236 (9.29)	238 (9.37)
185/70SR13	237 (9.33)	239 (9.41)
185/70HR13	237 (9.33)	239 (9.41)

If height of the vehicle is not as specified, try to level the vehicle by shaking it down. If the height of the vehicle is still not correct, check for bad springs and worn or loose suspension parts.

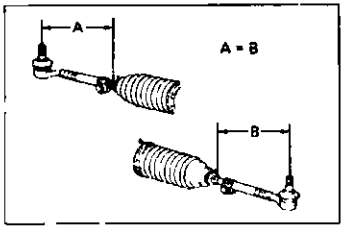




3. ADJUST WHEEL ANGLE

Remove the caps of the knuckle stopper bolts and check the steering angles.

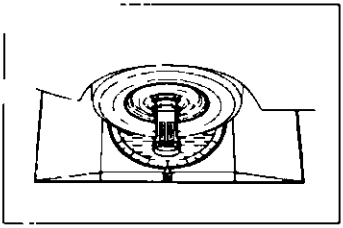
Wheel angle		w/P.S	w/o P.S
Max	Inside wheel	38°30' ± 2°	38°30' ± 2°
	Outside wheel (Reference)	33°	33°30'
at 20°	Inside wheel	21°	
	Outside wheel	20°	



If steering angles differ from the standard specifications, check to see if the lengths of the left and right tie rods are the same

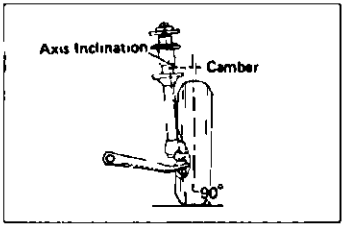
NOTE If the tie rod lengths are not equal, the steering angle cannot be adjusted properly

If the tie rod lengths were changed to adjust the steering angle, reinspect the toe-in



4. INSTALL WHEEL ALIGNMENT EQUIPMENT

Follow the specific instructions of the equipment manufacturer

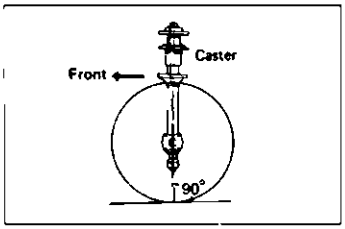


5 INSPECT CAMBER AND STEERING AXIS INCLINATION

Camber	Australia	Others
Inspection standard	15 ± 45	20 ± 45
Adjustment standard	15 ± 30	20' ± 30
Left right error	30	30

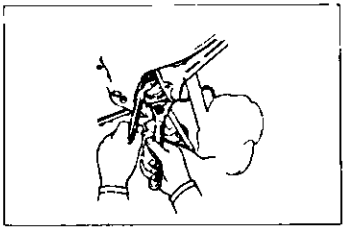
Steering axis inclination	Australia	Others
Inspection standard	8°50 ± 45	8°45 ± 45
Adjustment standard	8°50 ± 30	8°45 ± 30
Left right error	30	30

If camber or steering axis inclination checks are out of tolerance, inspect and replace damaged or worn front suspension parts



6 ADJUST CASTER

Caster	4A 4A-C	4A GE	w/P S
Inspection standard	2°45 ± 45	3°40' ± 45	3°40 ± 45'
Adjustment standard	2°45 ± 30	3°40 ± 30	3°40 ± 30
Left right error	30	30	30

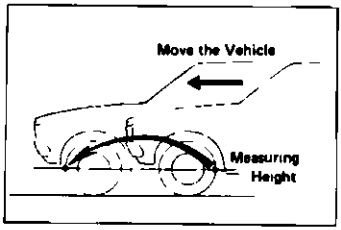


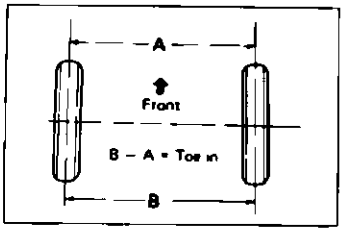
If caster is out of tolerance adjust the caster with the staked nuts of the strut bar

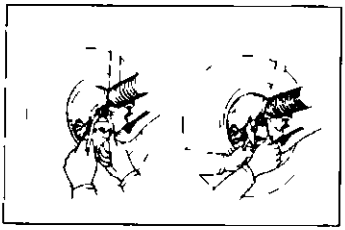
Torque. 925 kg-cm (67 ft lb)

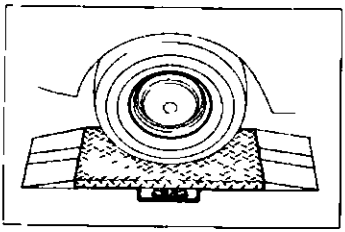
NOTE Decrease caster by lengthening the strut bar Increase caster by shortening the strut bar One turn of the nut is equal to 8'

If caster still cannot be adjusted within limits, inspect and replace any damaged or worn front suspension parts









7. **ADJUST TOE-IN**

(a) Make sure the wheels are positioned straight ahead

(b) Mark the center of each rear tread and measure the distance between the marks on the right and left tires

(c) Advance the vehicle until the marks on the rear side of the tires come to the front.

NOTE The toe-in should be measured at the same point on the tire and at the same level

(d) Measure the distance between the marks on the front side of the tires

Toe-in:

Inspection standard 1 ± 4 mm (0.04 ± 0.16 in.)
Adjustment standard 1 ± 1 mm (0.04 ± 0.04 in.)

(e) Remove the rack boot clips and loosen the clamp bolts

(f) Adjust the toe-in by turning the left and right rack end and equal amount

NOTE Make sure that the tie rods are the same length

(g) Tighten the clamp bolts and torque them

Torque. 175 kg-cm (13 ft-lb)

NOTE Make sure that the tie rod is perpendicular with the stud

(h) Install the rack boot clips

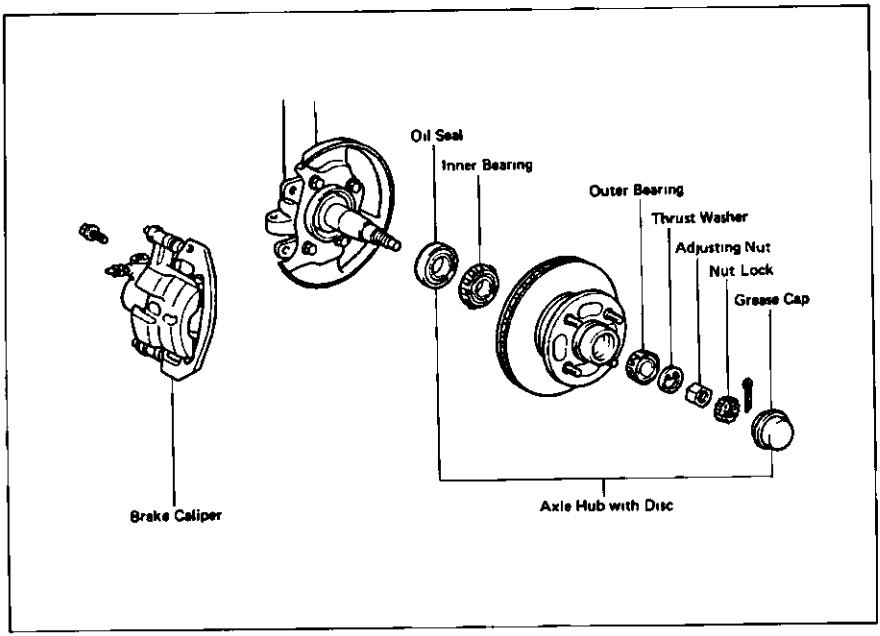
8. **INSPECT SIDE SLIP WITH SIDE SLIP TESTER**

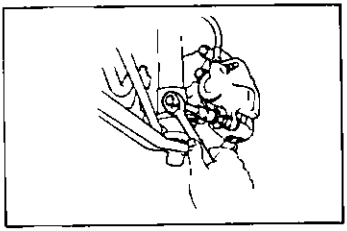
Side slip limit:
Less than 3.0 mm/m (0.118 in./3.3 ft)

If the side slip exceeds the limit, the toe-in or other front wheel alignment may not be correct

FRONT AXLE HUB

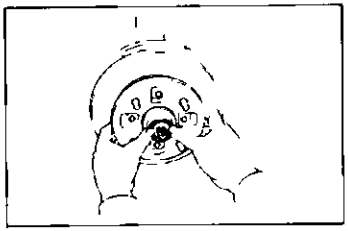
COMPONENTS



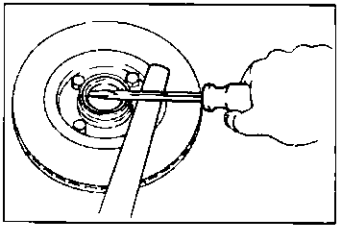


DISASSEMBLY OF FRONT AXLE HUB

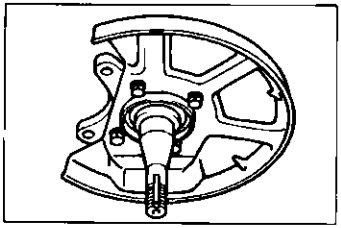
1. **REMOVE DISC BRAKE CALIPER**
   (a) Remove the two caliper mounting bolts and remove the caliper from the dust cover.
   (b) Suspend the caliper with a cord
   NOTE Do not disconnect the brake hose



2. **REMOVE AXLE HUB WITH DISC**
   (a) Remove the grease cap, cotter pin, nut lock and adjusting nut.
   (b) Remove the hub and disc together with the outer bearing and thrust washer
   NOTE Be careful not to drop the outer bearing.

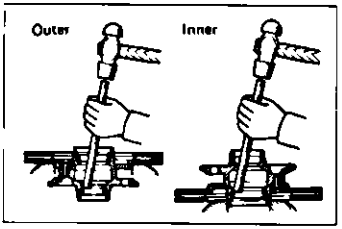


3. **REMOVE INNER BEARING AND OIL SEAL**
   (a) Using a screwdriver, pry out the oil seal
   (b) Remove the inner bearing from the hub.



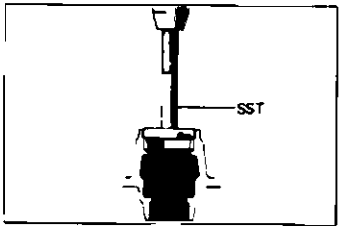
INSPECTION AND REPAIR OF FRONT AXLE HUB

1. **INSPECT SPINDLE**
   Using a magnetic flaw detector or flaw detecting penetrant, check for damage or cracks



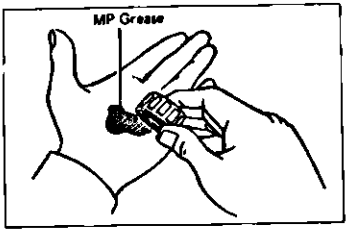
2. **INSPECT BEARING**
   Clean the bearings and outer races and inspect them for wear or damage

3 **REPLACE BEARING OUTER RACE**
   (a) Using a brass bar and hammer, drive out the bearing outer race



   (b) Using SST, carefully drive in the new bearing outer race

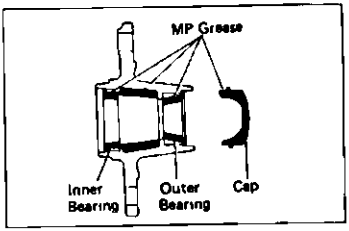
   SST 09608 20011



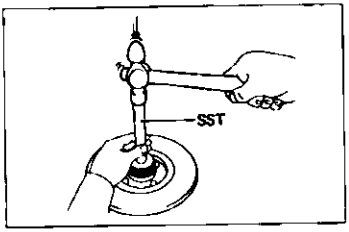
INSTALLATION OF FRONT AXLE HUB

(See page FA-6)

1. **PACK BEARINGS WITH MP GREASE**
   (a) Place MP grease in the palm of your hand
   (b) Pack grease into the bearing, continuing until the grease oozes out from the other side
   (c) Do the same around the bearing circumference.

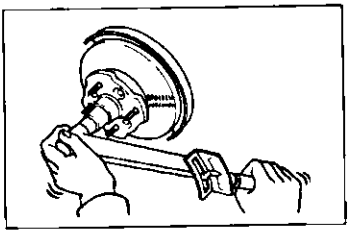


2. **COAT INSIDE OF HUB AND GREASE CAP WITH MP GREASE**

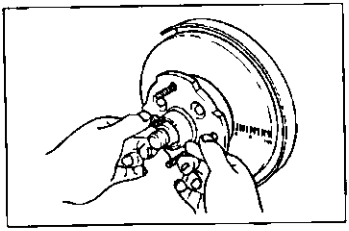


3 **INSTALL INNER BEARING AND OIL SEAL**
Place the inner bearing into the hub. Using SST, drive the oil seal into the hub. Coat the oil seal with MP grease.
SST 09608-20011

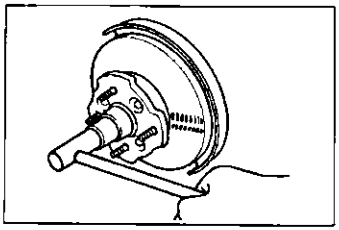
4. **INSTALL AXLE HUB ON SPINDLE**
   (a) Place the axle hub on the spindle
   (b) Install the outer bearing and thrust washer.



5. **ADJUST PRELOAD**
   (a) Install and torque the adjusting nut
   Torque: 290 kg-cm (21 ft-lb)



(b) Snug down the bearing by turning the hub several times

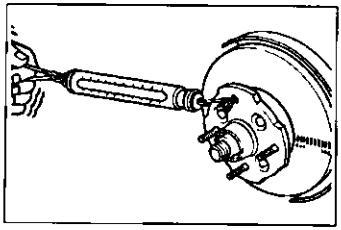


(c) Retighten the adjusting nut

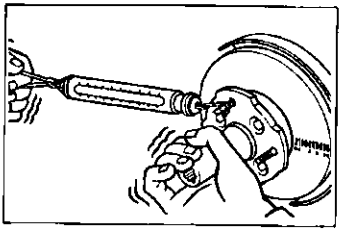
Torque: 290 kg-cm (21 ft-lb)

(d) Loosen the adjusting nut until it can be turned by hand

NOTE Confirm that there is absolutely no brake drag



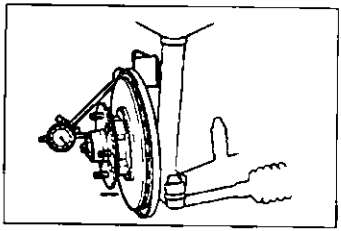
(e) Measure and make a note of the rotation frictional force of the oil seal



(f) Tighten the adjusting nut until the preload is within standard

Preload:
(In addition to rotation friction force of the oil seal)
0 – 1,050 g (0 – 2.3 lb)

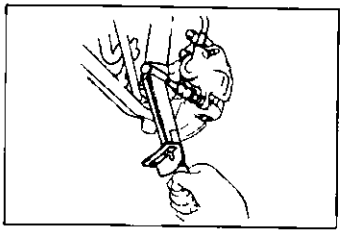
(g) Insure that the hub rotates smoothly



(h) Measure the hub axial play.

Limit: 0.05 mm (0.0020 in.)

6. INSTALL NUT LOCK, COTTER PIN AND GREASE CAP



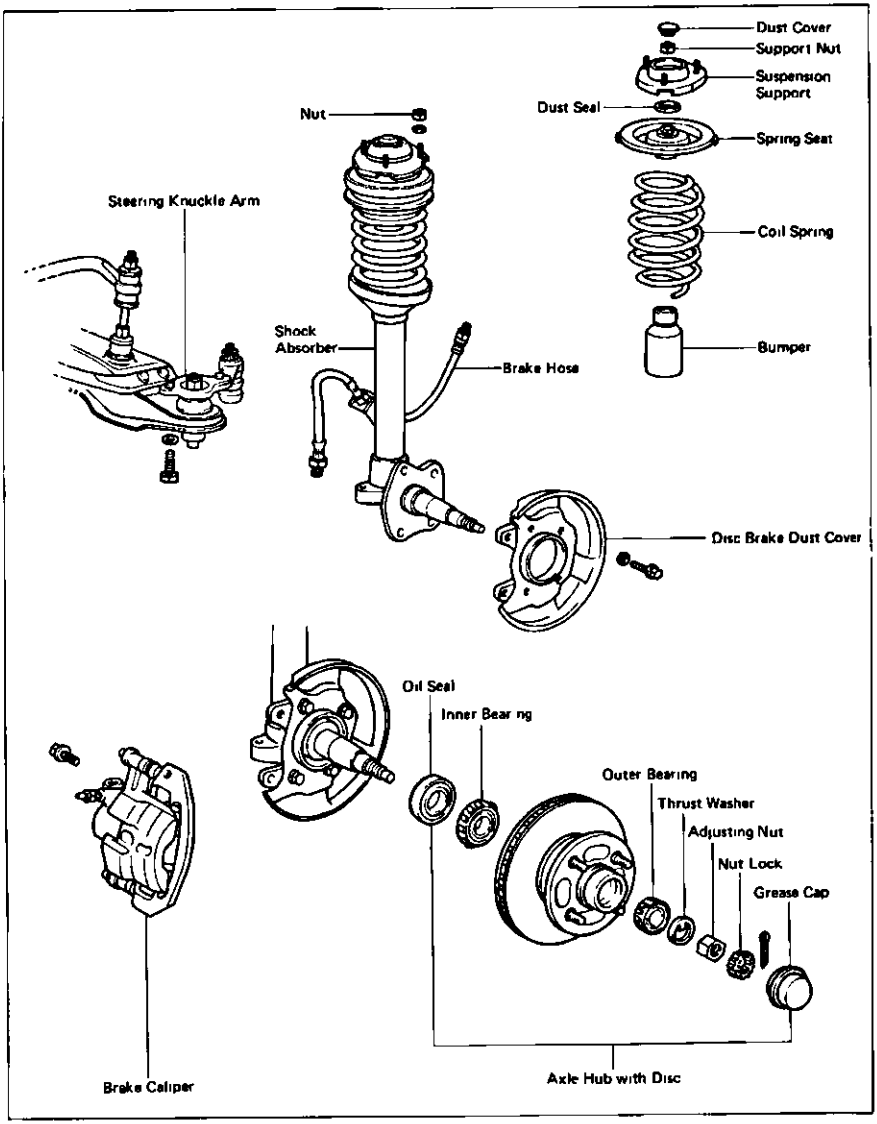
7. INSTALL DISC BRAKE CALIPER

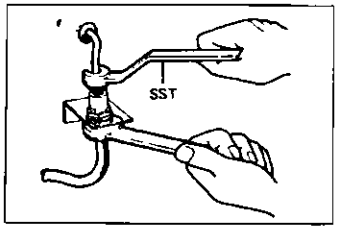
Install brake caliper Torque the mounting bolts

Torque. 650 kg-cm (47 ft-lb)

FRONT AXLE SHOCK ABSORBER

COMPONENTS





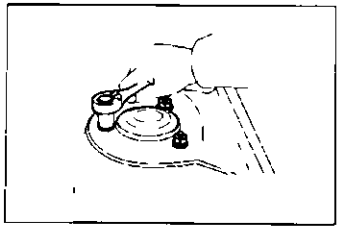
REMOVAL OF FRONT SHOCK ABSORBER ASSEMBLY

1. DISCONNECT BRAKE TUBE

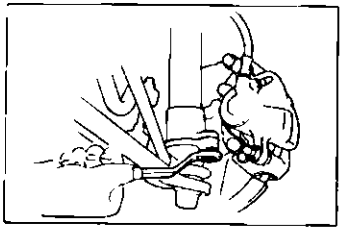
Using SST and an open end wrench, disconnect the brake tube from the flexible hose

Drain the brake fluid into a container

SST 09751-36011

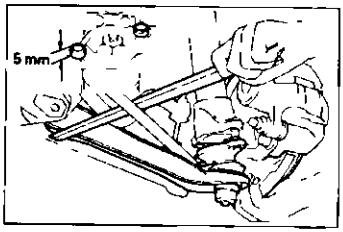


2. REMOVE THREE NUTS



3. REMOVE TWO BOLTS

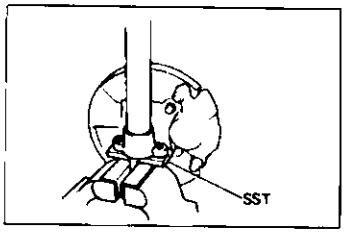
Remove the two bolts mounting the shock absorber assembly to the steering knuckle arm



4. REMOVE FRONT SHOCK ABSORBER, FRONT AXLE HUB AND BRAKE CALIPER

NOTE Collars extend into the steering knuckle bolt holes about 5 mm (0.20 in.) deep

Push the suspension lower arm down and remove the front shock absorber, front axle hub and brake caliper



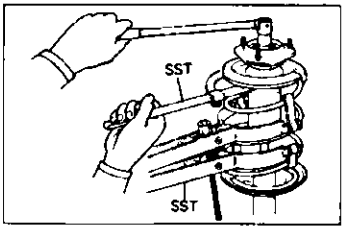
5. MOUNT FRONT SHOCK ABSORBER IN VISE OR LOCKING PLATE (SST)

SST 09720-00010

6. **REMOVE TWO BRAKE HOSES**

7. **REMOVE BRAKE CALIPER AND FRONT AXLE HUB** (See page FA-6)

8. **REMOVE BACKING PLATE**



9. **REMOVE COIL SPRING**

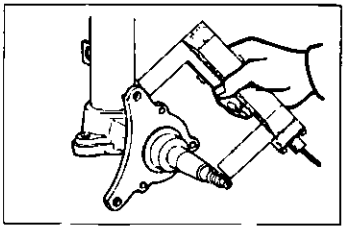
(a) Using SST, compress the coil spring

SST 09727 22031

(b) Lower the bumper and using SST to hold the support, remove the support nut

SST 09729-22021

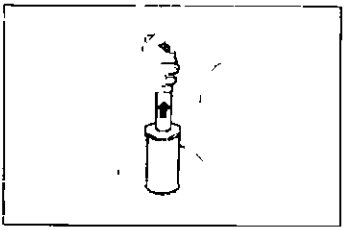
(c) Remove the suspension support, dust seal, spring seat, spring and bumper



INSPECTION OF FRONT SHOCK ABSORBER ASSEMBLY

1. **INSPECT STEERING KNUCKLE PART OF SHOCK ABSORBER**

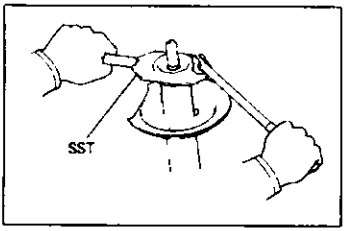
Using a magnetic flaw detector or flaw detecting penetrant, inspect the steering knuckle part of the shock absorber for damage or cracks



2. **INSPECT OPERATION OF SHOCK ABSORBER**

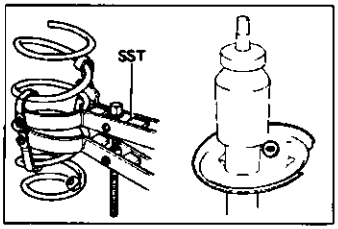
(a) Pull out the shock absorber piston rod at a constant speed and check to see that the pull feeling through out the stroke is the same

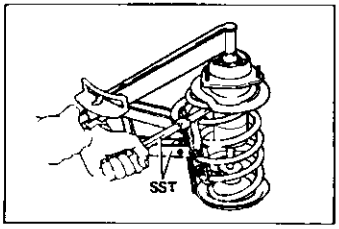
(b) Check that there is no change in the pull when the piston rod is suddenly moved up and down with a stroke of 5 – 10 mm (0.20 – 0.39 in.)



(c) If the absorber operation is defective, use SST to remove the absorber from the outer shell and then either replace the cartridge or overhaul it

SST 09720 00010





INSTALLATION OF FRONT SHOCK ABSORBER ASSEMBLY

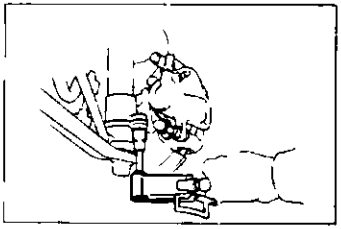
(See page FA 10)

1. **INSTALL BUMPER, COIL SPRING AND SPRING SEAT**
   (a) Mount the front shock absorber on a stand
   (b) Install the bumper to the shock absorber
   (c) Align the coil spring end with the lower seat hollow and install.
   (d) Align the spring seat with the piston rod and install
   (e) Install the dust seal on the spring seat
   (f) Using SST, compress the coil spring
   SST 09727 22031

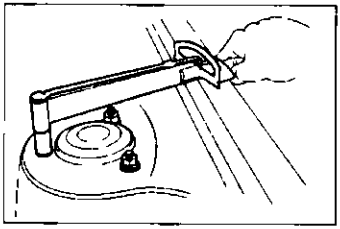
2. **INSTALL SUSPENSION SUPPORT**
   (a) Using SST to hold the support, install the support with a new nut Torque the nut
   SST 09729 22021
   Torque. 475 kg-cm (34 ft-lb)
   (b) Pack MP grease into the suspension support bearing
   (c) Install the dust cover on the suspension support

3. **INSTALL BACKING PLATE AND FRONT AXLE HUB, ADJUST PRELOAD** (See page FA-8)

4. **INSTALL TWO BRAKE HOSES AND BRAKE CALIPER** (See page FA-9)



5. **CONNECT STEERING KNUCKLE ARM**
   Place the shock absorber assembly in position, and connect the knuckle arm with two bolts Torque the bolts
   Torque: 800 kg-cm (58 ft-lb)



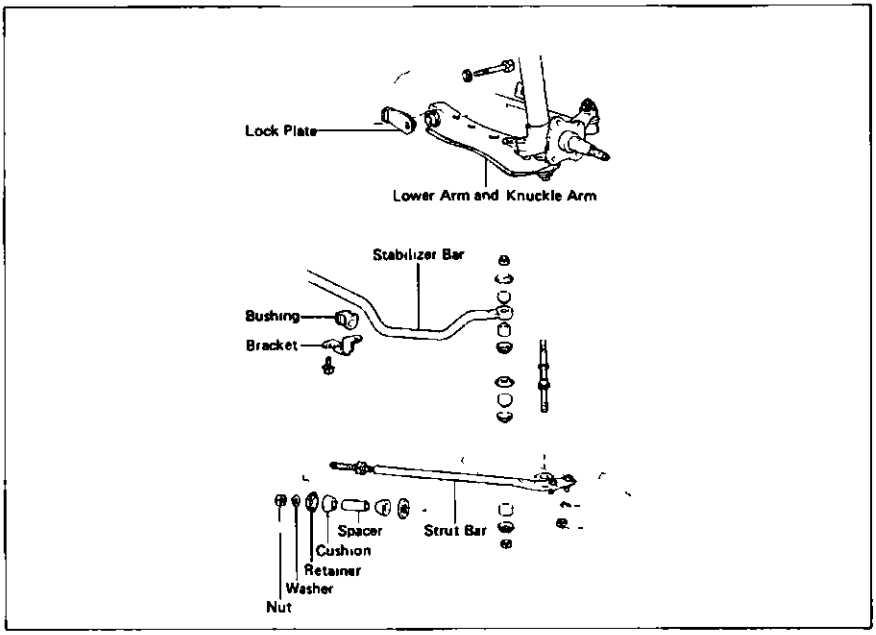
6. **INSTALL THREE NUTS**
   Install three nuts holding the top of the shock absorber Torque the nuts
   Torque. 185 kg-cm (13 ft-lb)

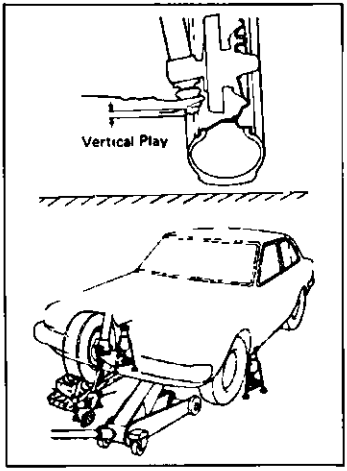
7. **CONNECT BRAKE TUBE AND BLEED BRAKE LINES** (See page BR-7)

8. **CHECK FRONT WHEEL ALIGNMENT AND SIDE SLIP** (See page FA-3)

FRONT SUSPENSION

COMPONENTS





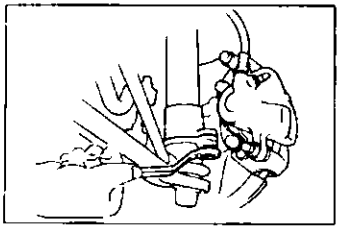
Ball Joints

INSPECTION OF BALL JOINTS

1. **INSPECT BALL JOINTS FOR EXCESSIVE LOOSENESS**
   (a) Jack up the front of the vehicle and place wooden blocks with a height of 180–200 mm (7.09–7.87 in.) under one front tire
   (b) Lower the jack until there is about half a load on the front coil springs. Place stands under the vehicle for safety
   (c) Make sure the front wheels are in a straight forward position and block them with chocks
   (d) Move the lower arm up and down and check that the ball joint has no excessive play

   Maximum ball joint vertical play: 2.5 mm (0.098 in.)

   (e) Inspect the ball joint on the opposite side in the same manner (steps a through d).

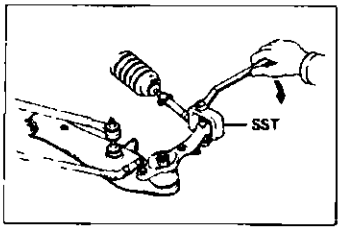


Lower Arm

(See page FA-14)

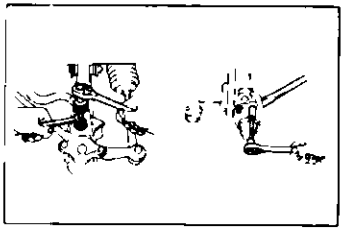
REMOVAL OF LOWER ARM

1. **DISCONNECT KNUCKLE ARM FROM SHOCK ABSORBER**
   (a) Remove two bolts holding the knuckle arm to the shock absorber
   (b) Push the lower arm down, and disconnect the shock absorber from the knuckle arm

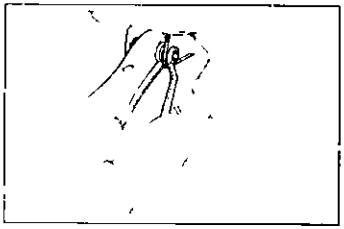


2. **DISCONNECT KNUCKLE ARM FROM TIE ROD**
   (a) Remove the cotter pin and nut holding the knuckle arm to the tie rod
   (b) Using SST, disconnect the knuckle arm from the tie rod

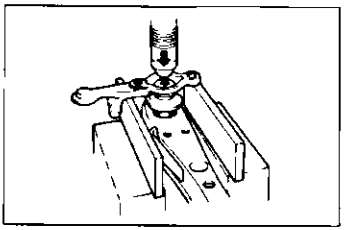
   SST 09611 22012



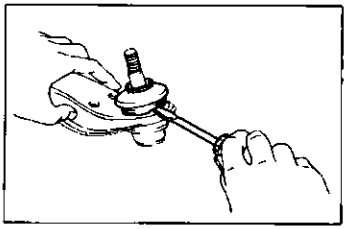
3. **DISCONNECT STABILIZER BAR AND STRUT BAR FROM LOWER ARM**
   (a) Remove the nut holding the stabilizer bar to the lower arm and disconnect the stabilizer bar
   (b) Remove the nuts holding the strut bar to the lower arm and disconnect the strut bar



4. **REMOVE LOWER ARM**
   Remove the bolt holding the lower arm to the cross-member and remove the lower arm



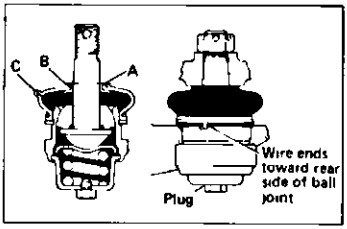
5. **DISCONNECT KNUCKLE ARM FROM LOWER ARM**
   (a) Remove the cotter pin and nut holding the knuckle arm to the ball joint
   (b) Using a press, disconnect the knuckle arm from the lower arm



REPLACEMENT OF LOWER ARM DUST COVER

1. **REMOVE DUST COVER**

   Remove the dust cover set wire and dust cover



2. **INSTALL DUST COVER**

   (a) Apply ball joint grease to areas "A" and "B" of a new dust cover

   (b) Install the dust cover with escape valve "C" facing the rear of the vehicle

   (c) Wind wire twice around the dust cover and bend the wire knot down

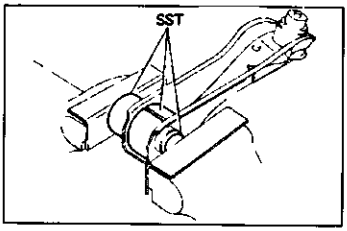
   (d) Remove the plug and install the grease fitting

   (e) Fill with ball joint grease

   Molybdenum Disulphide Lithium Base Grease:

   NLGI No. 1 or No. 2

   (f) Remove the grease fitting and install the plug

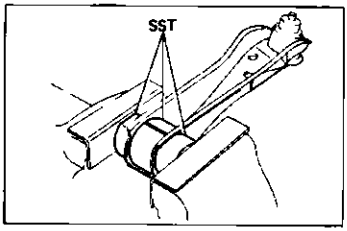


REPLACEMENT OF LOWER ARM BUSHING

1. **REMOVE LOWER ARM BUSHING**

   Using SST, press out the bushing from the lower arm

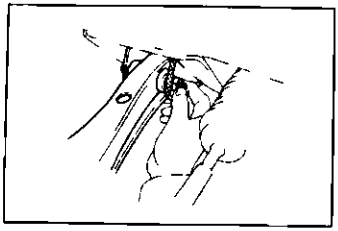
   SST 09726 12021



2. **INSTALL LOWER ARM BUSHING**

   Using SST, press the bushing into the lower arm

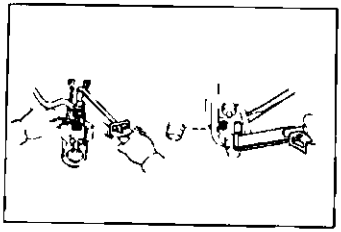
   SST 09726-12021



INSTALLATION OF LOWER ARM

1. **INSTALL LOWER ARM IN CROSSMEMBER**

   Install the lower arm to the crossmember with a bolt
   Do not torque the bolt



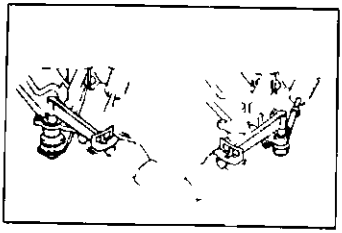
2. **CONNECT STABILIZER BAR AND STRUT BAR TO LOWER ARM**

   (a) Connect the stabilizer bar to the lower arm with the bolt and nut Torque the nut

   Torque: 180 kg-cm (13 ft lb)

   (b) Connect the strut bar to the lower arm with the two nuts. Torque the two nuts.

   Torque: 475 kg-cm (34 ft-lb)



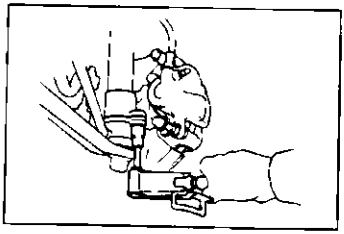
3. **CONNECT KNUCKLE ARM TO BALL JOINT AND TIE ROD**

   (a) Install the knuckle arm on the ball joint with the nut. Torque the nut and install a new cotter pin

   Torque: 800 kg-cm (58 ft lb)

   (b) Install the knuckle arm on the tie rod with the nut. Torque the nut and install a new cotter pin

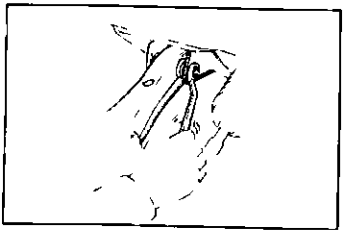
   Torque: 600 kg-cm (43 ft-lb)



4. **CONNECT KNUCKLE ARM TO SHOCK ABSORBER**

   Place the shock absorber assembly in position and connect the knuckle arm with two bolts Torque the bolts

   Torque. 800 kg-cm (58 ft-lb)



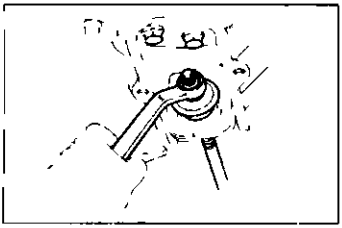
5. **INSTALL WHEEL AND LOWER VEHICLE**

6. **TORQUE BOLT HOLDING LOWER ARM TO CROSSMEMBER**

   After bouncing the vehicle to settle the suspension, torque the bolt.

   Torque: 800 kg-cm (58 ft-lb)

7. **CHECK FRONT WHEEL ALIGNMENT AND SIDE SLIP**



Strut Bar

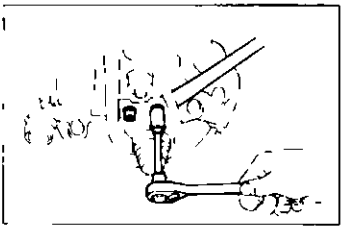
(See page FA-14)

REMOVAL OF STRUT BAR

1. **DISCONNECT STRUT BAR FROM BRACKET**

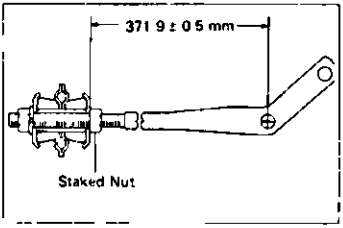
   Remove the nut, washer, retainer, spacer and cushion from the bracket

   NOTE Do not remove the staked nut



2. **REMOVE STRUT BAR FROM LOWER ARM**

   Jack up the lower arm and disconnect the strut bar
   Remove the nuts holding the strut bar to the lower arm, and disconnect the strut bar
   Remove the cushion and retainer from the strut bar



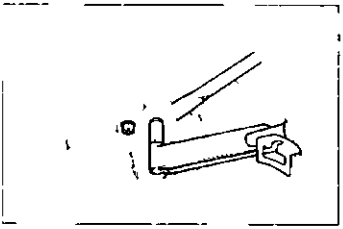
INSTALLATION OF STRUT BAR

1. **ADJUST STAKED NUT**

   Check that the distance between the staked nut and center of the bolt hole is 371 9 ± 0 5 mm (14 642 ± 0 020 in)
   Adjust the staked nut as necessary

   NOTE Do not adjust the staked nut unless required

2 **INSTALL RETAINER AND CUSHION ONTO STRUT BAR**

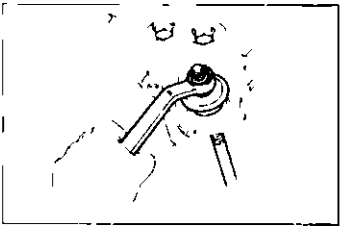


3. **INSTALL FRONT END TO BRACKET**

4. **CONNECT STRUT BAR TO LOWER ARM**

   Jack up the lower arm and connect the strut bar to the lower arm Torque the nuts

   Torque 475 kg-cm (34 ft-lb)



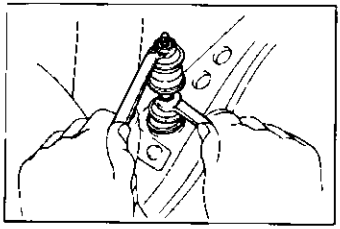
5 **CONNECT STRUT BAR TO BRACKET**

   (a) Install the spacer, cushion, retainer, washer and nut

   (b) Torque the nut

   Torque. 925 kg-cm (67 ft-lb)

6 **CHECK FRONT WHEEL ALIGNMENT AND SIDE SLIP**



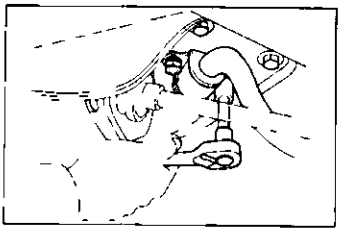
Stabilizer Bar

(See page FA-14)

REMOVAL OF STABILIZER BAR

1 REMOVE ENGINE UNDER COVER

2. DISCONNECT STABILIZER BAR FROM LOWER ARMS



3. REMOVE BOTH STABILIZER BAR BRACKETS FROM STRUT BAR BRACKETS

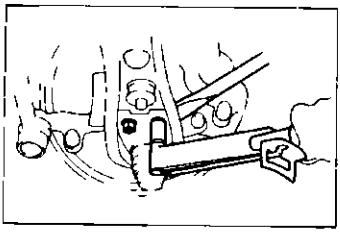
4. REMOVE STRUT BAR WITH STRUT BAR BRACKET ON ONE SIDE

   (a) Remove the two nuts, and disconnect the strut bar from the lower arm

   (b) Remove the four strut bar bracket bolts

5 REMOVE STABILIZER BAR

Pull out the stabilizer bar through the strut bar bracket hole



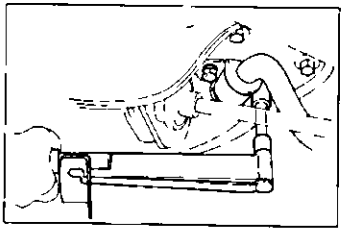
INSTALLATION OF STABILIZER BAR

1 INSERT STABILIZER BAR THROUGH STRUT BAR BRACKET HOLE

2. INSTALL STRUT BAR BRACKET

Install the strut bar bracket and torque the four bolts

Torque 475 kg-cm (34 ft lb)



3. INSTALL STRUT BAR TO LOWER ARM

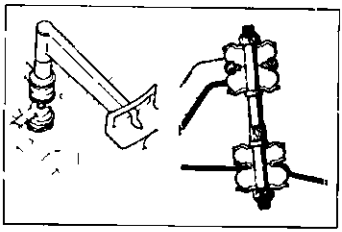
Install the strut bar and torque the nuts.

Torque 475 kg-cm (34 ft-lb)

4. INSTALL STABILIZER BAR ON BRACKETS

Place the stabilizer bar in position and install both stabilizer bushings and brackets on the strut bar brackets
Torque the bolts

Torque. 130 kg-cm (9 ft-lb)



5 CONNECT STABILIZER BAR TO LOWER ARMS

Connect the stabilizer bar on both sides to the lower arms with the bolts, cushions and nuts as shown Torque the nuts

Torque 180 kg-cm (13 ft-lb)

6. INSTALL ENGINE UNDER COVER

7. CHECK FRONT WHEEL ALIGNMENT

REAR AXLE AND SUSPENSION

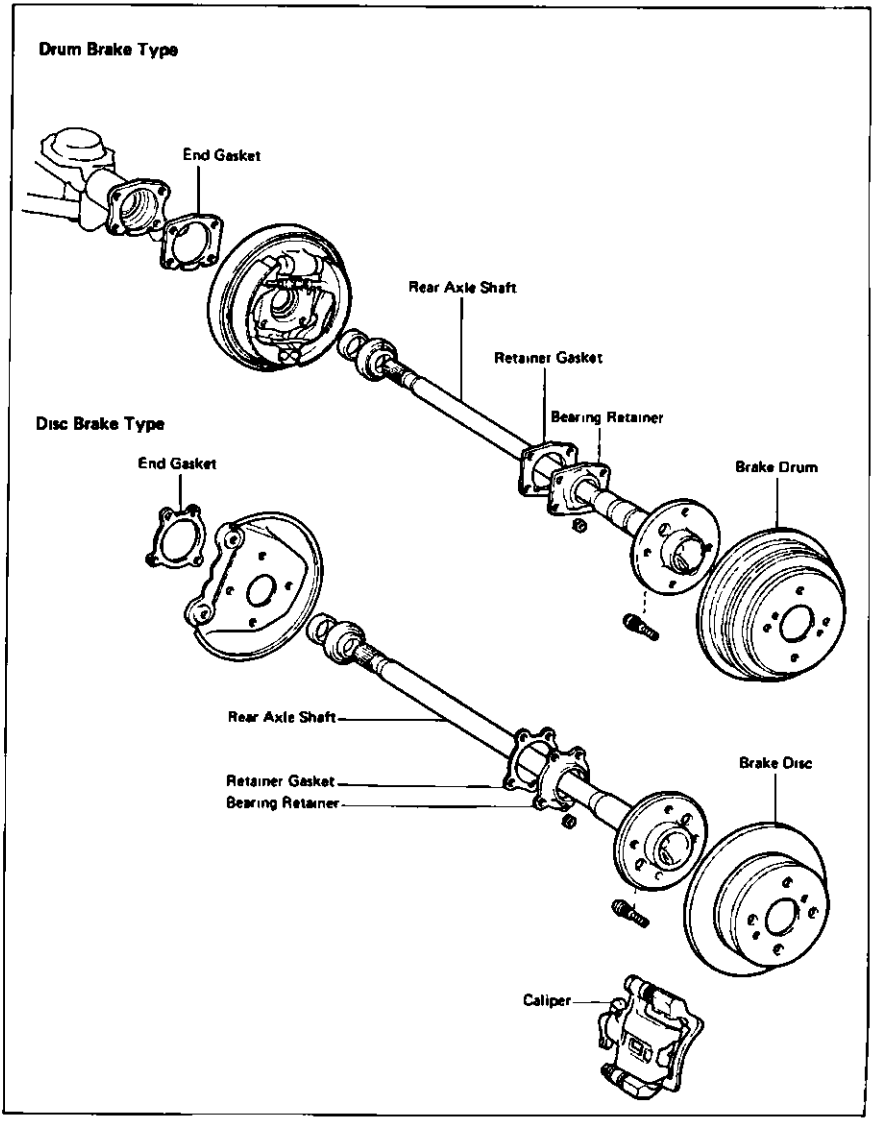
	Page
TROUBLESHOOTING	RA-2
REAR AXLE SHAFT	RA-3
CONVENTIONAL TYPE DIFFERENTIAL	RA-8
LIMITED SLIP DIFFERENTIAL	RA-25
REAR SUSPENSION	RA-32

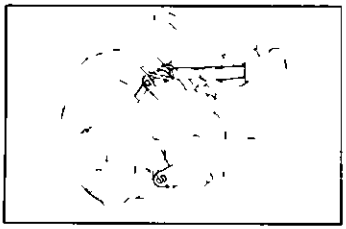
TROUBLESHOOTING

Problem	Possible cause	Remedy	Page
Oil leak at rear axle	Oil seals worn or damaged	Replace oil seal	RA-6
	Bearing retainer loose	Replace retainer	RA-5
	Rear axle housing cracked	Repair as necessary	
Oil leak at pinion shaft	Oil level too high or wrong oil grade	Drain or replace oil	
	Oil seal worn or damaged	Replace oil seal	RA 12
	Companion flange loose or damaged	Tighten or replace flange	RA 12
Noises in rear axle	Oil level low or wrong oil grade	Refill or replace oil	
	Excessive backlash between pinion and ring or side gear	Check backlash	RA-11
	Ring pinion or side gears worn or chipped	Inspect gears	RA-11
	Pinion shaft bearing worn	Replace bearing	RA 11
	Axle shaft bearing worn	Replace bearing	RA 3
	Differential bearing loose or worn	Tighten or replace bearings	RA 13
Bottoming	Vehicle overloaded	Check loading	
	Shock absorber worn out	Replace shock absorber	RA 33
	Springs weak	Replace spring	RA 33
Faulty LSD operation	Oil wrong grade	Drain and replace oil	
	Clutch plate, thrust washer and side gear burnt	Repair differential case	RA 25
	Clutch plate, thrust washer side gear and clutch member worn out	Repair differential case	RA 25
	Different al case cover loose	Tighten differential case cover	RA 25
	Adjustment incorrect	Repair and adjust differential case	RA 25

REAR AXLE SHAFT

COMPONENTS





REMOVAL OF REAR AXLE SHAFT

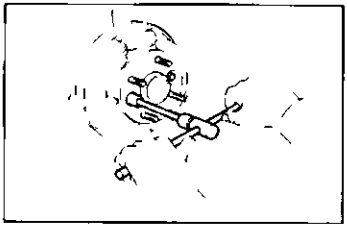
(See page RA-3)

1 REMOVE WHEEL

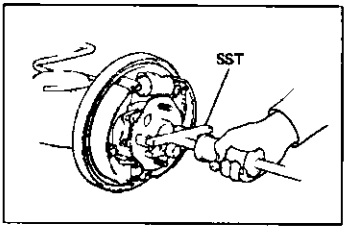
2. REMOVE FOLLOWING PARTS.

(Drum brake type)
- Brake drum

(Disc brake type)
- Brake caliper
- Disc rotor



3. REMOVE FOUR BACKING PLATE MOUNTING NUTS

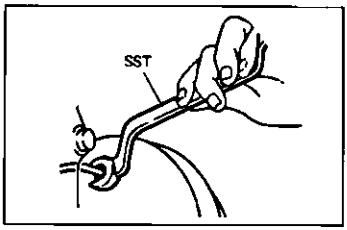


4. REMOVE REAR AXLE SHAFT

Using SST, pull out the rear axle shaft

SST 09520-00031

CAUTION: When pulling out the rear axle shaft, be careful not to damage the oil seal.



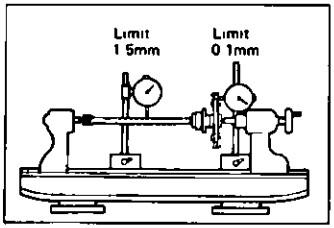
5. REMOVE END GASKET

(a) Using SST, disconnect the brake tube
Use a container to catch the brake fluid

SST 09751-36011

(b) Remove the backing plate

(c) Remove the end gasket from the rear axle housing

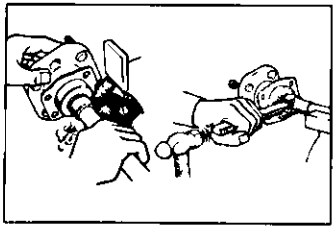


INSPECTION AND REPAIR OF REAR AXLE SHAFT COMPONENTS

1 **INSPECT REAR AXLE SHAFT AND FLANGE FOR WEAR, DAMAGE OR RUNOUT**

Maximum shaft runout: 1.5 mm (0.059 in.)
Maximum flange runout: 0.1 mm (0.004 in.)

If the rear axle shaft or flange are damaged or worn, or if runout is greater than maximum, replace the rear axle shaft.



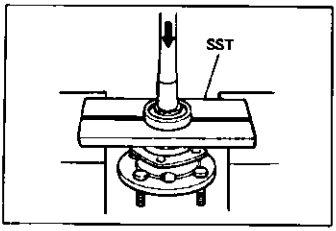
2. **INSPECT REAR AXLE BEARING FOR WEAR OR DAMAGE**

If the bearing is damaged or worn, replace it

3 **REMOVE BEARING INNER RETAINER**

(a) Using a grinder, grind down the inner retainer

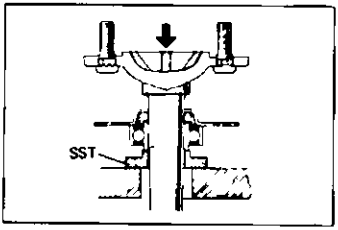
(b) Using a hammer and chisel, cut off the retainer and remove it from the shaft



4. **REMOVE BEARING FROM SHAFT**

Using SST, press the bearing off of the shaft

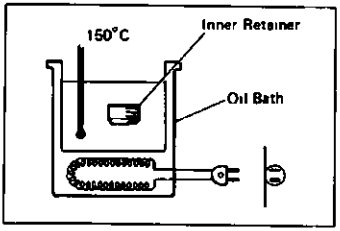
SST 09527 21011 (Drum Brake Type)
09527 30010 (Disc Brake Type)



5. **INSTALL BEARING OUTER RETAINER AND NEW BEARING ON SHAFT**

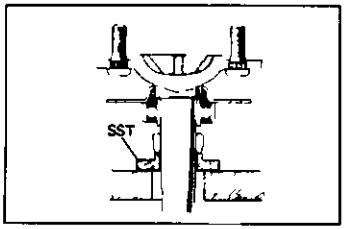
Using SST, press on the bearing outer retainer and a new bearing

SST 09515-21010



6. **INSTALL BEARING INNER RETAINER ON SHAFT**

(a) Heat the bearing inner retainer to about 150°C (302°F) in an oil bath

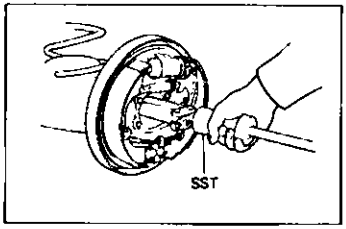


(b) Using SST, press the retainer onto the shaft while the inner retainer is still hot.

SST 09515-21010

NOTE

- Be sure that there is no oil or grease on the rear axle shaft or retainer
- Face the non beveled side of the inner retainer toward the bearing



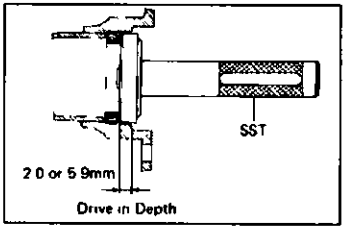
7. INSPECT OIL SEAL FOR WEAR OR DAMAGE

If the seal is damaged or worn, replace it

8. REMOVE OIL SEAL FROM AXLE HOUSING

Using SST, remove the oil seal

SST 09308 00010



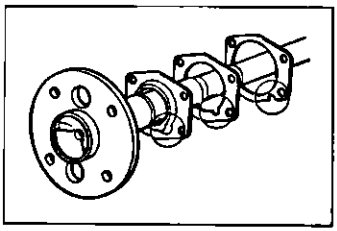
9. INSTALL NEW OIL SEAL IN AXLE HOUSING

(a) Apply MP grease to the oil seal

(b) Using SST, drive in the oil seal to a depth of 5.9 mm or 2.0 mm

Depth. Drum Brake Type
5.9 ± 0.2 mm (0.232 ± 0.008 in.)
Disc Brake Type
2.0 ± 0.5 mm (0.079 ± 0.020 in.)

SST 09517 12010 (Drum Brake Type)
09517 30010 (Disc Brake Type)



INSTALLATION OF REAR AXLE SHAFT

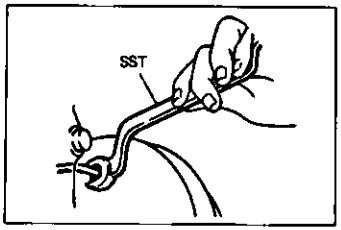
(See page RA-3)

1. **CLEAN FLANGE OF AXLE HOUSING AND BACKING PLATE**

2. **APPLY LIQUID SEALER TO BOTH SIDES OF END GASKET AND RETAINER GASKET**

3. **PLACE END GASKET ONTO END OF AXLE HOUSING**

   Face the notch of gasket downward



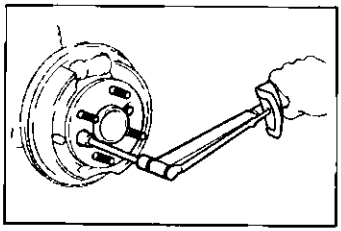
4. **INSTALL REAR AXLE SHAFT**

   NOTE Align the notches of the two gaskets and bearing outer retainer with the oil hole of the backing plate

   (a) Install the backing plate to the axle housing and, using SST, connect the brake tube

   SST 09751 36011

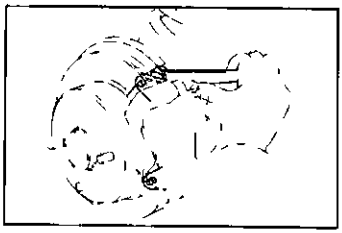
   (b) Place the retainer gasket on the axle shaft



   (c) Install the rear axle shaft with four new self locking nuts

   Torque: 670 kg-cm (48 ft-lb)

   NOTE
   - Be careful not to damage the oil seal
   - When inserting the axle shaft, be careful not to hit or deform the oil deflector inside the axle housing.



5. **INSTALL FOLLOWING PARTS:**

   (Drum brake type)
   - Brake drum

   (Disc brake type)
   - Disc rotor
   - Brake caliper

   Torque: 475 kg-cm (34 ft-lb)

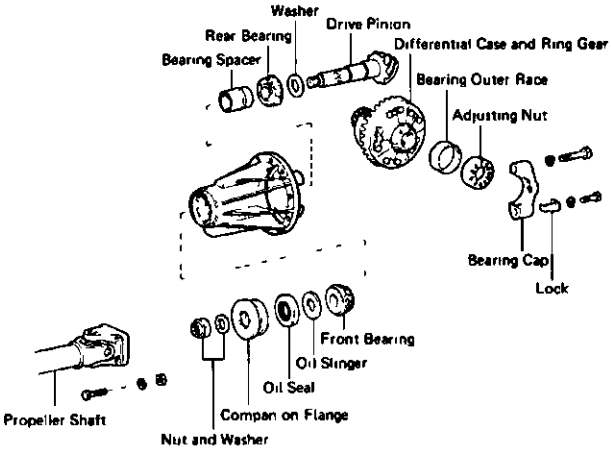
6. **BLEED BRAKE LINES** **(See page BR-7)**

7. **INSTALL WHEEL**

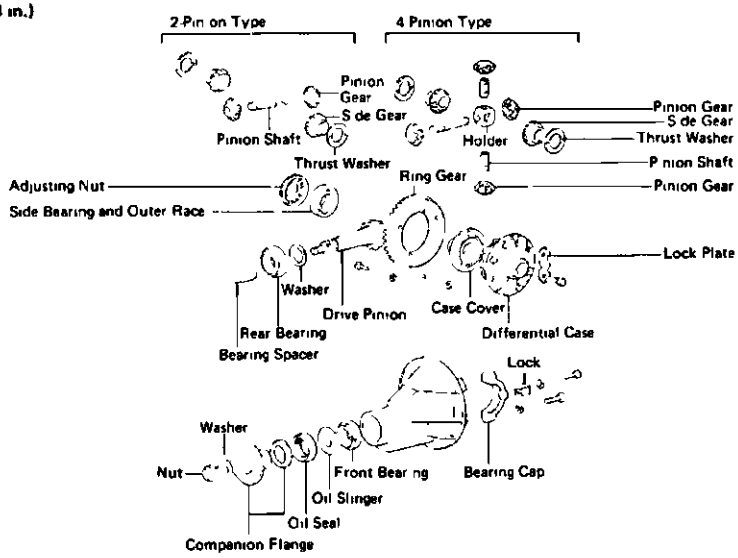
CONVENTIONAL TYPE DIFFERENTIAL

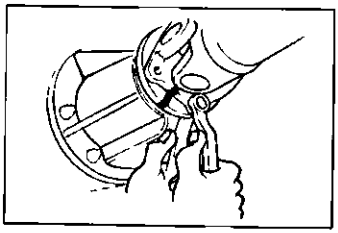
COMPONENTS

(6.7 in.)



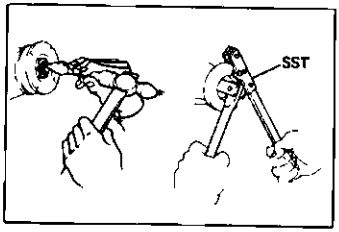
(6.38 in.)





ON-VEHICLE REPLACEMENT OF OIL SEAL

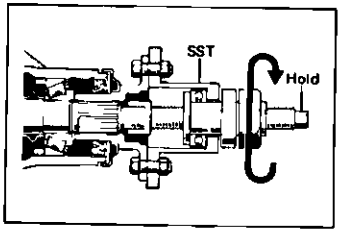
1. DISCONNECT PROPELLER SHAFT FROM DIFFERENTIAL
   (a) Place alignment marks on the flanges
   (b) Remove the four bolts and nuts.



2. REMOVE COMPANION FLANGE
   (See step 7 on page RA-12)
   SST 09330 00020 and 09557 22022

3 REMOVE OIL SEAL AND OIL SLINGER
   (See step 8 on page RA-12)
   SST 09308 10010

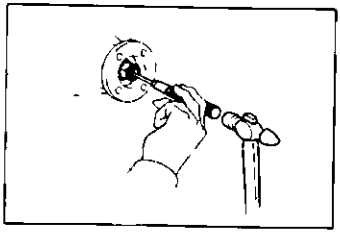
4. REMOVE FRONT BEARING AND BEARING SPACER
   (See step 9 on page RA-12)
   SST 09556 22010



5. INSTALL NEW BEARING SPACER AND FRONT BEARING (See step 9 on page RA-21)

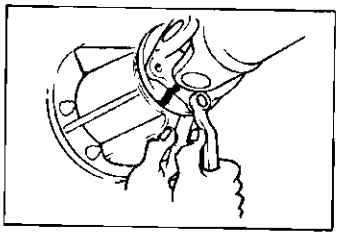
6. INSTALL OIL SLINGER AND NEW OIL SEAL
   (See step 10 on page RA 22)
   SST 09554 22010

7. INSTALL COMPANION FLANGE
   (See step 11 on page RA-22)
   SST 09557 22022

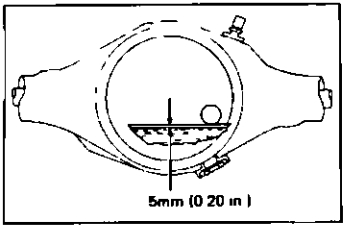


8 ADJUST FRONT BEARING PRELOAD
   (See step 12 on page RA 22)

9. STAKE DRIVE PINION NUT



10 CONNECT PROPELLER SHAFT FLANGE TO COMPANION FLANGE
   (a) Align the marks on the flanges and connect the flanges with four bolts and nuts
   (b) Torque the four bolts and nuts
   Torque: 350 kg-cm (25 ft-lb)

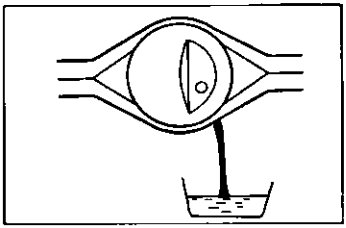


11. CHECK DIFFERENTIAL OIL LEVEL

Fill with hypoid gear oil if necessary

Hypoid gear oil. SAE 90 API GL-5
SAE 80W or 80W-90
at temperature below – 18°C (0°F)
w/LSD use LSD oil only

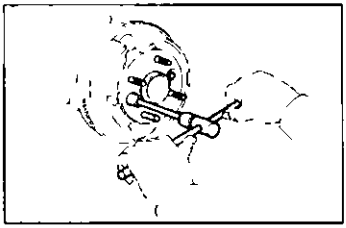
Capacity:
6.7 in. and LSD 1.3 liters (1.4 US qts, 1.1 Imp. qts)
6.38 in. 1.0 liters (1.1 US qts, 0.9 Imp. qts)



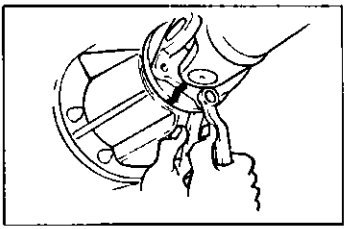
REMOVAL OF DIFFERENTIAL

(See page RA-8)

1. REMOVE DRAIN PLUG AND DRAIN DIFFERENTIAL OIL



2. REMOVE REAR AXLE SHAFT (See page RA-3)



3. DISCONNECT PROPELLER SHAFT FROM DIFFERENTIAL (See page RA-8)

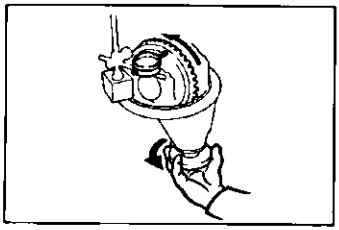
4. REMOVE DIFFERENTIAL CARRIER ASSEMBLY

DISASSEMBLY OF DIFFERENTIAL

(See page RA-8)

NOTE If the differential is noisy, perform the following pre-inspection before disassembly to determine the cause of the noise

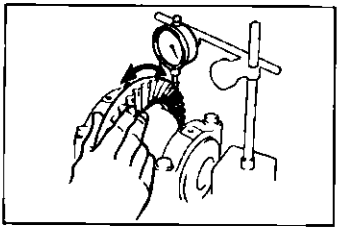
If the differential has severe problems, disassemble and repair it as necessary



1. CHECK RING GEAR RUNOUT

If the runout is greater than maximum, install a new ring gear

Maximum runout 0.07 mm (0.0028 in.)



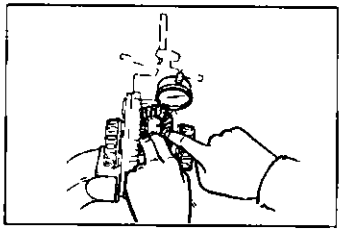
2. CHECK RING GEAR BACKLASH

If the backlash is not within specifications, adjust the side bearing preload or repair as necessary (See step 5 on page RA-19)

Backlash: 0.13 – 0.18 mm (0.0051 – 0.0071 in.)

3 INSPECT TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION (See step 6 on page RA-20)

Note the tooth contact position



4 CHECK SIDE GEAR BACKLASH

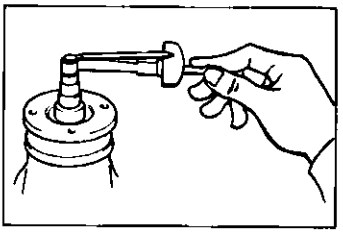
(6.7 in.)

Measure the side gear backlash while holding one pinion gear toward the case

Standard backlash:

0.05 – 0.20 mm (0.0020 – 0.0079 in.)

If the backlash is not within specification, install the correct thrust washers



5 MEASURE DRIVE PINION PRELOAD

Using a torque meter, measure the preload of the backlash between the drive pinion and ring gear

Preload. 5 – 8 kg-cm (4.3 – 6.9 in.-lb)

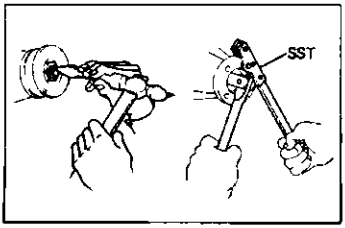
6. CHECK TOTAL PRELOAD

Using a torque meter measure the total preload

Total preload. In addition to drive pinion preload

6.7 in. and LSD 3 – 5 kg-cm (2.6 – 4.3 in.-lb)

6.38 in. 2 – 4 kg-cm (1.7 – 3.5 in.-lb)

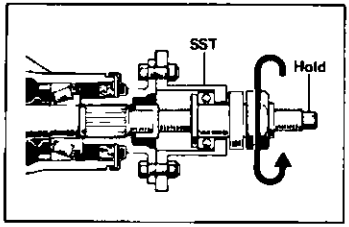


7. REMOVE COMPANION FLANGE

(a) Using a hammer and chisel, unstake the nut

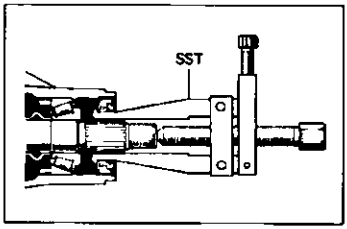
(b) Using SST to hold the flange, remove the nut

SST 09330-00020



(c) Using SST, remove the companion flange

SST 09557 22022

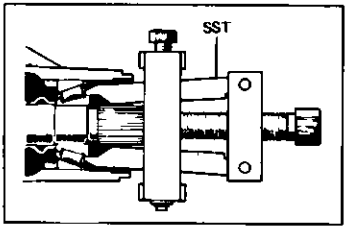


8. REMOVE OIL SEAL AND OIL SLINGER

(a) Using SST, remove the oil seal from the housing

SST 09308-10010

(b) Remove the oil slinger



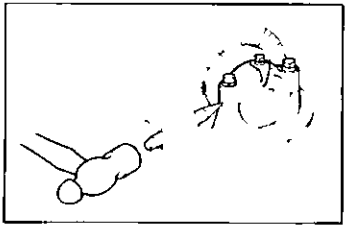
9. REMOVE FRONT BEARING AND BEARING SPACER

(a) Using SST, remove the front bearing from the housing

SST 09556 22010

(b) Remove the bearing spacer

If the front bearing is damaged or worn, replace the bearing

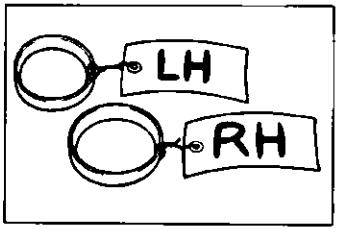


10. REMOVE DIFFERENTIAL CASE AND RING GEAR

(a) Place alignment marks on the bearing cap and differential carrier

(b) Remove the two adjusting nut locks

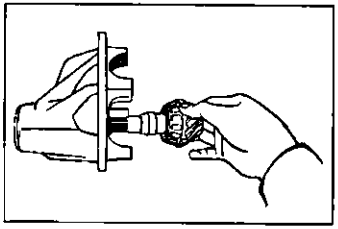
(c) Remove the two bearing caps and two adjusting nuts



(d) Remove the bearing outer races

(e) Remove the differential case from the carrier

NOTE Tag the disassembled parts to show their location for reassembly



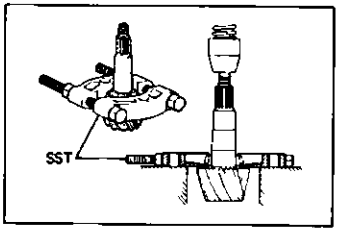
11. REMOVE DRIVE PINION FROM DIFFERENTIAL CARRIER

INSPECTION AND REPLACEMENT OF DIFFERENTIAL

1 REPLACE DRIVE PINION REAR BEARING

(a) Using a press and SST, pull out the rear bearing from the drive pinion

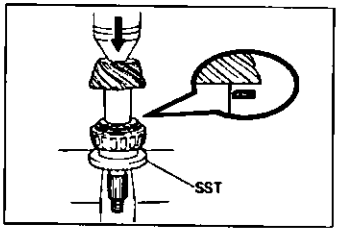
SST 09950-00020



(b) Install the washer on the drive pinion with the chamfered end facing the pinion gear

(c) Using a press and SST, press the reused washer and rear bearing onto the drive pinion

SST 09506 30011 (6.7 in. and LSD)
09608 20011 (6.38 in.)

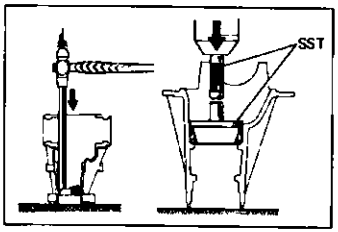


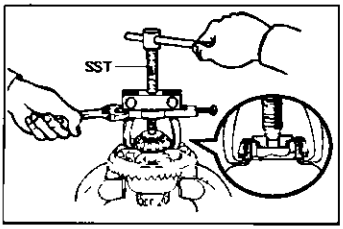
2. REPLACE DRIVE PINION FRONT AND REAR BEARING OUTER RACE

(a) Using a hammer and driver, drive out the outer race

(b) Using SST, drive in a new outer race

SST 6.7 in. and LSD 09608 30011 (Front Bearing)
09608 30030 (Rear Bearing)
6.38 in. 09608 12020 (Front Bearing)
09608 20011 (Rear Bearing)

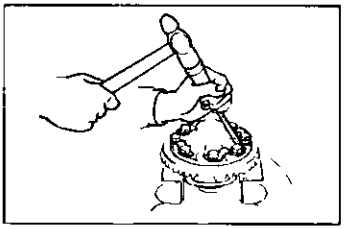




3. **REMOVE SIDE BEARINGS FROM DIFFERENTIAL CASE**

Using SST, pull the side bearing from the differential case.

SST 09950-20014 (6 7 in)
09502 10012 (6 38 in)

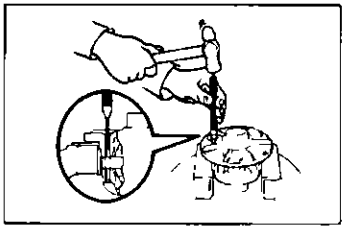


4. **REMOVE RING GEAR**

(a) Remove the ring gear set bolts and lock plates

(b) Place alignment marks on the ring gear and differential case

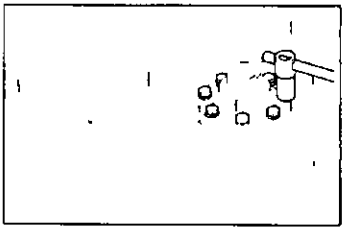
(c) Using a plastic or copper hammer, tap on the ring gear to separate it from the differential case



5. **DISASSEMBLE DIFFERENTIAL CASE**

(6 7 in.)

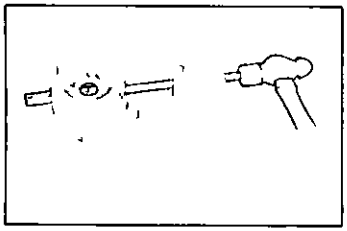
Using a hammer and punch, drive out the straight pin
Remove the pinion shaft, two pinion gears, two side gears and two thrust washers



(6 38 in)

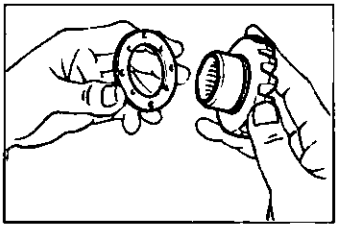
(a) Place matchmarks on the differential case and case cover, and remove the bolts

(b) Remove the case cover



(c) Tap out three pinion shafts and remove the following parts

- Pinion shaft holder
- Pinion gear
- Side gear
- Thrust washer



6. ASSEMBLE DIFFERENTIAL CASE

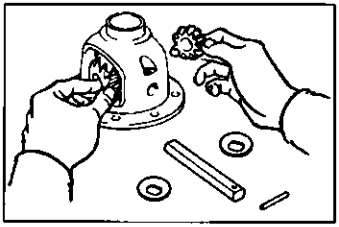
(6.7 in.)

(a) Install the correct thrust washers and side gears in the differential case. Referring to the table below, select thrust washers which adjust the backlash to within specification. Try to select washers of the same size for both sides.

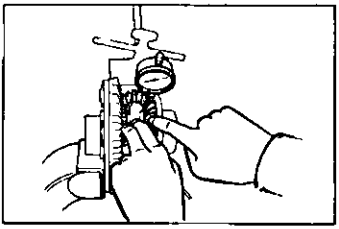
Standard backlash: 0.05 – 0.20 mm (0.0020 – 0.0079 in.)

Thrust washer thickness

Thickness	mm (in.)	Thickness	mm (in.)
0.95	(0.0374)	1.10	(0.0433)
1.00	(0.0394)	1.15	(0.0453)
1.05	(0.0413)	1.20	(0.0472)



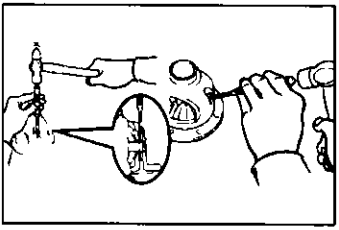
Install the thrust washers and side gears in the differential case.



(b) Check the side gear backlash.
Measure the side gear backlash while holding one pinion gear toward the case.

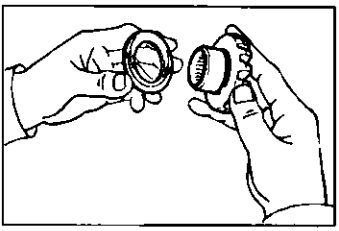
Standard backlash: 0.05 – 0.20 mm (0.0020 – 0.0079 in.)

If the backlash is not within specification, install a thrust washer of different thickness.



(c) Install the straight pin.

- Using a hammer and punch, drive the straight pin through the case and hole in the pinion shaft.
- Stake the pin and differential case.

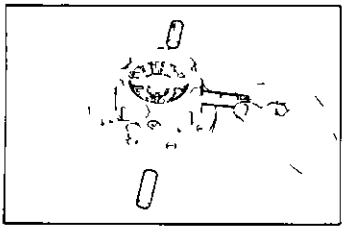


(6.38 in.)

(a) Install the correct thrust washers and side gears in the differential case.

Using the table below, select thrust washers which adjust the backlash to within specification. Try to select washers of the same size for both sides.

Standard backlash: 0.02 – 0.20 mm (0.0008 – 0.0079 in.)



Thrust washer thickness

Thickness mm (in.)		Thickness mm (in.)	
1.50	(0.0591)	1.65	(0.0650)
1.55	(0.0610)	1.70	(0.0669)
1.60	(0.0630)	1.75	(0.0689)

(b) Install the thrust washer and side gear in the differential case

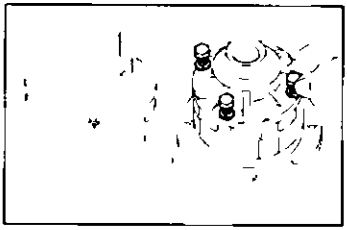
(c) Install the pinion gears and shafts in the differential case

(d) Check the side gear backlash

Measure the side gear backlash while holding one pinion gear toward the case

Standard backlash: 0.02 – 0.20 mm (0.0008 – 0.0079 in.)

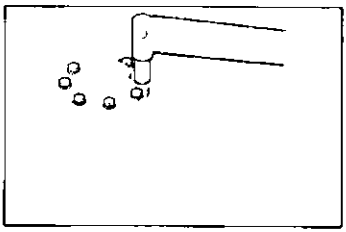
If the backlash is not within specification, install a thrust washer of different thickness



(e) Install the case cover with the side gear and other parts assembled to it

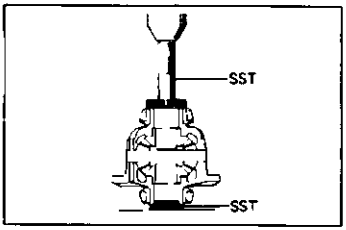
(f) Align the alignment marks

(g) Place the three long bolts into the pinion shaft holes



(h) Tighten the bolts uniformally and a little at time

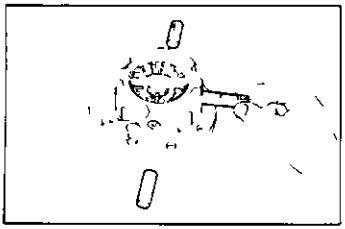
Torque 315 kg-cm (23 ft-lb)



7 **INSTALL NEW SIDE BEARING**

Using SST, press in a new side bearing on to the differential case

SST 09550-10012 (6.7 in.)
09608-12010 (6.38 in.)



Thrust washer thickness

Thickness mm (in.)		Thickness mm (in.)	
1.50	(0.0591)	1.65	(0.0650)
1.55	(0.0610)	1.70	(0.0669)
1.60	(0.0630)	1.75	(0.0689)

(b) Install the thrust washer and side gear in the differential case

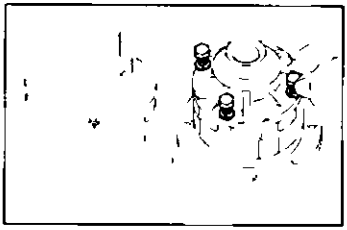
(c) Install the pinion gears and shafts in the differential case

(d) Check the side gear backlash

Measure the side gear backlash while holding one pinion gear toward the case

Standard backlash: 0.02 – 0.20 mm (0.0008 – 0.0079 in.)

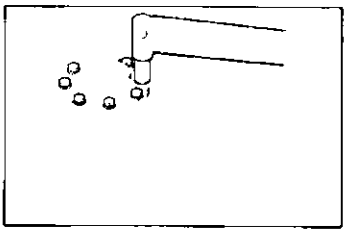
If the backlash is not within specification, install a thrust washer of different thickness



(e) Install the case cover with the side gear and other parts assembled to it

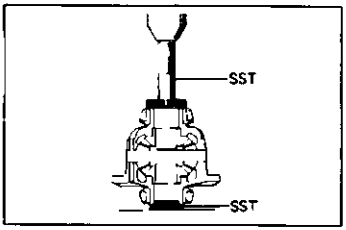
(f) Align the alignment marks

(g) Place the three long bolts into the pinion shaft holes



(h) Tighten the bolts uniformally and a little at time

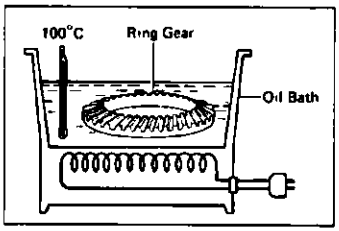
Torque 315 kg-cm (23 ft-lb)



7 **INSTALL NEW SIDE BEARING**

Using SST, press in a new side bearing on to the differential case

SST 09550-10012 (6.7 in.)
09608-12010 (6.38 in.)



8 **INSTALL RING GEAR ON DIFFERENTIAL CASE**

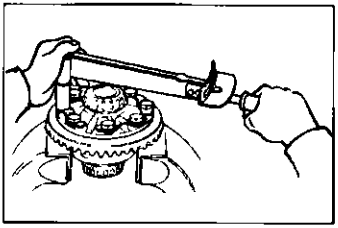
(a) Clean the contact surface of the differential case.

(b) Heat the ring gear to about 100°C (212°F) in an oil bath

(c) Clean the contact surface of the ring gear with cleaning solvent

(d) Then quickly install the ring gear on the differential case

(e) Align the marks on the ring gear and differential case



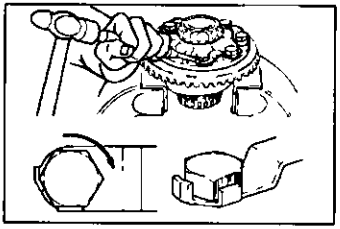
CAUTION: Do not heat the ring gear above 110°C (230°F)

(f) Coat the ring gear set bolts with gear oil

(g) Install the lock plates and set bolts Tighten the set bolts uniformly and a little at a time Torque the bolts

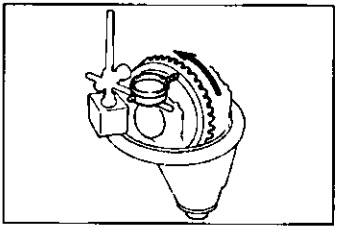
Torque

6 7 in. 985 kg-cm (71 ft-lb)
6 38 in. 750 kg-cm (54 ft-lb)



(h) Using a hammer and drift punch, stake the lock plates.

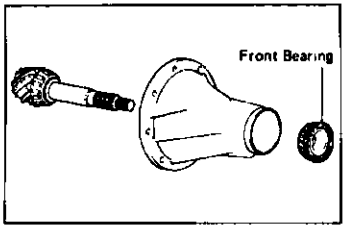
NOTE Stake one claw flush with the flat surface of the nut For the claw contacting the protruding portion of the nut, stake only the half on the tightening side



(i) Check the ring gear runout

Maximum runout 0.07 mm (0 0028 in.)

Install the differential case onto the carrier and tighten the adjusting nut just to where there is no play in the bearing



ASSEMBLE OF DIFFERENTIAL

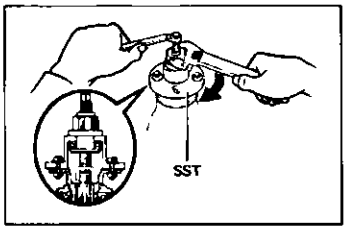
(See page RA-8)

1. TEMPORARILY ADJUST DRIVE PINION PRELOAD

(a) Install the following parts

- Drive pinion
- Front bearing

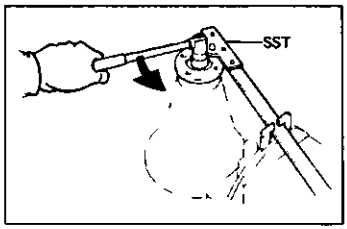
NOTE Assemble the spacer, oil slinger and oil seal after adjusting the gear contact pattern



(b) Install the companion flange with SST

Coat the threads of the nut with MP grease

SST 09557 22022

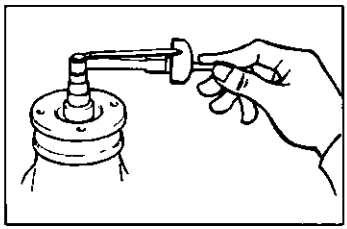


(c) Adjust the drive pinion preload by tightening the companion flange nut

Using SST to hold the flange, tighten the nut

SST 09330-00020

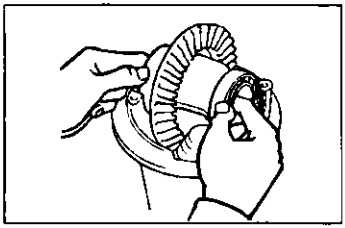
CAUTION As there is no spacer, tighten a little at a time, being careful not to overtighten



(d) Using a torque meter, measure the preload

Preload:

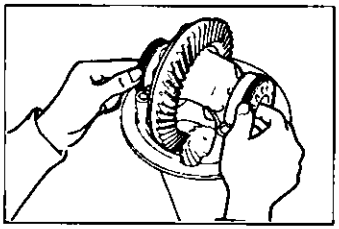
New bearing	10 – 16 kg-cm (8.7 – 13.9 in. lb)
Reused bearing	5 – 8 kg-cm (4.3 – 6.9 in. lb)



2 INSTALL DIFFERENTIAL CASE IN CARRIER

(a) Place the bearing outer races on their respective bearings. Make sure the left and right outer races are not interchanged.

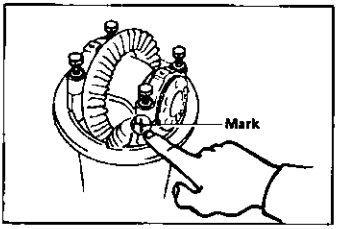
(b) Install the case in the carrier



3 **INSTALL ADJUSTING NUTS**

Install the adjusting nuts on their respective carrier, mak ing sure the nuts are threaded properly.

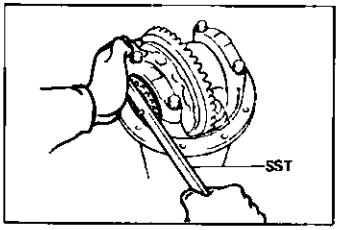
NOTE Make sure that there is backlash between the ring gear and drive pinion



4. **INSTALL BEARING CAPS**

Align the marks on the cap and carrier Screw in the two bearing cap bolts two or three turns and press down the bearing cap by hand.

NOTE. If the bearing cap does not fit tightly on the car rier, the adjusting nut threads are not threaded properly Reinstall adjusting nuts if necessary

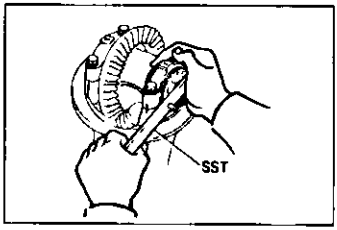


5. **ADJUST SIDE BEARING PRELOAD**

(a) Tighten the bearing cap bolts until the spring washers are slightly compressed

(b) Using SST, tighten the adjusting nut on the ring gear side until the ring gear has a backlash of about 0 2 mm (0 008 in)

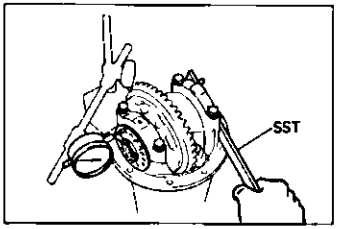
SST 09504 00011



(c) Using SST, firmly tighten the adjusting nut on the drive pinion side

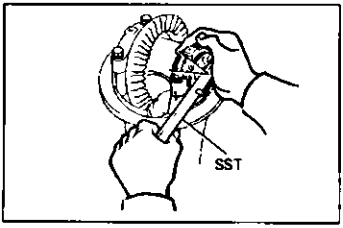
(d) Check the ring gear backlash

If tightening the adjusting nut creates ring gear backlash, loosen the nut to where the backlash is eliminated

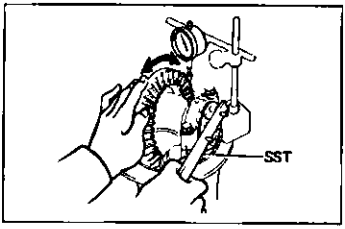


(e) Place a dial indicator on the top of the bearing cap on the ring gear side

(f) Adjust the side bearing to zero preload by tightening the other adjusting nut until the pointer on the indi cator begins to move



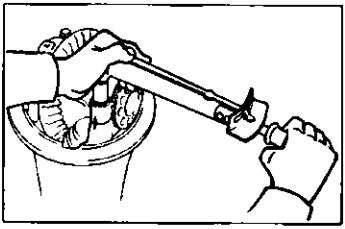
(g) Tighten the adjusting nut 1 – 1½ notches from the zero preload position



(h) Using a dial indicator, adjust the ring gear backlash to within specification

Backlash: 0.13 – 0.18 mm (0.0051 – 0.0071 in.)

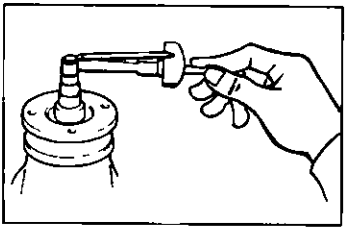
NOTE: The backlash is adjusted by turning the left and right adjusting nuts equal amounts. For example, loosen the nut on the left side one notch and tighten the nut on the right side one notch.



(i) Torque the bearing cap bolts

Torque:

6.7 in. and LSD	**800 kg-cm (58 ft-lb)**
6.38 in.	**600 kg-cm (43 ft-lb)**



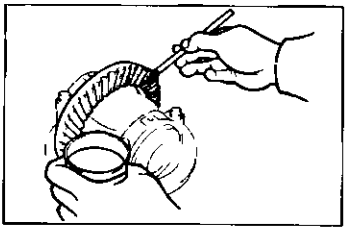
(j) Recheck the ring gear backlash

(k) Using a torque meter, measure the total preload

Total Preload (In addition to drive pinion preload):

6.7 in. and LSD	**3 – 5 kg-cm (2.6 – 4.3 in.-lb)**
6.38 in.	**2 – 4 kg-cm (1.7 – 3.5 in.-lb)**

Backlash: 0.13 – 0.18 mm (0.0051 – 0.0071 in.)

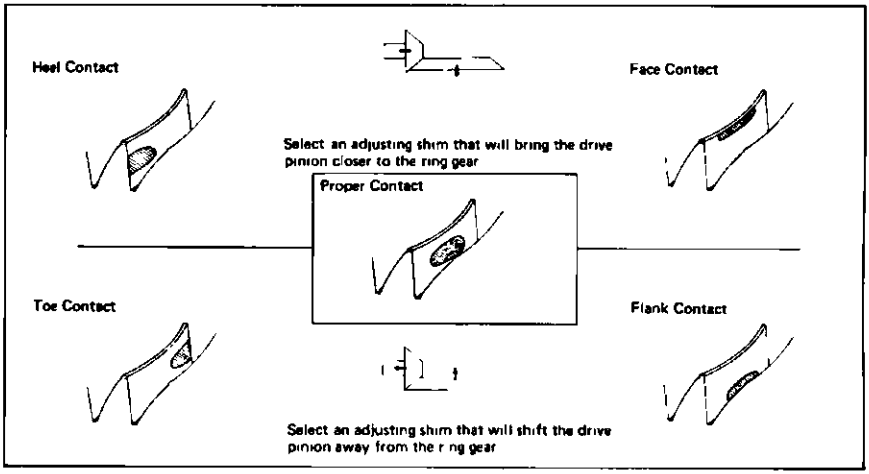


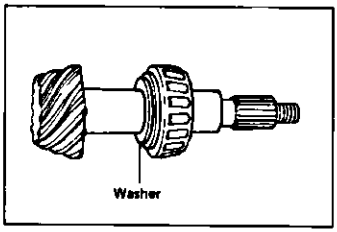
6 INSPECT TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION

(a) Coat red lead on 3 or 4 teeth of the ring gear at 3 different locations.

(b) Hold the companion flange firmly and rotate the ring gear in both directions.

(c) Inspect the tooth pattern.





If the teeth are not contacting properly, use the following chart to select a proper washer for correction.

(6.7 in. and LSD)

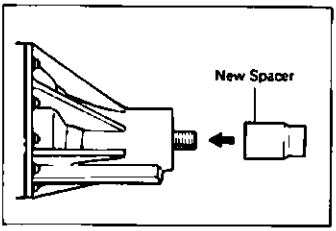
Washer thickness — mm (in.)

Thickness		Thickness	
2.27	(0.0894)	2.51	(0.0988)
2.30	(0.0906)	2.54	(0.1000)
2.33	(0.0917)	2.57	(0.1012)
2.36	(0.0929)	2.60	(0.1024)
2.39	(0.0941)	2.63	(0.1035)
2.42	(0.0953)	2.66	(0.1047)
2.45	(0.0965)	2.69	(0.1059)
2.48	(0.0976)		

(6.38 in.)

Washer thickness — mm (in.)

Thickness		Thickness	
2.52	(0.0992)	2.67	(0.1051)
2.55	(0.1004)	2.70	(0.1063)
2.58	(0.1016)	2.73	(0.1075)
2.61	(0.1028)	2.76	(0.1087)
2.64	(0.1039)		



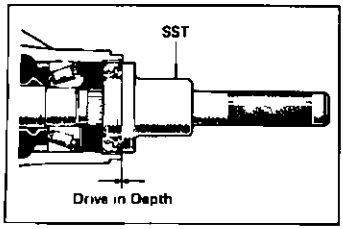
7. **REMOVE COMPANION FLANGE**
(See step 7 on page RA-12)

8. **REMOVE FRONT BEARING**
(See step 9 on page RA-12)

9. **INSTALL NEW BEARING SPACER AND FRONT BEARING**

(a) Install a new bearing spacer on the shaft

(b) Install the front bearing on the shaft



10. INSTALL OIL SLINGER AND NEW OIL SEAL

(a) Install the oil slinger facing as shown.

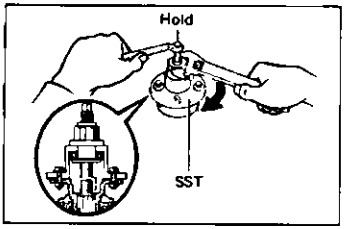
(b) Using SST, drive in a new oil seal

Oil seal drive in depth:

6.7 in. and LSD	4.0 mm (0.157 in.)
6.38 in.	0 – 0.5 mm (0 – 0.020 in.)

SST 09554-22010

(c) Apply MP grease to the oil seal lip.

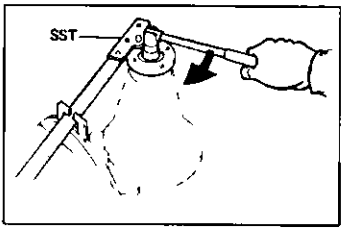


11 INSTALL COMPANION FLANGE

(a) Install the companion flange with SST

Coat the threads of the nut with MP grease

SST 09557-22022

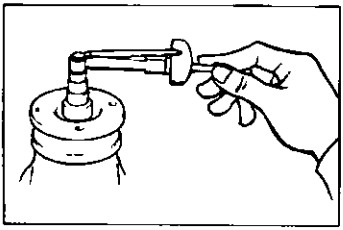


(b) Coat the threads of a new nut with MP grease

(c) Using SST to hold the flange, tighten and torque the nut

Torque: 1,100 kg-cm (80 ft-lb)

SST 09330-00020



12. ADJUST FRONT BEARING PRELOAD

Using a torque meter, measure the preload of the backlash between the drive pinion and ring gear

Preload:

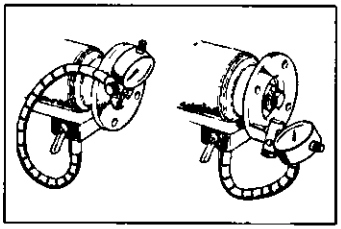
New bearing	10 – 16 kg-cm (8.7 – 13.9 in.-lb)
Reused bearing	5 – 8 kg-cm (4.3 – 6.9 in.-lb)

(a) If preload is greater than specification, replace the bearing spacer

(b) If preload is less than specification, retighten the nut 130 kg-cm (9 ft-lb) at a time until the specified preload is reached

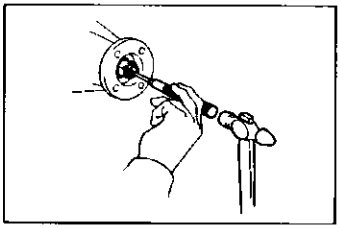
If the maximum torque is exceeded while retightening the nut, replace the bearing spacer and repeat the preload procedure. Do not back off the pinion nut to reduce the preload

Maximum torque: 2,400 kg-cm (174 ft-lb)

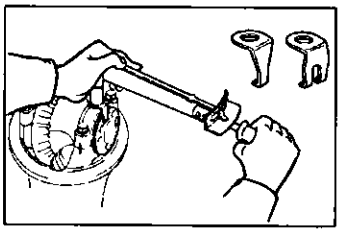


13. CHECK DEVIATION OF COMPANION FLANGE

Maximum longitudinal deviation: 0.10 mm (0.0039 in.)
Maximum latitudinal deviation: 0.10 mm (0.0039 in.)



14. STAKE DRIVE PINION NUT



15. INSTALL ADJUSTING NUT LOCKS

(a) Select either a lock No. 1 or No. 2 whichever fits the adjusting nuts.

(b) Install the lock on the bearing caps.

Torque: 130 kg-cm (9 ft-lb)

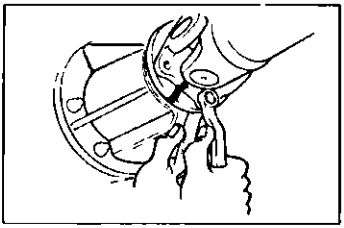
INSTALLATION OF DIFFERENTIAL

(See page RA-8)

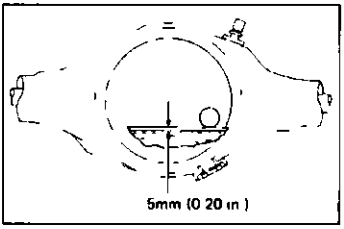
1. **INSTALL A NEW GASKET**

2. **INSTALL DIFFERENTIAL CARRIER ASSEMBLY**

   Install the differential carrier assembly in the axle and install the twelve nuts.



3. **CONNECT PROPELLER SHAFT FLANGE TO COMPANION FLANGE**



4. **INSTALL REAR PLUG AND FILL DIFFERENTIAL WITH GEAR OIL**

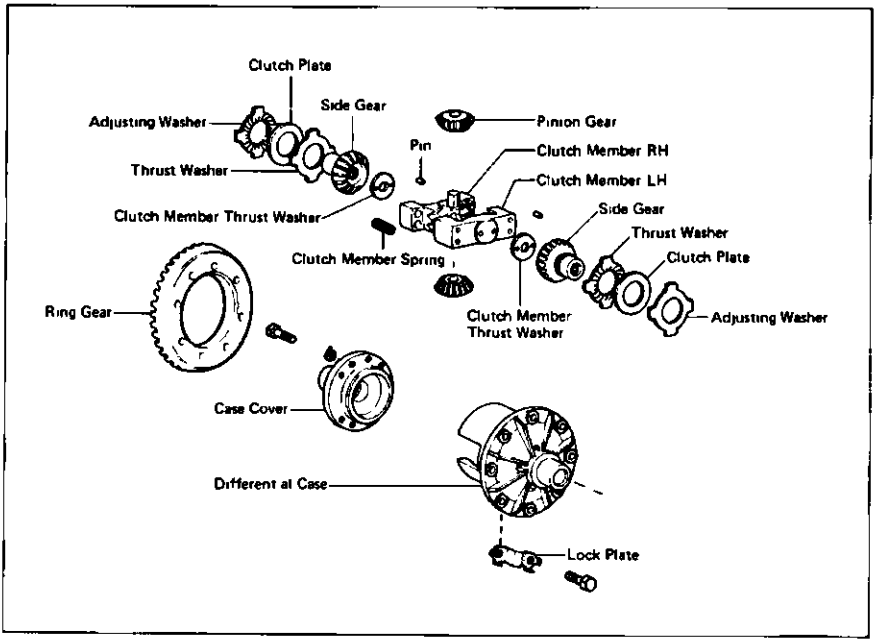
   Hypoid gear oil: SAE 90 API GL 5
   SAE 80W or 80W – 90
   at temperature below – 18°C (0°F)
   w/LSD use LSD oil only

   Capacity 6.7 in. and LSD
   1.3 liters (1.4 US qts, 1.1 Imp. qts)
   6.38 in.
   1.0 liters (1.1 US qts, 0.9 Imp. qts)

   Install the filler plug

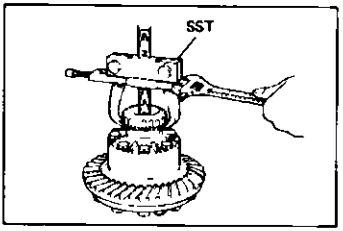
LIMITED SLIP DIFFERENTIAL

COMPONENTS



REMOVAL OF DIFFERENTIAL CASE

1. REMOVE DIFFERENTIAL (See page RA-8)
2. REMOVE DIFFERENTIAL CASE FROM CARRIER (See page RA 11)



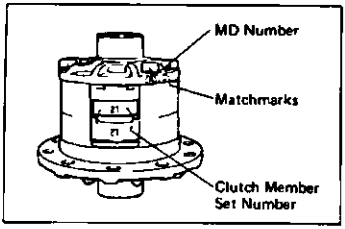
DISASSEMBLY OF LIMITED SLIP DIFFERENTIAL

1. REMOVE SIDE BEARING

SST 09950 20014

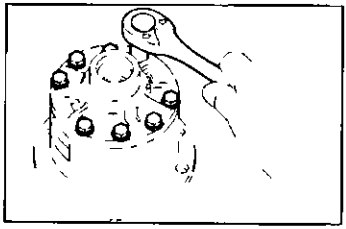
NOTE

- If the side gear or clutch member has been replaced, be sure to replace the thrust washer contacting this part
- Any disassembled part that is to be reused must be re assembled to its former location



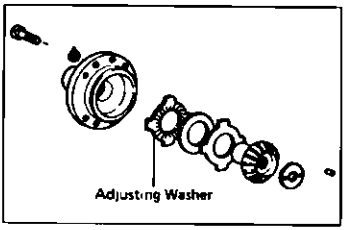
2. **PUT MATCHMARKS ON CASE AND CASE COVER**

3. **CHECK CASE COVER MARKS AND CLUTCH MEMBER RH, LH SET NUMBER**

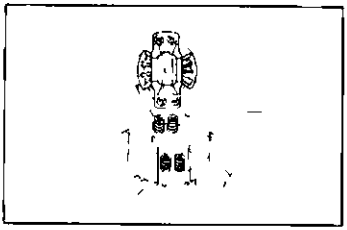


4. **REMOVE CASE BOLTS AND CASE COVER WITH SIDE GEAR**

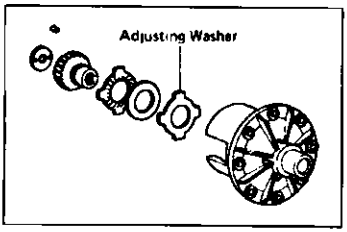
NOTE Case cover bolts have been treated with retaining compound making it difficult to loosen them
Removal will be made easier by heating the assembly to around 150°C (302°F) in an oil heater or similar means.



5. **REMOVE FOLLOWING PARTS FROM CASE COVER:**
   (a) Clutch member thrust washer
   (b) Side gear
   (c) Thrust washer
   (d) Clutch plate
   (e) Adjusting washer



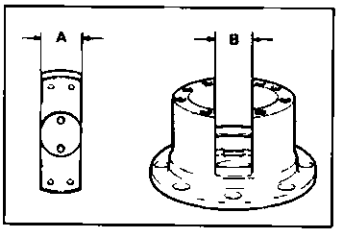
6. **REMOVE FOLLOWING PARTS FROM DIFFERENTIAL CASE:**
   (a) Clutch member RH with pinion gear



   (b) Clutch member spring
   (c) Clutch member LH
   (d) Side gear and clutch member thrust washer
   (e) Thrust washer
   (f) Clutch plate
   (g) Adjusting washer

INSPECTION AND ADJUSTMENT OF DIFFERENTIAL CASE

1. REPLACE PARTS THAT ARE DAMAGED OR WORN



2. CHECK CLUTCH MEMBER LH AND DIFFERENTIAL CASE

Check the clearance between the left clutch member and differential case

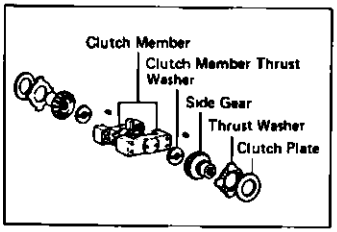
	Specifications	mm (in.)
Clutch member (A)	36.975 – 36.995	(1.4557 – 1.4565)
Differential case (B)	37.000 – 37.025	(1.4567 – 1.4577)
Clearance	0.005 – 0.050	(0.0002 – 0.0020)

3. ADJUST SIDE GEAR THRUST CLEARANCE

NOTE Adjust the axial clearance inside the differential case by selecting a proper thickness adjusting washer

Standard clearance:
0.05 – 0.15 mm (0.0020 – 0.0059 in.)

(a) Clean the parts

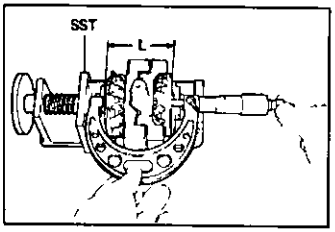


(b) Assemble the following parts to SST

SST 09411-22011

NOTE Do not assemble the adjusting washers and clutch member springs

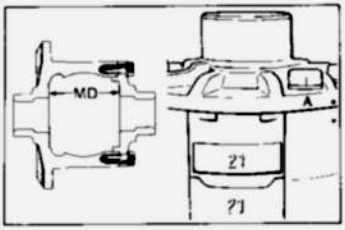
(1) Clutch plate
(2) Side gear thrust washer
(3) Side gear
(4) Clutch member thrust washer
(5) Clutch member LH
(6) Clutch member RH
(7) Clutch member thrust washer
(8) Side gear
(9) Side gear thrust washer
(10) Clutch plate

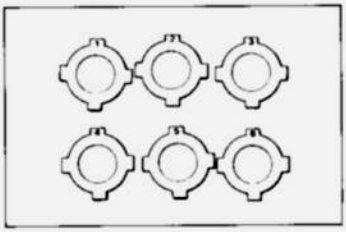


(c) Loosen the nut of SST and hold the parts with spring tension

(d) Using a micrometer, measure dimension "L"

NOTE Properly align the parts to be measured and measure dimension "L", as shown, several times. Take the average of the readings.





(e) As shown below, code letters are inscribed on the differential case in accordance with its mounting dimensions (MD).

Mounting dimension mm (in.)

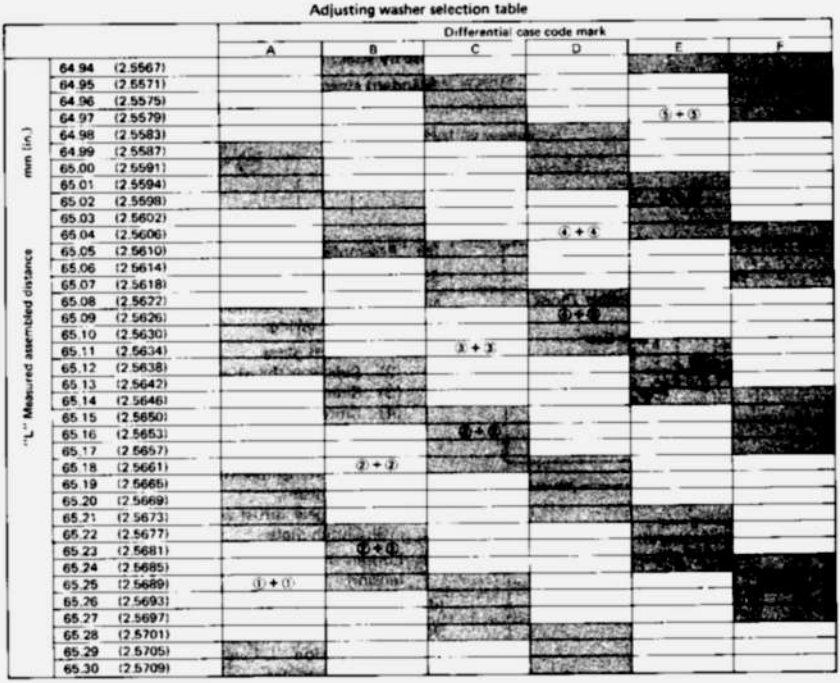
A	68.54 – 68.57	(2.6984 – 2.6996)
B	68.57 – 68.60	(2.6996 – 2.7008)
C	68.60 – 68.63	(2.7008 – 2.7020)
D	68.63 – 68.66	(2.7020 – 2.7031)
E	68.66 – 68.69	(2.7031 – 2.7043)
F	68.69 – 68.72	(2.7043 – 2.7055)

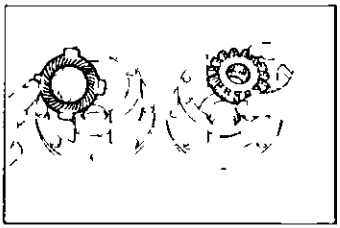
(f) Refering to the selection table below, select the proper adjusting washers by matching the MD (inscribed on case) with the dimension L.

Adjusting washer sizes mm (in.)

Mark	Thickness	Mark	Thickness
1	1.60 (0.0630)	4	1.75 (0.0689)
2	1.65 (0.0650)	5	1.80 (0.0709)
3	1.70 (0.0669)	6	1.85 (0.0728)

Adjusting washer selection table

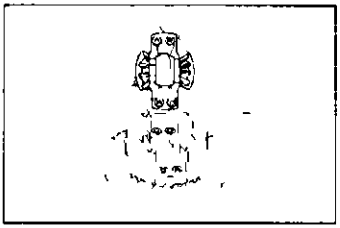


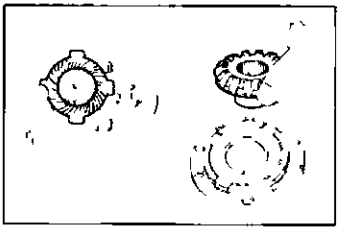


(g) Install the following parts onto the differential case
- Adjusting washer

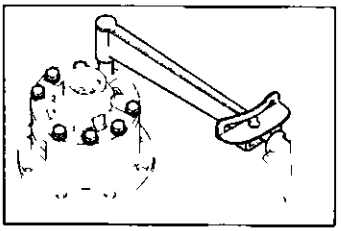
NOTE If using washers of different thickness, install the thicker one to the differential case
- Clutch plate
- Thrust washer
- Side gear
- Clutch member thrust washer
- Clutch member LH

NOTE Do not install the clutch member spring
- Clutch member RH with pinion gear



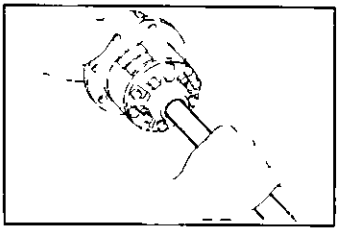


(h) Install the following parts onto the differential case cover
- Adjusting washer
- Clutch plate
- Thrust washer
- Side gear
- Clutch member thrust washer



(i) Tighten the bolts to specified torque

Torque: 450 kg-cm (33 ft-lb)



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

NOTE Reselect adjusting washers if the side gear does not turn smoothly

(k) Disassemble the differential case

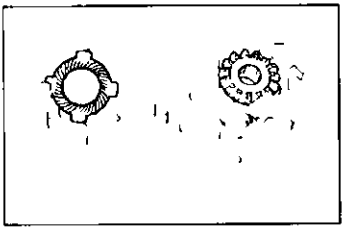
ASSEMBLY OF DIFFERENTIAL CASE

(See page RA-25)

1. **WASH DIFFERENTIAL CASE ASSEMBLY**

   Wash the differential case and bolts with trichloroethylene

   NOTE Other cleaning solvent may be used if it has the same degreasing effect as trichloroethylene



2 **INSTALL FOLLOWING PARTS ONTO DIFFERENTIAL CASE**

NOTE Coat the following parts of the LSD with gear oil

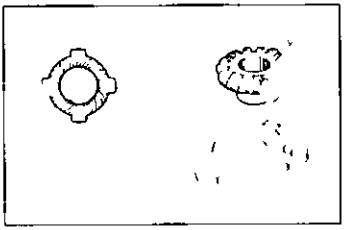
- Adjusting washer

NOTE Face the oil groove toward the side gear

- Clutch plate
- Thrust washer
- Side gear
- Clutch member thrust washer

NOTE Face the oil groove toward the side gear

- Clutch member LH
- Clutch member spring
- Clutch member RH with pinion gear



3. **INSTALL FOLLOWING PARTS ONTO DIFFERENTIAL CASE COVER**

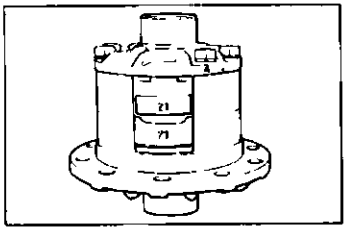
- Adjusting washer

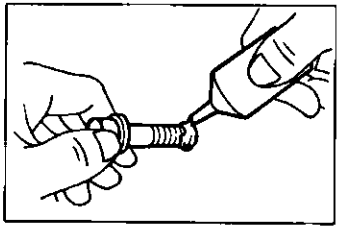
NOTE Face the oil groove toward the clutch plate

- Clutch plate
- Thrust washer
- Side gear
- Clutch member thrust washer

NOTE Face the oil groove toward the side gear

Align the marks on the case and case cover





4. INSTALL CASE COVER BOLTS

(a) Apply retaining compound to the bolts

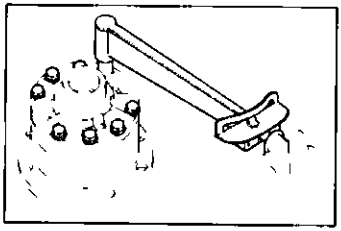
NOTE Use Lock Tight.

NOTE: Application of Lock-Tight

(1) Apply Lock Tight primer T to the case threads and the mounting bolts, and allow it to dry throughly

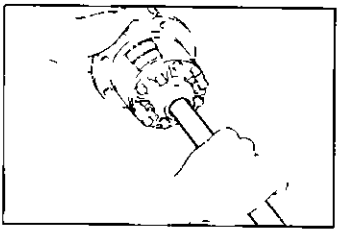
(2) Apply Lock Tight to the case threads and the bolts and install the bolts

(3) Allow to stand at least 3 hours after tightening the bolts [In cold weather, first heat to 30 – 50°C (86 – 122°F)]



(b) Tighten the bolts uniformly and a little at a time

Torque: 450 kg-cm (33 ft-lb)



5. CHECK SIDE GEAR THRUST CLEARANCE

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

6 INSTALL SIDE BEARING (See page RA 16)

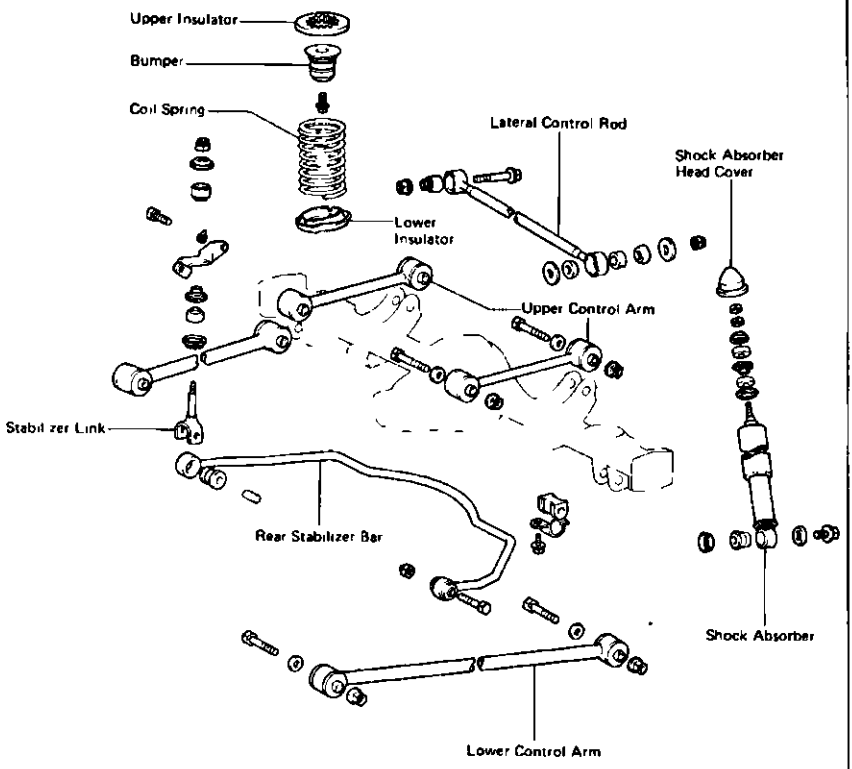
INSTALLATION OF DIFFERENTIAL

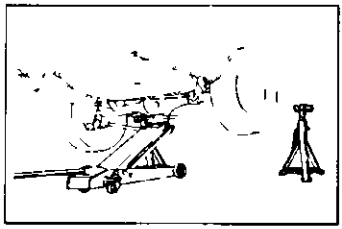
1 INSTALL DIFFERENTIAL CASE IN CARRIER (See page RA 18)

2 INSTALLATION OF DIFFERENTIAL (See page RA-24)

REAR SUSPENSION

COMPONENTS





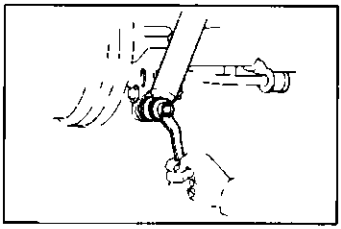
Coil Spring and Rear Shock Absorber

(See page RA-32)

REMOVAL OF COIL SPRING AND SHOCK ABSORBER

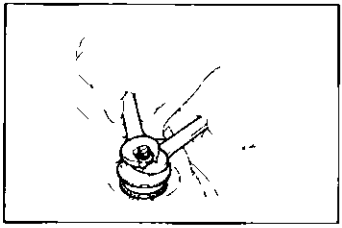
1. JACK UP VEHICLE

Jack up the rear axle housing and support the body with stands. Leave the jack under the rear axle.

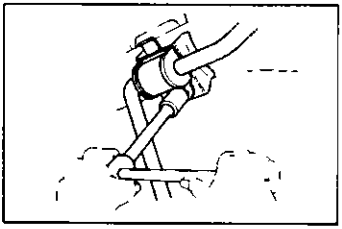


2. REMOVE REAR SHOCK ABSORBER

(a) Remove the bolt holding the shock absorber to the rear axle housing and disconnect the shock absorber.

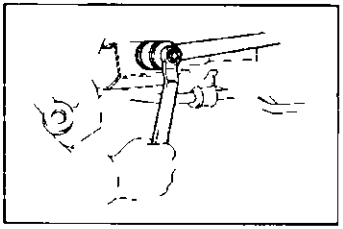


(b) If replacing the shock absorber, remove the shock absorber head cover and nut holding the shock absorber to the body, and remove the shock absorber.



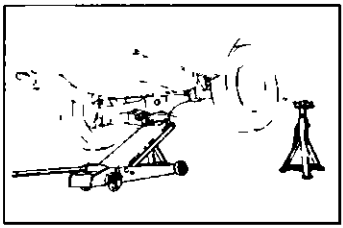
3. REMOVE STABILIZER BAR BUSHING BRACKETS

Remove the bolts holding the stabilizer bar brackets to the rear axle housing.



4. DISCONNECT LATERAL CONTROL ROD FROM REAR AXLE HOUSING

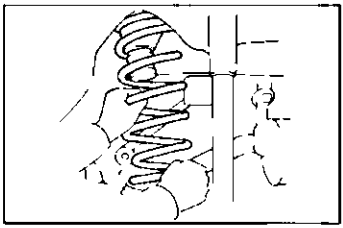
Remove the nut holding the lateral control rod to the rear axle housing and disconnect the lateral control rod.



5. REMOVE COIL SPRING

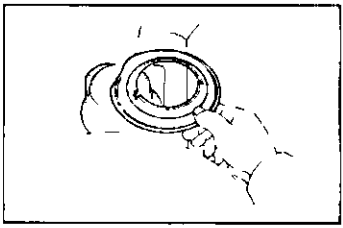
(a) Begin lowering the rear axle housing.

NOTE Be careful not to pull the brake line and parking brake cable

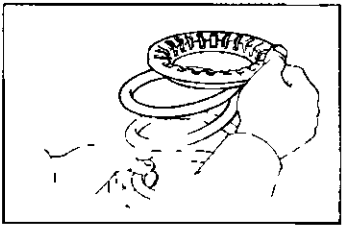


(b) While lowering the rear axle housing, remove the coil spring and upper and lower insulators.

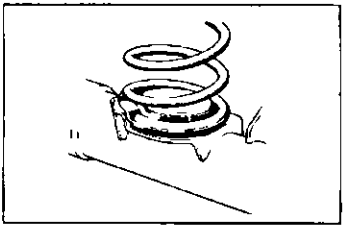
INSTALLATION OF COIL SPRING AND SHOCK ABSORBER



1. PUT LOWER INSULATOR ON AXLE HOUSING



2. PUT UPPER INSULATOR ON COIL SPRING



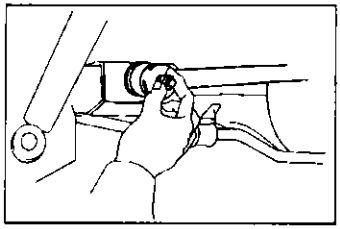
3. INSTALL COIL SPRING

4 CHECK POSITION OF LOWER INSULATOR

(a) Jack up the rear axle housing

(b) Check that the lower insulator is installed correctly.

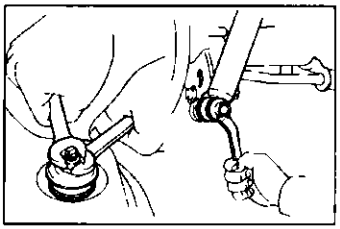
If the insulator is not in correct position, reinstall the coil spring



5. INSTALL LATERAL CONTROL ROD

In order, install the washer bushing, spacer, lateral control rod, bushing, washer and nut on to the rear axle housing.

NOTE Do not tighten the nut yet



6 INSTALL SHOCK ABSORBER

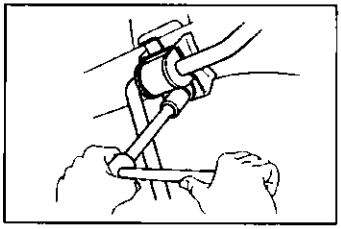
(a) Connect the shock absorber to the body with the nut.

Hold the shaft with an adjustable wrench. Torque the lock nut.

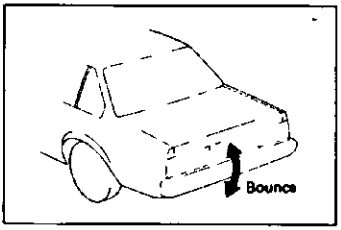
Torque: 250 kg-cm (18 ft-lb)

(b) Connect the shock absorber to the rear axle housing with the bolt Torque the bolt.

Torque: 375 kg-cm (27 ft lb)

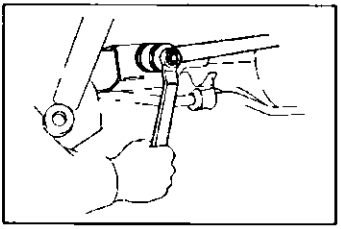


7 INSTALL STABILIZER BAR BUSHING BRACKETS TO REAR AXLE



8. STABILIZE SUSPENSION

Remove the stands and bounce the car to stabilize the suspension

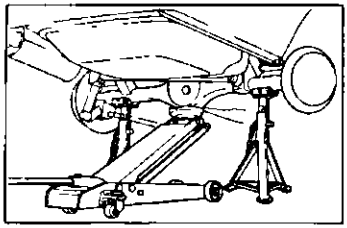


9. TIGHTEN LATERAL CONTROL ROD NUT

(a) Raise the axle housing until the body is free from the stands

(b) Torque the lateral control rod nut

Torque: 650 kg-cm (47 ft-lb)



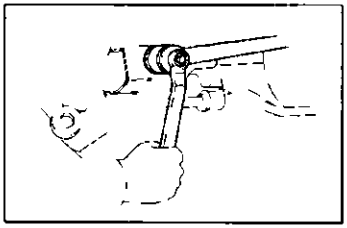
Lateral Control Rod

(See page RA-32)

REMOVAL OF LATERAL CONTROL ROD

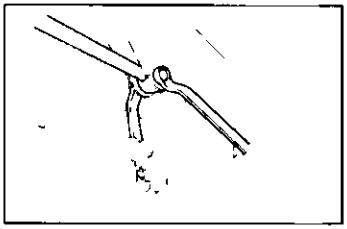
1 SUPPORT REAR AXLE HOUSING

Jack up the rear axle housing and support it with stands.



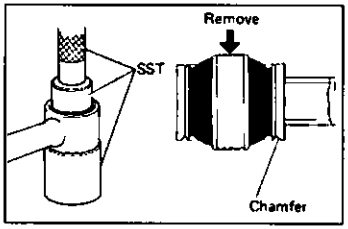
2. DISCONNECT LATERAL CONTROL ROD FROM REAR AXLE HOUSING

Remove the nut holding the lateral control rod to the rear axle housing, and disconnect the lateral control rod



3. DISCONNECT LATERAL CONTROL ROD FROM BODY

Remove the nut holding the lateral control rod to the body, and remove the lateral control rod



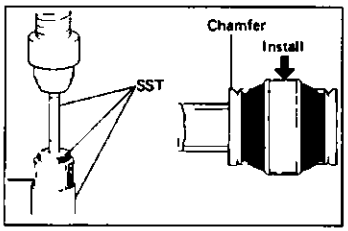
REPLACEMENT OF LATERAL CONTROL ROD BUSHING

1. REMOVE BUSHING

Using SST, press out the bushing from the lateral control rod.

SST 09710-14012

NOTE When inserting and removing the bushing, press or pull from the chamfered side as shown in the figure

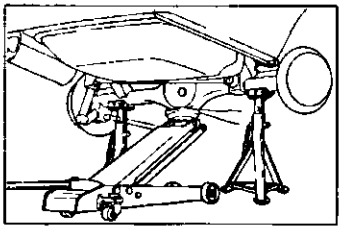


2. INSTALL BUSHING

Using SST, press a new bushing into the lateral control rod

SST 09710-14012

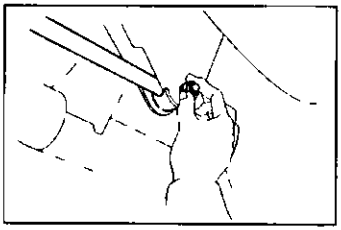
NOTE Do not use a lubricant when pressing in the bush ing



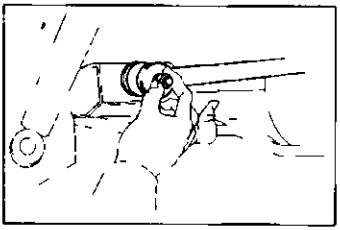
INSTALLATION OF LATERAL CONTROL ROD

1 INSTALL LATERAL CONTROL ROD TO BODY

(a) Raise the axle housing until the housing is free from the stands.

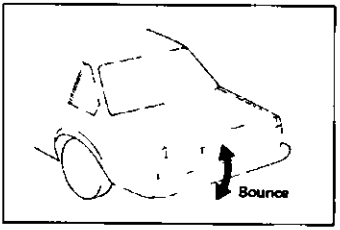


(b) Install the lateral control rod to the body with the nut

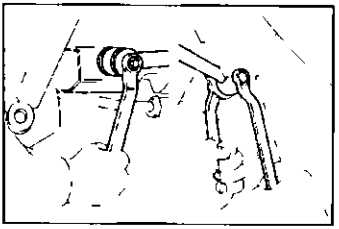


2. INSTALL LATERAL CONTROL ROD TO REAR AXLE HOUSING

(a) In this order, install the washer, bushing, spacer, lateral control arm, bushing, washer and nut on the rear axle housing



(b) Remove the stands and bounce the car to stabilize the suspension

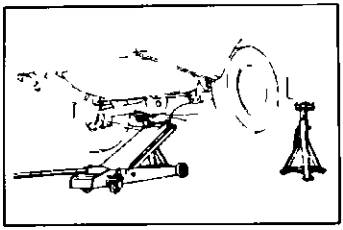


(c) Jack up the axle housing

(d) Torque the nut

Torque:

Body side	1,150 kg-cm (83 ft-lb)
Axle housing side	650 kg-cm (47 ft-lb)



Upper and Lower Control Arm

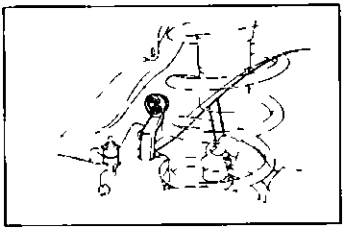
(See page RA-32)

REMOVAL OF UPPER AND LOWER CONTROL ARM

1. JACK UP VEHICLE

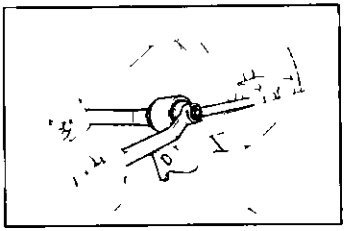
Jack up the vehicle and support the body with stands.

Support the rear axle housing with a jack.

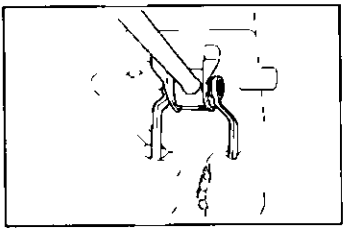


2. REMOVE UPPER CONTROL ARM

(a) Remove the bolt holding the upper control arm to the body.

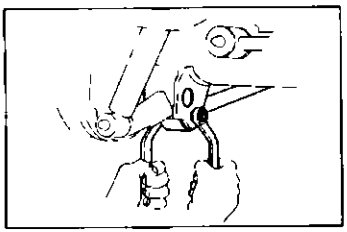


(b) Remove the bolt holding the upper control arm to the rear axle housing, and remove the upper control arm

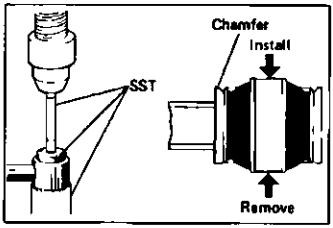


3. REMOVE LOWER CONTROL ARM

(a) Remove the bolt holding the lower control arm to the body



(b) Remove the bolt holding the lower control arm to the rear axle housing, and remove lower control arm



REPLACEMENT OF UPPER AND LOWER CONTROL ARM BUSHING

1. **REMOVE BUSHING**

   Using SST, press out the bushing from the control arm

   SST 09710-14012

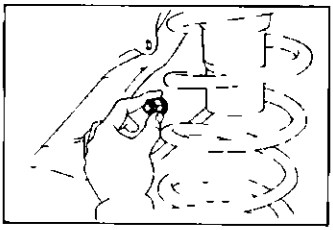
   NOTE When inserting and removing the bushing, press or pull from the chamfered side as shown in the figure

2. **INSTALL BUSHING**

   Using SST, press a new bushing into the control arm

   SST 09710-14012

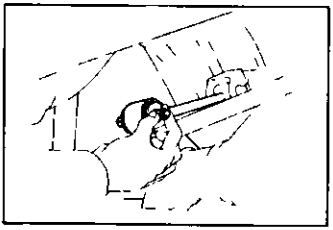
   NOTE Do not use a lubricant when pressing in the bushing



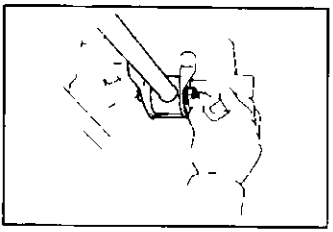
INSTALLATION OF UPPER AND LOWER CONTROL ARM

1. **INSTALL UPPER CONTROL ARM**

   (a) Install the upper control arm on the body with the bolt and nut Do not tighten the nut yet

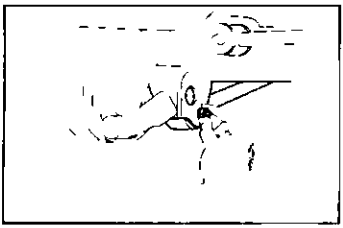


   (b) Install the upper control arm on the rear axle housing with the bolt and nut Do not tighten the nut yet

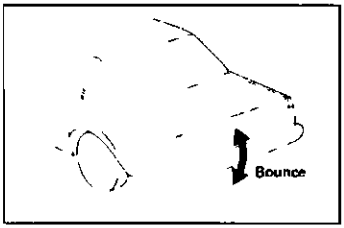


2. **INSTALL LOWER CONTROL ARM**

   (a) Install the lower control arm on the body with the bolt and nut Do not tighten the nut yet

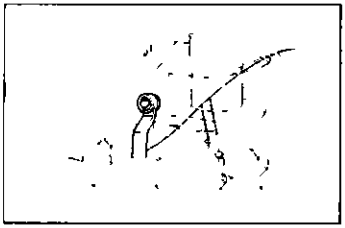


(b) Install the lower control arm on the rear axle housing with bolt and nut. Do not tighten the nut yet



3. **STABILIZE SUSPENSION**

Remove the stands and bounce the car to stabilize the suspension

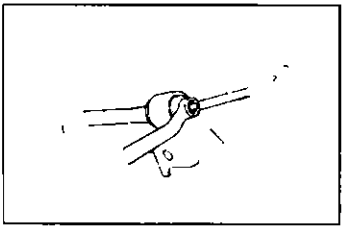


4. **JACK UP VEHICLE**

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

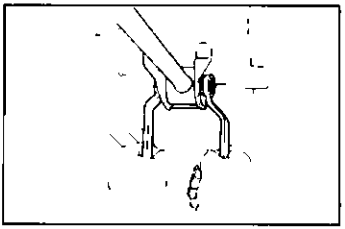
5. **TIGHTEN BOLT HOLDING UPPER CONTROL ARM TO BODY**

Torque. 1,200 kg-cm (87 ft-lb)



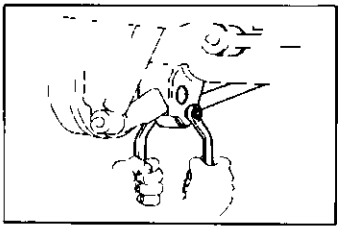
6. **TIGHTEN BOLT HOLDING UPPER CONTROL ARM TO REAR AXLE HOUSING**

Torque: 1,200 kg-cm (87 ft lb)

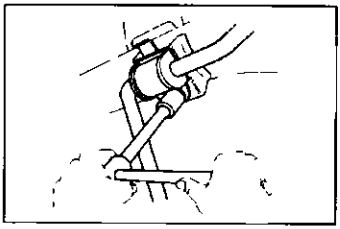


7 **TIGHTEN BOLT HOLDING LOWER CONTROL ARM TO BODY**

Torque 1,200 kg-cm (87 ft-lb)



8. TIGHTEN BOLT HOLDING LOWER CONTROL ARM TO REAR AXLE HOUSING
   Torque: 1,200 kg-cm (87 ft-lb)



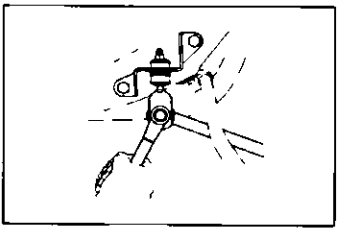
Rear Stabilizer Bar

(See page RA-32)

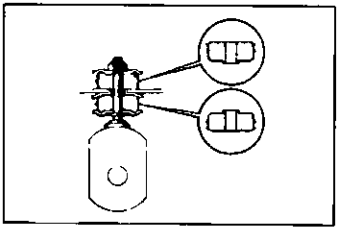
REMOVAL OF REAR STABILIZER BAR

1 REMOVE STABILIZER BAR BUSHING BRACKETS

2. REMOVE BUSHINGS FROM BAR

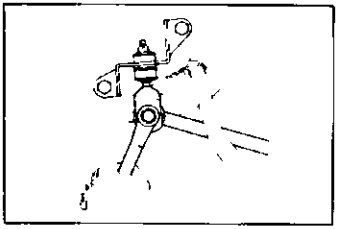


3. REMOVE REAR STABILIZER BAR FROM BODY
   (a) Disconnect the link from the bracket
   (b) Disconnect the link from the bar end

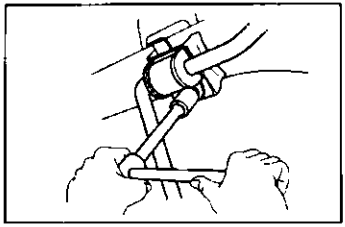


INSTALLATION OF REAR STABILIZER BAR

1 INSTALL STABILIZER LINK TO BODY
Install the link onto the body as shown



2. INSTALL STABILIZER BAR TO LINK
   Connect the stabilizer bar on both sides to the link with bolts, collars, cushions, nut and new cotter pins
   Torque. 310 kg-cm (22 ft-lb)



3. **INSTALL BRACKETS OVER BUSHING TO REAR AXLE HOUSING**

   Torque: 375 kg-cm (27 ft-lb)

BRAKE SYSTEM

	Page
PRECAUTIONS	BR-2
TROUBLESHOOTING	BR 2
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MASTER CYLINDER	BR-9
BRAKE BOOSTER	BR-12
FRONT BRAKE	BR-23
REAR BRAKE (Drum Type)	BR-29
REAR BRAKE (Disc Type)	BR 36
BRAKE HOSES AND TUBES	BR-46

PRECAUTIONS

(a) Care must be taken to replace each part properly as it could affect the performance of the brake system and result in a driving hazard. Replace the parts with parts of the same part number or equivalent.

(b) It is very important to keep parts and area clean when repairing the brake system.

TROUBLESHOOTING

Problem	Possible cause	Remedy	Page
Low or spongy pedal	Linings worn	Replace brake shoes or pads	BR 23,29, 38
	Leak in brake system	Locate and repair	
	Master cylinder faulty	Repair or replace master cylinder	BR 9
	Air in brake system	Bleed brake system	BR 7
	Wheel cylinder faulty	Repair wheel cylinder	BR 29
	Piston seals worn or damaged	Repair brake calipers	BR 25,39
	Rear brake automatic adjuster faulty	Repair or replace adjuster	BR 35
Brakes drag	Parking brake out of adjustment	Adjust parking brake	BR-8
	Binding parking brake cable	Repa r as necessary	
	Booster push rod out of adjustment	Adjust push rod	BR 21
	Return spring faulty	Replace spring	
	Brake line restricted	Repair as necessary	
	Lining cracked or distored	Replace brake shoe	
	Wheel cylinder or caliper piston sticking	Repair as necessary	BR 25 29, 39
	Automatic adjuster broken	Replace adjuster	BR 35
	Master cylinder faulty	Repair or replace master cylinder	BR 9
Brakes pull	Tires improperly inflated	Inflate tires to proper pressure	
	Oil or grease on linings	Check for cause / Replace lining	BR 23 29 36
	Brake shoes distorted, linings worn or glazed	Replace brake shoes	BR 29
	Drum or disc out of round	Replace drum or disc	BR 25,29, 39
	Return spring faulty	Replace spring	
	Wheel cylinder faulty	Repair wheel cylinder	BR 29
	Piston frozen in caliper	Repair caliper	BR 25,39
	Disc brake pad sticking	Replace pads	BR 23,36
Brakes grab/chatter	Oil or grease on linings	Check for cause/Replace shoes	BR 23 29 36
	Drum or disc scored or out of round	Replace drum or disc	BR 25,29 39
	Brake shoes distorted linings worn or glazed	Replace brake shoes	BR 29
	Wheel cylinder faulty	Repair wheel cylinder	BR 29
	Disc brake pads sticking	Replace pads	BR 23 36
	Brake booster faulty	Repair booster	BR 12

TROUBLESHOOTING (Cont'd)

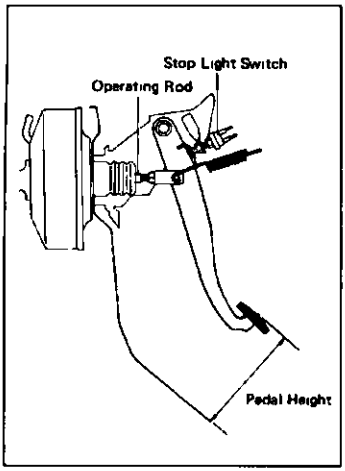
Problem	Possible cause	Remedy	Page
Hard pedal but brakes inefficient	Oil or grease on linings	Check for cause / Replace shoes	BR 23,29, 36
	Brake shoes distorted, linings worn or glazed, drums worn	Replace brake shoes	BR 29
	Disc brake pads worn	Replace pads	BR 23 36
	Piston frozen in caliper	Repair caliper	BR 25,29
	Brake booster faulty	Repair booster	BR 12
	Brake line restricted	Repair as necessary	
Snapping or clicking no se when brakes are applied	Drum brakes -- brake shoes binding at backing plate ledges (3 places)	Lubricate	BR 29
	Drum brakes -- backing plate ledges worn (3 places)	Replace and lubricate ledges	BR 29
	Drum brakes -- loose or missing hold-down spring	Replace	BR 29
	Drum brakes -- looseness of set bolt at backing plate	Tighten	BR 29
	Disc brakes -- rust on front edge of inboard shoes	Inspect lubricate or replace if necessary	BR 23 36
	Disc brakes -- loose or missing pad support plate	Replace	BR 23, 36
	Disc brakes -- looseness of main pin bolt	Tighten	BR 25, 39
	Disc brakes -- wear on main pin	Replace	BR 25 39
Scrap ng or grinding noise when brakes are applied	Worn brake linings	Replace refinish drums or rotors if heavily scored	BR 23 29 36
	Caliper to wheel or rotor interference	Replace as required	BR 25 39
	Dust cover to rotor or drum interference	Correct or replace	BR 23 29 36
	Other brake system components Warped or bent brake backing plate or splash shield, cracked drums or rotors	Inspect or service	BR 25 29, 39
	Tires rubbing against chassis and body	Inspect or service	

TROUBLESHOOTING (Cont'd)

Problem	Possible cause	Remedy	Page
Squeaking, squealing groaning or chattering noise when brakes are applied Note Brake friction mater als inherently generate noise and heat in order to dis s pate energy As a result occasional squeal is normal and is aggravated by severe environmental condi t ons such as cold heat wetness snow, salt mud etc This occas onal squeal s not a functional pro blem and does not indi cate any loss of brake effectiveness	Brake drums and linings, rotors and pads worn or scored	Inspect, service or replace	BR 25 29 39
	Disc brakes – missing or damaged brake pad anti squeal shim	Replace	BR 23 36
	Disc brakes – burred or rusted calipers	Clean or deburr	BR 25 39
	Dirty, greasy, contaminated or glazed linings	Clean or replace	BR 23, 36
	Improper lining parts	Check for correct parts/Replace	BR 29
	Mal adjustment of brake pedal or booster push rod	Inspect and adjust	BR-6 21
	Drum brakes – weak damaged or incorrect shoe retracting springs loose or damaged shoe retaining pins, springs and clips and grooved backing plate ledges	Inspect, service or replace	BR 29
Squeal ng and squeak ing noise when brakes are not appl ed	Bent or warped backing plate caus ng inter ference with drum	Service or replace	BR 29
	Improper machining of drum causing interference with backing plate or shoe	Replace drum	BR 29
	Mal-adjustment of brake pedal or booster push rod	Inspect and adjust	BR-6, 21
	Poor return of brake booster or master cylinder or wheel cyl nder	Inspect service or replace	BR-9, 12 29
	D sc brakes – rusted, stuck	Inspect and lubricate if necessary	BR 25 39
	Other brake system components Loose or extra parts in brakes Rear drum adjustment too tight causing lining to glaze Worn damaged or insuff ciently lubricated wheel bearings	Inspect service or replace as required	BR 25, 29, 39 FA 6
	Drum brakes – weak damaged or incor rect shoe retracting springs	Inspect service or replace	BR 29
	Drum brakes – grooved backing plate ledges		BR 29
	Improper positioning of pads in caliper	Inspect and service	BR 23 36
	Outs de diameter of rotor rubbing caliper hous ng	Inspect correct or replace	BR 23,36
	Housing installation of disc brake anti rattle springs	Correct	BR 23 36

TROUBLESHOOTING (Cont'd)

Problem	Possible cause	Remedy	Page
Groaning, clicking or rattling noise when brakes are not applied	Stones or foreign material trapped inside wheel covers	Remove stones etc	
	Loose wheel nuts	Tighten to correct torque/Replace if stud holes are elongated	
	Disc brakes – loose or missing anti rattle springs or support plate or crimping on outer pad	Inspect service or replace	BR 23,36
	Disc brakes – failure of shim	Inspect and replace if necessary	BR 23 36
	Disc brakes – wear on main pin	Inspect and replace if necessary	BR 25 39
	Disc brakes – looseness of installation bolt	Inspect and tighten if necessary	BR 25 39
	Mal adjustment of break pedal or booster push-rod	Inspect and adjust	BR 6, 21
	Disc brakes – poor return of piston	Inspect, service or replace	BR 25,39
	Drum brakes – loose or extra parts	Inspect, remove or service	BR 29
	Worn damaged or dry wheel bearings	Inspect, lubricate or replace	FA-6



CHECKS AND ADJUSTMENTS

CHECK AND ADJUSTMENT OF BRAKE PEDAL

1 CHECK THAT PEDAL HEIGHT IS CORRECT, AS SHOWN

Pedal height from asphalt sheet:
LHD 161 – 171 mm (6.34 – 6.73 in.)
RHD 162 – 172 mm (6.38 – 6.77 in.)

2 IF NECESSARY, ADJUST PEDAL HEIGHT

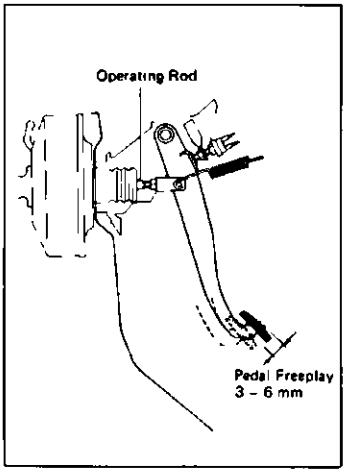
(a) Remove the instrument lower finish panel and air duct

(b) Sufficiently loosen the stop light switch

(c) Adjust the pedal height by turning the operating rod

(d) Return the stop light switch until it lightly contacts the pedal stopper.

(e) After adjusting the pedal height, check and adjust the pedal freeplay



3. CHECK THAT PEDAL FREEPLAY IS CORRECT, AS SHOWN

(a) Stop the engine and depress the brake pedal several times until there is no more vacuum left in the booster

(b) Push in the pedal until the beginning of resistance is felt. Measure the distance, as shown

Pedal freeplay: 3 – 6 mm (0.12 – 0.24 in.)

NOTE: The pedal freeplay is the amount of the stroke until the booster air valve is moved by the operating rod

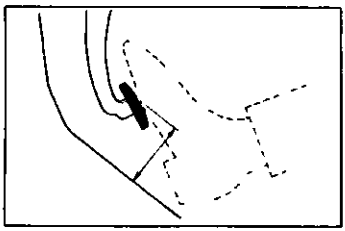
4 IF NECESSARY, ADJUST PEDAL FREEPLAY

(a) If incorrect, adjust the pedal freeplay by turning the operating rod

(b) Start the engine and confirm that pedal freeplay exists

(c) After adjusting the pedal freeplay, check the pedal height

(d) Install the air duct and instrument lower finish panel

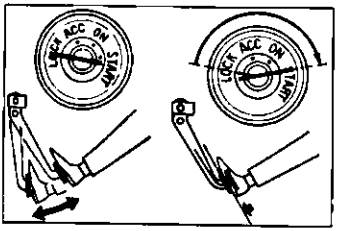


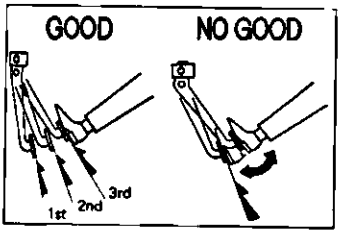
5. CHECK THAT PEDAL RESERVE DISTANCE IS CORRECT, AS SHOWN

Release the parking brake
With engine running, depress the pedal and measure the pedal reserve distance, as shown

Pedal reserve distance from asphalt sheet at 50 kg (110.2 lb):
More than 75 mm (2.95 in.)

If incorrect, troubleshoot the brake system



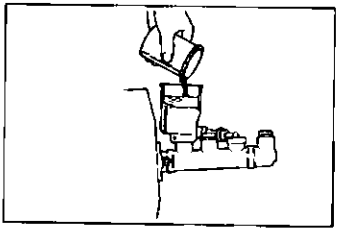


OPERATIONAL TEST OF BRAKE BOOSTER

NOTE If available, use a brake booster tester to check the booster operating condition

1. OPERATING CHECK
   (a) Depress the brake pedal several times with the engine off, and check that there is no change in the pedal reserve distance
   (b) Depress the brake pedal and start the engine If the pedal goes down slightly, operation is normal

2. AIR TIGHTNESS
   (a) Start the engine and stop it after one or two minutes Depress the brake pedal several times slowly If the pedal goes down furtherest the first time, but gradual ly rises after the second or third time, the booster is air tight
   (b) Depress the brake pedal while the engine is running, and stop it with the pedal depressed If there is no change in pedal reserve travel after holding the pedal for thirty seconds, the booster is air tight

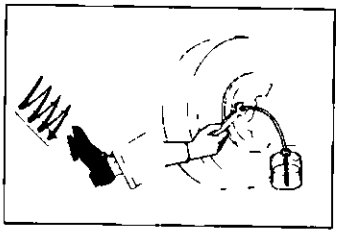


BLEEDING OF BRAKE SYSTEM

NOTE If any work is done on the brake system or if air is suspected in the brake lines, bleed the system of air

CAUTION. Do not let brake fluid remain on a painted surface. Wash it off immediately

1. FILL BRAKE RESERVOIR WITH BRAKE FLUID
   Check the reservoir after bleeding each wheel Add fluid, if necessary



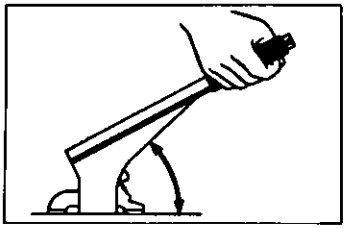
2 BEGIN BLEEDING AIR FROM WHEEL CYLINDER WITH LONGEST HYDRAULIC LINE

3. CONNECT VINYL TUBE TO WHEEL CYLINDER OR BRAKE CYLINDER BLEEDER PLUG
   Insert the other end of the tube in a half filled container of brake fluid

4. BLEED BRAKE LINE
   (a) Slowly pump the brake pedal several times
   (b) While an assistant depresses the pedal, loosen the bleeder plug until fluid starts to run out Then close the bleeder plug
   (c) Repeat this procedure until there are no more air bubbles in the fluid

   Bleeder plug tightening torque: 85 kg cm (74 in lb)

5 REPEAT PROCEDURE FOR EACH WHEEL

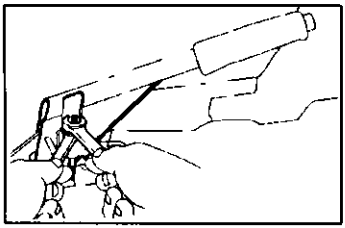


CHECK AND ADJUSTMENT OF PARKING BRAKE

1 CHECK THAT PARKING BRAKE LEVER TRAVEL IS CORRECT

Pull the parking brake lever all the way up, and count the notches of lever travel.

Parking brake lever travel at 20 kg (44.1 lb):
w/Rear brake drum 5 – 8 clicks
w/Rear brake disc 6 – 9 clicks



2. IF NECESSARY, ADJUST PARKING BRAKE

NOTE. Before adjusting the parking brake, be sure that the rear brake shoe clearance has been adjusted.

For shoe clearance adjustment, see step 8 on page BR 35.

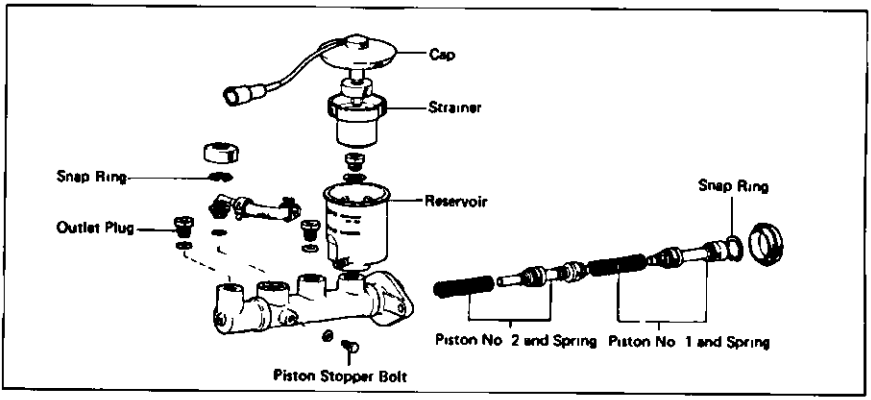
(a) Remove the rear console box.

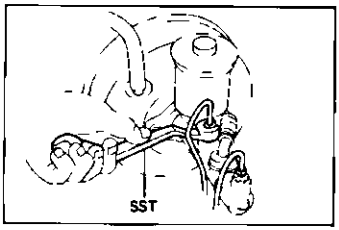
(b) Loosen the lock nut and turn the adjusting screw until the travel is correct

(c) Tighten the lock nut and install the console box

MASTER CYLINDER

COMPONENTS





REMOVAL OF MASTER CYLINDER

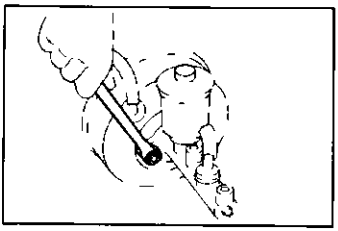
1. TAKE OUT FLUID WITH SYRINGE OR SUCH

   CAUTION: Do not let brake fluid remain on a painted surface. Wash it off immediately.

2. DISCONNECT TWO BRAKE TUBES

   Using SST, disconnect two brake tubes from the master cylinder.

   SST 09751-36011



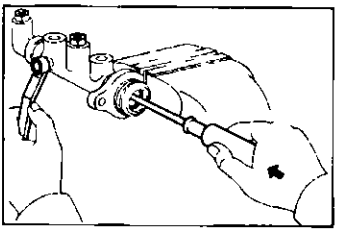
3. REMOVE MASTER CYLINDER

   (a) Disconnect brake warning connector.

   (b) Remove the two nuts.

   (c) Remove the master cylinder and gasket from the brake booster.

DISASSEMBLY OF MASTER CYLINDER



1. PLACE CYLINDER IN VISE

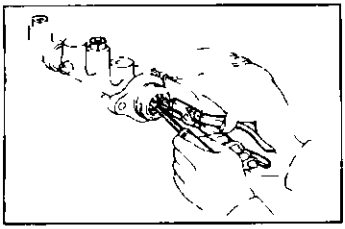
2. DISCONNECT RESERVOIR AND HOSE

   (a) Remove the set bolt from the reservoir.

   (b) Remove the reservoir with the hose from the master cylinder.

3. REMOVE PISTON STOPPER BOLT

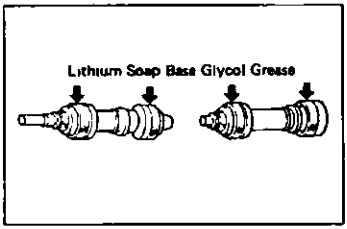
   Using a screwdriver, push the pistons in all the way, and remove the piston stopper bolt.



4. REMOVE TWO PISTONS AND SPRINGS
   (a) Using snap ring pliers, remove the snap ring
   (b) Remove two pistons and springs from the master cylinder

   NOTE It may be necessary to inject compressed air into the outlet plug to force out the No 2 Piston

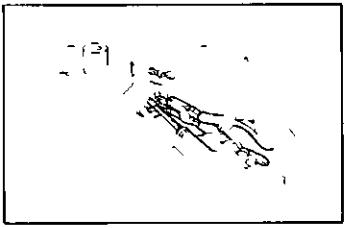
5. REMOVE TWO OUTLET PLUGS



ASSEMBLY OF MASTER CYLINDER

(See page BR 9)

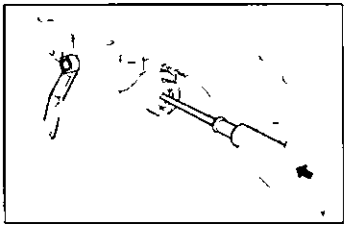
1. APPLY LITHIUM SOAP BASE GLYCOL GREASE TO RUBBER PARTS OF PISTON



2. INSTALL TWO SPRINGS AND PISTONS

   CAUTION: Be careful not to damage the rubber lips on the pistons

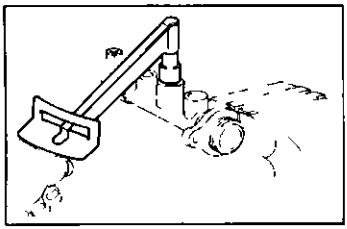
   (a) Insert the two springs and pistons in the master cylinder housing
   (b) Push in the piston and install the snap ring



3 INSTALL PISTON STOPPER BOLT

Using a screwdriver, push the pistons in all the way, and install the piston stopper bolt Torque the bolt.

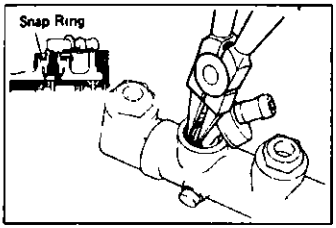
Torque: 100 kg-cm (7 ft lb)



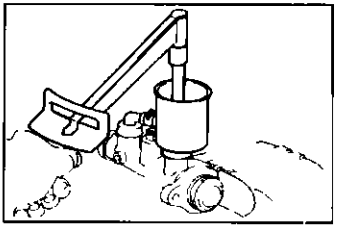
4. INSTALL TWO OUTLET PLUGS

Torque the outlet plugs.

Torque: 450 kg-cm (33 ft-lb)

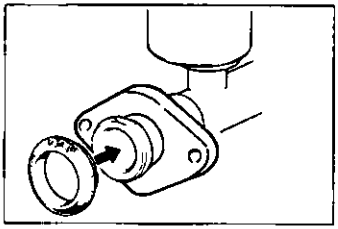


5. **INSTALL RESERVOIR AND HOSE**
   (a) Push in the elbow and install the snap ring
   (b) Apply lithium soap base glycol grease to the O ring
   (c) Pack lithium soap base glycol grease between the snap ring and elbow



   (d) Install the reservoir on the master cylinder with the "MAX" mark facing toward the front Torque the bolt

   Torque. 250 kg-cm (18 ft-lb)

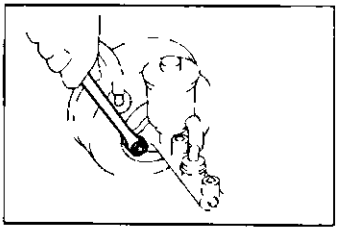


INSTALLATION OF MASTER CYLINDER

(See page BR-9)

1 **CLEAN OUT GROOVE ON LOWER INSTALLATION SURFACE OF MASTER CYLINDER**

2 **CONFIRM THAT "UP" MARK ON MASTER CYLINDER BOOT IS IN CORRECT POSITION**

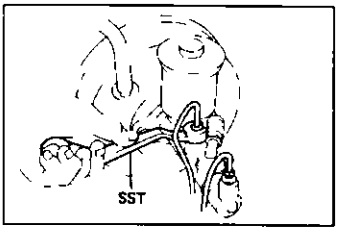


3 **ADJUST LENGTH OF BRAKE BOOSTER PUSH ROD BEFORE INSTALLING MASTER CYLINDER**
(See page BR 17)

4 **INSTALL MASTER CYLINDER**

Install the master cylinder and gasket on the brake booster with two nuts Torque the nuts

Torque· 130 kg-cm (9 ft lb)



5 **CONNECT TWO BRAKE TUBES**

Using SST, connect two brake tubes to the outlet plugs Torque the nuts.

SST 09751 36011

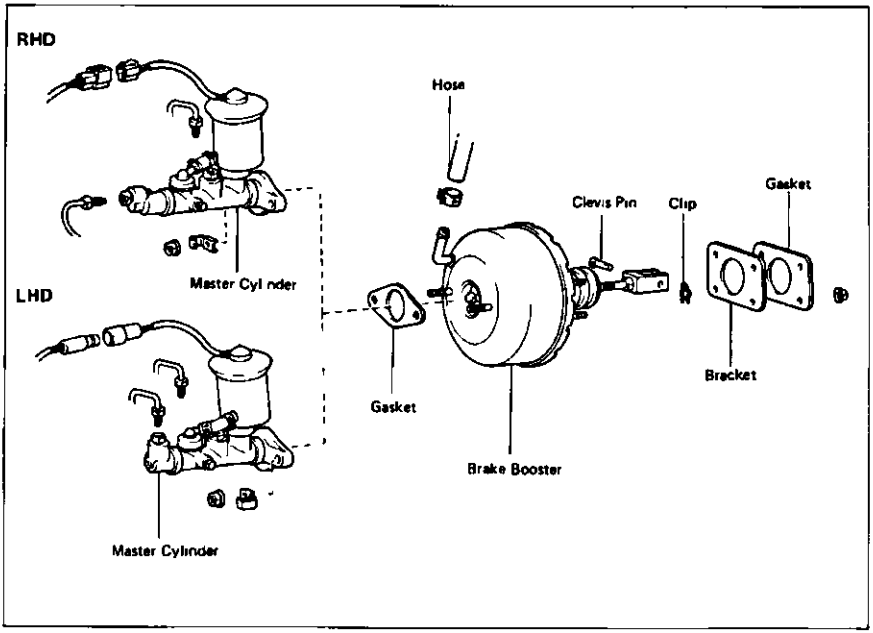
Torque: 155 kg-cm (11 ft-lb)

6. **ADJUST BRAKE PEDAL** **(See page BR 6)**

7. **FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM** **(See page BR-7)**

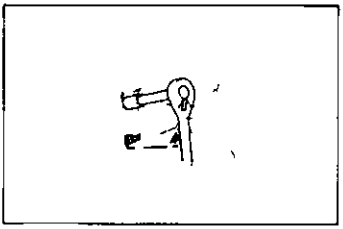
BRAKE BOOSTER

REMOVAL OF BRAKE BOOSTER



1. REMOVE MASTER CYLINDER (See page BR 9)
2. DISCONNECT VACUUM HOSE FROM BRAKE BOOSTER
3. REMOVE INSTRUMENT LOWER FINISH PANEL AND AIR DUCT
4. REMOVE CLUTCH MASTER CYLINDER, PEDAL RETURN SPRING AND CLEVIS PIN (RHD with 4A-G Engine only)

   NOTE Do not disconnect the clutch line tube

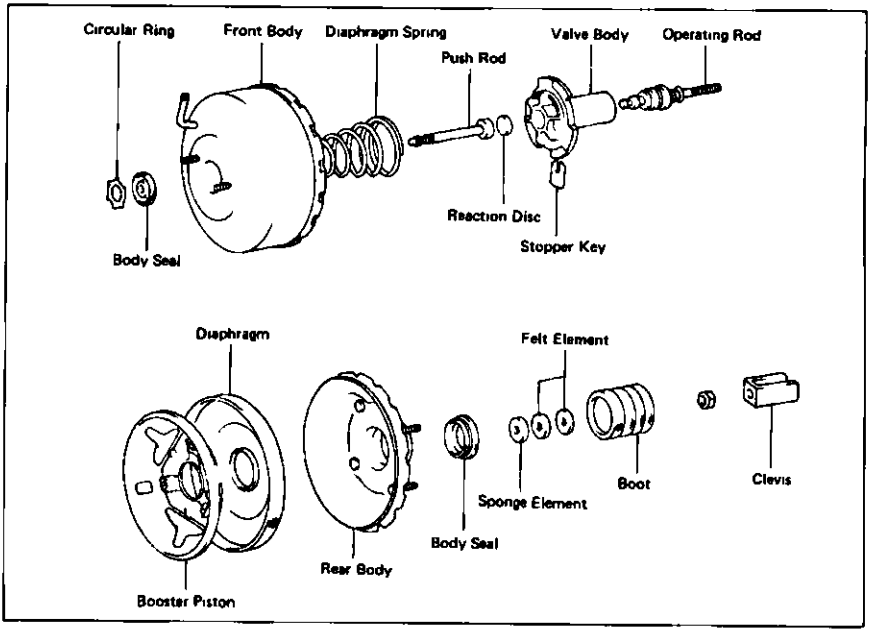


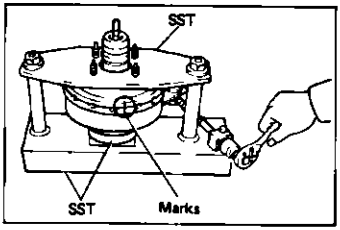
5. REMOVE PEDAL RETURN SPRING
6. REMOVE CLIP AND CLEVIS PIN
7. REMOVE BRAKE BOOSTER, BRACKET, AND GASKET

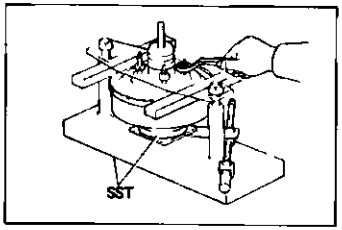
   Remove the four nuts, and pull out the brake booster, bracket and gasket.

Brake Booster (AISIN Type)

COMPONENTS

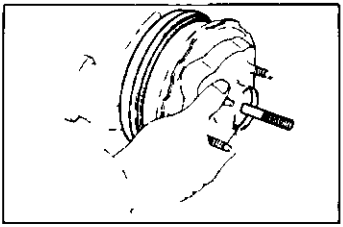




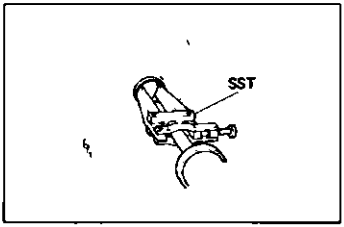


DISASSEMBLY OF BRAKE BOOSTER

1. **REMOVE CLEVIS**
2. **SEPARATE FRONT AND REAR BODIES**
   (a) Put an matchmarks on the front and rear bodies
   (b) Set the booster in SST
   SST 09753 00012, 09753 40010 and 09753-40020
   CAUTION: Be careful not to tighten the two nuts of the SST too tight.
   (c) Turn the front body, clockwise until the front and rear bodies separate
   (d) Loosen the upper left and right nuts of the SST, and insert pieces of wood between the front body and upper plate
   CAUTION: Be careful that the pieces of wood do not contact the rear body
   (e) Evenly tighten down the four booster mounting nuts to separate the front and rear bodies
   (f) Remove the diaphragm spring and push rod
3. **REMOVE BOOT FROM REAR BODY**



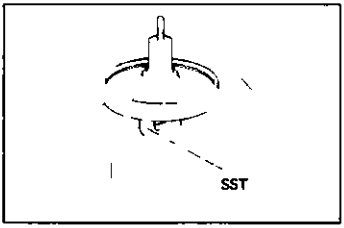
4. **REMOVE DIAPHRAGM ASSEMBLY FROM REAR BODY**



5 **REMOVE BODY SEAL FROM REAR BODY**

Using SST, remove the seal

SST 09308-00010



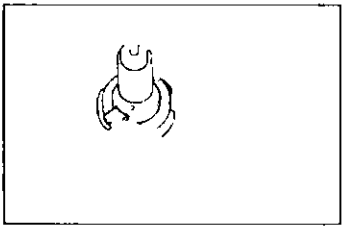
6. **REMOVE VALVE BODY AND DIAPHRAGM FROM BOOSTER PISTON**

(a) Mount SST in a vise

SST 09736-27010

(b) Put the diaphragm assembly on SST and turn it to separate the valve body and booster piston

(c) Remove the diaphragm from the booster piston

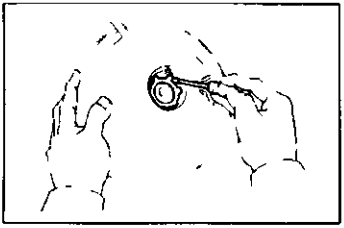


7. **REMOVE OPERATING ROD FROM VALVE BODY**

(a) Push the operating rod in the valve body and remove the stopper key

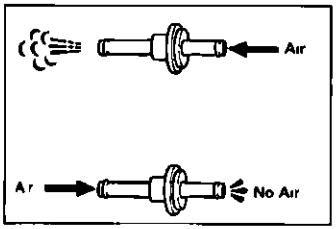
(b) Pull out the operating rod with the three elements

8. **REMOVE REACTION DISC FROM VALVE BODY**



9 **REMOVE BODY SEAL FROM FRONT BODY**

Using a screwdriver, pry out the circular ring, and remove the seal



INSPECTION OF BRAKE BOOSTER

INSPECT CHECK VALVE OPERATION

(a) Check that air flows from the booster side to the hose side

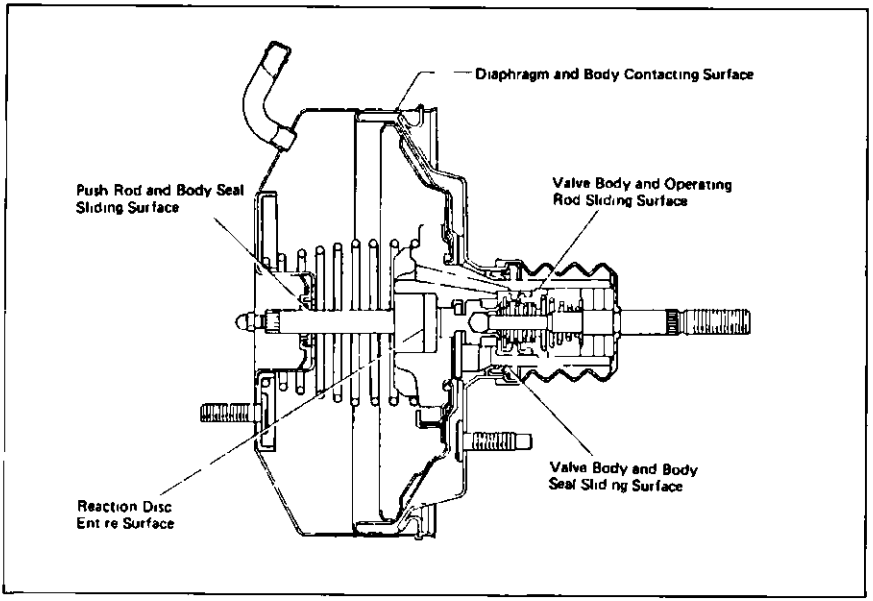
(b) Check that air does not flow from the hose side to the booster side

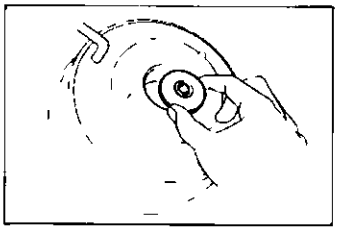
Replace, if necessary

ASSEMBLY OF BRAKE BOOSTER

(See page BR-13)

1 APPLY SILICONE GREASE TO PARTS SHOWN BELOW

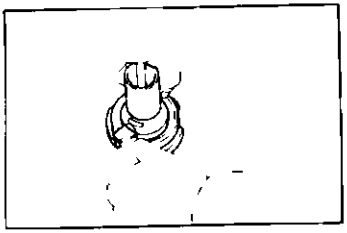




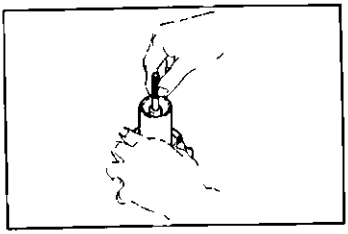
2 INSTALL BODY SEAL TO FRONT BODY

(a) Place the body seal in position

(b) Secure the body seal with the circular ring

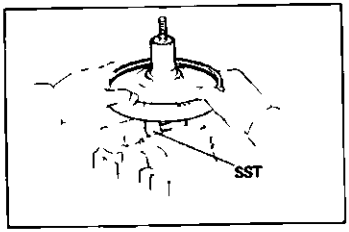


3. INSTALL OPERATING ROD TO VALVE BODY
   (a) Insert the operating rod into the valve body
   (b) Push the operating rod into the valve body and install the stopper key

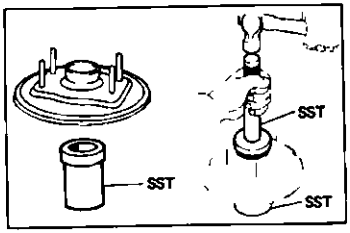


   (c) Pull on the operating rod and confirm that the stopper key is working

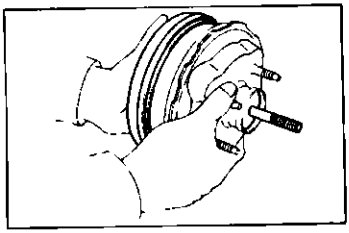
4. INSTALL REACTION DISC TO VALVE BODY



5. INSTALL VALVE BODY AND DIAPHRAGM TO BOOSTER PISTON
   (a) Install the diaphragm to the booster piston
   (b) Insert the valve body to the booster piston.
   (c) Mount SST in a vise.
   SST 09736-27010
   (d) Put the diaphragm assembly on SST, and turn it to install

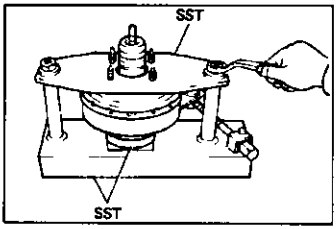


6 INSTALL BODY SEAL TO REAR BODY
Using SST, drive in the seal
SST 09515-30010 and 09608-20011



7. INSTALL DIAPHRAGM ASSEMBLY TO REAR BODY

8. INSTALL FOLLOWING PARTS TO REAR BODY:
   (a) Felt elements
   (b) Sponge element
   (c) Boot



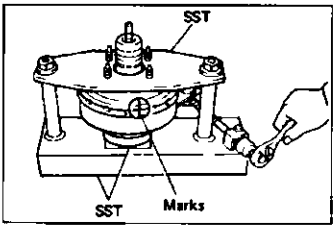
9. ASSEMBLE FRONT AND REAR BODIES

(a) Place the spring and push rod in the front body

(b) Using SST, compress the spring between the front and rear bodies.

SST 09753-00012, 09753-40010 and 09753-40020

CAUTION: Be careful not to tighten the two nuts of the SST too tight



(c) Assemble the front and rear bodies by turning the front body counterclockwise until the matchmarks match

NOTE If the front body is too tight to be turned, apply more silicone grease on the diaphragm edge that contacts the front and rear bodies.

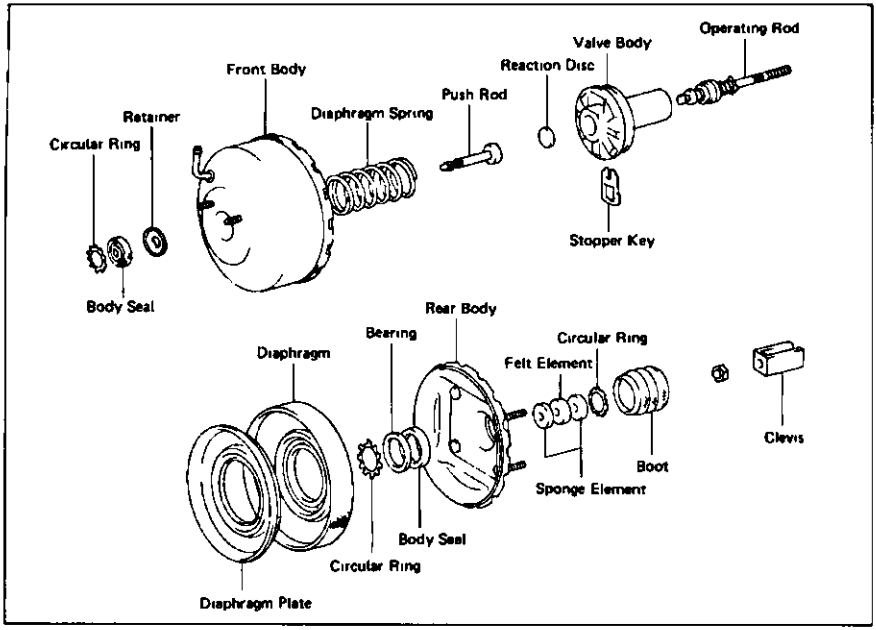
10. INSTALL CLEVIS

INSTALLATION OF BRAKE BOOSTER

(See pages BR 21, 22)

Brake Booster (JKC Type)

COMPONENTS



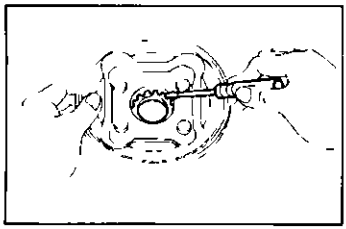
DISASSEMBLY OF BRAKE BOOSTER

1 REMOVE CLEVIS

2. SEPARATE FRONT AND REAR BODIES
(See step 2 on page BR-13)

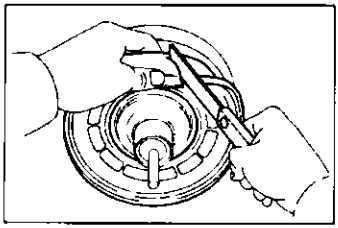
3 REMOVE BOOT FROM REAR BODY

4 REMOVE DIAPHRAGM ASSEMBLY FROM REAR BODY (See step 4 on page BR-14)



5. REMOVE BEARING AND BODY SEAL FROM REAR BODY

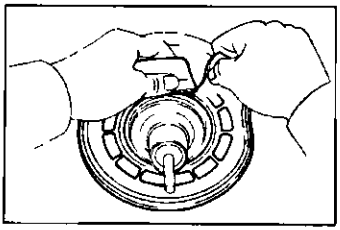
Using a screwdriver, pry out the circular ring, and remove the bearing and body seal



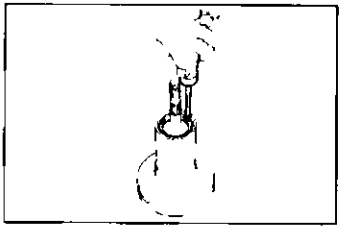
6. REMOVE VALVE BODY AND DIAPHRAGM FROM DIAPHRAGM PLATE

(a) Using a knife, cut off the diaphragm

CAUTION: Be careful not to damage the valve body when cutting the diaphragm.



(b) Pull out the diaphragm and remove the valve body

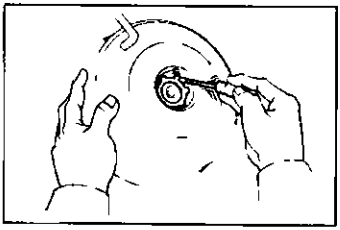


7 REMOVE OPERATING ROD FROM VALVE BODY

(a) Using a screwdriver, pry out the circular ring

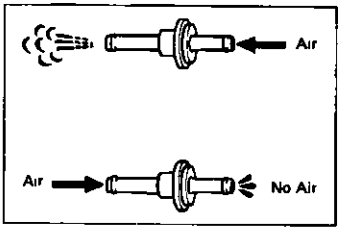
(b) Remove the operating rod
(See step 7 on page BR 14)

8. REMOVE REACTION DISC FROM VALVE BODY



9. REMOVE BODY SEAL AND RETAINER FROM FRONT BODY

Using a screwdriver pry out the circular ring, and remove the body seal and retainer



INSPECTION OF BRAKE BOOSTER

INSPECT CHECK VALVE OPERATION

(a) Check that air flows from the booster side to the hose side

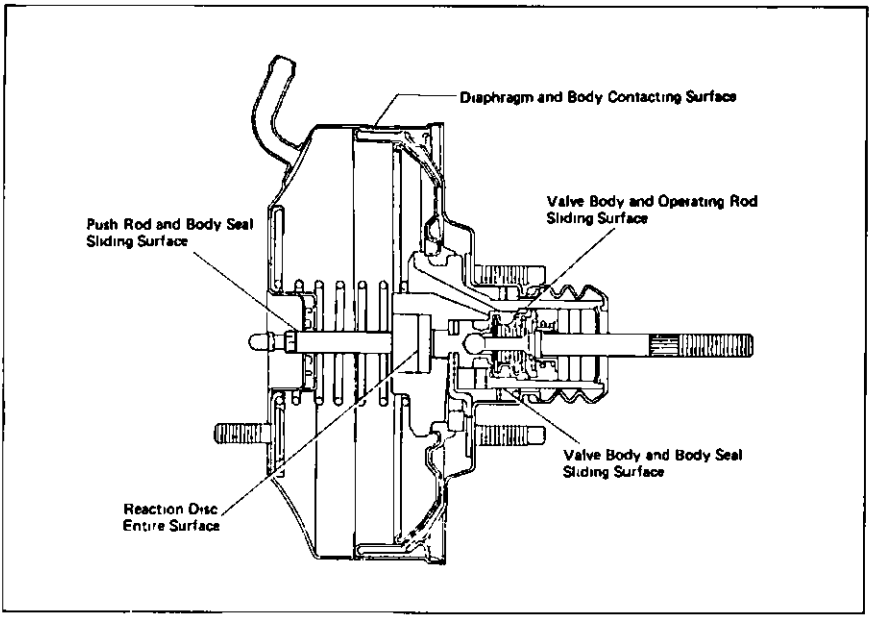
(b) Check that air does not flow from hose side to the booster side

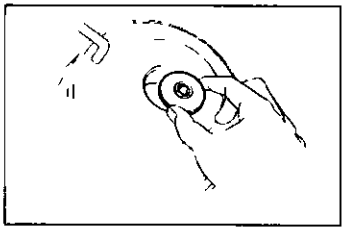
Replace, if necessary

ASSEMBLY OF BRAKE BOOSTER

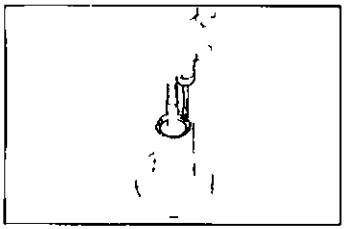
(See page BR-18)

1. APPLY SILICONE GREASE TO PARTS SHOWN BELOW

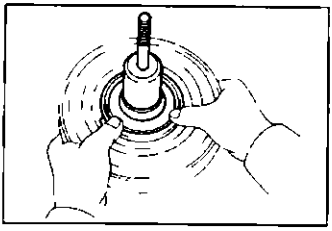




2. INSTALL BODY SEAL AND RETAINER TO FRONT BODY
   (a) Place the retainer and body seal in position
   (b) Secure the body seal with the circular ring
3. INSTALL OPERATING ROD TO VALVE BODY
   (See step 3 on page BR-16)
4. INSTALL REACTION DISC TO VALVE BODY



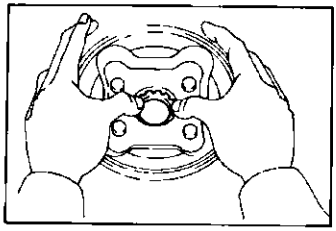
5. INSTALL AIR FILTER ELEMENTS
   (a) Install the felt element and sponge elements
   (b) Secure the elements with the circular ring



6 INSTALL VALVE BODY AND DIAPHRAGM TO DIAPHRAGM PLATE

(a) Insert the valve body in the diaphragm plate.

(b) Install the diaphragm between the diaphragm plate and valve body



7. INSTALL BODY SEAL AND BEARING TO REAR BODY

(a) Place the body seal and bearing in position

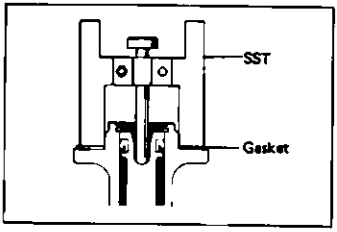
(b) Secure the bearing with the circular ring.

8. INSTALL DIAPHRAGM ASSEMBLY TO REAR BODY
(See step 7 on page BR 16)

9. INSTALL BOOT TO REAR BODY

10 ASSEMBLY FRONT AND REAR BODIES
(See step 9 on page BR 17)

11. INSTALL CLEVIS

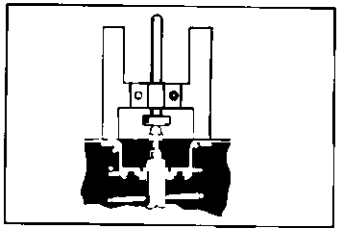


INSTALLATION OF BRAKE BOOSTER
(See page BR-12)

1. ADJUST LENGTH OF BOOSTER PUSH ROD

(a) Set SST on the master cylinder with the gasket, and lower the pin until its tip slightly touches the piston

SST 09737 00010

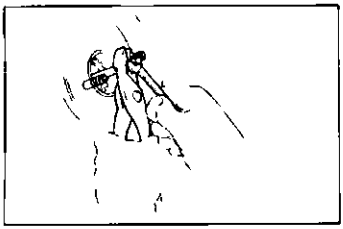


(b) Turn SST upside down, and set it on the booster

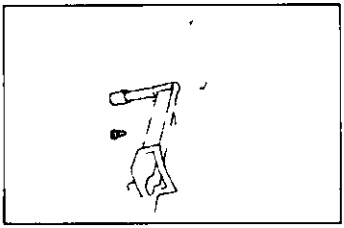
SST 09737-00010

(c) Measure the clearance between the booster push rod and pin head (SST)

Clearance: 0 mm (0 in.)



(d) Adjust the booster push rod length until the push rod lightly touches the pin head.



2. INSTALL BRAKE BOOSTER, BRACKET, AND GASKET
Torque: 130 kg-cm (9 ft-lb)

3. CONNECT CLEVIS TO BRAKE PEDAL
Insert the clevis pin into the clevis and brake pedal and install the clip to the clevis pin

4 INSTALL PEDAL RETURN SPRING

5 INSTALL CLUTCH MASTER CYLINDER, CLEVIS PIN AND PEDAL RETURN SPRING
(RHD with 4A G Engine only)

6. INSTALL INSTRUMENT LOWER FINISH PANEL AND AIR DUCT

7 INSTALL MASTER CYLINDER
(See page BR 11)

8. CONNECT HOSE TO BRAKE BOOSTER

9. FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM (See page BR 7)

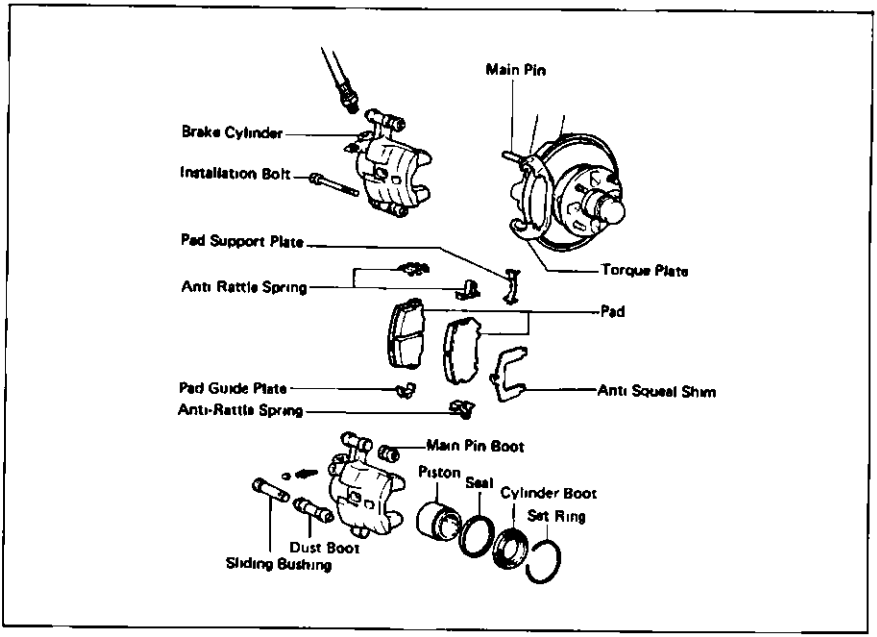
10 CHECK FLUID LEAKAGE

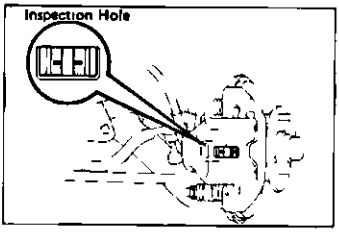
11 CHECK AND ADJUST BRAKE PEDAL
(See page BR 6)

12 PERFORM OPERATIONAL CHECK
(See page BR-7)

FRONT BRAKE

COMPONENTS



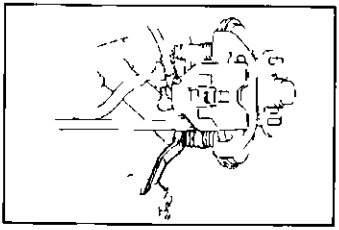


REPLACEMENT OF BRAKE PADS

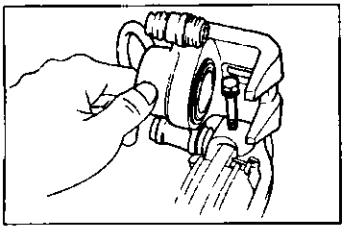
1. **INSPECT PAD THICKNESS**

   Check pad thickness through the cylinder inspection hole and replace pads if not within specification

   Minimum thickness: 1.0 mm (0.039 in.)



2. **DRAW OUT A SMALL AMOUNT OF BRAKE FLUID**
3. **REMOVE CYLINDER INSTALLATION BOLT**



4. LIFT UP CYLINDER
   (a) Lift up the cylinder.
   (b) Insert a bolt into the torque plate hole to secure the cylinder

5. REMOVE PADS AND ANTI-SQUEAL SHIM

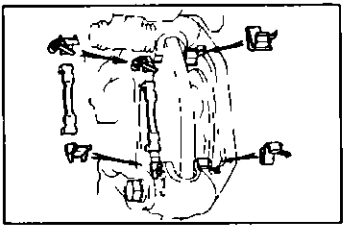
6 REMOVE ANTI-RATTLE SPRINGS, PAD GUIDE PLATE AND SUPPORT PLATE

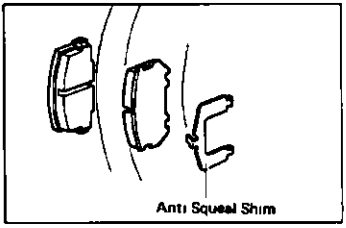
7. CHECK ROTOR DISC THICKNESS
(See step 2 on page BR-26)

8. CHECK ROTOR DISC RUNOUT
(See step 3 on page BR-27)

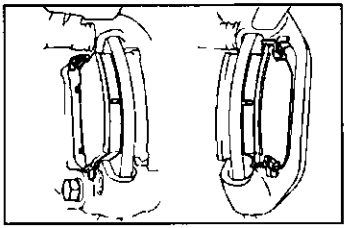
9. INSTALL NEW PAD SUPPORT PLATE, NEW PAD GUIDE PLATE AND NEW ANTI-RATTLE SPRINGS

10. PUSH PISTON INTO CYLINDER



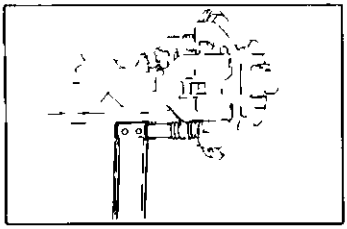


11. INSTALL NEW PADS AND NEW ANTI-SQUEAL SHIM
   (a) Install the anti-squeal shim toward the vehicle outside of the pad



(b) Install the pads onto each spring

CAUTION. Do not allow oil or grease to touch the rubbing face



12. LOWER CYLINDER

Remove the bolt from the torque plate and lower the cylinder

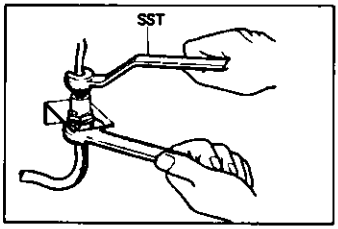
NOTE Insert the cylinder carefully so the boot is not wedged

13. INSTALL CYLINDER INSTALLATION BOLT

Install and torque the cylinder installation bolt

Torque: 200 kg-cm (14 ft-lb)

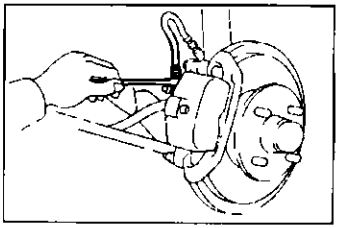
14. FILL WITH BRAKE FLUID



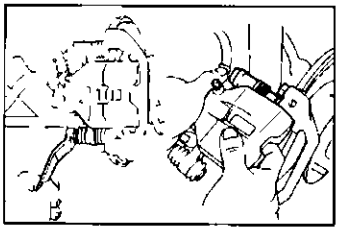
REMOVAL OF CYLINDER

(See page BR-23)

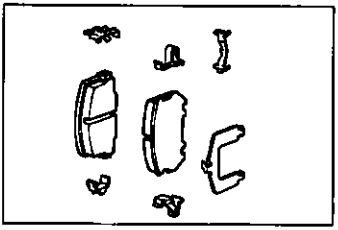
1. DISCONNECT BRAKE HOSE FROM BRAKE TUBE AND CYLINDER
   (a) Using SST and a spanner, disconnect the brake tube from the hose
   SST 09751 36011
   (b) Use a container to catch the brake fluid



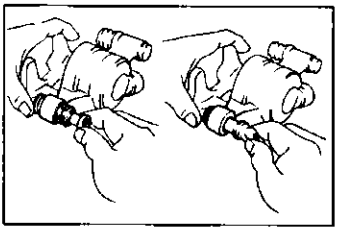
   (c) Remove the clip from the brake hose
   (d) Disconnect the brake hose from the cylinder.



2. REMOVE CYLINDER
   (a) Remove the cylinder installation bolt
   (b) Lift up and push out the cylinder from the torque plate pin.



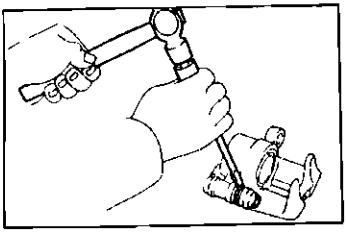
3. REMOVE FOLLOWING PARTS.
   (a) Anti squeal shim
   (b) Brake pads
   (c) Anti-rattle springs
   (d) Pad guide plate
   (e) Pad support plate



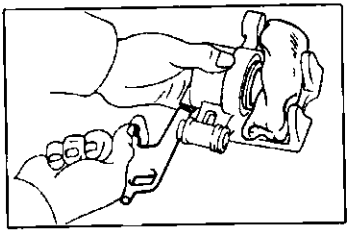
DISASSEMBLY OF CYLINDER

(See page BR-23)

1. REMOVE SLIDING BUSHING AND BOOT



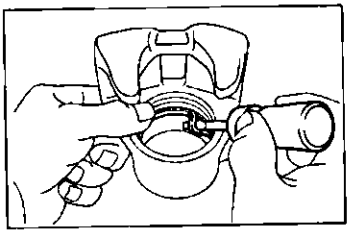
2. REMOVE MAIN PIN BOOT WITH A CHISEL



3. REMOVE CYLINDER BOOT AND SET RING FROM CYLINDER

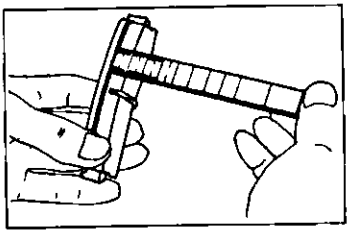
4. REMOVE PISTON FROM CYLINDER
   (a) Put a piece of cloth or such between the piston and cylinder
   (b) Use compressed air to remove the piston from the cylinder

   WARNING: Do not place your fingers in front of the piston when using compressed air.



5. REMOVE PISTON SEAL FROM CYLINDER

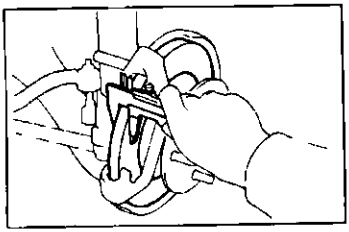
INSPECTION OF FRONT BRAKE COMPONENTS



1. MEASURE PAD LINING THICKNESS

   Minimum thickness. 1.0 mm (0.039 in.)

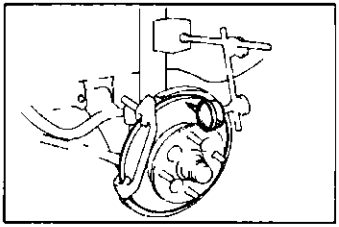
   Replace the pad if the thickness is less than the minimum (the 1.0 mm slit is no longer visible) or if it shows sign of uneven wear



2. MEASURE ROTOR DISC THICKNESS

Standard thickness:	
w/4A-GE and Switzerland 4A-C	18.0 mm (0.709 in.)
Others	12.5 mm (0.492 in.)
Minimum thickness:	
w/4A-GE and Switzerland 4A-C	17.0 mm (0.669 in.)
Others	11.5 mm (0.453 in.)

If the disc thickness is less than minimum, replace the disc.



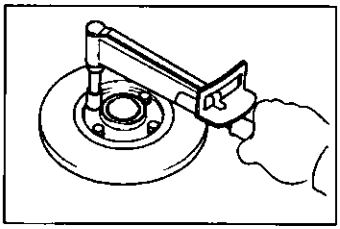
3. **MEASURE ROTOR DISC RUNOUT**

Measure the rotor disc runout at 10 mm (0.39 in.) from the outer edge of the rotor disc

Maximum disc runout: 0.15 mm (0.0059 in.)

If the runout is greater than the maximum, replace the disc

NOTE Make sure the front bearing is adjusted correctly



4. **IF NECESSARY, REPLACE ROTOR DISC**

(a) Remove the torque plate from the dust cover

(b) Remove the axle hub (See page FA-6)

(c) Remove the disc from the axle hub.

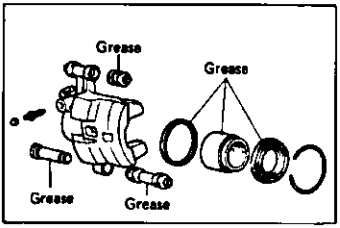
(d) Install a new rotor disc Torque the four bolts

Torque: 650 kg-cm (47 ft-lb)

(e) Install the axle hub and adjust the front bearing preload (See page FA-8, 9)

(f) Install the torque plate onto the dust cover.

Torque: 650 kg-cm (47 ft-lb)



ASSEMBLY OF CYLINDER

(See page BR-23)

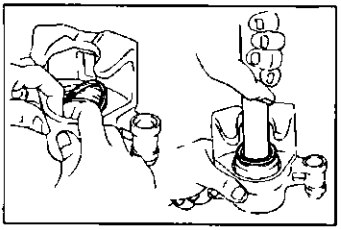
1. **APPLY LITHIUM SOAP BASE GLYCOL GREASE TO FOLLOWING PARTS**

(a) Main pin boot

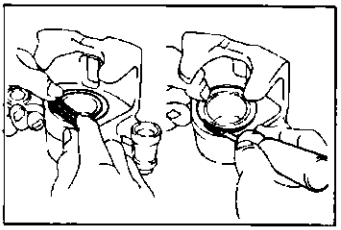
(b) Sliding pin and boot

(c) Piston seal and piston

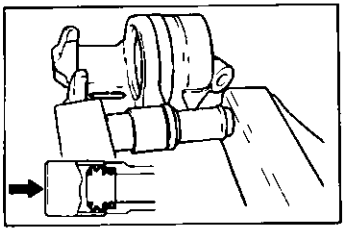
(d) Cylinder boot



2. **INSTALL PISTON SEAL AND PISTON IN CYLINDER**

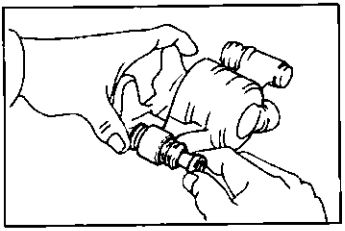


3. **INSTALL CYLINDER BOOT AND SET RING IN CYLINDER**



4. INSTALL NEW MAIN PIN BOOT

Using a 22 mm socket wrench, press in the new boot



5. INSTALL DUST BOOT AND SLIDING BUSHING

(a) Install the dust boot

NOTE Be careful that the seal does not fold under

(b) Install the bushing into the boot, facing the flange toward the inside.

SEE
FRONT BRAKE
REPLACEMENT OF BRAKE PADS
BR-23

INSTALLATION OF CYLINDER

(See page BR 23)

1. INSTALL FOLLOWING PARTS:

(a) Pad support plate

(b) Pad guide plate

(c) Anti rattle springs

(d) Brake pads

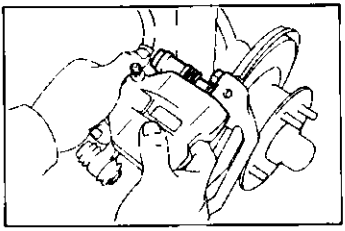
(e) Anti squeal shim

2. INSTALL CYLINDER

(a) Install the cylinder onto the main pin

NOTE Make sure that the boot end is installed into the groove of the main pin

(b) Install the cylinder over the brake pads

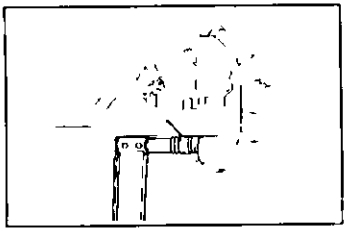


3 INSTALL CYLINDER INSTALLATION BOLT

Install the cylinder installation bolt and torque the bolt.

Torque: 200 kg-cm (14 ft-lb)

NOTE Insert the installation bolt into the cylinder carefully so as not to wedge the boot



4. CONNECT BRAKE LINE

(a) Connect the brake hose to the cylinder

Torque: 235 kg-cm (17 ft-lb)

(b) Using SST, connect brake hose to the brake tube

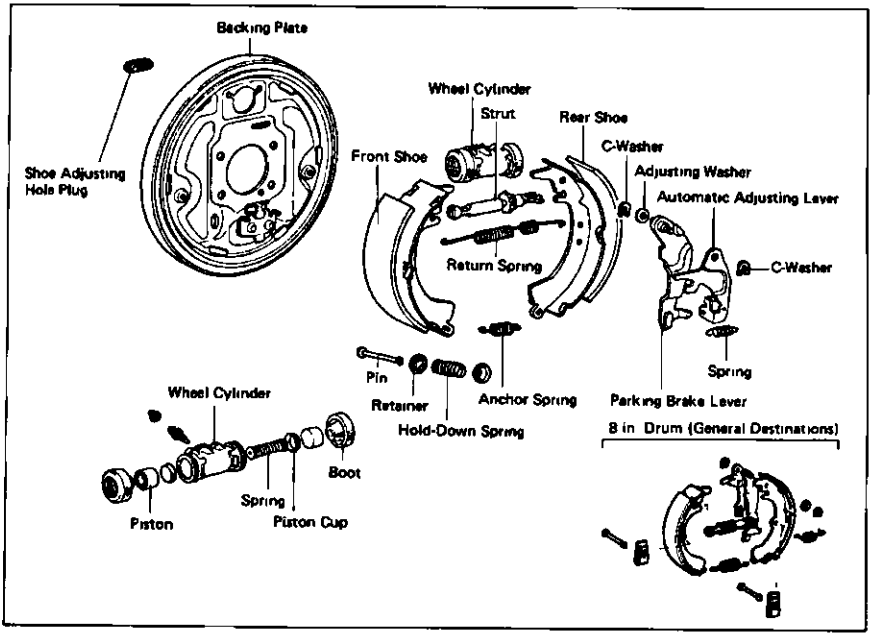
SST 09751-36011

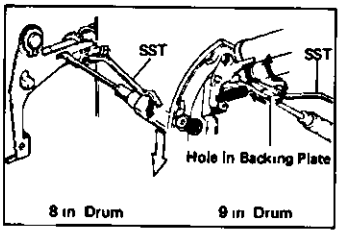
Torque: 155 kg-cm (11 ft-lb)

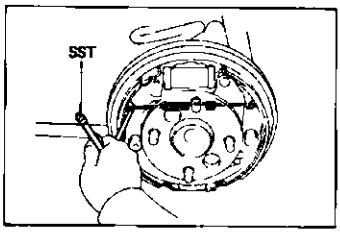
5. FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM (See page BR 7)

REAR BRAKE (Drum Type)

COMPONENTS







REMOVAL OF REAR BRAKE

1. **REMOVE REAR WHEEL AND BRAKE DRUM**

   NOTE If the brake drum is difficult to remove, perform the following

   (a) Insert a screwdriver through the hole in the backing plate, and hold the automatic adjusting lever away from the adjusting bolt

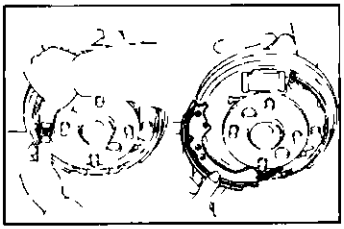
   (b) Using SST or another screwdriver, reduce the brake shoe tension by turning the adjusting bolt

   SST 09704-10010

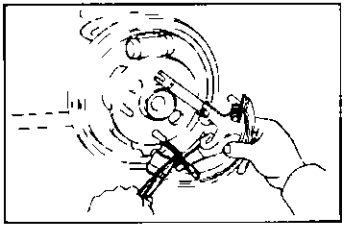
2. **REMOVE FRONT SHOE**

   (a) Using SST, remove the return spring

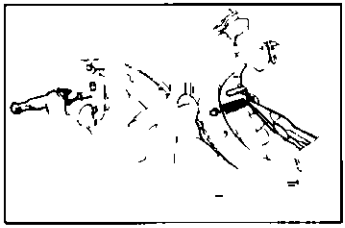
   SST 09703 30010



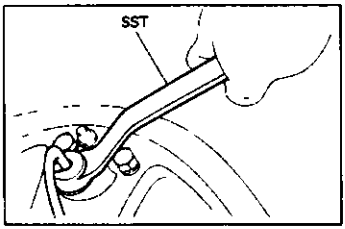
(b) Remove the hold-down spring and pin.
(c) Remove the front shoe and the anchor spring



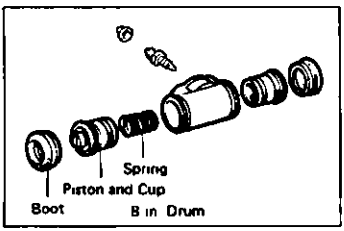
3. REMOVE REAR SHOE
(a) Remove the hold-down spring and pin
(b) Remove the rear shoe with strut.
(c) Disconnect the parking brake cable from the lever.



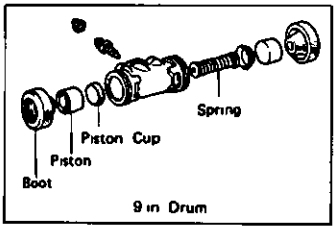
4. REMOVE STRUT FROM REAR SHOE
(a) Remove the adjusting lever spring
(b) Remove the strut.



5 IF NECESSARY, REMOVE AND DISASSEMBLE WHEEL CYLINDER
(a) Using SST, disconnect the brake tube
SST 09751-36011
(b) Remove the two bolts and the wheel cylinder



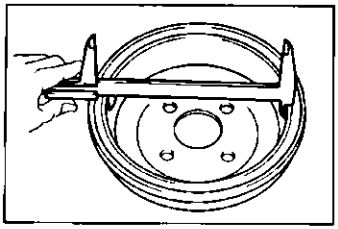
6. DISASSEMBLE WHEEL CYLINDER
(a) Use a container to catch the fluid
(b) Remove the following parts from the wheel cylinder
(8 in Drum)
- Two boots
- Two pistons and cups
- Spring



9 in Drum

(9 in Drum)

- Two boots
- Two pistons
- Two piston cups
- Spring



INSPECTION OF REAR BRAKE COMPONENTS

1. MEASURE BRAKE DRUM INSIDE DIAMETER

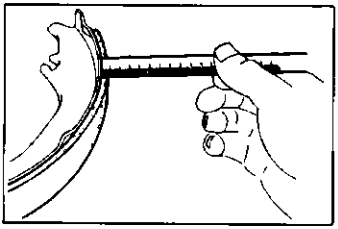
Standard inside diameter:

8 in. Drum	200.0 mm (7 874 in.)
9 in. Drum	228.6 mm (9 000 in.)

Maximum inside diameter:

8 in Drum	202 0 mm (7 953 in.)
9 in. Drum	230 6 mm (9 079 in.)

If the drum is scored or worn, the brake drum may be lathed to the maximum inside diameter



2 MEASURE BRAKE SHOE LINING THICKNESS

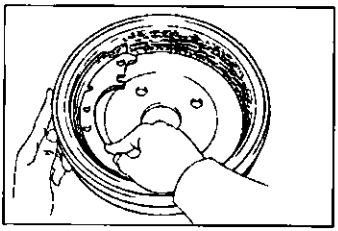
Standard thickness:

8 in Drum 4 0 mm (0 157 in.)
9 in Drum 5 0 mm (0 197 in.)

Minimum thickness: 1.0 mm (0.039 in.)

If the shoe lining is less than minimum or shows signs of uneven wear, replace the brake shoes

NOTE In order to maintain effective brakes, replace all of the brake shoes if the thickness of any one is not within specification

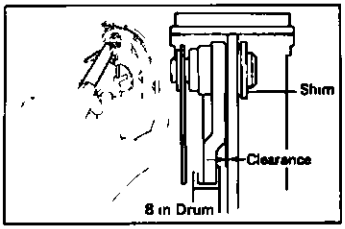


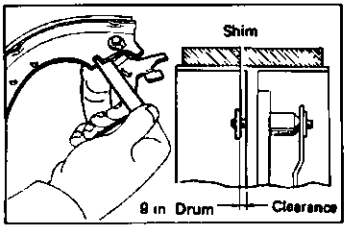
3 INSPECT BRAKE LINING AND DRUM FOR PROPER CONTACT

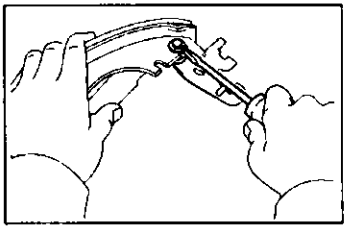
Replace the brake shoe or lathe the brake drum as necessary

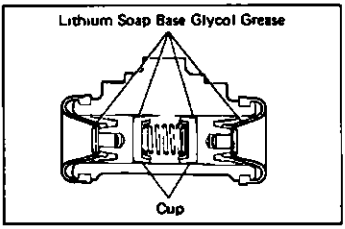
4. INSPECT WHEEL CYLINDER FOR CORROSION OR DAMAGE

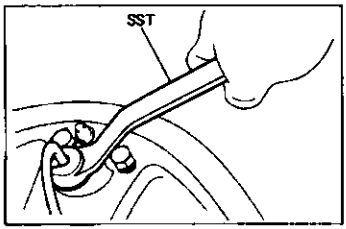
5 INSPECT BACKING PLATE FOR WEAR OR DAMAGE











6. **MEASURE CLEARANCE BETWEEN BRAKE SHOE AND LEVER**

Using a feeler gauge, measure the clearance

Standard clearance: 0 – 0.35 mm (0 – 0.0138 in.)

If the clearance is not within specification, replace the shim with one of the correct size

Shim thickness mm (in.)

Thickness	Thickness
0.2 (0.008)	0.5 (0.020)
0.3 (0.012)	0.6 (0.024)
0.4 (0.016)	0.9 (0.035)

7. **IF NECESSARY, CHANGE SHIM**

(a) Remove the C-washer from the rear shoe

(b) Install the correct size shim.

(c) Install the parking brake lever with a new C-washer

ASSEMBLY OF REAR BRAKE

(See page BR-29)

1. **ASSEMBLE WHEEL CYLINDER**

(a) Apply lithium soap base glycol grease to the piston cups

(b) Install the spring and two piston cups in the wheel cylinder.

CAUTION: Make sure the flanges of the cups are pointed inward

(c) Apply lithium soap base glycol grease to the inside of the boots

(d) Install the two boots to the pistons and install them into the cylinder.

2. **INSTALL WHEEL CYLINDER ON BACKING PLATE**

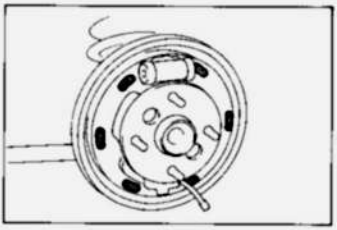
(a) Install the wheel cylinder on the backing plate with two bolts Torque the bolts.

Torque: 100 kg-cm (7 ft-lb)

(b) Using SST, connect the brake tube

SST 09751-36011

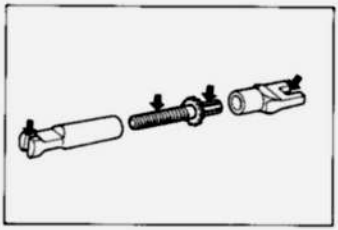
Torque: 155 kg-cm (11 ft-lb)



3. APPLY HIGH-TEMPERATURE TYPE GREASE TO FOLLOWING PARTS:

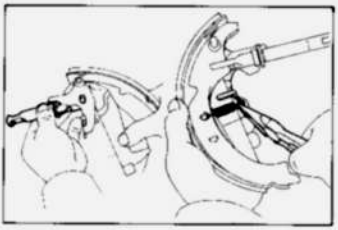
(a) Backing plate and brake shoe contact points

(b) Anchor plate and brake shoe contact points



(c) Strut and adjusting bolt contact points

(d) Strut and brake shoe contact points

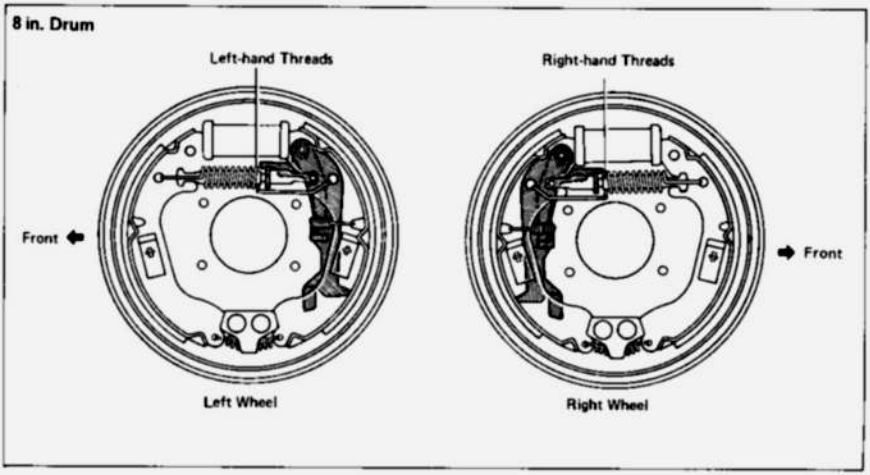


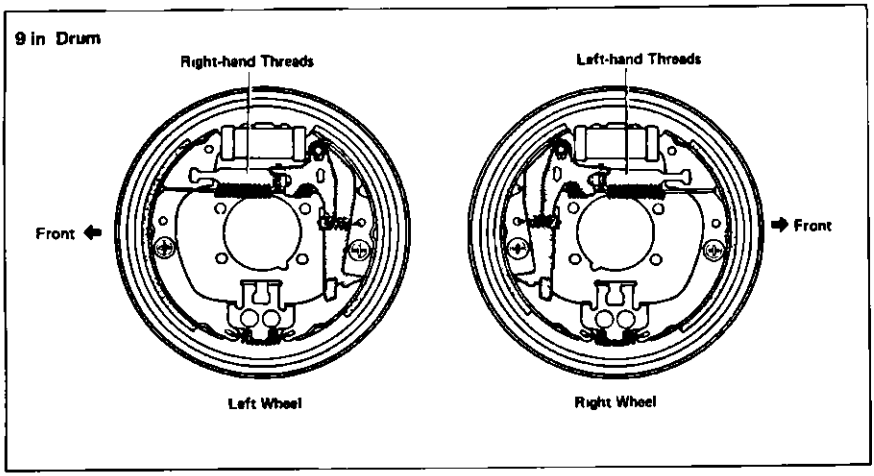
4. INSTALL STRUT ONTO REAR SHOE

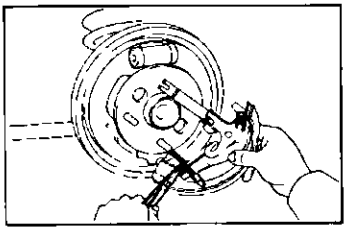
(a) Install the strut.

(b) Install the adjusting lever spring.
(8 in. Drum)

(c) Install the return spring to the strut.

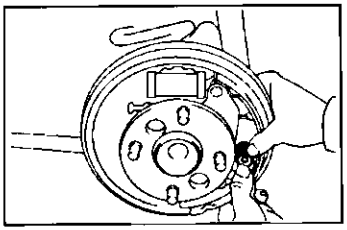






5. INSTALL REAR SHOE

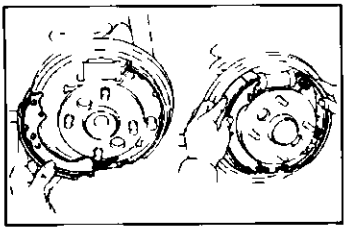
(a) Connect the parking brake cable to the lever



(b) Set the rear shoe in place with the end of the shoe inserted in the wheel cylinder and the other end in the anchor plate

(c) Install the pin and the shoe hold-down spring

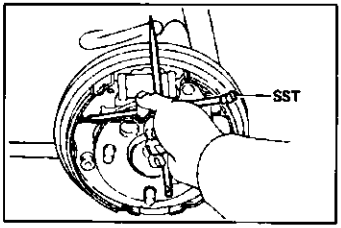
CAUTION: Do not allow oil or grease to get on the rubbing face.



6. INSTALL FRONT SHOE

(a) Install the anchor spring between the front and rear shoes

(b) Set the front shoe in place with the end of the shoe inserted in the wheel cylinder and the strut.

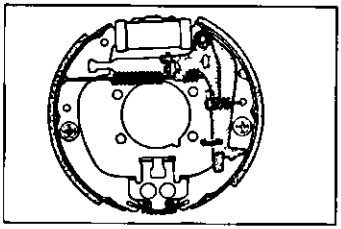


(c) Install the shoe hold-down spring and pin

(d) Using SST, install the return spring.

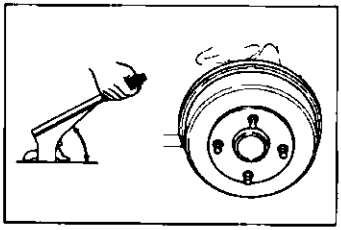
SST 09703 30010

CAUTION. Do not apply oil, grease or such to the shoe surfaces.



7. CHECK OPERATION OF AUTOMATIC ADJUSTER MECHANISM

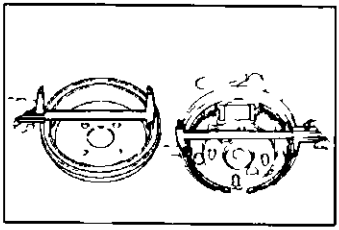
(a) Check that the adjusting bolt turns when the parking brake lever is pulled
If the bolt does not turn, check for incorrect installation of the rear brakes



(b) Adjust the strut to the shortest possible length

(c) Install the drum

(d) Pull the parking brake lever all the way up several times



8. CHECK CLEARANCE BETWEEN BRAKE SHOES AND DRUM

(a) Remove the drum

(b) Measure the brake drum inside diameter and the diameter of the brake shoes. Check that the difference between the diameters equals the correct shoe clearance

Shoe clearance: 0.6 mm (0.024 in.)

If incorrect, check the parking brake system

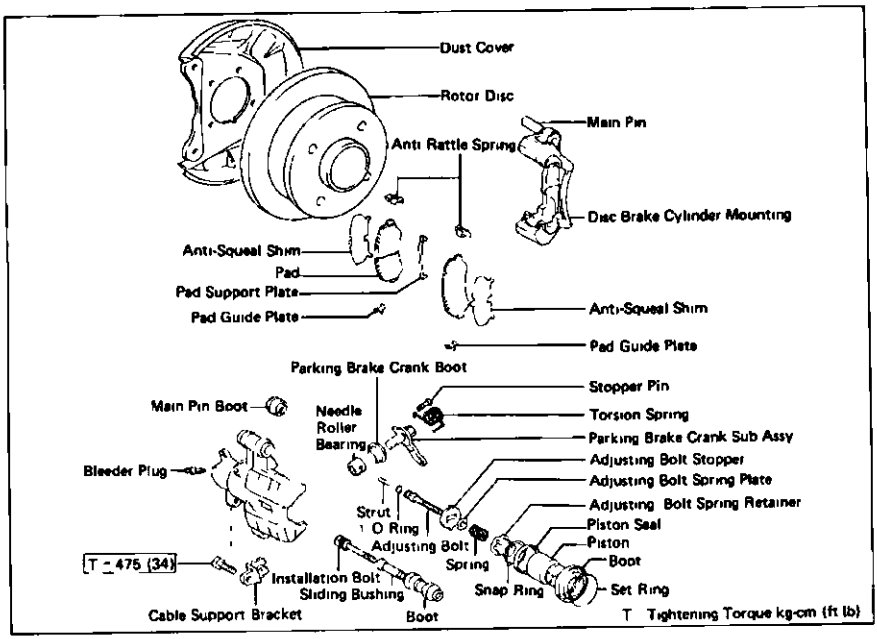
9. INSTALL BRAKE DRUM AND REAR WHEEL

10. FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM (See page BR 7)

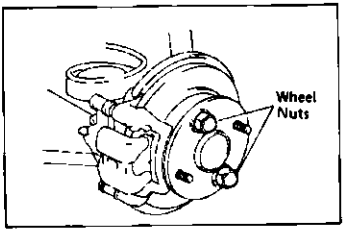
11. CHECK FOR FLUID LEAKAGE

REAR BRAKE (Disc Type)

COMPONENTS

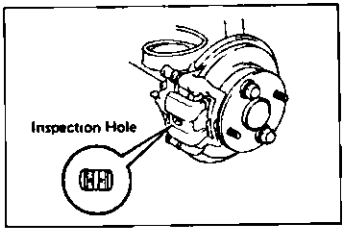


REPLACEMENT OF BRAKE PADS



1 REMOVE REAR WHEEL

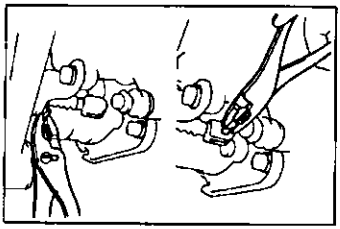
Remove the wheel and temporarily fasten the rotor disc with the wheel nuts



2. INSPECT PAD LINING THICKNESS

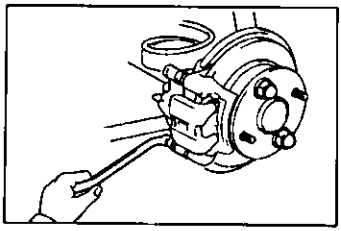
Check the pad thickness through the cylinder inspection hole and replace the pads if not within specification.

Standard thickness. 9.5 mm (0.374 in.)
Minimum thickness. 1.0 mm (0.039 in.)

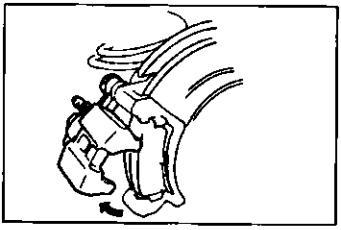


3. **DRAW OUT A SMALL AMOUNT OF BRAKE FLUID**

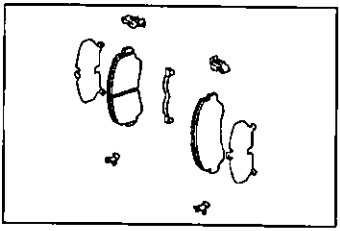
4. **DISCONNECT PARKING BRAKE CABLE**
   (a) Using pliers, remove the clip, cotter pin and hole pin.
   (b) Pull out the cable from the parking brake cable bracket



5. **REMOVE CYLINDER INSTALLATION BOLT**



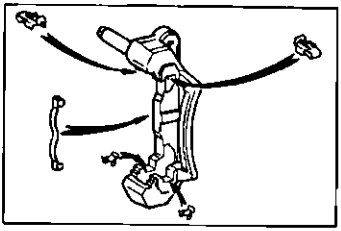
6. **LIFT UP CYLINDER**
   NOTE Do not remove the cylinder from the main pin



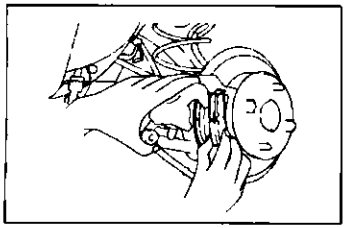
7. **REMOVE FOLLOWING PARTS:**
   (a) Brake pads
   (b) Anti squeal shims
   (c) Anti rattle springs
   (d) Pad support plate
   (e) Pad guide plates

8. **CHECK ROTOR DISC THICKNESS**
   (See step 2 on page BR-41)

9. **CHECK ROTOR DISC RUNOUT**
   (See step 3 on page BR-41)

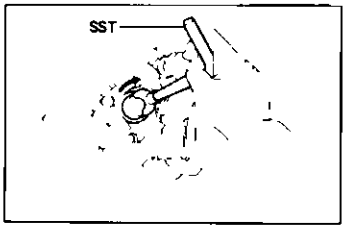


10. **INSTALL NEW PAD SUPPORT PLATE, ANTI-RATTLE SPRINGS AND PAD GUIDE PLATES**



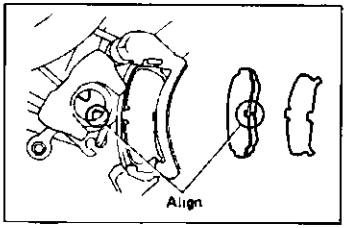
11. INSTALL NEW PADS AND NEW ANTI-SQUEAL SHIMS
    (a) Install the anti squeal shims to the pads
    (b) Raise the cylinder, and install the pads to the cylinder mounting.

    CAUTION: Do not allow oil or grease to get on the rubbing face.



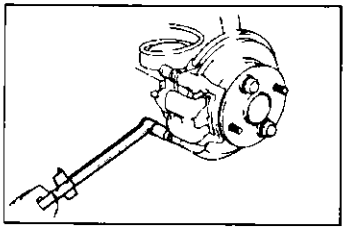
12. LOWER CYLINDER
    (a) Using SST, slowly turn the piston clockwise while pushing it in to where it locks.

    SST 09719-14020



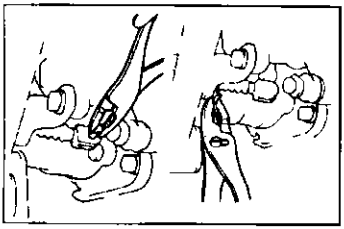
    (b) Fit the pad protrusion into the piston stopper groove, and install the cylinder

    NOTE Insert the cylinder carefully so the boot is not wedged



13. INSTALL CYLINDER INSTALLATION BOLT
    Install and torque the cylinder installation bolt

    Torque. 200 kg-cm (14 ft-lb)

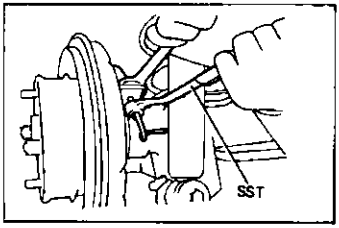


14. CONNECT PARKING BRAKE CABLE
    Using pliers, install the hole pin, cotter pin and clip to the parking brake cable bracket

15. ADJUST PARKING BRAKE AUTOMATIC ADJUSTER BY FULLY PULLING AND RELEASING PARKING BRAKE LEVER

16. INSTALL REAR WHEEL

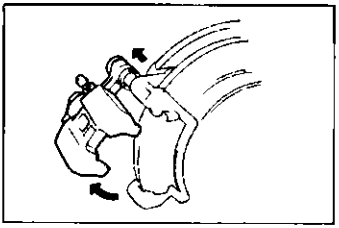
17. CHECK THAT FLUID LEVEL IS AT "MAX" LINE

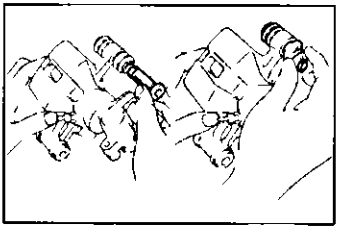


REMOVAL OF CYLINDER

(See page BR-36)

1. DISCONNECT BRAKE HOSE FROM BRAKE TUBE
   (a) Using SST and a spanner, disconnect the brake tube from the hose.
   SST 09751 36011
   (b) Use a container to catch the brake fluid
2. DISCONNECT BRAKE HOSE FROM CYLINDER
3. REMOVE PADS (See step 4 to 7 on page BR-37)
4. REMOVE CYLINDER
   (a) Remove the main pin boot (mounting side)
   (b) Lift up and push out the cylinder from the main pin

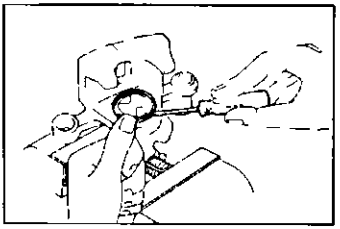




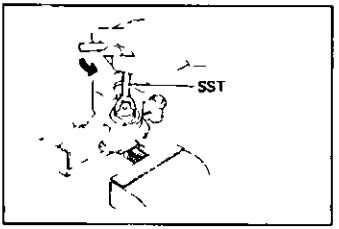
DISASSEMBLY OF CYLINDER

(See page BR-36)

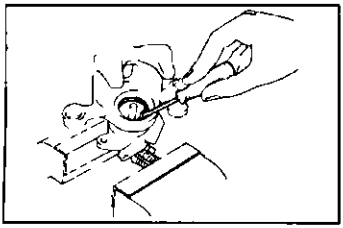
1. REMOVE SLIDING BUSHING AND BOOT



2. REMOVE CYLINDER BOOT SET RING AND CYLINDER BOOT
   Using a screwdriver, remove the cylinder boot set ring and cylinder boot

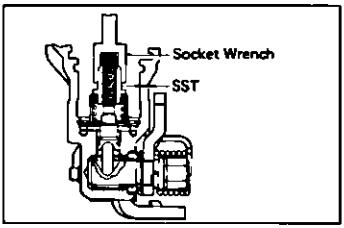


3. REMOVE PISTON FROM CYLINDER
   Using SST, turn the piston counter clockwise and remove it
   SST 09719-14020



4. **REMOVE PISTON SEAL FROM CYLINDER**

Using a screwdriver, remove the piston seal



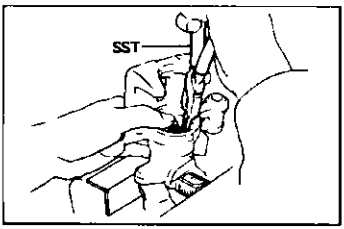
5. **REMOVE SNAP RING FROM CYLINDER**

(a) Set SST onto the adjusting nut, and lightly tighten it with a 14 mm socket.

SST 09756-00010

CAUTION:

- To insure safety, always use SST as there is a possibility of the spring flying out, causing injury or damage to the interior surface of the cylinder
- Be careful not to tighten the SST too tight as might damage the spring retainer.

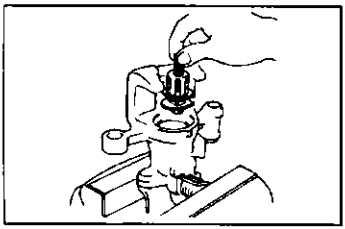


(b) Using SST or snap ring pliers, remove the snap ring from the cylinder

SST 09905-00013

(c) Remove the SST

SST 09756-00010



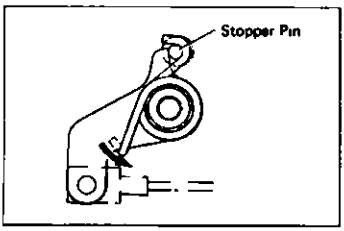
6. **REMOVE ADJUSTING BOLT**

From the cylinder, pull out the spring retainer, spring, spring plate and stopper together with the adjusting bolt.

CAUTION:

- Be careful not to pry too hard.
- Be careful not to damage the O-ring.

7. **REMOVE STRUT**

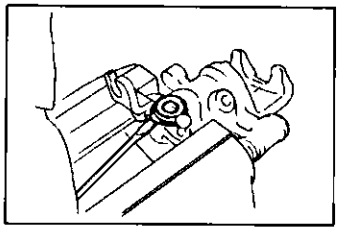


8 **REMOVE TORSION SPRING FROM PARKING BRAKE CRANK**

9. **REMOVE PARKING BRAKE CRANK FROM CYLINDER**

Turn the crank to where it will not catch on the stopper pin, and pull it out from the cylinder

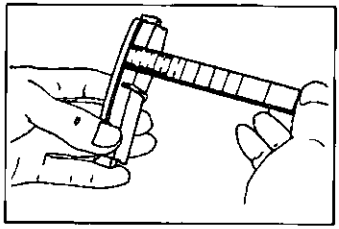
NOTE Do not attempt to disassemble the crank from the sub assembly state Even if the nut is removed, the lever is pressure fitted to the pin so it cannot be disassembled



10. REMOVE PARKING BRAKE CRANK BOOT

Using a screwdriver, lightly tap on the metal portion of the boot to remove it

NOTE Do not remove the boot unless replacing it

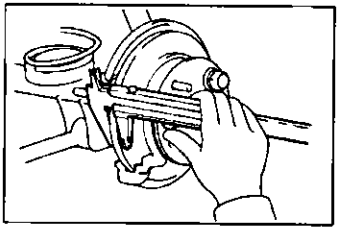


INSPECTION OF REAR BRAKE COMPONENTS

1 MEASURE PAD LINING THICKNESS

Standard thickness: 9.5 mm (0.374 in.)
Minimum thickness: 1.0 mm (0.039 in.)

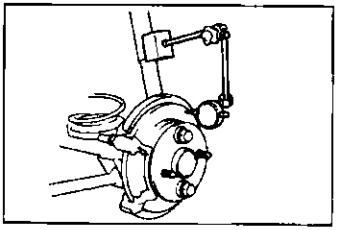
Replace the pad if the thickness is less than the minimum (the 1.0 mm slit is no longer visible) or if it shows sign of uneven wear



2. MEASURE ROTOR DISC THICKNESS

Standard thickness: 10.0 mm (0.394 in.)
Minimum thickness: 9.0 mm (0.354 in.)

If the disc is scored or worn, or if thickness is less than minimum, repair or replace the disc

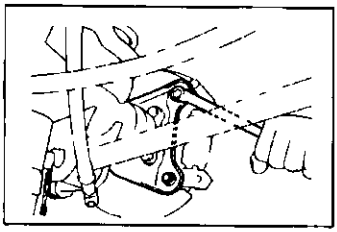


3 MEASURE ROTOR DISC RUNOUT

Measure the rotor disc runout at 10 mm (0.39 in.) from the outer edge of the rotor disc

Maximum disc runout: 0.15 mm (0.0059 in.)

If the runout is greater than the maximum, replace the disc



4. IF NECESSARY, REPLACE ROTOR DISC

(a) Remove the disc brake cylinder mounting from the dust cover

(b) Remove the hub nuts and rotor disc

(c) Install a new rotor disc and temporarily fasten the disc with wheel nuts

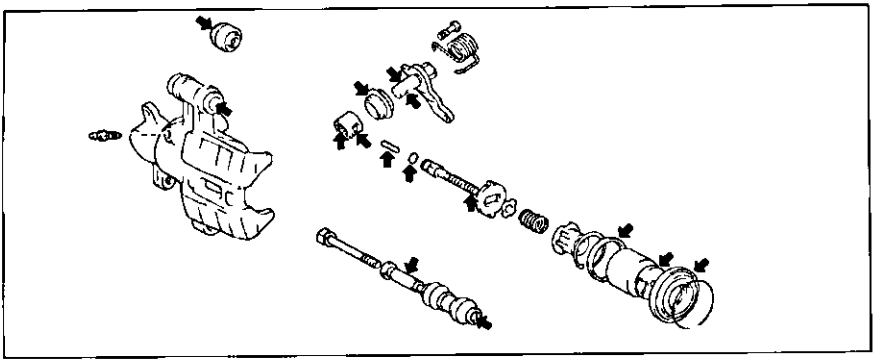
(d) Install the disc brake cylinder mounting to the dust cover

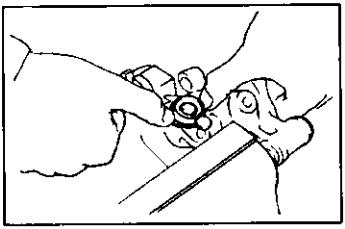
Torque: 475 kg-cm (34 ft-lb)

ASSEMBLY OF CYLINDER

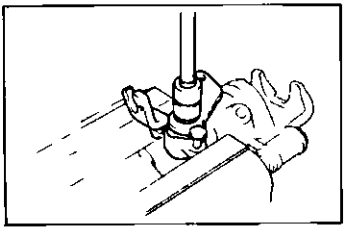
(See page BR-36)

1. APPLY LITHIUM SOAP BASE GLYCOL GREASE TO PARTS INDICATED BY ARROWS





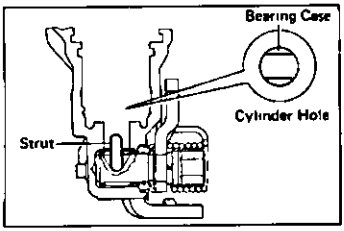
2. INSTALL PARKING BRAKE CRANK BOOT IN CYLINDER



3. INSTALL PARKING BRAKE CRANK IN CYLINDER

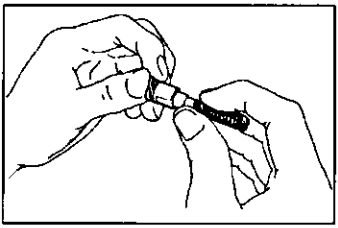
CAUTION: Securely match the crank boot with the groove of the crank seal.

4. INSTALL TORSION SPRING

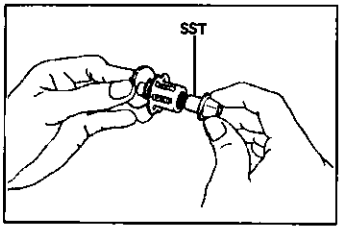


5. INSTALL STRUT

Before installing the strut, adjust the rollers of the needle roller bearing so they do not catch on the cylinder hole



6. INSTALL A NEW O RING TO ADJUSTING BOLT



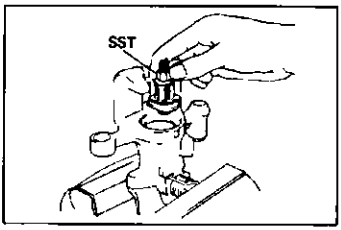
7. ASSEMBLE ADJUSTING BOLT

(a) Assemble the stopper, washer, spring and spring case to the adjusting bolt and, using SST, fully tighten them down by hand

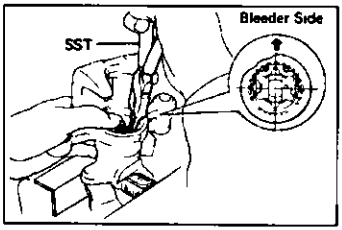
SST 09756-00010

CAUTION:

- Position the inscribed surface of the stopper upward.
- Align the notches of the spring case with the notches of the stopper.



(b) Install the adjusting bolt sub-assy in the cylinder



8. INSTALL SNAP RING

(a) Using SST or snap ring pliers, install the snap ring

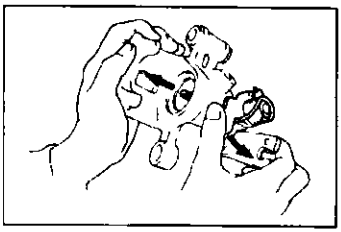
SST 09905-00013

NOTE Face the snap ring opening toward the bleeder side

(b) Remove the SST

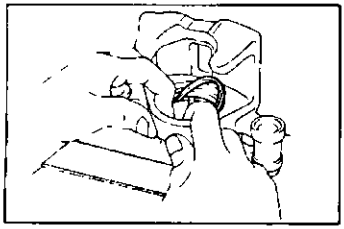
SST 09756-00010

(c) Pull up strongly on the adjusting bolt by hand and insure that it does not move

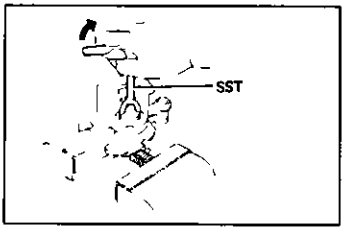


9. PERFORM OPERATIONAL CHECK

After performing steps 1 to 8, move the parking brake crank by hand and insure that the adjusting bolt moves smoothly



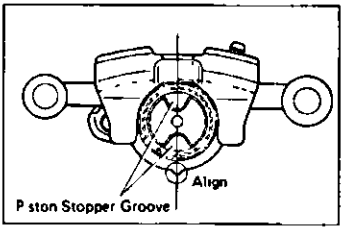
10 INSTALL PISTON SEAL IN CYLINDER



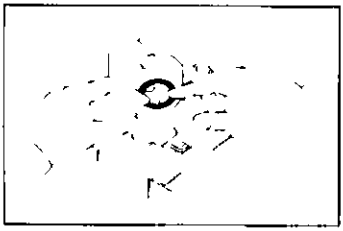
11. ASSEMBLE PISTON IN CYLINDER

(a) Using SST, slowly screw in the piston clockwise to where it will not descend any further

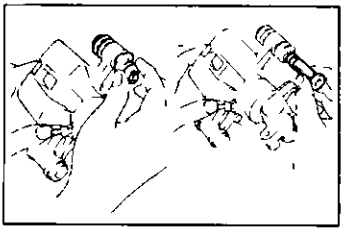
SST 09719 14020



(b) Align the center of the piston stopper groove with the positioning protrusion of the cylinder



12. INSTALL CYLINDER BOOT AND SET RING IN CYLINDER

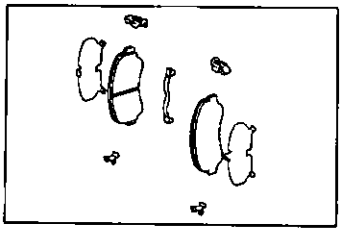


13 INSTALL DUST BOOT AND SLIDING BUSHING

(a) Install the dust boot

NOTE Be careful that the seal does not fold under

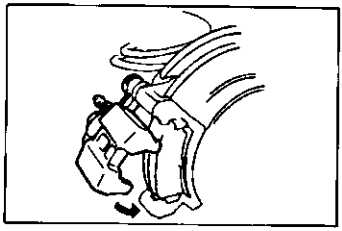
(b) Install the bushing into the boot, facing the flange toward the inside



INSTALLATION OF CYLINDER

(See page BR-36)

1. INSTALL FOLLOWING PARTS.
   (a) Pad guide plates
   (b) Pad support plate
   (c) Anti rattle springs
   (d) Brake pads
   (e) Anti squeal shims

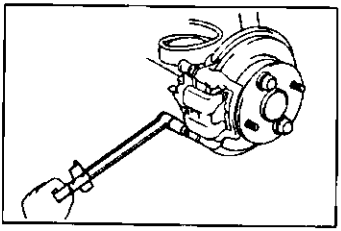


2. INSTALL CYLINDER
   (a) Install the cylinder onto the main pin

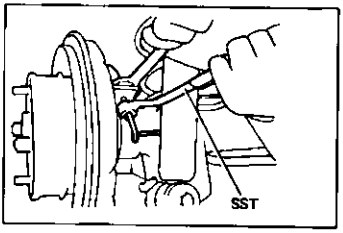
   NOTE Make sure that the boot end is installed into the groove of the main pin

   (b) Install the cylinder so the piston stopper groove fits with the pad protrusion

   NOTE: Work carefully so as not to wedge the boot



3. INSTALL CYLINDER INSTALLATION BOLT
   Install the cylinder installation bolt and torque the bolt
   Torque: 200 kg-cm (14 ft lb)

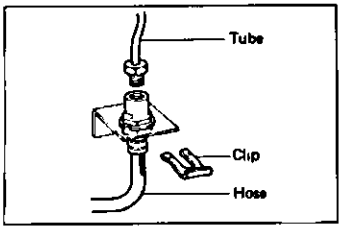


4 CONNECT PARKING BRAKE CABLE
(See step 14 on page BR 38)

5. CONNECT BRAKE HOSE
   (a) Connect the brake hose to the cylinder
   Torque: 235 kg-cm (17 ft-lb)
   (b) Using SST, connect the brake hose to the brake tube
   SST 09751-36011
   Torque. 156 kg-cm (11 ft-lb)

6. FULL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM (See page BR-7)

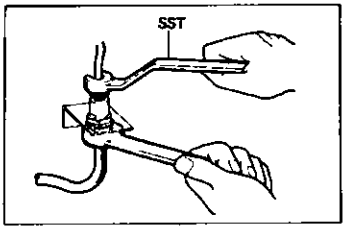
7 CHECK FOR FLUID LEAKAGE



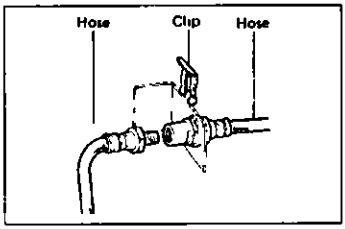
BRAKE HOSES AND TUBES

DISCONNECT AND CONNECT HOSE AND TUBE

1. DISCONNECT HOSE AND TUBE
   (a) Disconnect the clip.
   (b) Using a wrench to hold the hose and SST to hold the tube, disconnect the tube and hose
   SST 09751 36011

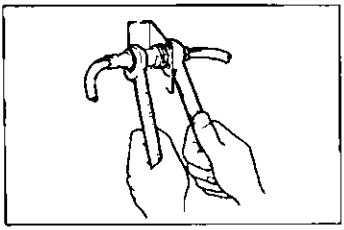


2. CONNECT HOSE AND TUBE
   (a) Connect the hose and tube by hand
   (b) Using a wrench to hold the hose and SST to hold the tube, torque the connection
   SST 09751-36011
   Torque: 155 kg-cm (11 ft-lb)
   (c) Install a new hose clip

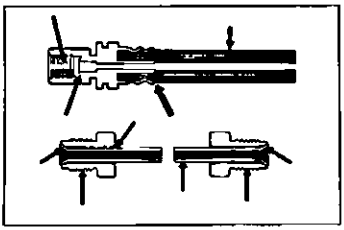


DISCONNECT AND CONNECT TWO HOSES

1. DISCONNECT TWO HOSES
   (a) Remove the clip
   (b) Using two wrenches, disconnect the two hoses



2 CONNECT TWO HOSES
   (a) Connect the two hoses by hand
   (b) Using two wrenches, torque the connection
   Torque. 235 kg cm (17 ft-lb)
   NOTE All hoses must be free from excessive bending, twisting and pulling
   (c) Install a new hose clip



INSPECTION OF BRAKE HOSES AND TUBES

1. INSPECT BRAKE HOSES
   (a) Inspect the hose for damage, cracks or swelling
   (b) Inspect the threads for damage

2. INSPECT BRAKE TUBES
   (a) Inspect the tube for damage, cracks, dents or corro sion
   (b) Inspect the threads for damage

STEERING

	Page
PRECAUTIONS	SR-2
TROUBLESHOOTING	SR-2
ON-VEHICLE INSPECTION	SR 3
STEERING MAIN SHAFT WITH TILT STEERING	SR-3
STEERING GEAR HOUSING	SR-11
POWER STEERING	SR 21
On-Vehicle Inspection	SR 21
Bleeding of Power Steering System	SR-23
Oil Pressure Check	SR-23
Vane Pump	SR-25
Gear Housing	SR 33

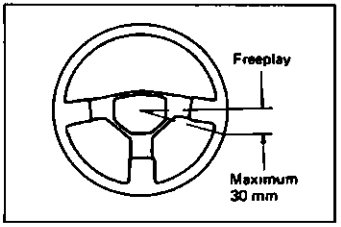
SR

PRECAUTIONS

Care must be taken to replace each part properly because it could affect the performance of the steering system and result in a driving hazard

TROUBLESHOOTING

Problem	Possible cause	Remedy	Page
Hard steering	Tires improperly inflated	Inflate tires to proper pressure	
	Insufficient lubricant	Lubricate suspension and steering linkage	
	Excessive caster	Check front end alignment	FA 3
	Steering system joint worn	Replace steering system joint	SR 11, 33
	Lower arm ball joints worn	Replace lower arm ball joints	FA 14
	Steering column binding	Inspect steering column	SR 3
	Steering gear out of adjustment or broken	Adjust or repair steering gear	SR 11, 33
	Power steering belt loose	Adjust belt	SR 21
	Fluid level in reservoir low	Check reservoir	SR 21
	Power steering unit faulty	Check power steering unit	SR 21
Poor return	Tires improperly inflated	Inflate tires to proper pressure	
	Insufficient lubricant	Lubricate suspension and steering linkage	
	Wheel alignment incorrect	Check front end alignment	FA 3
	Steering column binding	Inspect steering column	SR 3
	Steering gear out of adjustment or broken	Adjust or repair steering gear	SR 11, 33
Excessive play	Front wheel bearing worn	Replace front wheel bearing	FA-6
	Main shaft yoke or intermediate shaft yoke worn	Replace main shaft or intermediate shaft	SR 3
	Lower arm ball joints worn	Replace lower arm ball joints	FA 14
	Steering system joints worn	Replace steering system joints	SR 11, 33
	Steering gear out of adjustment or broken	Adjust or repair steering gear	SR 11, 33
Abnormal noise	Steering linkage loose	Tighten steering linkage	
	Steering system joints worn	Replace steering system joints	SR 11, 33
	Steering gear out of adjustment or broken	Adjust or repair steering gear	SR 11, 33



ON-VEHICLE INSPECTION

1 **CHECK THAT STEERING WHEEL FREEPLAY IS CORRECT**

With the vehicle stopped and pointed straight ahead, rock the steering wheel gently back and forth with light finger pressure Freeplay should not exceed the maximum limit

Maximum play. 30 mm (1.18 in.)

If incorrect, repair

2. **CHECK STEERING LINKAGE AND GEAR HOUSING**

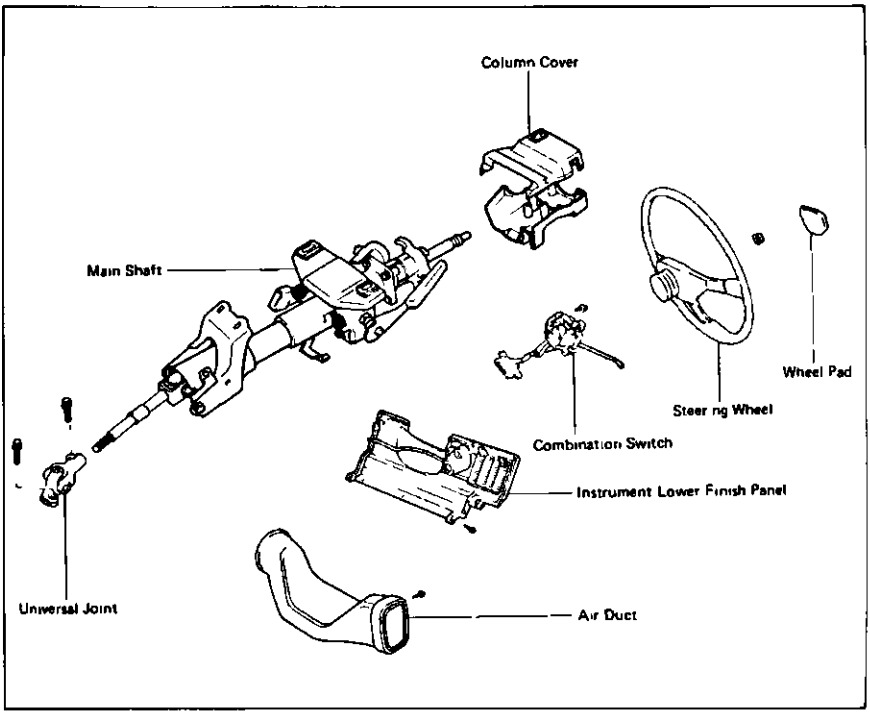
(a) Check the steering linkage for looseness or damage Check that

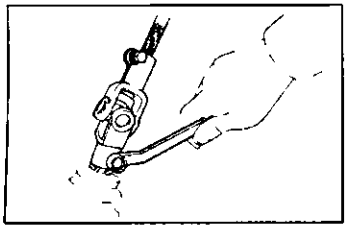
- Tie rod ends do not have excessive play
- Boots are not damaged.
- Boot clamps are not loose

(b) Check gear housing for grease leakage or oozing

STEERING MAIN SHAFT WITH TILT STEERING

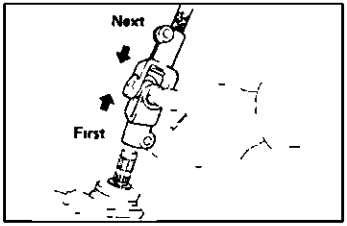
REMOVAL OF STEERING MAIN SHAFT



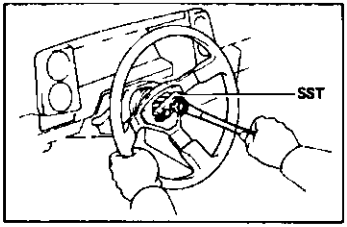


1 REMOVE NEGATIVE CABLE FROM BATTERY

2. REMOVE UNIVERSAL JOINT
   (a) Remove the two set bolts.



   (b) First pull the universal joint from the gear housing, and then pull it out from the main shaft



3 REMOVE STEERING WHEEL
   (a) Remove the wheel pad
   (b) Remove the steering wheel nut.
   (c) Using SST, remove the steering wheel
   SST 09609 20011

4. REMOVE INSTRUMENT LOWER FINISH PANEL, AIR DUCT AND COLUMN LOWER COVER

5 DISCONNECT IGNITION SWITCH CONNECTOR

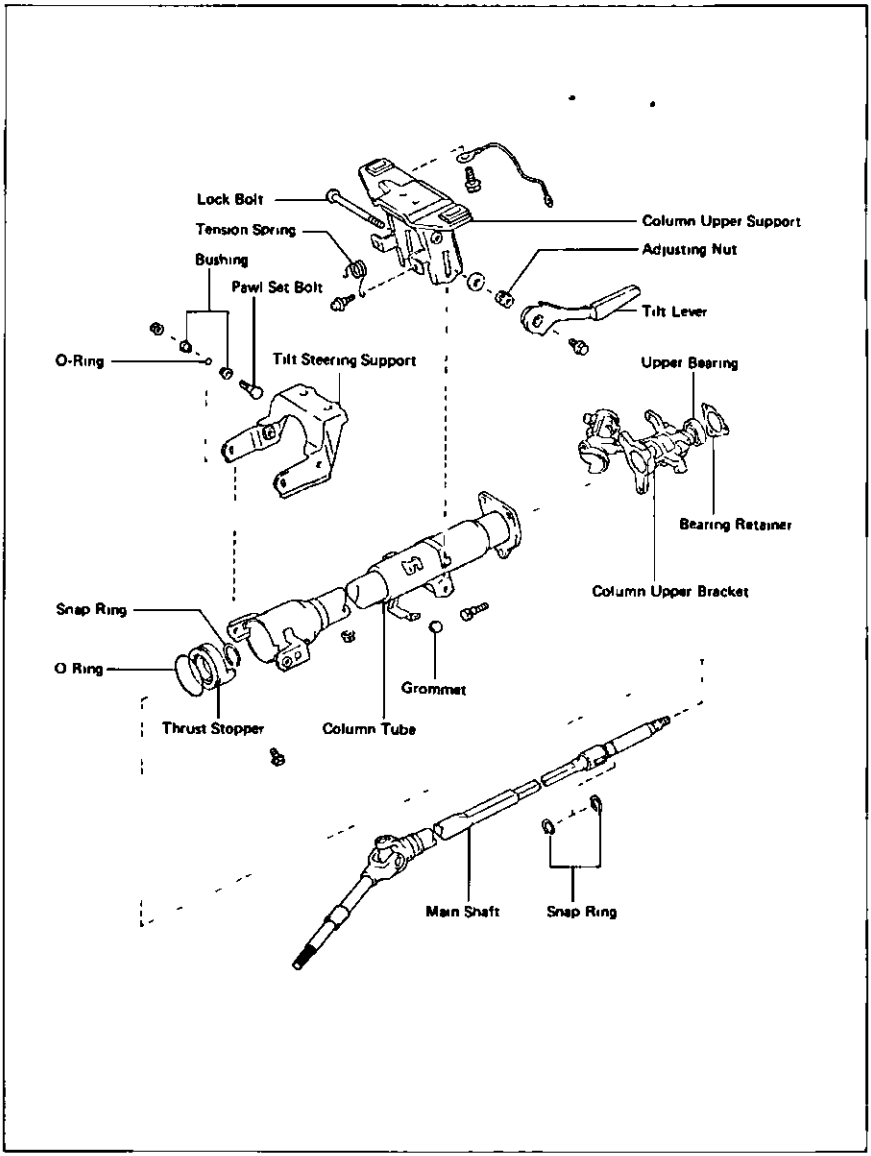
6. REMOVE COMBINATION SWITCH WITH COLUMN UPPER COVER

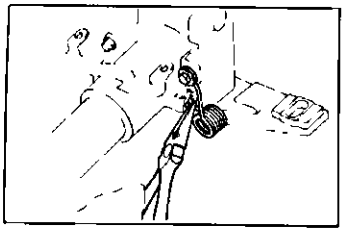
7. LOOSEN HOLE COVER CLAMP BOLT



8. REMOVE MAIN SHAFT
   (a) Remove the support mounting nuts
   (b) Pull out the main shaft

COMPONENTS

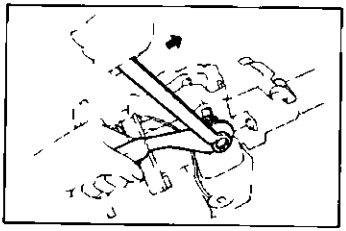

Lock Bolt
Tension Spring
Bushing
Pawl Set Bolt
O-Ring
Tilt Steering Support
Column Upper Support
Adjusting Nut
Tilt Lever
Upper Bearing
Bearing Retainer
Column Upper Bracket
Snap Ring
O Ring
Thrust Stopper
Column Tube
Grommet
Main Shaft
Snap Ring



DISASSEMBLY OF STEERING MAIN SHAFT AND TILT MECHANISM

(See page SR-5)

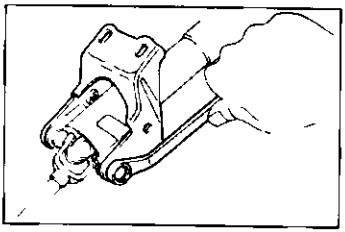
1. REMOVE TENSION SPRINGS AND GROMMETS



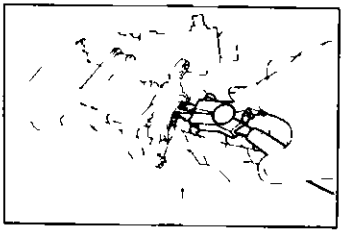
2. REMOVE COLUMN UPPER SUPPORT
   (a) Remove the set bolt and tilt lever

   NOTE The bolt has LH threads

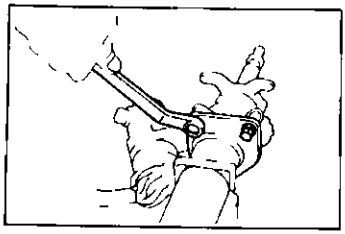
   (b) Remove the adjusting nut and washer.
   (c) Pull out the lock bolt and remove the column upper support.
   (d) Remove the connector bracket



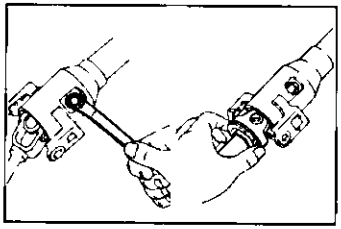
3 REMOVE TILT STEERING SUPPORT
   (a) Remove the two nuts and the pawl set bolts
   (b) Remove the bushings, O rings and tilt steering support



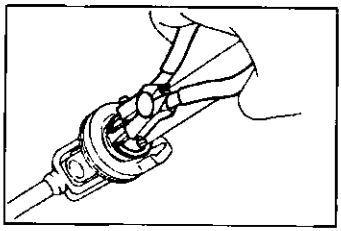
4. REMOVE UPPER BRACKET FROM MAIN SHAFT
   (a) Remove the three screws and retainer from the upper bracket
   (b) Using snap ring pliers, remove the snap ring
   (c) Release the steering lock
   (d) Remove the tapered-head bolt by tapping on it with a hammer and punch



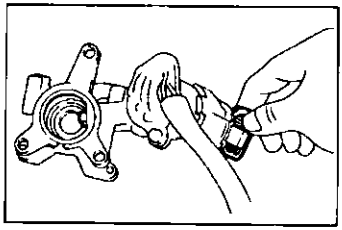
   (e) Remove the three bolts, and separate the upper bracket and column tube



5. REMOVE MAIN SHAFT FROM COLUMN TUBE
   (a) Remove the two bolts
   (b) Pull out the main shaft from the column tube

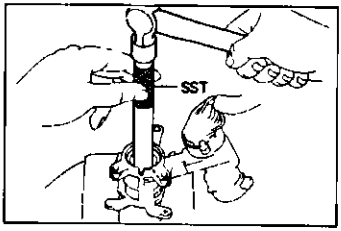


6. REMOVE THRUST STOPPER ASSEMBLY
   (a) Using snap ring pliers, remove the snap ring
   (b) Remove the thrust stopper assembly

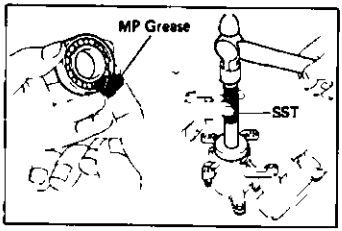


INSPECTION AND REPAIR OF STEERING MAIN SHAFT

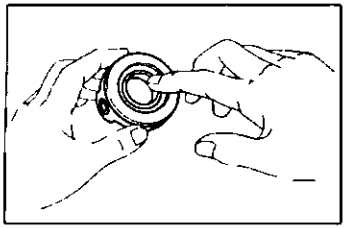
1. INSPECT UPPER BRACKET
   (a) Check that the steering lock mechanism operates properly
   (b) Check the upper bearing rotation condition and check for abnormal noise



2. IF NECESSARY, REPLACE UPPER BEARING
   (a) Using SST, tap out the bearing
   SST 09620 30010



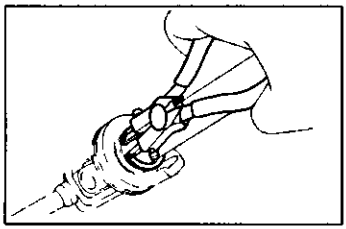
   (b) Pack a new bearing with MP grease
   (c) Using SST, tap in the new bearing
   SST 09620 30010



3 **INSPECT LOWER BEARING**

Check the bearing rotation condition and for abnormal noise

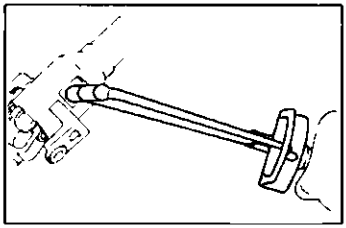
If faulty, replace the thrust stopper assembly



ASSEMBLY OF STEERING MAIN SHAFT AND TILT MECHANISM

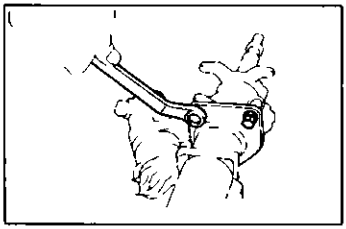
(See page SR-5)

1. **INSTALL THRUST STOPPER ASSEMBLY**
   (a) Install the thrust stopper assembly.
   (b) Using snap ring pliers, install the snap ring



2. **INSTALL MAIN SHAFT TO COLUMN TUBE**
   (a) Apply molybdenum disulphide lithium base grease to the thrust stopper
   (b) Install the main shaft and torque the bolts

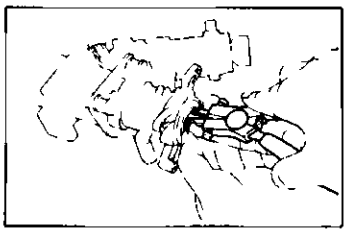
   Torque: 130 kg-cm (9 ft lb)



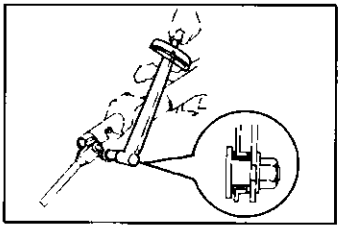
3 **INSTALL UPPER BRACKET TO MAIN SHAFT**
   (a) Release the steering lock
   (b) Install the upper bracket
   (c) Torque the two bolts

   Torque: 195 kg-cm (14 ft-lb)

   (d) Install the tapered head bolt and tighten it until the bolt head breaks off



   (e) Using snap ring pliers, install a new snap ring
   (f) Install the retainer to the upper bracket with the three screws.



4. INSTALL TILT STEERING SUPPORT

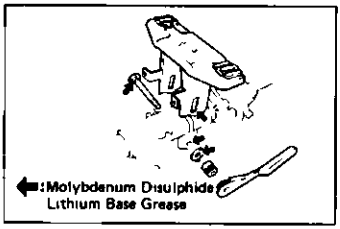
(a) Apply molybdenum disulphide lithium base grease to the bushings and O-rings, and install the two bushings to the column tube.

(b) Install the tilt steering support and pawl set bolts with the bushings and O-rings

NOTE. Be careful not to damage the bushings and O ring

(c) Torque the nuts

Torque. 120 kg-cm (9 ft-lb)



5. INSTALL COLUMN UPPER SUPPORT

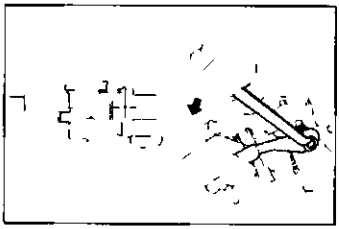
(a) Apply grease to the portions indicated by the arrows

(b) Install the column upper support and lock bolt

(c) Install the washer and torque the adjusting nut.

Torque: 95 kg-cm (82 in -lb)

If there is any play in the support, tighten the adjusting nut to eliminate the play

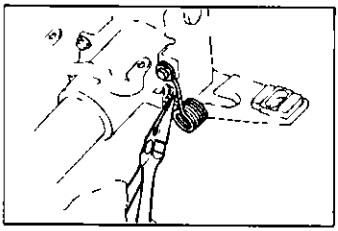


(d) Place the tilt lever in position and torque the set bolt

Torque· 340 kg-cm (25 ft-lb)

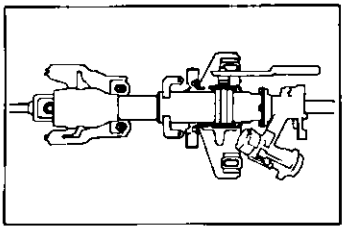
NOTE The bolt has LH threads

(e) Install the connector bracket



6. INSTALL TENSION SPRINGS AND GROMMETS

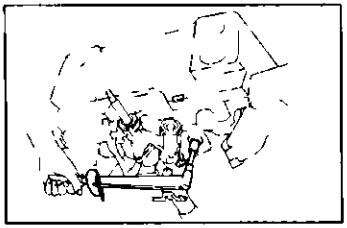
7. CHECK TILT MECHANISM



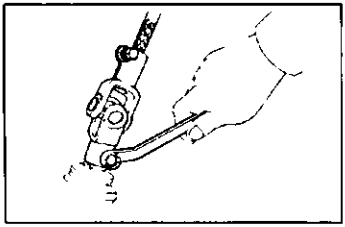
INSTALLATION OF STEERING MAIN SHAFT

(See page SR-3)

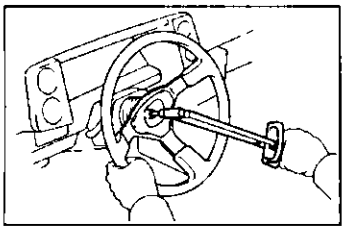
1. PLACE MAIN SHAFT IN INSTALLED POSITION
   (a) Place the main shaft in the hole cover.
   (b) Position the main shaft so the ends of lower support holes and mounting bolts touch.



2. TORQUE TILT STEERING SUPPORT NUTS AND COLUMN UPPER SUPPORT NUTS
   (a) Finger tighten the support mounting nuts
   (b) Torque the tilt steering support nuts
   Torque: 280 kg-cm (20 ft-lb)
   (c) Torque the column upper support nuts
   Torque: 290 kg-cm (21 ft-lb)
3. TORQUE HOLE COVER CLAMP BOLT
4. CONNECT IGNITION SWITCH CONNECTOR
5. INSTALL COMBINATION SWITCH WITH COLUMN UPPER COVER
6. INSTALL COLUMN LOWER COVER, AIR DUCT AND INSTRUMENT LOWER FINISH PANEL
7. INSTALL STEERING WHEEL



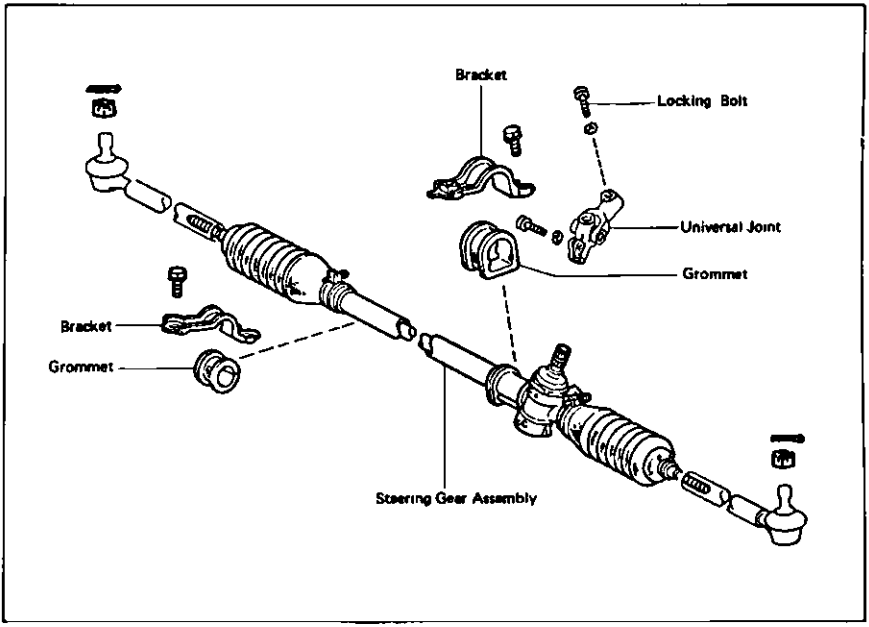
8. INSTALL UNIVERSAL JOINT
   Install the universal joint and torque the two bolts.
   Torque: 380 kg-cm (26 ft-lb)
9. CONNECT NEGATIVE CABLE TO BATTERY
10. CHECK STEERING WHEEL CENTER POINT

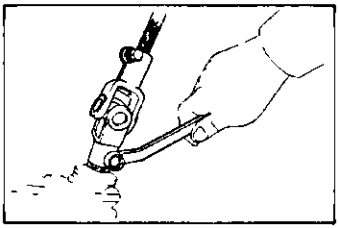


11. TORQUE STEERING WHEEL NUT
    Torque the nut
    Torque: 350 kg-cm (25 ft-lb)

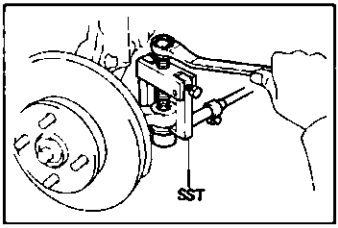
STEERING GEAR HOUSING

REMOVAL OF GEAR HOUSING





1. **REMOVE UNIVERSAL JOINT**
   (a) Remove the two set bolts
   (b) Remove the universal joint

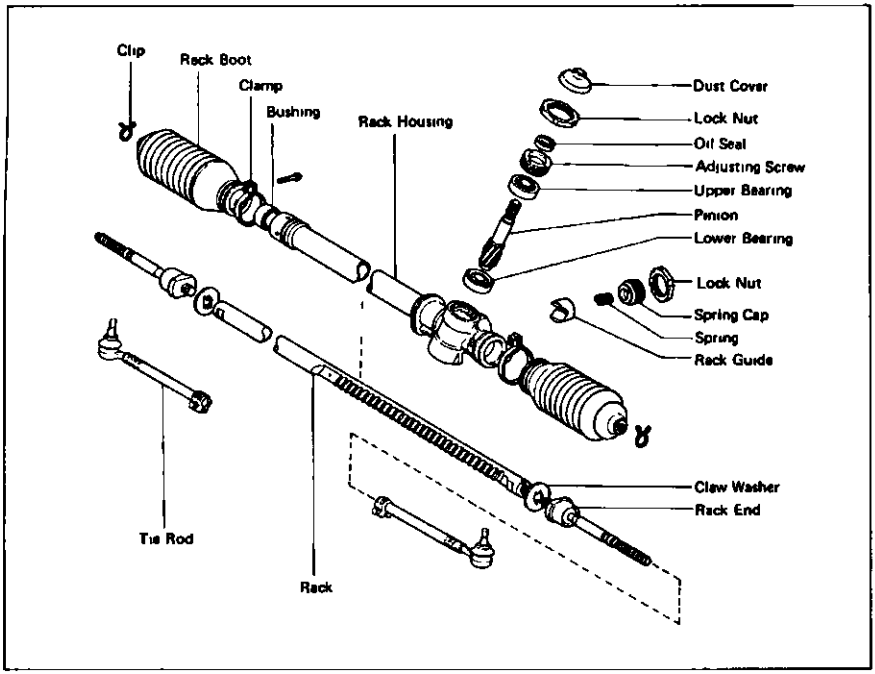


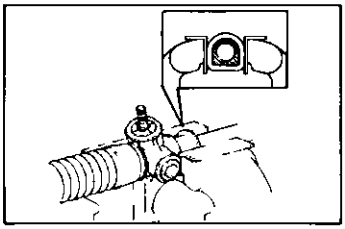
2. **DISCONNECT TIE ROD ENDS**
   (a) Remove the cotter pin and nut holding the knuckle arm to the tie rod
   (b) Using SST, disconnect the knuckle arm from the tie rod end

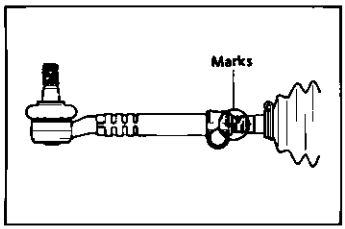
   SST 09628-62011

3. **REMOVE GEAR HOUSING ASSEMBLY**
   (a) Remove the gear housing bracket set bolts
   (b) Remove the gear housing assembly.

COMPONENTS







DISASSEMBLY OF GEAR HOUSING

1. **CLAMP GEAR HOUSING IN VISE**

   NOTE

   - The rack housing is made of aluminum so always use soft jaws on the vise and clamp onto the part shown in the figure
   - If clamping onto the center tube, wrap a piece of cloth around the tube and be careful not to damage the tube.

2. **REMOVE TIE RODS**

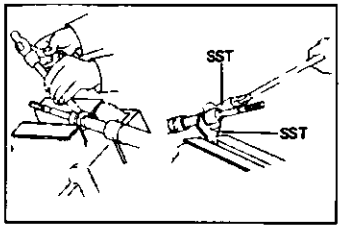
   (a) Place matchmarks on the tie rod and rack end

   (b) Loosen the clamp bolt and remove the tie rod from the rack end

3. **REMOVE CLIPS, CLAMPS AND RACK BOOTS**

   (a) Remove the clip and clamp, and remove the rack boot

   (b) Mark the left and right boots accordingly



4. REMOVE RACK ENDS AND CLAW WASHERS

(a) Unstake the claw washer

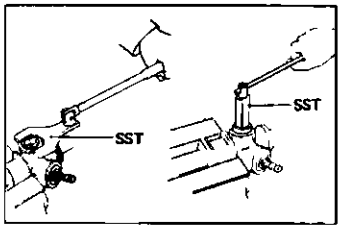
CAUTION: Avoid any impact to the rack

(b) Using SST, remove the rack ends.

SST 09612 10092 and 09612 24011

NOTE Mark the left and right rack ends.

(c) Remove the claw washer.



5. REMOVE RACK GUIDE SPRING CAP LOCK NUT

Using SST, remove the rack guide spring cap lock nut

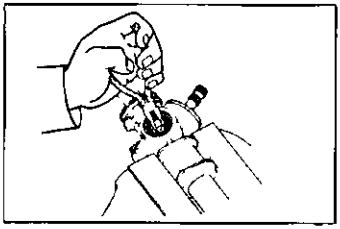
SST 09612 10092

6. REMOVE RACK GUIDE SPRING CAP

Using SST, remove the rack guide spring cap.

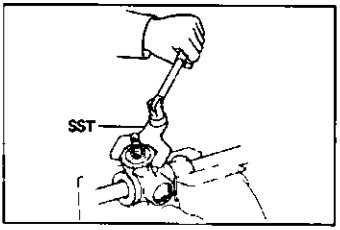
SST 09612 10092

7. REMOVE RACK GUIDE SPRING



8. REMOVE RACK GUIDE

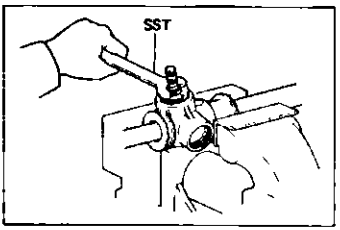
9 REMOVE DUST COVER



10. REMOVE PINION BEARING ADJUSTING SCREW LOCK NUT

Using SST, remove the pinion bearing adjusting screw lock nut

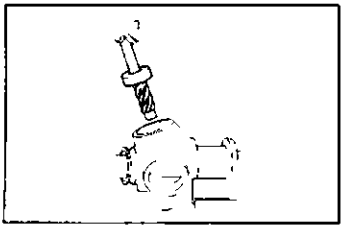
SST 09612 10092



11. REMOVE PINION BEARING ADJUSTING SCREW

Using SST, remove the pinion bearing adjusting screw

SST 09612 10092

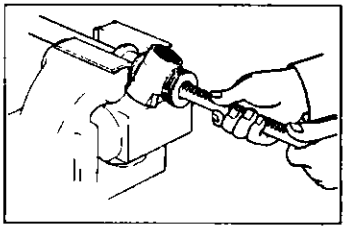


12. REMOVE PINION WITH UPPER BEARING

NOTE Be careful not to damage the serrations

(a) Fully pull the rack from the housing side and align the rack notched portion with the pinion.

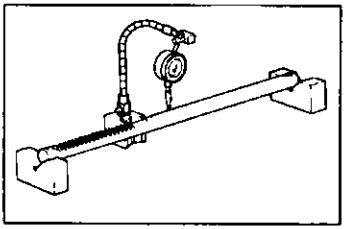
(b) Remove the pinion together with the upper bearing



13. REMOVE RACK

Remove the rack from the pinion side without revolving it

NOTE If the rack is pulled from the tube side there is possibility of damaging the bushing with the rack teeth surface



INSPECTION AND REPAIR OF GEAR HOUSING COMPONENTS

1. INSPECT RACK

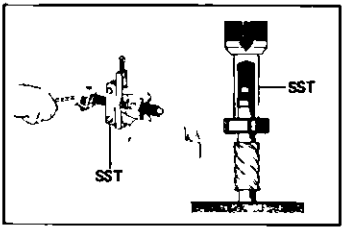
(a) Check the rack for runout and for teeth wear or damage

(b) Check the back surface for wear or damage

If faulty, replace it

Maximum runout. 0.3 mm (0.012 in.)

NOTE Do not use a wire brush when cleaning



2. INSPECT PINION BEARINGS

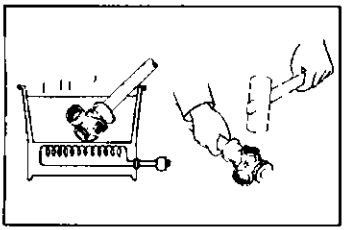
3. IF NECESSARY, REPLACE PINION UPPER BEARING

(a) Remove the upper bearing with SST

SST 09950-20014

(b) Install a new upper bearing with SST

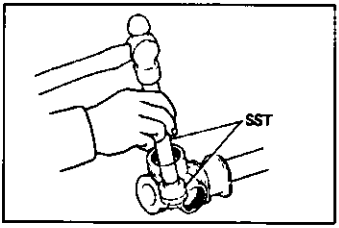
SST 09612-10092



4 IF NECESSARY, REPLACE PINION LOWER BEARING

(a) Heat the rack housing to above 80°C (176°F)

(b) Tap the rack housing with a plastic hammer or such to remove the lower bearing by recoil

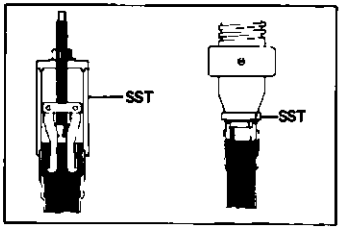


(c) Heat the rack housing to above 80°C (176°F).

(d) Install a new lower bearing with SST

SST 09620 30010

NOTE Observe the correct bearing direction.



5. **IF NECESSARY, REPLACE RACK BUSHING**

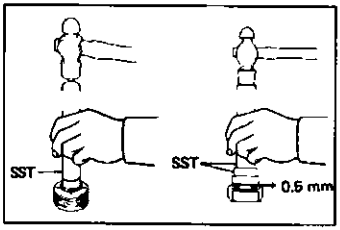
(a) Remove the rack bushing with SST

SST 09612-10092

(b) Install a new rack bushing with SST

SST 09612-10092

Press it in until the rack tube edge surface is even with the SST surface



6. **IF NECESSARY, REPLACE PINION OIL SEAL**

(a) Remove the pinion oil seal with SST

SST 09620 30010 and 09630-24012

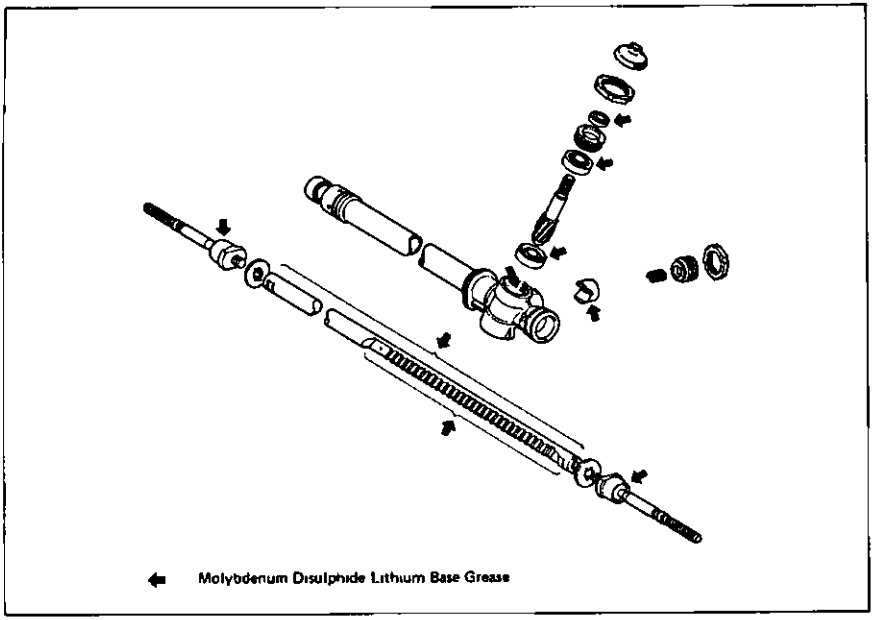
(b) Using SST, drive in a new pinion oil seal until it is protruding 0.5 mm (0.020 in.)

SST 09620-30010 and 09630-24012

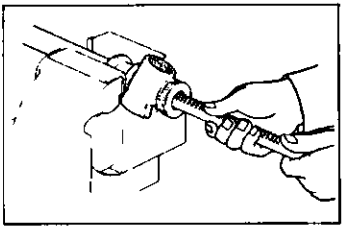
ASSEMBLY OF GEAR HOUSING

(See page SR 12)

1. PACK GREASE ON PARTS SHOWN:



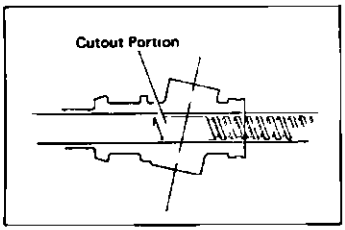
⇐ Molybdenum Disulphide Lithium Base Grease



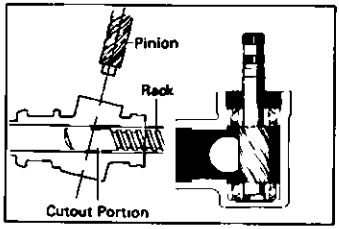
2 INSTALL RACK INTO RACK HOUSING

(a) From the pinion side, install the rack into the rack housing

(b) Set the rack notched portion so that the pinion can be positioned inside

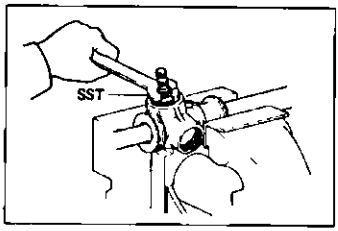


(c) Line up the cutout portion of the rack with the pinion



3. **INSTALL PINION INTO HOUSING**

Insure that the pinion end is securely in the lower bearing

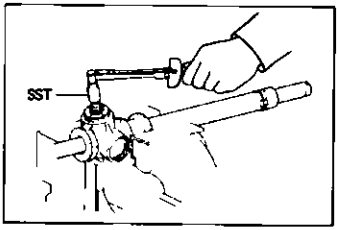


4. **INSTALL PINION BEARING ADJUSTING SCREW**

(a) Coat liquid sealer onto the screw thread surface

(b) Install the pinion bearing adjusting screw with SST

SST 09612-10092

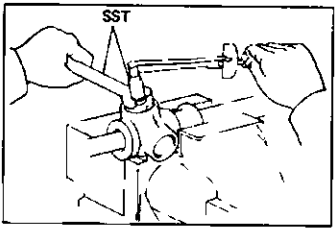


5. **ADJUST PINION PRELOAD**

(a) Line up the cutout portion of the rack with the pinion

(b) Using SST, tighten the pinion bearing adjusting screw to the point where the turning torque is 3.7 kg-cm (3.2 in. lb)

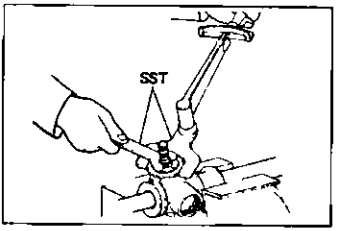
SST 09612-10092



(c) Using SST, loosen the pinion bearing adjusting screw to the point where the turning torque is 2.3 – 3.3 kg-cm (2.0 – 2.9 in. lb)

SST 09612-10092

Preload (turning): 2.3 – 3.3 kg-cm (2.0 – 2.9 in. lb)



6 **INSTALL PINION BEARING ADJUSTING SCREW LOCK NUT**

(a) Coat liquid sealer onto the lock nut and housing contact surface.

(b) Install the lock nut and torque it with SST

SST 09612-10092

Torque: 1,150 kg-cm (83 ft-lb)

(c) Recheck the pinion preload

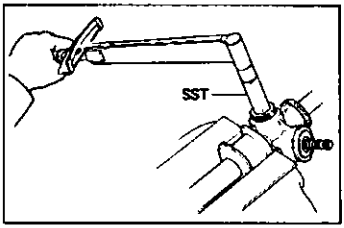
If incorrect, readjust

Preload (turning): 2.3 – 3.3 kg-cm (2.0 – 2.9 in.-lb)

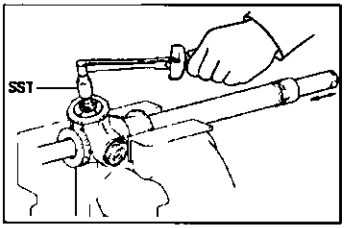
7. INSTALL RACK GUIDE

8. INSTALL RACK GUIDE SPRING

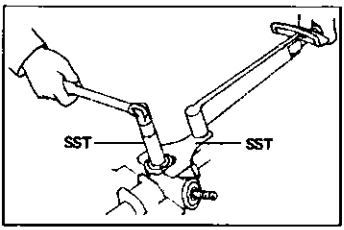
9. INSTALL RACK GUIDE SPRING CAP
   (a) Coat liquid sealer onto the guide spring cap threads.
   (b) Mesh the rack with the pinion
   (c) Install the rack guide spring cap with SST
   SST 09612 10092



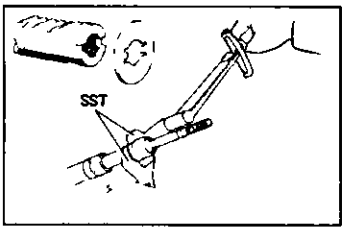
10. ADJUST TOTAL PRELOAD
   (a) Tighten the rack guide spring cap and torque it with SST
   SST 09612 10092
   Torque: 250 kg-cm (18 ft-lb)
   (b) Using SST, return the rack guide spring cap 25°
   SST 09612-10092



   (c) Measure the total preload with SST
   SST 09612-10092
   Preload (starting): 7.5 – 9.5 kg-cm (6.5 – 8.2 in-lb)
   (d) If preload is insufficient
   Retorque the rack guide spring cap, and then return it slightly less than 12°.
   (e) If there is excess preload
   Slightly return the rack guide spring cap

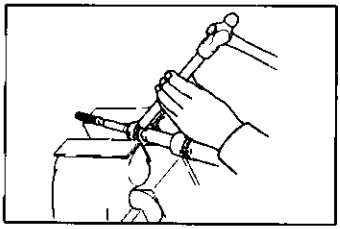


11. INSTALL RACK GUIDE SPRING CAP LOCK NUT
   (a) Coat liquid sealer onto the lock nut thread and housing surface.
   (b) Tighten the lock nut and torque it with SST
   SST 09612 10092
   Torque: 700 kg-cm (51 ft-lb)
   (c) Recheck the total preload If incorrect, readjust.
   Preload (starting). 7.5 – 9.5 kg-cm (6.5 – 8.2 in.-lb)

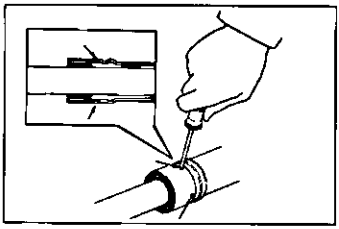


12. INSTALL DUST COVER

13. INSTALL CLAW WASHERS AND RACK ENDS
   (a) Install the claw washer
   NOTE Align the claw of the claw washer with the rack groove
   (b) Install the rack end and torque it with SST
   SST 09612-10092 and 09612-24011
   Torque: 850 kg-cm (61 ft-lb)



(c) Stake the claw washer



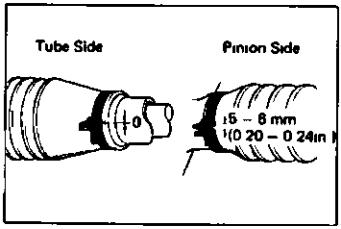
14. INSTALL RACK BOOTS, CLAMPS AND CLIPS

(a) Insure that the tube hole is not clogged with grease

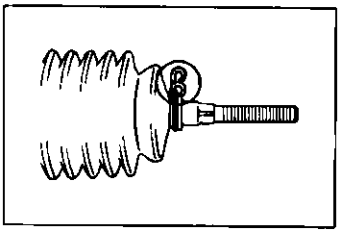
NOTE If the tube hole is clogged, the pressure inside the boot will change after it is assembled and the steering wheel turned

(b) Install the boots

NOTE Be careful not to damage or twist the boots The left and right boots are different Be careful not to interchange them

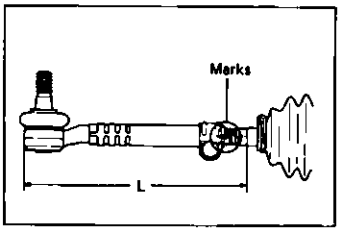


(c) Install the clamps as shown in the figure



(d) Install the clips

NOTE Face the open ends outward, as shown, to avoid damage to the boots



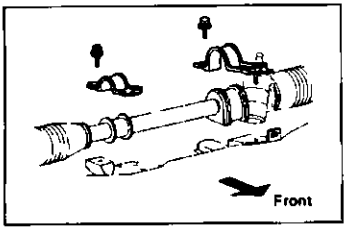
15. INSTALL TIE RODS

(a) Screw the tie rods onto the rack ends until the match marks are aligned

NOTE: The length of L in figure should be approximately 230 mm (9 06 in).

(b) After adjusting toe-in, torque the clamp bolt.

Torque: 175 kg-cm (13 ft-lb)



INSTALLATION OF GEAR HOUSING

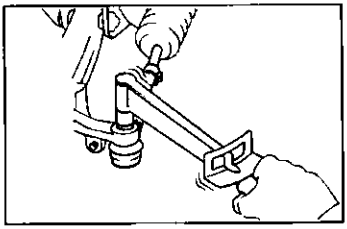
(See page SR-11)

1. **INSTALL GEAR HOUSING ASSEMBLY**

   Install the four bolts and torque them.

   NOTE Be careful not to damage the boots.

   Torque: 375 kg-cm (27 ft-lb)

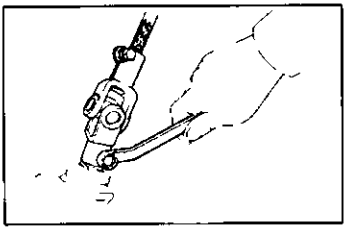


2. **CONNECT TIE ROD ENDS TO KNUCKLE ARMS**

   (a) Install the tie rod ends to the knuckle arms and torque the nuts.

   Torque: 600 kg-cm (43 ft-lb)

   (b) Install a new cotter pin.



3. **INSTALL UNIVERSAL JOINT**

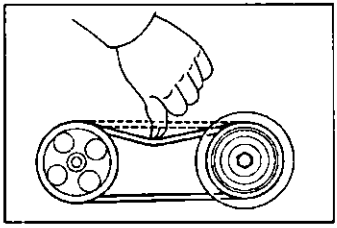
   Install the two bolts and torque them

   Torque: 360 kg-cm (26 ft-lb)

4. **CHECK STEERING WHEEL FREEPLAY**

5. **ADJUST TOE-IN** (See page FA-3)

6. **CHECK STEERING WHEEL CENTER POINT**



POWER STEERING

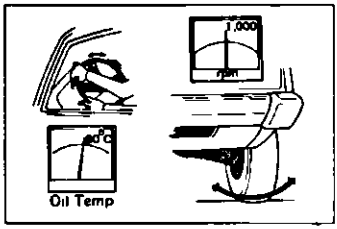
On-Vehicle Inspection

CHECK OF DRIVE BELT TENSION

Measure the drive belt tension.

Drive belt tension: at 10 kg (22.0 lb)
New belt 7 – 9 mm (0.28 – 0.35 in.)
Used belt 9 – 14 mm (0.35 – 0.55 in.)

NOTE
- "New belt" refers to a brand new belt which has never before been used
- "Used belt" refers to a belt which has been used on a running engine for 5 minutes or more
- After installing the drive belt, check that it fits properly in the ribbed grooves



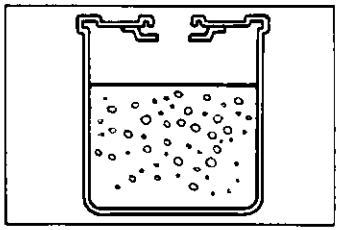
FLUID LEVEL CHECK

1 **KEEP VEHICLE LEVEL**

2 **BOOST FLUID TEMPERATURE**

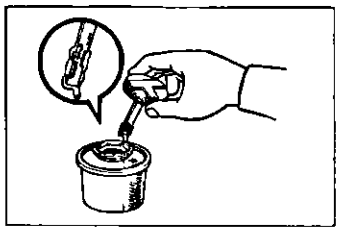
With the engine idling at 1,000 rpm or less, turn the steering wheel from lock to lock several times to boost the fluid temperature

Fluid temperature: 80°C (176°F)



3. **CHECK FOR FOAMING OR EMULSIFICATION**

NOTE Foaming and emulsification indicate the existence of air in the system or that the fluid level is too low

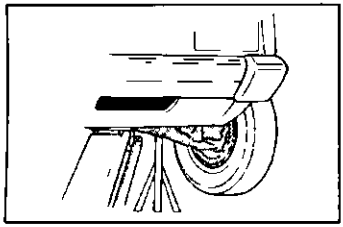


4. **CHECK FLUID LEVEL IN RESERVOIR TANK**

Check the fluid level and add fluid if necessary.

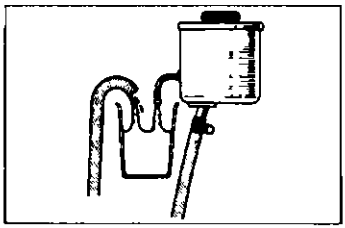
Fluid: ATF type DEXRON or DEXRON II

NOTE Check that the fluid level is within the HOT LEVEL of the dipstick If the fluid is cold, check that it is within the COLD LEVEL of the dipstick

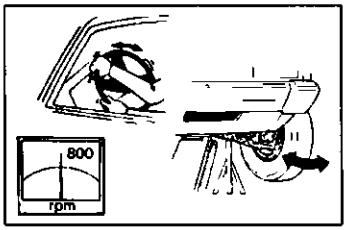


REPLACEMENT OF POWER STEERING FLUID

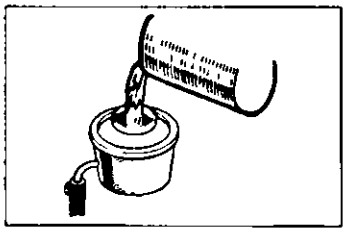
1. JACK UP FRONT OF VEHICLE AND SUPPORT IT WITH STANDS



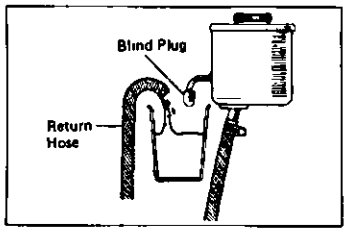
2. REMOVE FLUID RETURN HOSE FROM RESERVOIR TANK AND DRAIN FLUID INTO A CONTAINER



3. WITH ENGINE IDLING, TURN STEERING WHEEL FROM LOCK TO LOCK WHILE DRAINING FLUID
4. STOP ENGINE

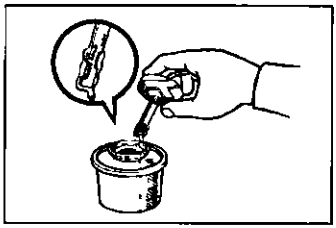


5. FILL RESERVOIR TANK WITH FRESH FLUID
   Fluid ATF type DEXRON or DEXRON II



6 START ENGINE AND RUN IT AT 1,000 RPM
After 1 or 2 seconds, fluid will begin to discharge from the return hose. Stop the engine immediately at this time

7. REPEAT STEPS 5 AND 6 FOUR OR FIVE TIMES UNTIL THERE IS NO MORE AIR IN FLUID
8. CONNECT RETURN HOSE TO RESERVOIR TANK
9. BLEED POWER STEERING SYSTEM



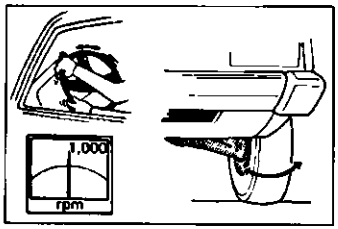
Bleeding of Power Steering System

1. **CHECK FLUID LEVEL IN RESERVOIR TANK**

   Check the fluid level and add fluid if necessary

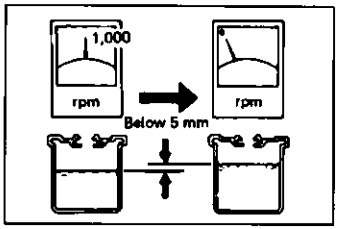
   Fluid: **ATF type DEXRON or DEXRON II**

   NOTE Check that the fluid level is within the HOT LEVEL of the dipstick If the fluid is cold, check that it is within the COLD LEVEL.



2. **START ENGINE AND TURN STEERING WHEEL FROM LOCK TO LOCK THREE OR FOUR TIMES**

   Run the engine at 1,000 rpm or less

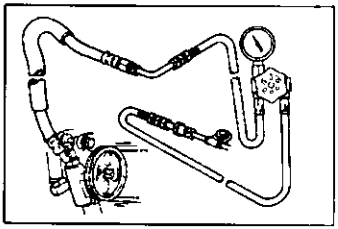


3. **CHECK THAT FLUID IN RESERVOIR IS NOT FOAMY OR CLOUDY AND DOES NOT RISE OVER MAXIMUM WHEN ENGINE IS STOPPED**

   Measure the fluid level with the engine running Stop the engine and measure the fluid level

   Maximum rise: 5 mm (0 20 in.)

   If a problem is found, repeat steps 7 and 8 Repair the vane pump if the problem persists



Oil Pressure Check

1. **CONNECT PRESSURE GUAGE**

   (a) Using SST, remove the pressure line from the vane pump.

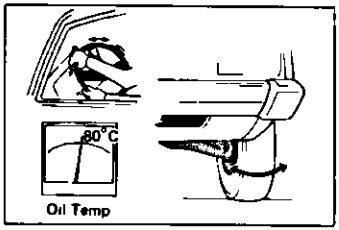
   SST 09631 22020

   (b) Connect the gauge side of the pressure gauge to the vane pump

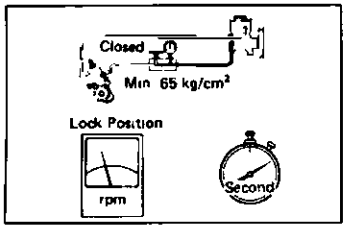
   (c) Connect the valve side of the pressure gauge to the pressure line

   (d) Bleed the system Start the engine and turn the steering wheel from lock to lock two or three times

   (e) Check that the fluid level is correct



2. **CHECK THAT FLUID TEMPERATURE IS AT LEAST 80°C (176°F)**



3. START ENGINE AND RUN IT AT IDLE

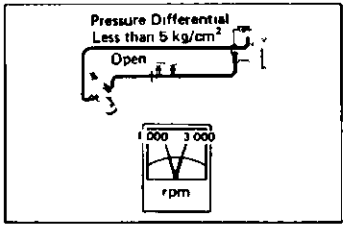
4. CHECK FLUID PRESSURE READING WITH VALVE CLOSED

Close the pressure gauge valve and observe the reading on the gauge

Minimum pressure: 65 kg/cm² (924 psi)

NOTE Do not keep the valve closed for more than 10 seconds

If pressure is low, repair or replace the vane pump.



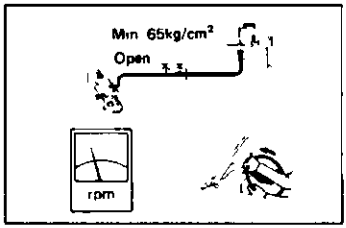
5 OPEN VALVE FULLY

6. CHECK AND RECORD PRESSURE READING AT 1,000 RPM

7 CHECK AND RECORD PRESSURE READING AT 3,000 RPM

Check that there is less than 5 kg/cm² (71 psi) difference in pressure between the 1,000 rpm and 3,000 rpm checks.

If the difference is greater, repair or replace the vane pump flow control valve

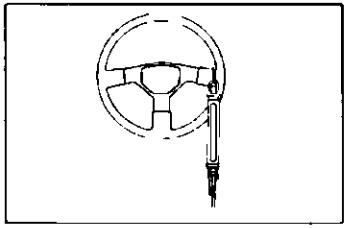


8 CHECK PRESSURE READING WITH STEERING WHEEL TURNED TO FULL LOCK

Be sure the pressure gauge valve is fully opened and the engine idling

Minimum pressure: 65 kg/cm² (924 psi)

If pressure is low, the gear housing has an internal leak and must be repaired or replaced



9. MEASURE STEERING EFFORT

Center the steering wheel and run the engine at idle

Using a scale, measure the steering effort in both directions

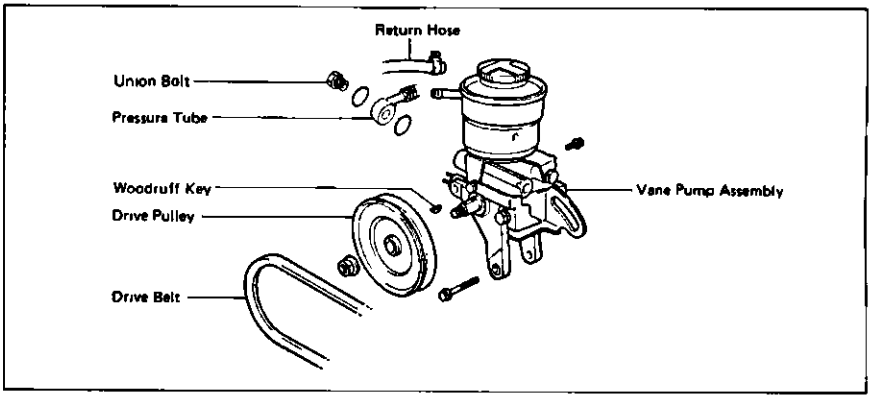
Maximum steering effort: 5.5 kg (12.1 lb)

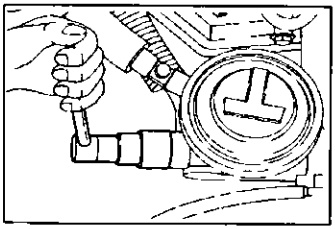
If steering effort is excessive, repair the power steering unit

NOTE Be sure to consider tire type, pressure and contact surface before making your diagnosis

Vane Pump

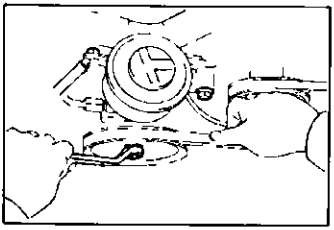
REMOVAL OF VANE PUMP





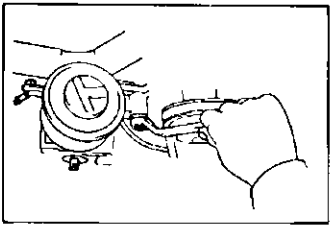
1. **TAKE OUT FLUID FROM RESERVOIR TANK WITH SYRINGE OR SUCH**

2. **DISCONNECT PRESSURE TUBE FROM VANE PUMP**
   Remove the union bolt and disconnect the pressure tube from the vane pump



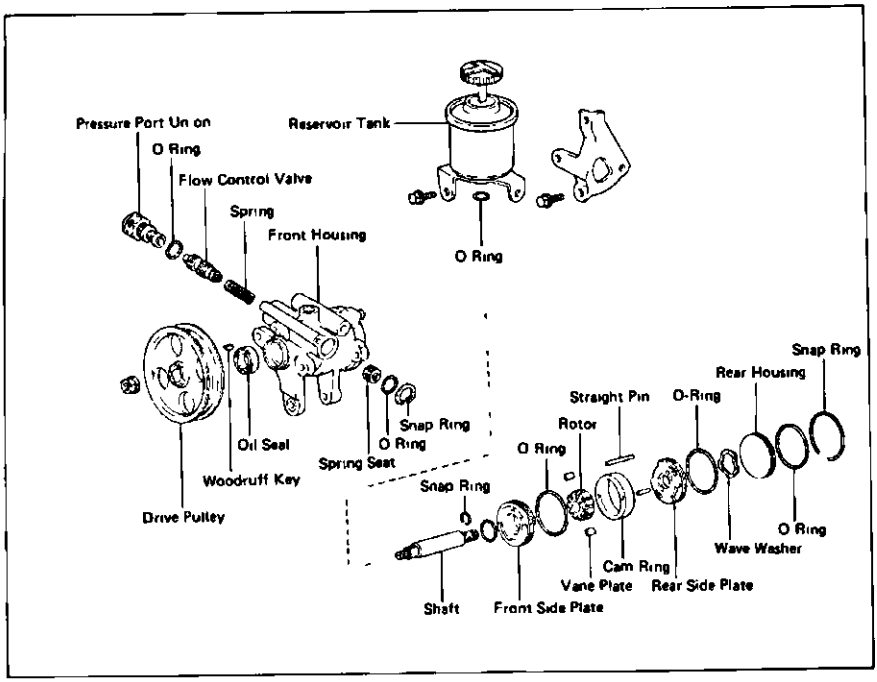
3. **DISCONNECT RETURN HOSE**

4. **REMOVE DRIVE BELT AND PULLEY**
   (a) Push on the drive belt to hold the pulley in place and remove the pulley set nut.
   (b) Loosen the adjusting bolt
   (c) Remove the drive belt
   (d) Remove the pulley and woodruff key



5. **REMOVE VANE PUMP**
   Remove the vane pump mounting bolts, and remove the vane pump from the bracket

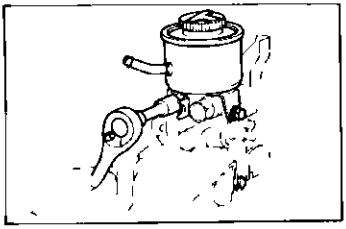
COMPONENTS



DISASSEMBLY OF VANE PUMP

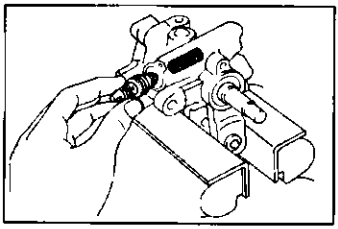
1. **MOUNT VANE PUMP IN VISE**

   CAUTION: Do not tighten the vise too tight.



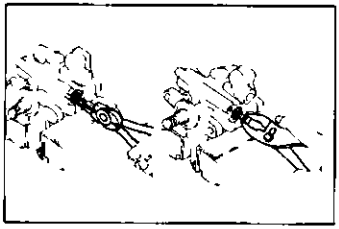
2. **REMOVE RESERVOIR TANK, BRACKET AND O-RING**

   Remove the four set bolts, reservoir tank, bracket and O ring



3. **REMOVE PRESSURE PORT UNION, FLOW CONTROL VALVE AND SPRING**

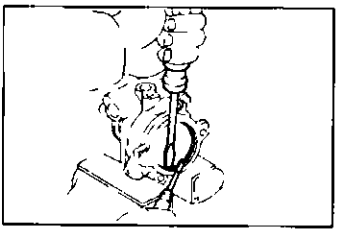
Remove the pressure port union, and remove the valve and spring



4 **REMOVE FLOW CONTROL SPRING SEAT**

(a) Using snap ring pliers, remove the snap ring

(b) Temporarily install a bolt to the seat and pull out it

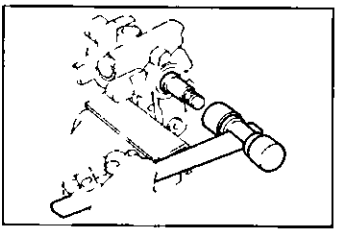


5. **REMOVE REAR HOUSING**

(a) Using two screwdrivers, remove the snap ring

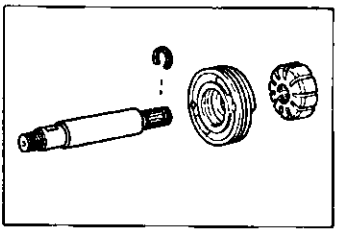
(b) Remove the rear housing and wave washer

6. **REMOVE REAR SIDE PLATE, STRAIGHT PINS, VANE PLATES AND CAM RING**



7. **REMOVE ROTOR ASSEMBLY**

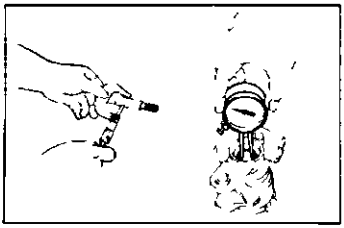
Using a plastic hammer, tap out the rotor assembly



8. **DISASSEMBLE ROTOR, SHAFT AND FRONT SIDE PLATE**

Using a small screwdriver, pry out the snap ring and remove the rotor and plate from the shaft

CAUTION: Be careful not to scratch the rotor



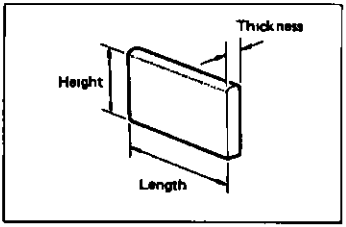
INSPECTION OF VANE PUMP

1 CHECK OIL CLEARANCE OF SHAFT AND BUSHING

Using a micrometer and calipers, check the oil clearance

Standard clearance: 0.01 – 0.03 mm (0.0004 – 0.0012 in.)
Maximum clearance: 0.07 mm (0.0028 in.)

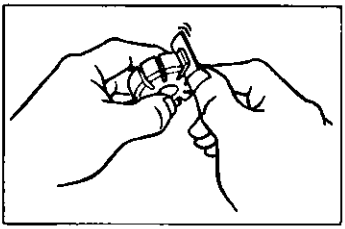
If more than maximum, replace the entire vane pump.



2. INSPECT ROTOR AND VANE PLATES

(a) Using calipers, measure the height, width and length of the vane plates

Minimum height: 8.1 mm (0.319 in.)
Minimum thickness: 1.797 mm (0.0707 in.)
Minimum length. 14.988 mm (0.5901 in.)



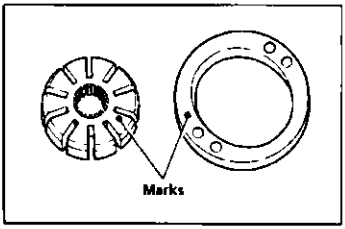
(b) Using a feeler gauge, measure the clearance between the rotor groove and vane plate

Maximum clearance: 0.028 mm (0.0011 in.)

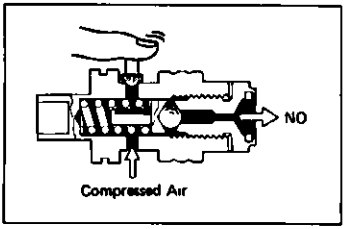
If more than maximum, replace the pump plate and/or rotor with one having the same mark as on the cam ring.

Inscribed mark: 1, 2, 3, 4 or None

NOTE There are five vane lengths with the following rotor and cam ring marks



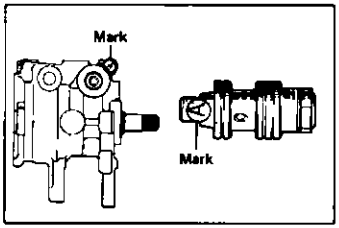
Rotor and cam ring mark	Vane length	mm (in.)
None	14.996-14.998	(0.59039 – 0.59047)
1	14.994-14.996	(0.59031 – 0.59039)
2	14.992-14.994	(0.59024 – 0.59031)
3	14.990-14.992	(0.59016 – 0.59024)
4	14.988-14.990	(0.59008 – 0.59016)



3. INSPECT FLOW CONTROL VALVE

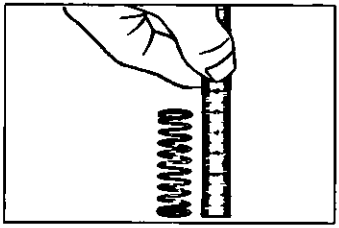
(a) Coat the valve with fluid and check that it falls smoothly into the valve hole by its own weight

(b) Check the flow control valve for leakage
Close one of the holes and apply compressed air [4 or 5 kg/cm² (57 or 71 psi)] into the opposite side, and confirm that air does not come out from the end hole.



If necessary, replace the valve with one having the same letter as on the front housing

Inscribed mark: A, B, C, D, E or F

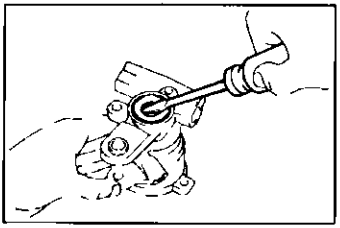


4 **INSPECT FLOW CONTROL SPRING**

Using a scale, measure the free length of the spring

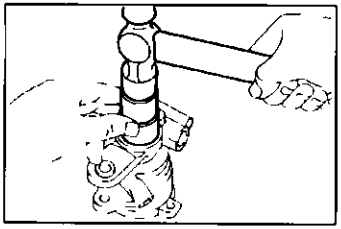
Spring length: 47 – 50 mm (1.85 – 1.97 in.)

If not within specification, replace the spring

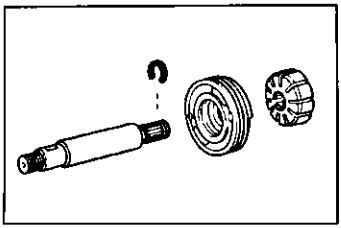


5. **IF NECESSARY, REPLACE OIL SEAL**

(a) Using a screwdriver, pry out the oil seal



(b) Using a 23-mm socket wrench and hammer, drive in a new oil seal

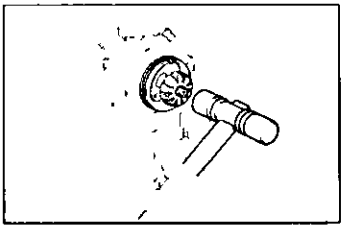


ASSEMBLY OF VANE PUMP

(See page SR 26)

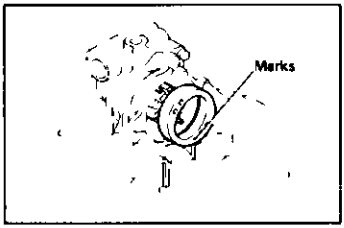
NOTE Coat all sliding surfaces with fluid before assembly

1. INSTALL FRONT SIDE PLATE, O-RING AND ROTOR TO SHAFT
   (a) Install new O-rings to the side plate
   (b) Place the side plate on the shaft
   (c) Place the rotor on the shaft with the inscribed mark facing upward, and secure them with a snap ring

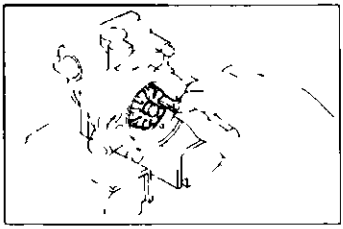


2. INSTALL LONG STRAIGHT PIN AND ROTOR ASSEMBLY TO FRONT HOUSING
   (a) Apply MP grease to the oil seal
   (b) Install the long straight pin in the housing
   (c) Using a plastic hammer, tap in the rotor assembly.

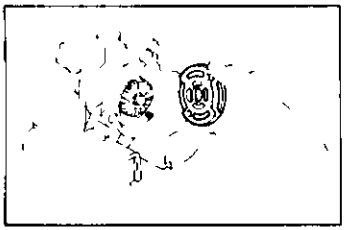
NOTE Be careful not to damage the oil seal and O-rings.



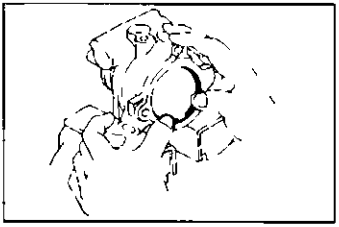
3 INSTALL SHORT STRAIGHT PIN AND CAM RING
   (a) Install the short straight pin
   (b) Insert the cam ring with the inscribed mark facing outward



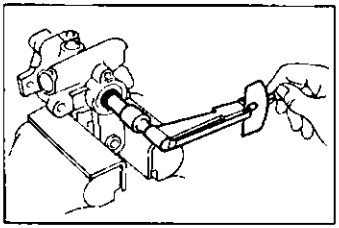
4. INSTALL VANE PLATES
   Install the vane plates with the round end facing outward



5 INSTALL REAR SIDE PLATE AND O RING
   (a) Install a new O-ring to the side plate
   (b) Align the holes of the side plate and pins, and install the side plate

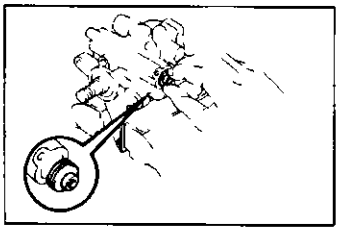


6. **INSTALL REAR HOUSING**
   (a) Install the wave washer
   (b) Install a new O-ring to the rear housing.
   (c) Using a plastic hammer, tap in the rear housing
   (d) Install the snap ring

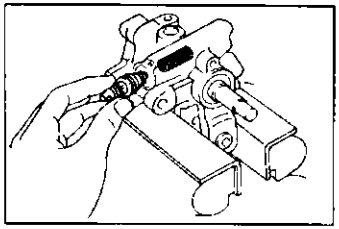


7. **CHECK SHAFT ROTATION CONDITION**
   (a) Check that the shaft rotates smoothly without abnormal noise
   (b) Temporarily install the pulley nut and check the rotating torque

   Rotating torque: Less than 2.8 kg-cm (2.4 in-lb)

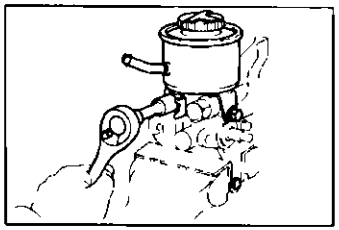


8. **INSTALL FLOW CONTROL SPRING SEAT, O-RING AND SNAP RING**
   (a) Install a new O ring in the spring seat
   (b) Insert the spring seat, and using snap ring pliers, install the snap ring



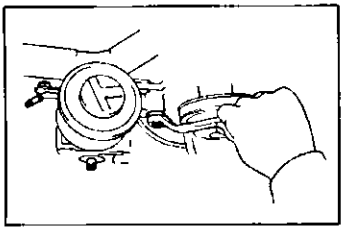
9. **INSTALL SPRING, FLOW CONTROL VALVE, O-RINGS AND PRESSURE PORT UNION**
   (a) Install the spring and the valve into the housing
   (b) Install a new O ring in the groove of the pressure port union
   (c) Torque the pressure port union

   Torque: 700 kg cm (51 ft lb)



10. **INSTALL O-RING, RESERVOIR TANK AND BRACKET**
    (a) Install a new O-ring to the reservoir tank
    (b) Install the reservoir tank, and bracket and torque the bolts

    Torque. 12 mm bolt 130 kg-cm (9 ft-lb)
    14 mm bolt 420 kg-cm (30 ft-lb)

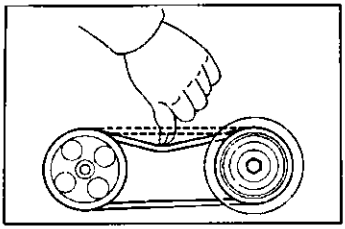


INSTALLATION OF VANE PUMP

(See page SR-25)

1 INSTALL VANE PUMP

Place the pump in position and provisionally install the three mounting bolts



2 INSTALL DRIVE PULLEY AND BELT

(a) Install the woodruff key, pulley and set nut

(b) Install the drive belt

(c) Adjust the drive belt tension and torque the mounting bolts.

Torque: 400 kg-cm (29 ft-lb)

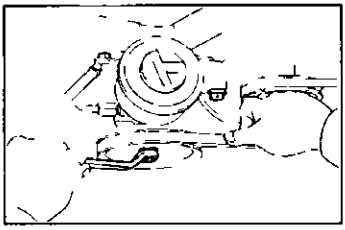
Drive belt tension. at 10 kg (22.0 lb)
New belt 7 – 9 mm (0.28 – 0.35 in.)
Used belt 9 – 14 mm (0.35 – 0.55 in.)

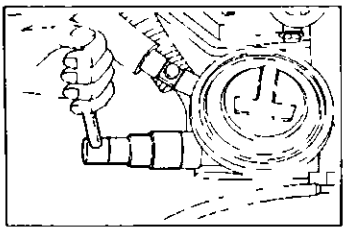
NOTE

- "New belt" refers to a brand new belt which has never before been used
- "Used belt" refers to a belt which has been used on a running engine for 5 minutes or more
- After installing the drive belt, check that it fits properly in the ribbed grooves

(d) Push down on the drive belt to hold the pulley in place, and torque the pulley set nut

Torque. 440 kg-cm (32 ft-lb)



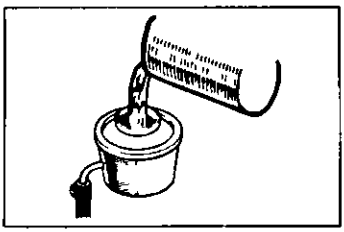


3 CONNECT PRESSURE TUBE TO VANE PUMP

Connect the pressure tube and torque the union bolt

Torque 475 kg-cm (34 ft-lb)

4. CONNECT RETURN HOSE TO RESERVOIR TANK



5 FILL RESERVOIR TANK WITH FLUID

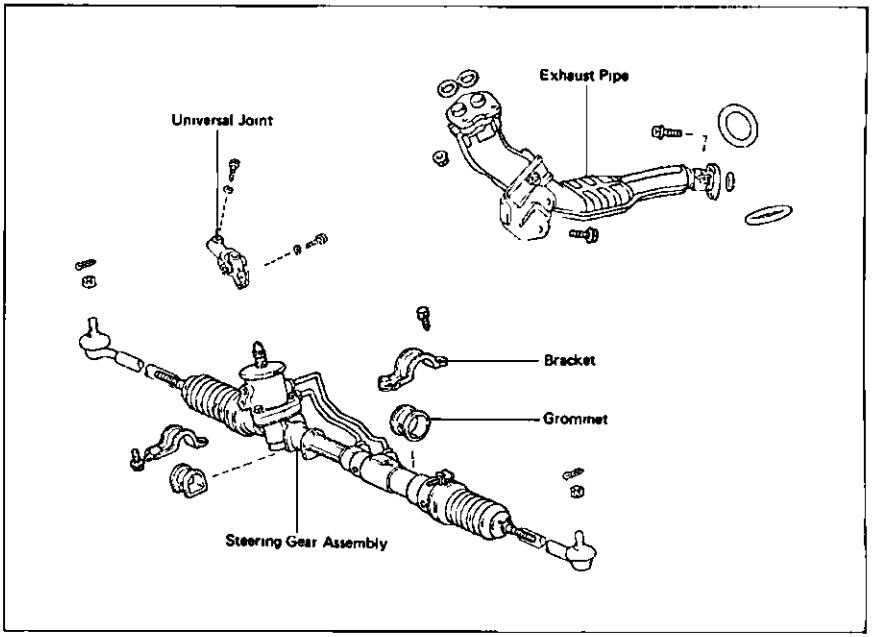
Fluid: ATF type DEXRON or DEXRON II

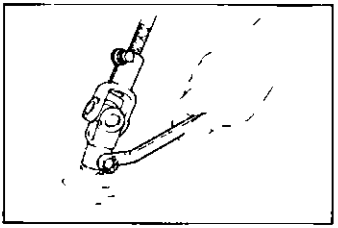
6. BLEED POWER STEERING SYSTEM (See page SR-23)

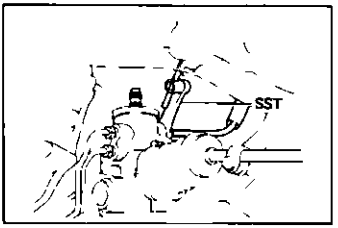
7. CHECK FOR FLUID LEAKS

Gear Housing

REMOVAL OF STEERING GEAR HOUSING

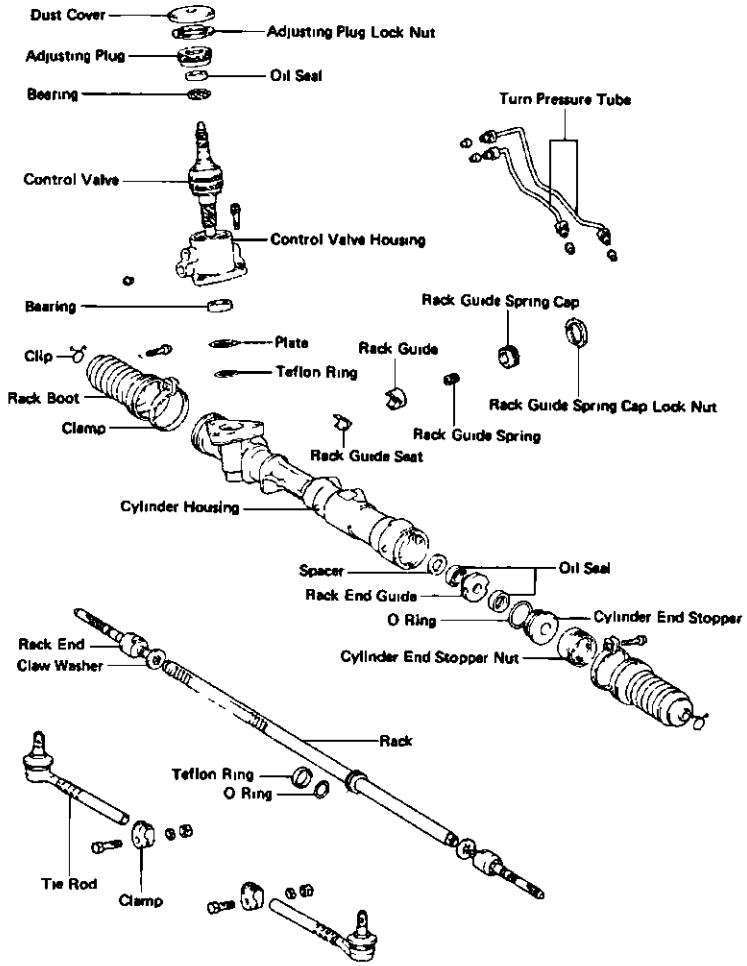


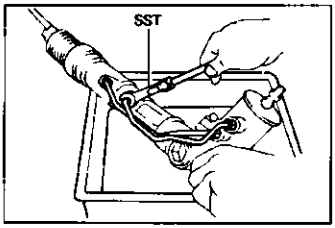




1. **REMOVE UNIVERSAL JOINT**
   (a) Remove the two set bolts
   (b) Remove the universal joint
2. **DISCONNECT TIE ROD ENDS**
   (See step 2 on page SR 11)
3. **RAISE VEHICLE**
4. **REMOVE EXHAUST PIPE**
5. **DISCONNECT RETURN AND PRESSURE LINES**
   Using SST, disconnect return and pressure lines
   Use a container to catch the power steering fluid
   SST 09631 22020
6. **REMOVE GEAR HOUSING ASSEMBLY**

COMPONENTS


Dust Cover
Adjusting Plug Lock Nut
Adjusting Plug
Oil Seal
Bearing
Turn Pressure Tube
Control Valve
Control Valve Housing
Bearing
Rack Guide Spring Cap
Plate
Rack Guide
Clip
Teflon Ring
Rack Guide Spring Cap Lock Nut
Rack Boot
Clamp
Rack Guide Spring
Rack Guide Seat
Cylinder Housing
Spacer
Oil Seal
Rack End Guide
O Ring
Cylinder End Stopper
Rack End
Claw Washer
Cylinder End Stopper Nut
Rack
Teflon Ring
O Ring
Tie Rod
Clamp

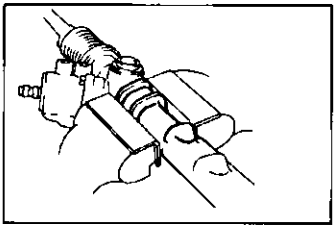


DISASSEMBLY OF STEERING GEAR HOUSING

1. **REMOVE TURN PRESSURE RIGHT AND LEFT TUBES**

   Using SST, remove the turn pressure tubes.

   SST 09631-22020



2. **CLAMP GEAR HOUSING IN VISE**

   NOTE

   - The rack housing is made of aluminum, so always use soft jaws on the vise and clamp onto the part shown in the figure
   - If necessary to clamp onto the center tube, wrap a piece of cloth around it to avoid damage

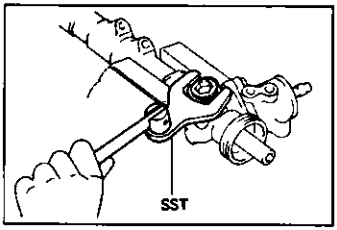
3. **REMOVE TIE RODS**
   (See step 2 on page SR-12)

4. **REMOVE CLIPS, CLAMPS AND RACK BOOTS**

   (a) Remove the clip and clamp, and remove the rack boot

   (b) Mark the left and right boots accordingly

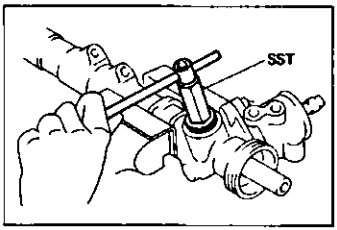
5. **REMOVE RACK ENDS AND CLAW WASHERS**
   (See step 4 on page SR-13)



6. **REMOVE RACK GUIDE SPRING CAP LOCK NUT**

   Using SST, remove the rack guide spring cap lock nut

   SST 09612 24011



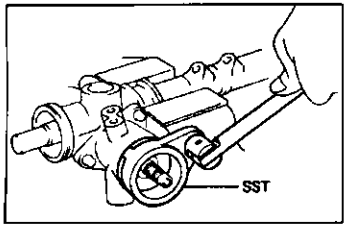
7. **REMOVE RACK GUIDE SPRING CAP**

   Using SST, remove the rack guide spring cap

   SST 09612-24011

8. **REMOVE RACK GUIDE SPRING, RACK GUIDE AND SEAT**

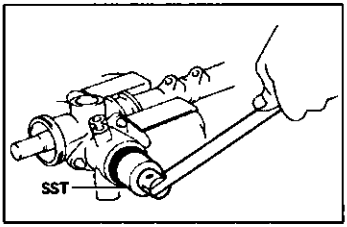
9 **REMOVE DUST COVER**



10. REMOVE ADJUSTING PLUG LOCK NUT

Using SST, remove the adjusting plug lock nut

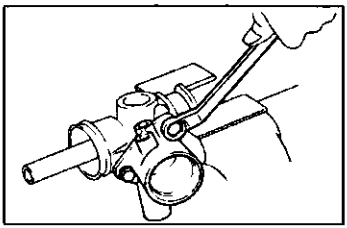
SST 09630-00010



11. REMOVE ADJUSTING PLUG

Using SST, remove the adjusting plug

SST 09630-00010



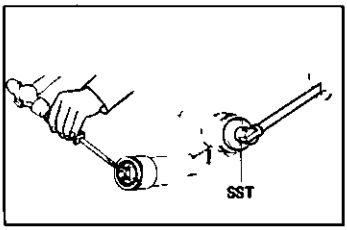
12. REMOVE CONTROL VALVE

Remove the bearing, control valve, bearing, plate and teflon ring

13. REMOVE CONTROL VALVE HOUSING

(a) Remove the three bolts

(b) Remove the control valve housing and O rings



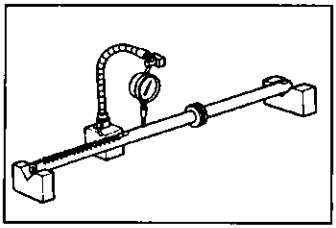
14 REMOVE CYLINDER END STOPPER NUT

(a) Unstake the cylinder end stopper nut

(b) Remove the cylinder end stopper nut with SST

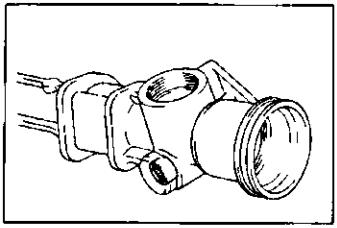
SST 09631 12010

15. REMOVE STEERING RACK WITH CYLINDER END STOPPER, O-RING AND RACK END GUIDE

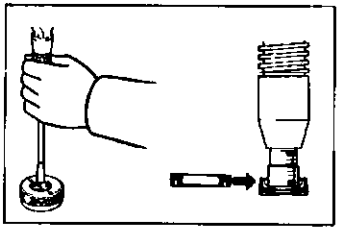


INSPECTION AND REPAIR OF GEAR HOUSING COMPONENTS

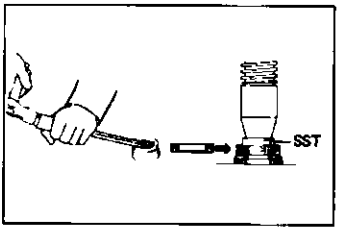
1. **INSPECT RACK**
   (a) Check the rack for runout and for teeth wear or damage
   (b) Check the back surface for wear or damage
   If faulty, replace it
   Maximum runout: 0.3 mm (0.012 in.)



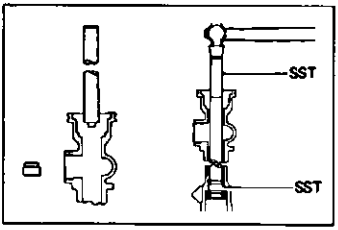
2. **INSPECT NEEDLE ROLLER BEARING**
   (a) Check for wear or damage.
   (b) If necessary, replace the cylinder housing assembly



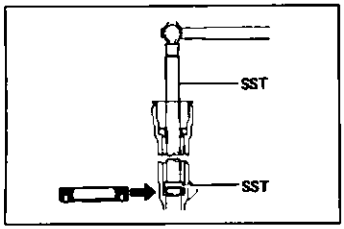
3. **IF NECESSARY, REPLACE ADJUSTING PLUG OIL SEAL**
   (a) Using a screwdriver, remove the oil seal
   (b) Install a new oil seal with a socket wrench



4. **IF NECESSARY, REPLACE CYLINDER END STOPPER OIL SEAL**
   (a) Using a screwdriver, remove the oil seal
   (b) Using SST, install a new oil seal
   SST 09631 12040



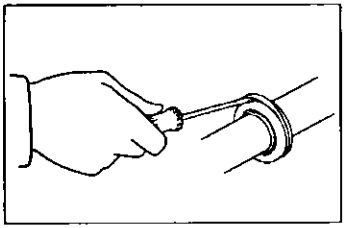
5. **IF NECESSARY, REPLACE CYLINDER HOUSING OIL SEAL**
   (a) Using SST, remove the oil seal with the spacer
   SST 09631 12020 and 09631 12030



(b) Insert SST into the oil seal and spacer

SST 09631 12020 and 09631 12040

(c) Tap in the spacer and oil seal softly through the rack end guide



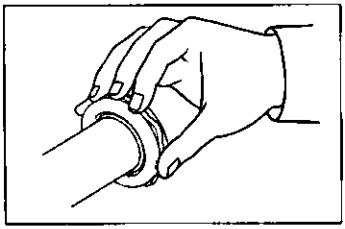
6. **IF NECESSARY, REPLACE TEFLON RING AND O-RING**

(a) Remove the teflon ring and O ring

(b) Install a new O ring.

(c) Expand a new teflon ring with your fingers

CAUTION: Do not expand the ring more than necessary.



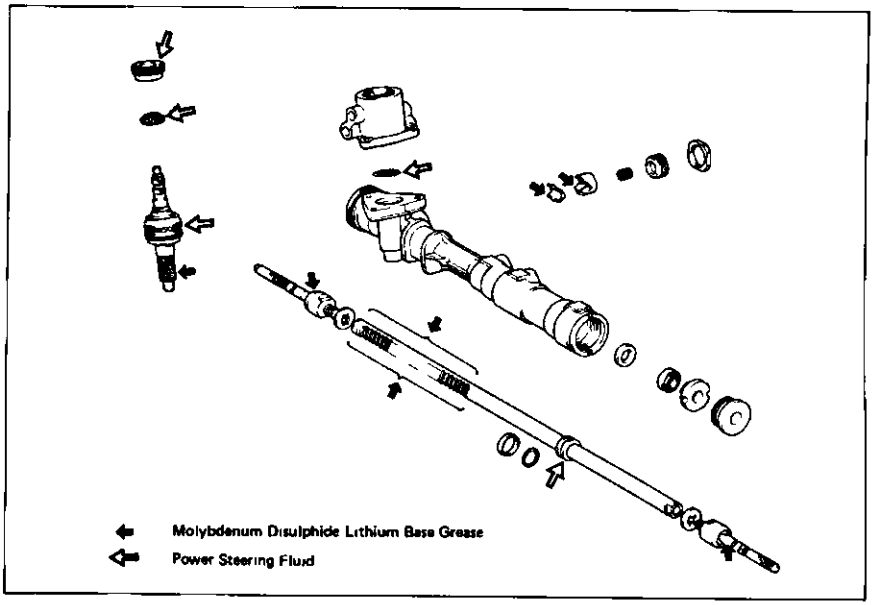
(d) Install the teflon ring into the piston groove of the rack

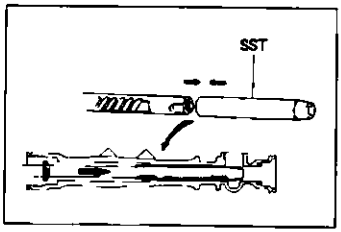
(e) Snug down the teflon ring with your fingers so that it fits tight in the groove

ASSEMBLY OF STEERING GEAR HOUSING

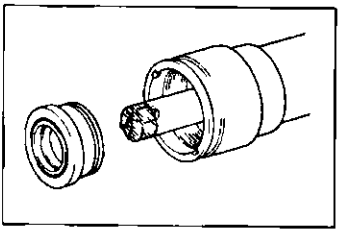
(See page SR-34)

1. COAT FOLLOWING PARTS WITH POWER STEERING FLUID OR GREASE.



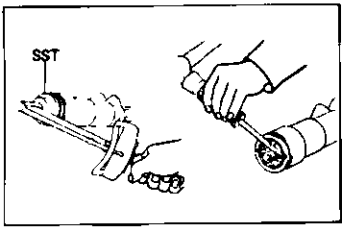


2. INSTALL RACK, RACK END GUIDE AND CYLINDER END STOPPER
   (a) Install SST to the rack
   SST 09631 16020
   (b) Coat SST with power steering fluid
   (c) Insert the rack into the cylinder
   (d) Remove SST



   (e) Install a new O ring to the cylinder end stopper
   (f) Wrap cellophane tape or such around the end of rack, and push on the rack end guide and cylinder end stopper

   NOTE Be careful not to damage the oil seal lip



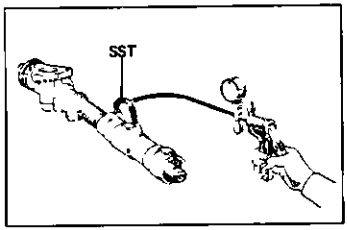
3. **INSTALL CYLINDER END STOPPER NUT**

(a) Using SST, torque the stopper nut

SST 09631 12010

Torque: 1,750 kg-cm (127 ft lb)

(b) Using a hammer and chisel or screwdriver, stake the stopper nut



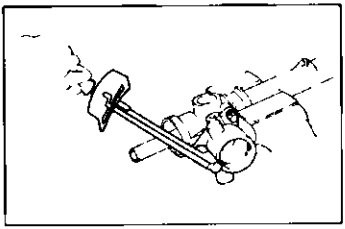
4. **TEST OF AIR TIGHTNESS**

(a) Install SST to the union of the cylinder housing

SST 09631-12050

(b) Apply 400 mmHg (15 75 in Hg) vacuum for about 30 seconds

(c) Check that there is no change in the vacuum



5. **INSTALL CONTROL VALVE HOUSING**

(a) Install new O rings to the valve housing

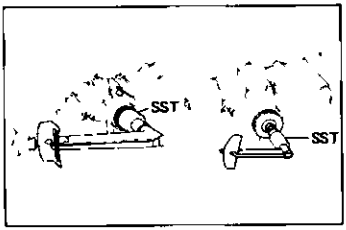
(b) Install the valve housing with the three bolts

(c) Torque the bolts

Torque 185 kg-cm (13 ft-lb)

6 **INSTALL CONTROL VALVE**

Install the teflon ring, plate, bearing, control valve and bearing



7. **ADJUST CONTROL VALVE SHAFT PRELOAD**

(a) Install the adjusting plug and torque it with SST

SST 09630-00010

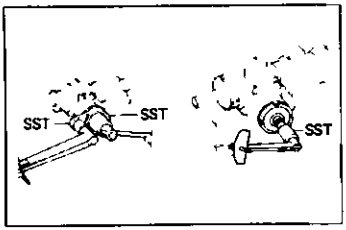
Torque 100 kg-cm (7 ft-lb)

(b) Measure the preload with SST

SST 09616 00010

Preload (turning) 4.0 – 6 5 kg cm (3 6 – 5 6 in.-lb)

(c) If the preload is not as specified, correct it by tightening or loosening the adjusting plug



8. **INSTALL ADJUSTING PLUG LOCK NUT**

(a) Using SST, install and torque the lock nut

SST 09630 00010

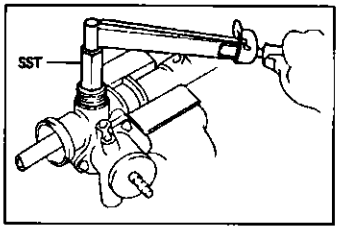
Torque: 500 kg-cm (36 ft-lb)

(b) Recheck the preload

If incorrect, readjust

Preload (turning) 4 0 – 6.5 kg-cm (3 5 – 5 6 in.-lb)

9. **INSTALL DUST COVER**



10. ADJUST TOTAL PRELOAD

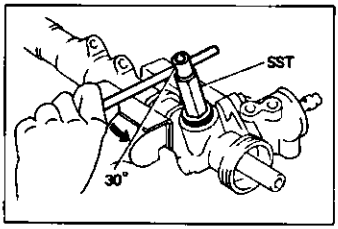
(a) Install the seat, rack guide and rack guide spring

(b) Coat liquid sealer onto the threads of the rack guide spring cap.

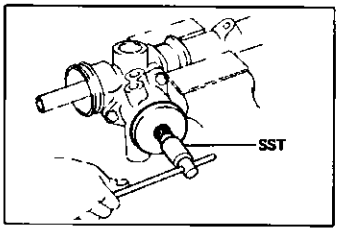
(c) Install the rack guide spring cap with SST and torque it

SST 09612-24011

Torque. 250 kg-cm (18 ft-lb)

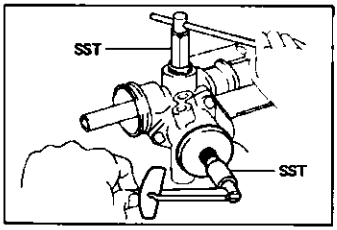


(d) Return the spring cap 30° with SST



(e) Using SST, turn the control valve shaft and operate the steering rack 2 full strokes to snug it down

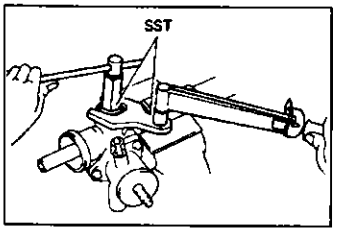
SST 09616 00010



(f) Using SST and a torque wrench, turn the rack guide spring cap until the preload is within specification

SST 09612 24011 and 09616-00010

Preload (turning): 5 – 10 kg-cm (4.3 – 8.7 in.-lb)



(g) Coat the lock nut and rack housing contact surfaces with liquid sealer

(h) Tighten the rack guide spring cap lock nut and torque it with SST

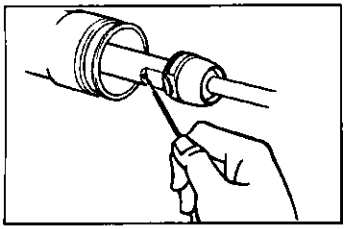
SST 09612 24011

Torque: 700 kg-cm (51 ft-lb)

(i) Recheck the total preload

If incorrect, readjust.

Preload (turning): 5 – 10 kg-cm (4.3 – 8.7 in. lb)

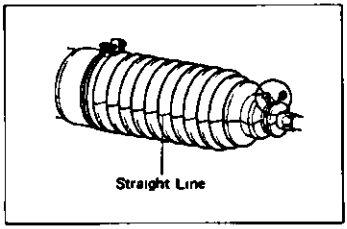


11. INSTALL CLAW WASHERS AND RACK ENDS
(See step 13 on page SR-18)

12. INSTALL RACK BOOTS, CLAMPS AND CLIPS

(a) Insure that the tube hole is not clogged with grease

NOTE If the tube hole is clogged, the pressure inside the boot will change after it is assembled and the handle turned



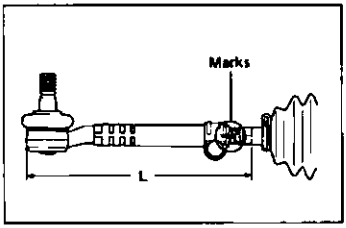
(b) Install the boots

NOTE: Be careful not to damage or twist the boots.

(c) Install the clamps

(d) Install the clips.

NOTE: Face the open ends outward, as shown, to avoid damage to the boots



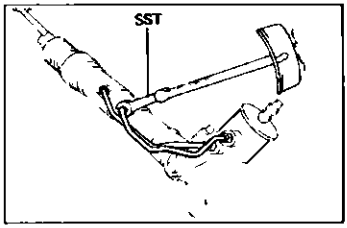
13. INSTALL TIE ROD

(a) Screw the tie rods onto the rack ends until the match marks are aligned

NOTE The length of L in the figure should be approximately 235 mm (9.25 in.)

(b) After adjusting toe-in, torque the clamp bolt

Torque: 175 kg-cm (13 ft-lb)



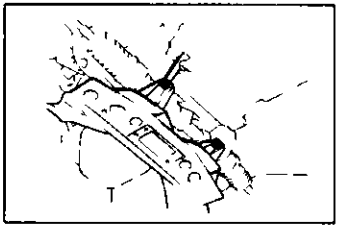
14. INSTALL TURN PRESSURE RIGHT AND LEFT TUBES

Using SST, tighten the nuts and torque them

NOTE First torque the nuts of the cylinder housing

SST 09631 22020

Torque 300 kg-cm (22 ft-lb)



INSTALLATION OF STEERING GEAR HOUSING

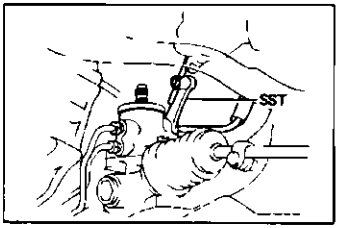
(See page SR-33)

1 **INSTALL STEERING GEAR HOUSING ASSEMBLY**

Install the four bolts and torque them

NOTE Be careful not to damage the boots and tubes.

Torque: 375 kg-cm (27 ft-lb)

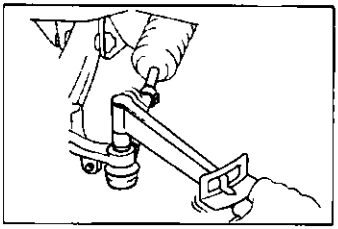


2. **CONNECT RETURN AND PRESSURE LINES**

Using SST, connect the return and pressure lines and torque them

SST 09631-22020

Torque: 450 kg-cm (33 ft-lb)



3. **CONNECT TIE ROD ENDS TO KNUCKLE ARMS**

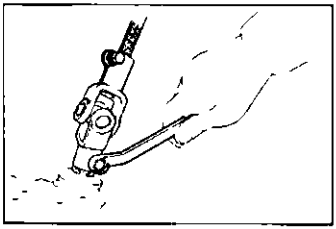
(a) Install the tie rod ends to the knuckle arms and torque the nuts

Torque: 600 kg-cm (43 ft-lb)

(b) Install new cotter pins.

4. **INSTALL EXHAUST PIPE**

5. **LOWER VEHICLE**



6. **INSTALL UNIVERSAL JOINT**

Install the universal joint and torque the two bolts.

Torque: 360 kg-cm (26 ft-lb)

7. **FILL WITH POWER STEERING FLUID**
(See page SR-22)

8 **BLEED SYSTEM** **(See page SR-23)**

9. **CHECK FOR FLUID LEAKS**

10. **ADJUST TOE IN** **(See page FA-3)**

11. **CHECK STEERING WHEEL CENTER POINT**

BODY ELECTRICAL SYSTEM

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WIPER AND WASHER	BE-18
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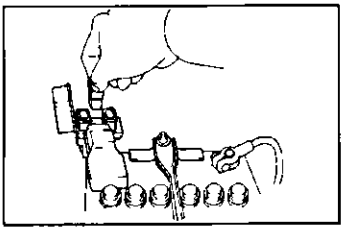


PRECAUTIONS

TAKE CARE WHEN INSPECTING HEADLIGHT CIRCUIT

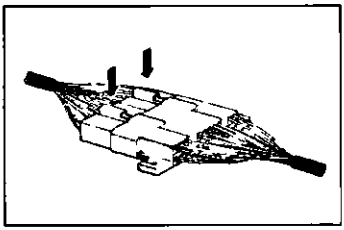
WARNING: With the headlight switch OFF, disconnect the pink fusible link before beginning work.

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	V = Violet
W = White	Y = Yellow

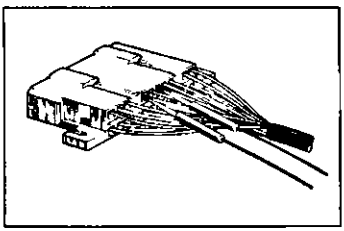
Example R-G indicates a Red wire with a Green stripe.



BULKHEAD TYPE CONNECTOR HANDLING AND INSPECTION

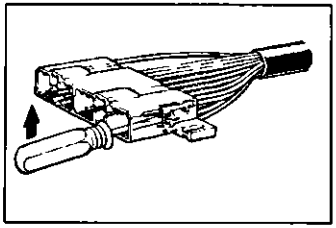
DISCONNECT BULKHEAD TYPE CONNECTOR

To remove the connector, push in the lock levers shown in the figure, and pull out



INSPECT BULKHEAD TYPE CONNECTOR

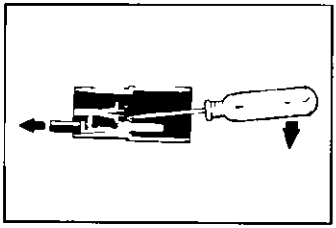
When checking the continuity or voltage with a circuit tester, insertion of the test probe into the receptacle connector may open the fitting to the connector and result in poor contact
Therefore, ensure that the test probe is inserted only from the wire harness side as shown in the figure



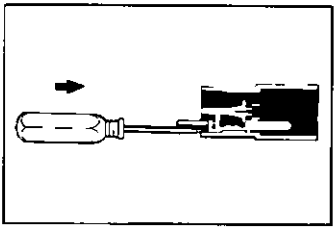
REPLACEMENT OF TERMINAL

REMOVE TERMINALS FROM BULKHEAD CONNECTOR

(a) From the open end, insert a miniature screwdriver between the locking lugs and terminal



(b) Pry up the locking lugs with the screwdriver and pull the terminal out from the rear



INSTALL TERMINALS TO BULKHEAD CONNECTOR

(a) Push in the terminal until it is securely locked in the connector lug

(b) Pull on the wire to confirm that it is securely locked

INSPECTION OF CIRCUIT AND CONNECTOR

INSPECT CIRCUIT

When inspecting the circuit, refer to the diagram at the back of the manual

INSPECT CONNECTOR

All connectors are shown from the component side Therefore, when inspecting from the body side, the left and right terminal connections will be in reverse

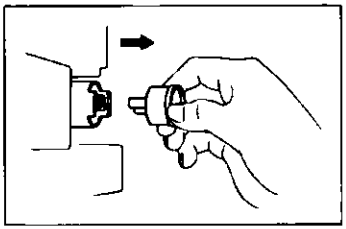
REPLACEMENT OF FUSE

Install a new fuse with the correct amperage

CAUTION:

1. **Turn off all electrical components and the ignition switch before replacing a fuse. Do not exceed the fuse amp rating.**
2. **Always use a fuse puller for removing and inserting a fuse. Remove and insert straight in and out without twisting. Twisting could force open the terminals too much, resulting in a bad connection.**

If a fuse continues to blow, a short circuit is indicated. The system must be checked by a qualified technician



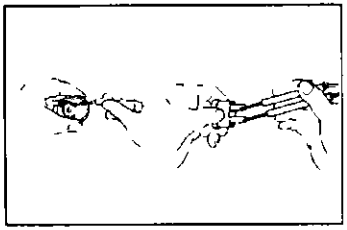
RESET CIRCUIT BREAKER

1 REMOVE CIRCUIT BREAKER

(a) Remove the kick panel

(b) Remove the circuit breaker

(c) Unlock the stopper and pull out the circuit breaker

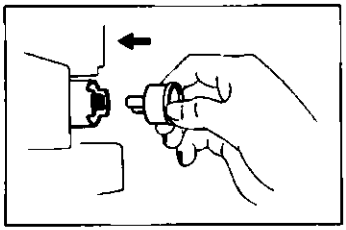


2 RESET CIRCUIT BREAKER

(a) Insert the needle into the reset hole and push it

(b) Using an ohmmeter, check that there is continuity between both terminals of the circuit breaker

If there is no continuity, replace the circuit breaker



3. INSTALL CIRCUIT BREAKER

(a) Assemble the circuit breaker into the case

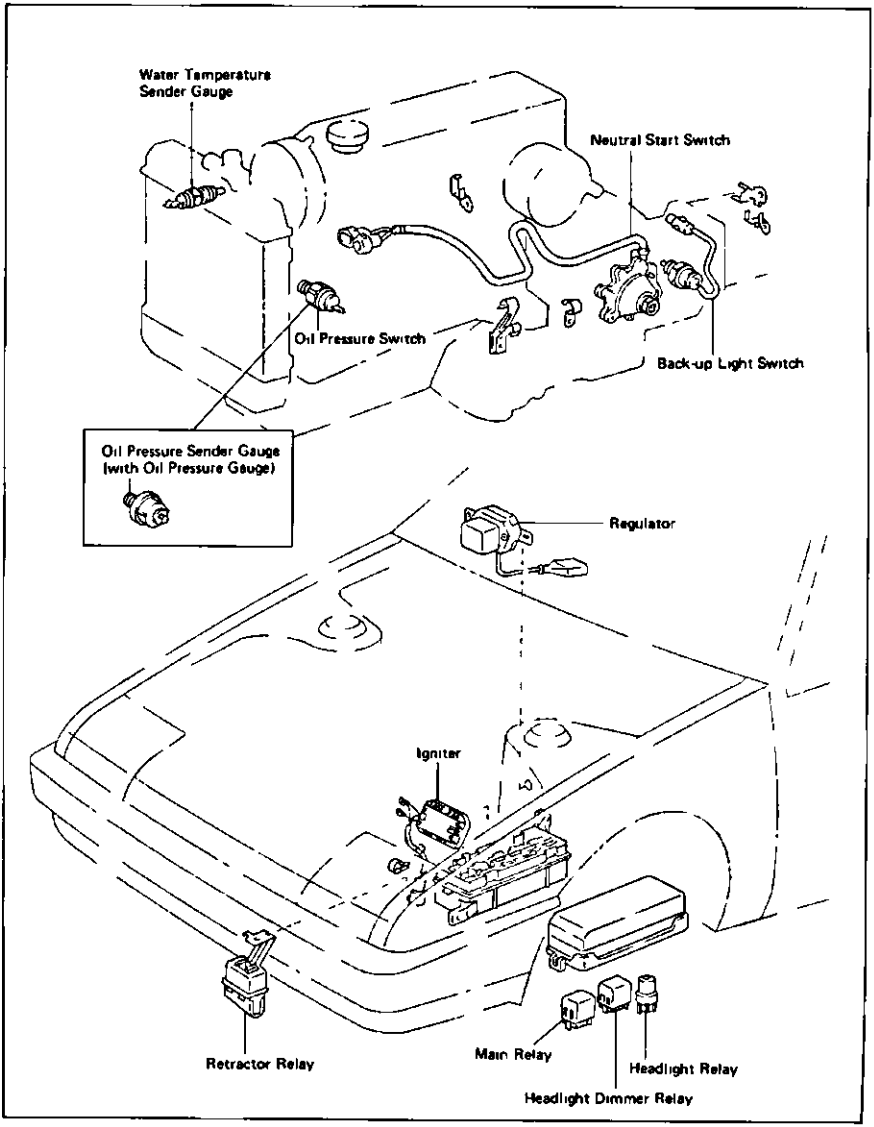
(b) Install the circuit breaker

NOTE If a circuit breaker continues to cut out, a short circuit is indicated The system must be checked by a qualified technician

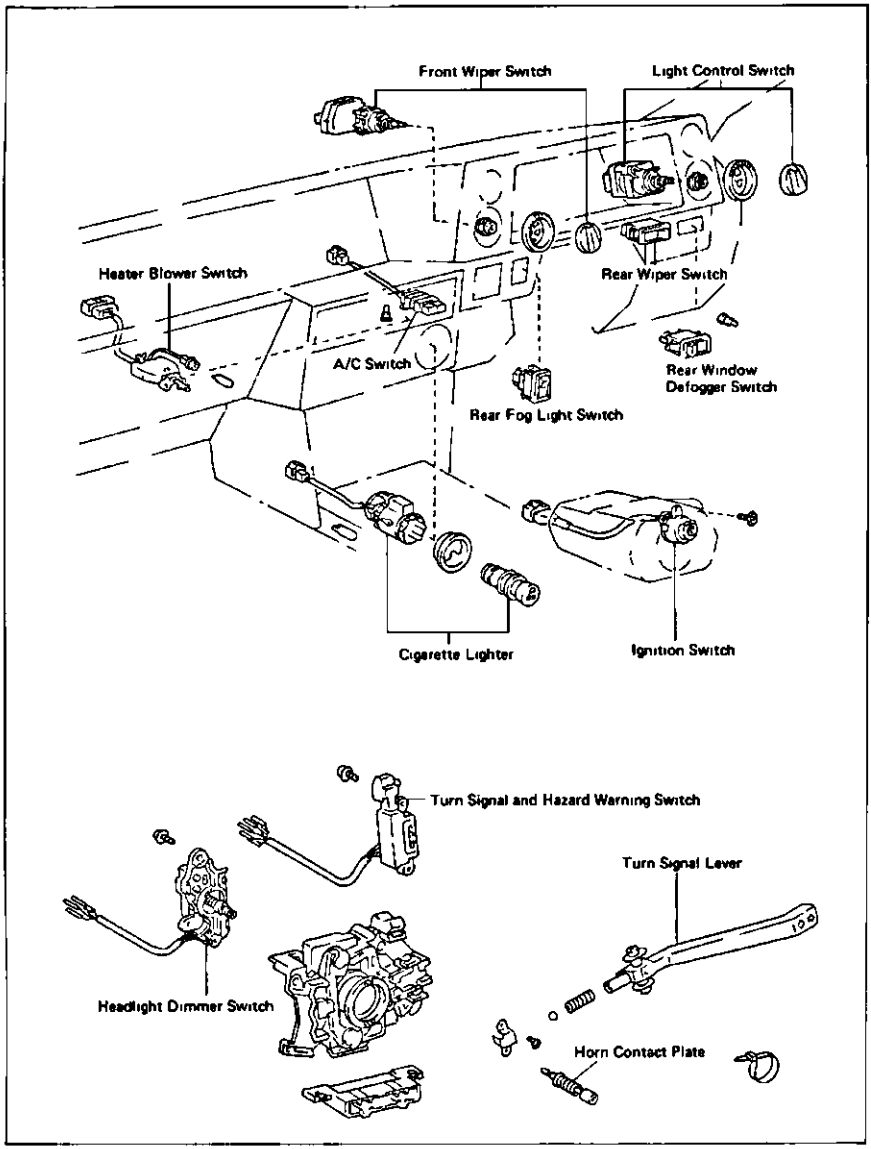
(c) Install the kick pannel

LOCATION OF SWITCHES AND RELAYS

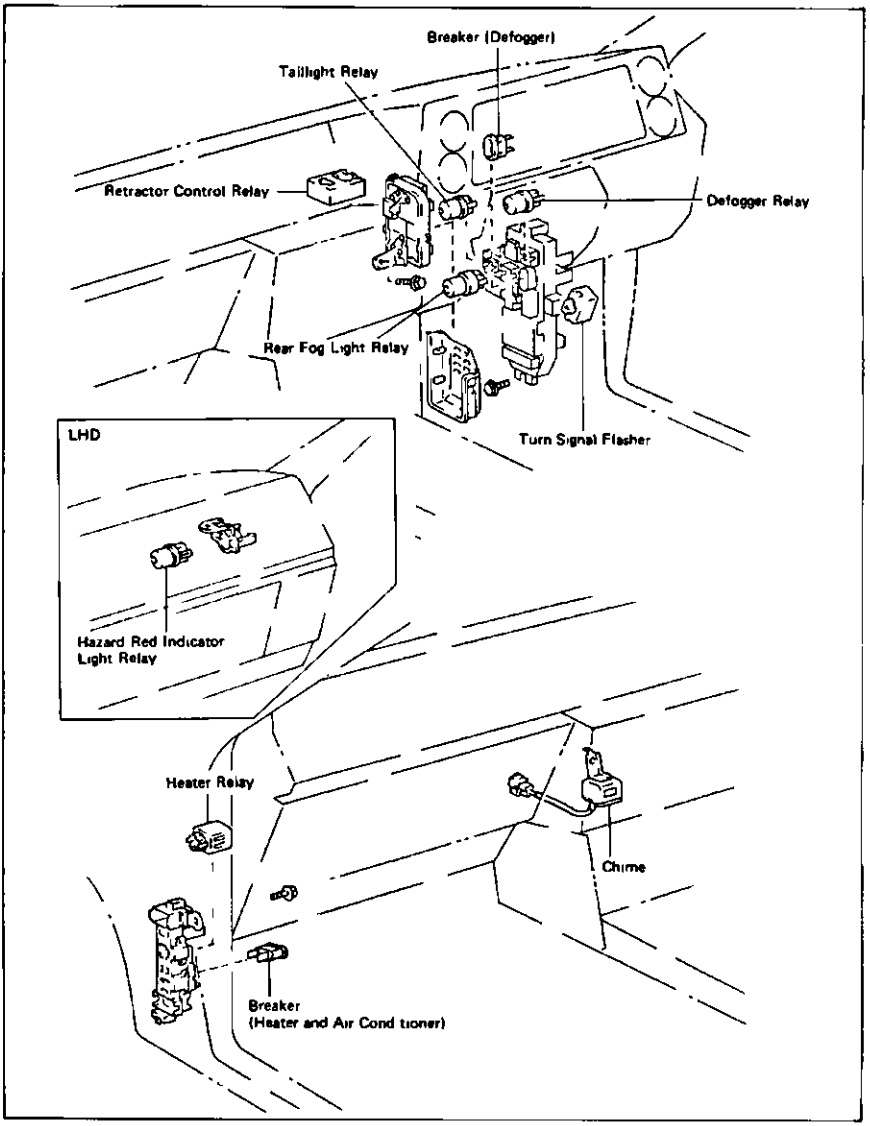
ENGINE COMPARTMENT SWITCHES AND RELAYS



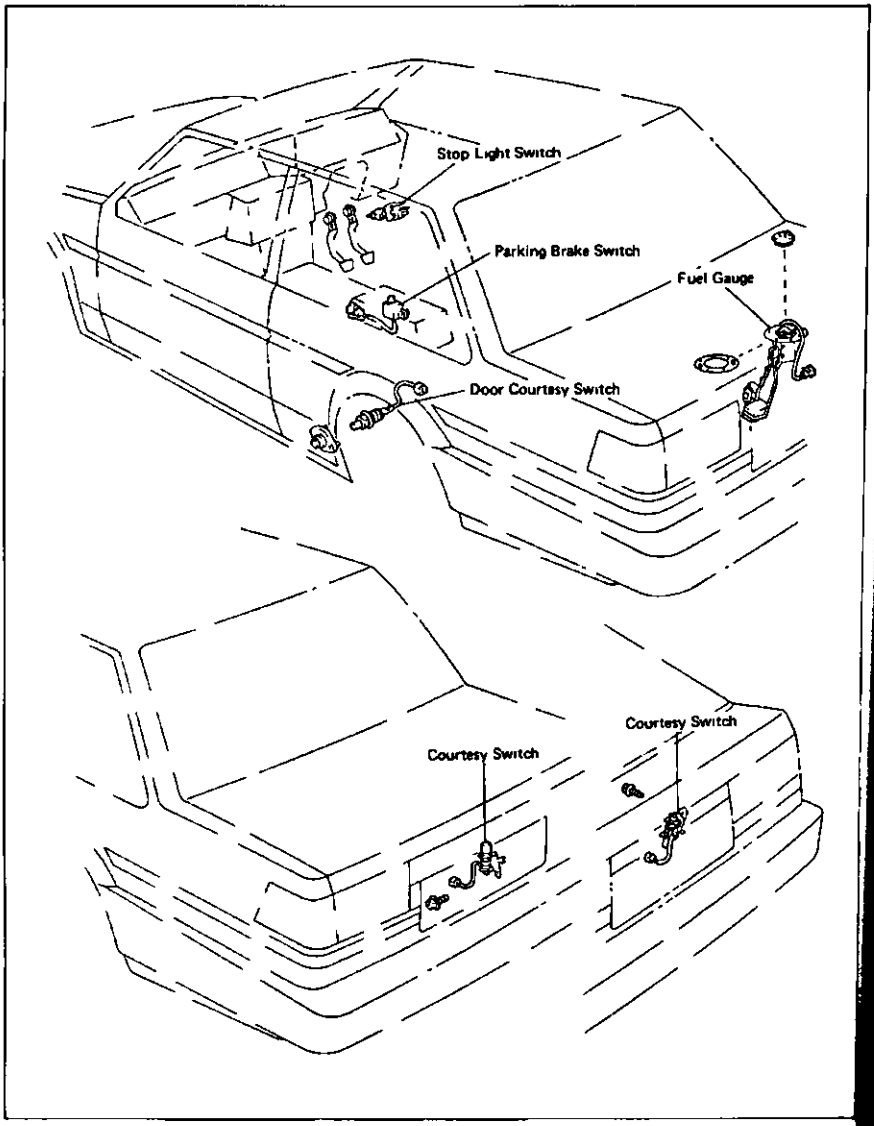
INSTRUMENT PANEL SWITCHES AND RELAYS

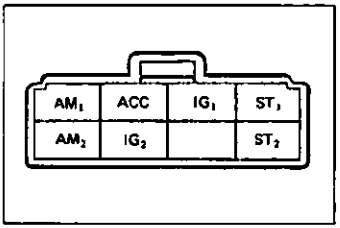


PASSENGER COMPARTMENT SWITCHES AND RELAYS



PASSENGER AND LUGGAGE COMPARTMENT SWITCHES AND RELAYS





SWITCHES

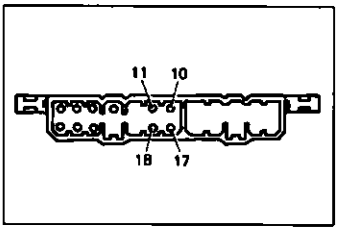
Ignition Switch

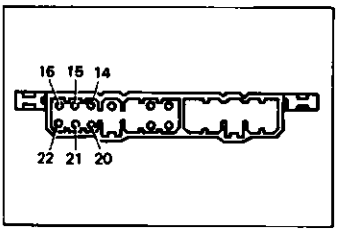
INSPECTION OF IGNITION SWITCH

INSPECT SWITCH CONTINUITY

Switch position \ Terminal (Wire color)	AM2 (B-R)	ACC (L-R)	IG1 (B-Y)	ST1 (B-W)	AM2 (BR)	IG2 (BR-W)	ST1 (BR-R)
LOCK							
ACC	○—○						
ON	○—○	—○			○—○		
START	○—	—○	—○		○—	—○	—○

If continuity is not as specified, replace the switch





Combination Switch

INSPECTION OF COMBINATION SWITCH

1 **INSPECT HEADLIGHT DIMMER SWITCH**

Inspect the switch continuity between terminals

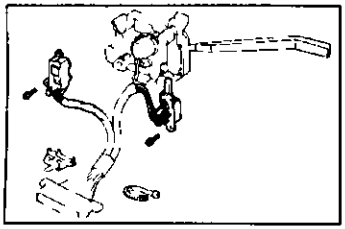
Switch position \ Terminal (Wire color)	10 ED (W-B)	18 HU (R-Y)	17 HL (R-G)	11 HF (R-W)
Headlight Flasher	○—○			—○
Low Beam	○—		—○	
High Beam	○—	—○		

2 **INSPECT TURN SIGNAL AND HAZARD WARNING SWITCH**

Inspect switch continuity between terminals

Switch position \ Terminal (Wire color)		14 TL (G-B)	20 TB (G-W)	15 TR (G-Y)	21 B1 (G-L)	16 F (G)	22 B2 (G-O)
Turn Signal	L	○—○			○—○		
	N				○—○		
	R		○—○		○—○		
Hazard	ON	○—○	—○			○—○	

If continuity is not as specified, replace the switch



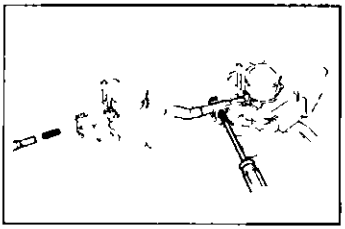
REPLACEMENT OF COMBINATION SWITCH

1. REPLACE HEADLIGHT DIMMER SWITCH

(a) Remove the terminals from the connector (See page BE 3)

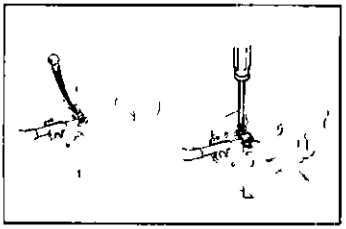
(b) Remove the turn signal and hazard warning switch

(c) Remove the headlight dimmer switch

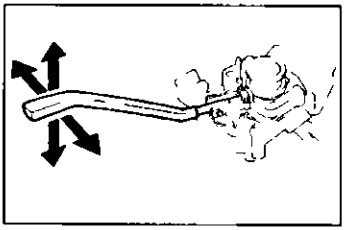


(d) Install the headlight dimmer switch

(e) Insert the spring into the lever and install the lever with the set screw

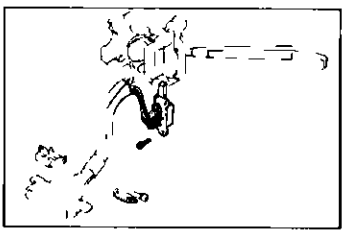


(f) Place the ball on the spring, position the lever at HI and install the plate



(g) Insure that the switch operates smoothly

(h) Install the terminals to the connector (See page BE 3)



2. REPLACE TURN SIGNAL AND HAZARD WARNING SWITCH

(a) Remove the terminals from the connector (See page BE 3)

(b) Remove the turn signal and hazard switch

(c) Install the turn signal and hazard switch

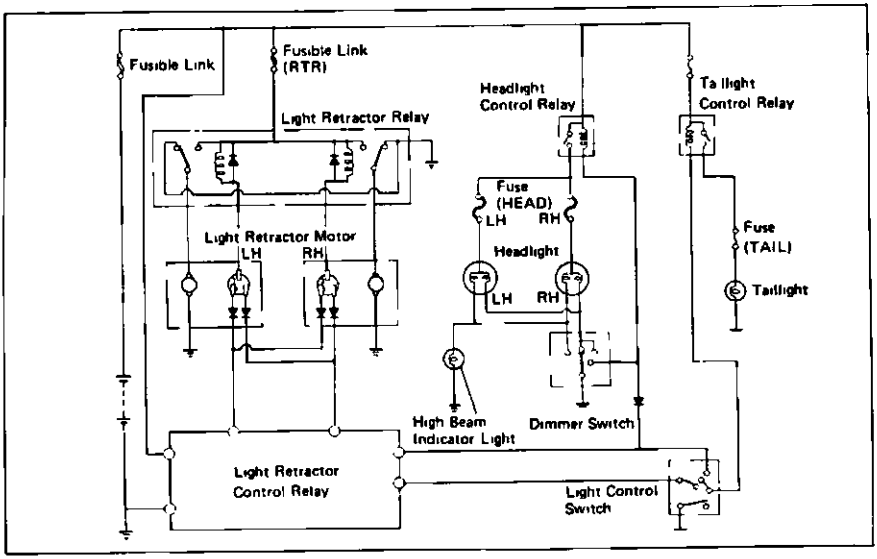
(d) Install the terminals to the connector (See page BE 3)

LIGHTING

Troubleshooting

Problem	Possible cause	Remedy	Page
Only one light does not light	Light bulb burned out	Replace bulb	
	Socket, wire or ground faulty	Repair as necessary	
No headlights light	Fusible link blown	Replace fusible link	
	Headlight control relay faulty	Check relay	BE 13
	Light control switch faulty	Check switch	BE 12
	Wiring or ground faulty	Repair as necessary	
High beam headlights or headlight flasher do not operate	Light control switch faulty	Check switch	BE 12
	Wiring faulty	Repair as necessary	
Tail, parking and license light do not light	TAIL fuse blown	Replace fuse and check for short	BE 4
	Fusible link blown	Replace fusible link	
	Taillight control relay faulty	Check relay	BE 13
	Light control switch faulty	Check switch	BE 12
	Wiring or ground faulty	Repair as necessary	
Stop lights do not light	STOP fuse blown	Replace fuse and check for short	BE-4
	Stop light switch faulty	Adjust or replace switch	
	Wiring or ground faulty	Repair as necessary	
Stop lights stay on	Stop light switch faulty	Adjust or replace switch	
Instrument lights do not light (taillights light)	Light control rheostat faulty	Check rheostat	BE 14
	Wiring or ground faulty	Repair as necessary	
Turn signal does not flash on one side	Turn signal switch faulty	Check switch	BE 9
	Wiring or ground faulty	Repair as necessary	
Turn signals do not operate	TURN fuse blown	Replace fuse and check for short	BE-4
	Turn signal flasher faulty	Check flasher	BE 16
	Turn signal/hazard switch faulty	Check switch	BE 9
	Wiring or ground faulty	Repair as necessary	
Hazard warning lights do not operate	HAZ HORN fuse blown	Replace fuse and check for short	BE-4
	Turn signal flasher faulty	Check flasher	BE 16
	Turn signal/hazard switch faulty	Check switch	BE 9
	Wiring or ground faulty	Repair as necessary	

Wiring Diagram

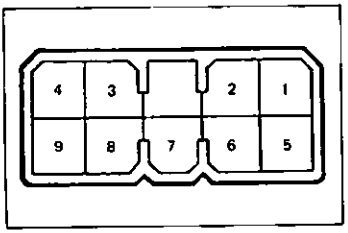


Light Control Switch and Rheostat

INSPECTION OF LIGHT CONTROL SWITCH AND RHEOSTAT

1 **INSPECT LIGHT CONTROL SWITCH CONTINUITY**

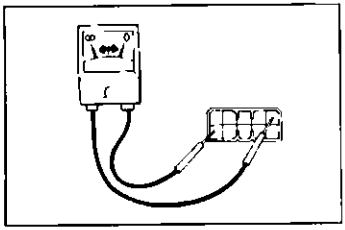
Inspect the switch continuity between terminals



Switch position \ Terminal	9 E	8 T	4 H	7 Ho
OFF				
TAIL	○	○		
HEAD	○	○	○	○
HOLD	○			○

HOLD position and Ho terminal Retractable Light Type

If continuity is not as specified, replace the switch

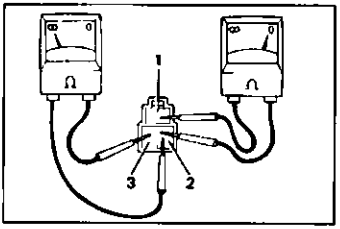


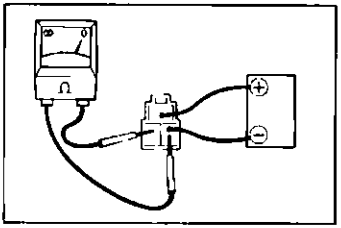
2. **CHECK RESISTANCE OF LIGHT CONTROL RHEOSTAT (With Light Control Rheostat only)**

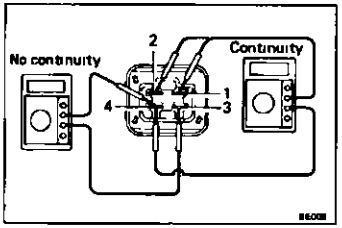
Using an ohmmeter, measure the resistance between terminals 1 and 9 at each point while turning the RHEOSTAT knob

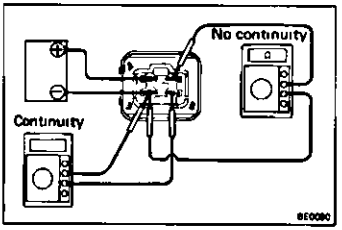
If resistance is not correct, replace the switch

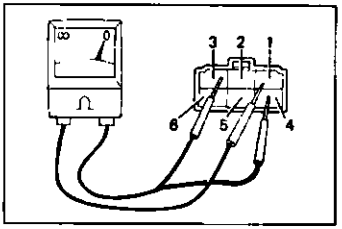
Point	Resistance (Ω)
Full clockwise	0
Midpoint	Approx. 5
Full counterclockwise	∞











Light Control Relays (Headlight and Taillight)

INSPECTION OF LIGHT CONTROL RELAY

1. INSPECT RELAY CONTINUITY
   (a) Check that there is continuity between terminals 1 and 2
   (b) Check that there is no continuity between terminals 2 and 3

   If continuity is not as specified, replace the relay
2. INSPECT RELAY OPERATION
   (a) Apply battery voltage across terminals 1 and 2
   (b) Check that there is continuity between terminals 2 and 3

   If operation is not as described, replace the relay

Dimmer Relay

INSPECTION OF DIMMER RELAY

1. INSPECT RELAY CONTINUITY
   (a) Check that there is continuity between terminals 1 and 4
   (b) Check that there is continuity between terminals 2 and 4
   (c) Check that there is no continuity between terminals 3 and 4

   If continuity is not as specified, replace the relay
2. INSPECT RELAY OPERATION
   (a) Apply battery voltage across terminals 2 and 4
   (b) Check that there is no continuity between terminals 1 and 4
   (c) Check that there is continuity between terminals 3 and 4.

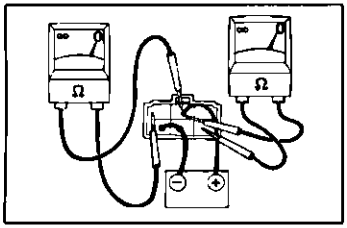
   If operation is not as described, replace the relay

Light Retractor Relay

INSPECTION OF LIGHT RETRACTOR RELAY

1. INSPECT RELAY CONTINUITY
   (a) Check that there is continuity between terminals 1 and 3 and also between terminals 1 and 4
   (b) Check that there is continuity between terminals 2 and 6 and also between terminals 2 and 5
   (c) Check that there is no continuity between terminals 1 and 2

   If continuity is not as specified, replace the relay

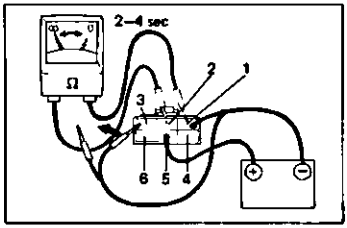


2. INSPECT RELAY OPERATION

(a) Connect the positive (+) lead from the battery to terminal 2 Connect the negative (–) lead to terminals 5 and 6

(b) Check the continuity between terminals 2 and 3 and terminals 2 and 4

If operation is not as described, replace the relay.



Light Retractor Control Relay

INSPECTION OF LIGHT RETRACTOR CONTROL RELAY

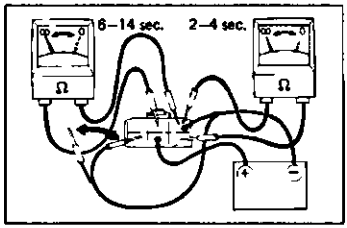
INSPECT RELAY OPERATION

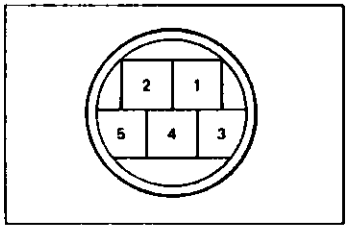
(a) Connect the positive (+) lead from the battery to terminal 5 Connect the negative (–) lead to terminal 1

(b) Connect the negative (–) lead from the battery to terminal 3 After disconnecting the connection between terminal 3 and battery, check the continuity for 2 – 4 seconds between terminals 1 and 2

(c) Check the continuity between terminals 1 and 4 after connecting the negative (–) lead from the battery to terminal 6 After disconnecting the connection between terminal 6 and the battery, check that there is continuity for 2 – 4 seconds between terminals 1 and 4, and continuity immediately for 6 – 14 seconds between terminals 1 and 2.

If operation is not as described replace the relay





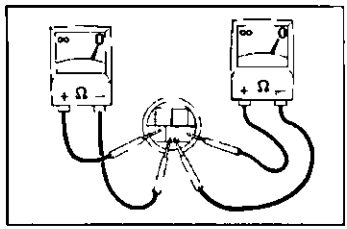
Light Retractor Motor

INSPECTION OF LIGHT RETRACTOR MOTOR

1. INSPECT MOTOR OPERATION

Connect the positive (+) lead from the battery to terminal 2 and connect the negative (–) lead to terminal 1 Check that the motor runs

If there is no motor operation, replace the motor



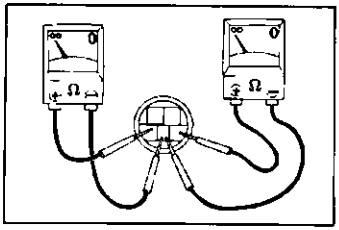
2 INSPECT DIODE CONTINUITY OF MOTOR

(a) Move the headlights to any position except the upper most or lowermost positions

(b) Connect the ohmmeter positive (+) lead to terminal 4 and the negative (–) lead to terminal 5

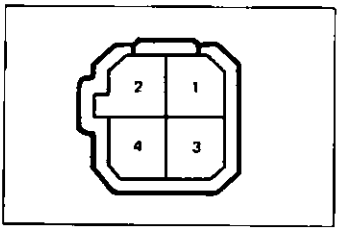
(c) Connect the ohmmeter positive (+) lead to terminal 4 and the negative (–) lead to terminal 3

If there is no continuity, replace the motor assembly



(d) Reverse the test leads of the ohmmeter and inspect continuity.

If there is continuity, replace the motor assembly



Rear Fog Light Switch

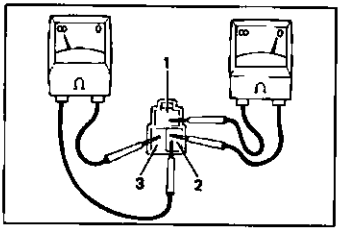
INSPECTION OF REAR FOG LIGHT SWITCH

INSPECT SWITCH CONTINUITY

Inspect the switch continuity between terminals

Switch position \ Terminal	2	1	3
ON	○	○	○
OFF			○

If continuity is not as specified, replace the switch or bulb



Rear Fog Light Relay

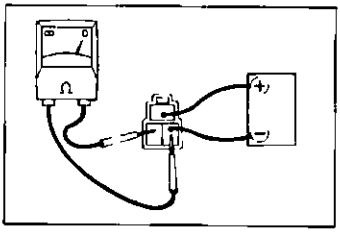
INSPECTION OF REAR FOG LIGHT RELAY

1. INSPECT RELAY CONTINUITY

(a) Check that there is continuity between terminals 1 and 2

(b) Check that there is no continuity between terminals 2 and 3

If continuity is not as specified, replace the relay



2. INSPECT RELAY OPERATION

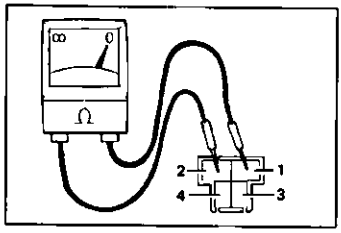
(a) Apply battery voltage across terminals 1 and 2

(b) Check that there is continuity between terminals 2 and 3

If operation is not as described, replace the relay

Hazard Red Indicator Light Relay

INSPECTION OF RED INDICATOR LIGHT RELAY



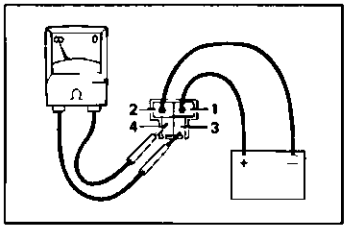
1. INSPECT RELAY CONTINUITY

(a) Check theat there is continuity between terminals 1 and 2

(b) Check that there is continuity between terminals 3 and 4

(c) Check that there is no continuity between terminals 1 and 3

If continuity is not as specified, replace the relay



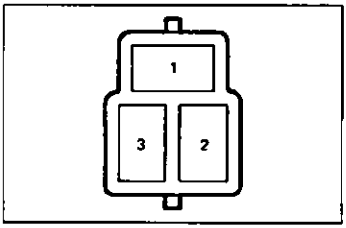
2. INSPECT RELAY OPERATION

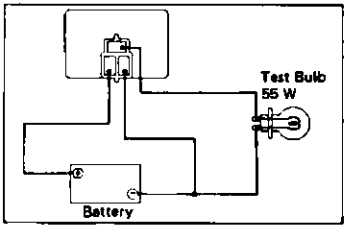
(a) Apply battery voltage across terminals 1 and 2

(b) Check that there is no continuity between terminals 3 and 4

(c) Check that there is no continuity between terminals 1 and 3

If operation is not as described, replace the relay





Turn Signal Flasher

INSPECTION OF TURN SIGNAL FLASHER

INSPECT RELAY OPERATION

(a) Connect the positive (+) lead from the battery to terminal 3. Connect the negative (–) lead to terminal 2.

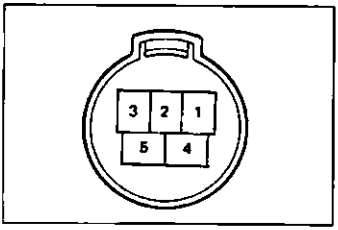
(b) Connect a 55W bulb between terminals 1 and 2, and check that the bulb goes on and off.

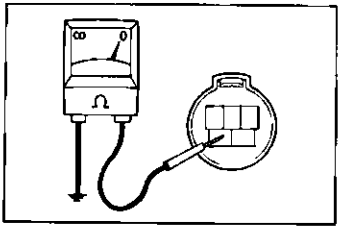
NOTE: The turn signal lights should flash 75 to 95 times per minute.

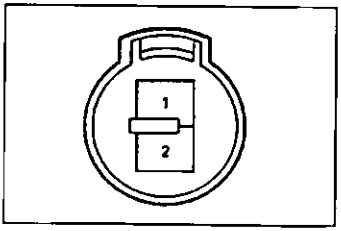
If one of the front or rear turn signal lights has an open circuit, the number of flashes would be more than 120 per minute.

If one of the side turn signal lights has an open circuit, the number of flashes would increase by about 10 per minute.

If operation is not as described, replace the relay







HEADLIGHT CLEANER

Headlight Cleaner Control Relay

INSPECTION OF HEADLIGHT CLEANER CONTROL RELAY

INSPECT RELAY OPERATION

(a) Check that there is continuity between terminal 2 and body ground with the washer switch "ON"

(b) Check that there is battery voltage between terminal 3 and body ground with the light control switch at "TAIL" or "HEAD"

(c) Check that there is continuity between terminal 5 and body ground for about 0.5 seconds when the light control switch is at "TAIL" or "HEAD" and the washer switch is pushed twice in succession

If operation is not as described, replace the relay

Cleaner Motor

INSPECTION OF CLEANER MOTOR

INSPECT MOTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 1. Connect the negative (–) lead to terminal 2.

(b) Check that the motor operates

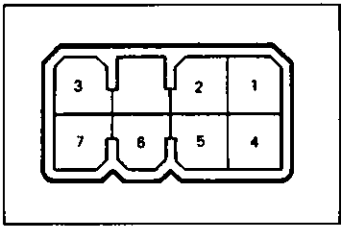
CAUTION: These tests must be performed quickly (within 3 – 5 seconds) to prevent the coil from burning out

If operation is not as described, replace the motor

WIPER AND WASHER

Troubleshooting

Problem	Possible cause	Remedy	Front Page	Rear Page
Wipers do not operate or return to off position	WIPER fuse blown	Replace fuse and check for short	BE-4	BE-4
	Wiper motor faulty	Check motor	BE 19	BE 20
	Wiper control switch faulty	Check switch	BE 18	BE 20
	Wiring or ground faulty	Repair as necessary		
Wipers do not operate in INT position	Wiper control relay faulty	Check switch	BE 18	
	Wiper control switch faulty	Check switch	BE 18	
	Wiper motor faulty	Check motor	BE-19	
	Wiring or ground faulty	Repair as necessary		
Washer does not operate	Washer hose or nozzle clogged	Repair as necessary		
	Washer motor faulty	Replace motor	BE 19	BE 20
	Wiper control switch faulty	Check switch	BE 18	BE 20
	Wiring faulty	Repair as necessary		



Front Wiper and Washer Switch

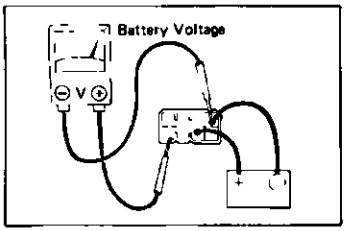
INSPECTION OF FRONT WIPER AND WASHER SWITCH

1. INSPECT SWITCH CONTINUITY

Switch position \ Terminal		5 +B	4 +2	7 +1	2 +S	1 Ew	3 W
OFF				o—o			
INT				o—o			
LO		o—		—o			
HI		o—	—o				
Washer	OFF						
	ON					⌒	—o

INT position With INT

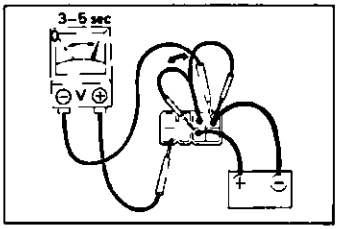
If continuity is not as specified, replace the switch



2 INSPECT SWITCH OPERATION (INT type only)

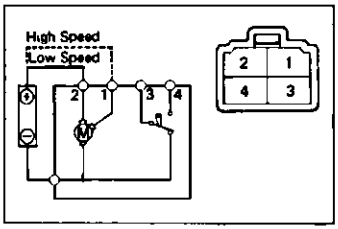
(a) Connect the positive (+) lead from the battery to terminal 5 and connect the negative (–) lead from the battery to terminal 1

(b) Connect the positive (+) lead from the voltmeter to terminal 7 and connect the negative (–) lead from the voltmeter to terminal 1 Turn the wiper switch to INT position and check that the meter needle indicates battery voltage



(c) After first connecting the +S probe to terminal 1, connect it to terminal 5. Then, immediately connect it to terminal 1 again, and check that the tester needle indicates 0 volts for 3 – 5 seconds before returning to its original position.

If operation is not as described, replace the switch.



Front Wiper Motor

INSPECTION OF FRONT WIPER MOTOR

INSPECT FRONT WIPER MOTOR OPERATION

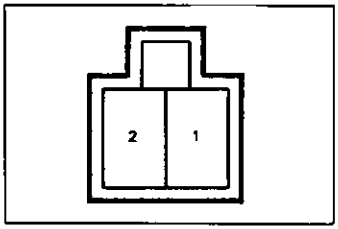
Disconnect the wiper motor.

Connect the negative (–) lead from the battery to the motor body and inspect the following operation.

(a) Connect the positive (+) lead to terminal 2 and check that the motor turns at low speed.

(b) Connect the positive (+) lead to terminal 1 and check that the motor turns at high speed.

If operation is not as described above, replace the motor.

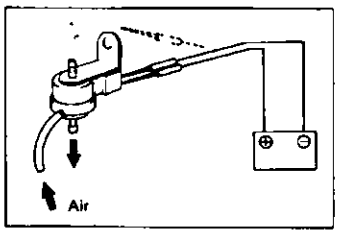


Washer Valve

INSPECTION OF WASHER VALVE

1. INSPECT VALVE CONTINUITY

Check that there is continuity between the terminals.

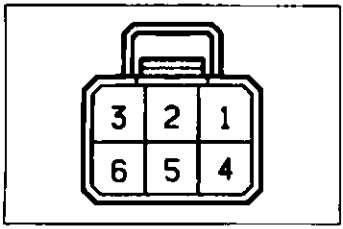


2 INSPECT VALVE OPERATION

(a) Check that air flows from the washer tank to the front washer hose and that air does not flow from the washer tank to the rear washer hose.

(b) Connect the positive (+) lead from the battery to terminal 2 and connect the negative (–) lead to terminal 1. Check that air flows from the washer tank to the rear washer hose and that air does not flow from the washer tank to the front washer hose.

If operation is not as described, replace the valve.



Rear Wiper and Washer Switch

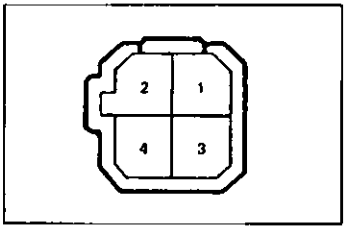
INSPECTION OF REAR WIPER AND WASHER SWITCH

INSPECT SWITCH CONTINUITY

Inspect the continuity between terminals for each switch position shown in the table below

If there is no continuity between the terminals specified, replace the switch

Switch position \ Terminal	1	2	6	3	4	5
OFF	○—○					
ON		○—○				
Washer I	○—○			○—○	○—○	○—○
Washer II		○—○		○—○	○—○	○—○



Rear Wiper Motor

INSPECTION OF REAR WIPER MOTOR

INSPECT REAR WIPER MOTOR OPERATION

Connect the negative (–) lead from the battery to the motor body Connect a positive (+) lead to terminal 3 and check that the motor turns

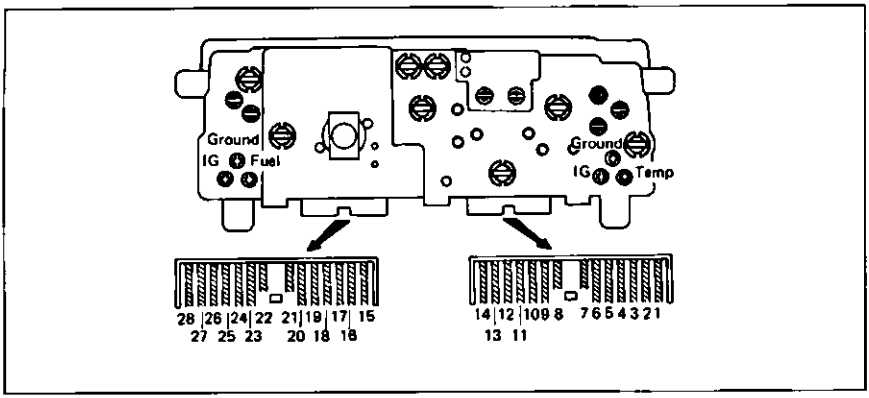
If operation is not as described above, replace the motor

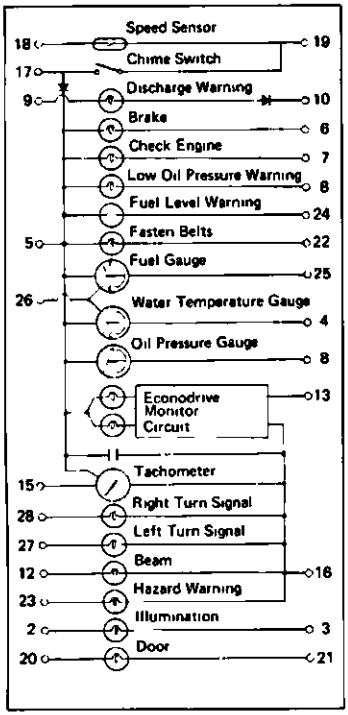
INSTRUMENTS AND SENDER GAUGES

Troubleshooting

Problem	Possible cause	Remedy	Page
Tachometer does not work	GAUGE fuse blown	Replace fuse and check for short	BE-4
	Tachometer faulty	Check tachometer	BE 24
	Wiring faulty	Repair as necessary	
Fuel receiver gauge does not work	GAUGE fuse blown	Replace fuse and check for short	BE-4
	Fuel receiver gauge faulty	Check receiver gauge	BE 25
	Sender gauge faulty	Check sender gauge	BE 25
	W ring or ground faulty	Repair as necessary	
Water temperature receiver gauge does not work	GAUGE fuse blown	Replace fuse and check for short	BE-4
	Water temperature receiver gauge faulty	Check receiver gauge	BE 26
	Water temperature sender gauge faulty	Check sender gauge	BE-26
	Wiring or ground faulty	Repair as necessary	
Oil pressure receiver gauge does not work	GAUGE fuse blown	Replace fuse and check for short	BE-4
	Oil pressure receiver gauge faulty	Check receiver gauge	BE 27
	Oil pressure sender gauge faulty	Check sender gauge	BE 27
	Wiring or ground faulty	Repair as necessary	
Brake warning light does not light	GAUGE fuse blown	Replace fuse and check for short	BE-4
	Bulb burned out	Replace bulb	
	Brake fluid level warning switch faulty	Check switch	BE 28
	Wir ng or ground faulty	Repair as necessary	
Parking brake warning l ght does not light (Australia only)	GAUGE fuse blown	Replace fuse and check for short	BE 4
	Bulb burned out	Replace bulb	
	Parking brake switch faulty	Check switch	
	Wiring or ground faulty	Repair as necessary	
Discharge warning light does not light	IGN fuse blown	Replace fuse and check for short	BE-4
	Bulb burned out	Replace bulb	
	Wiring faulty	Repair as necessary	

Combination Meter and Gauges (LHD)

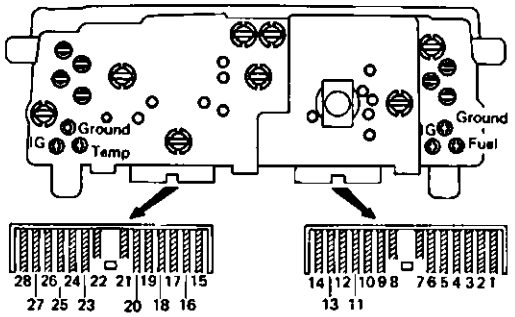


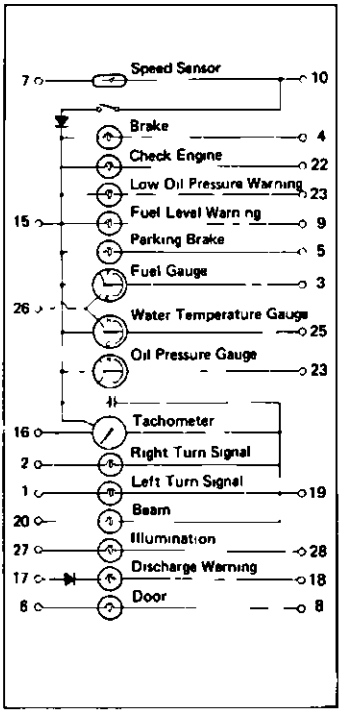


COMBINATION METER CIRCUIT

No	Wiring Connector Sides
1	–
2	TAIL Fuse
3	Rheostat or Ground
4	Water Temperature Sender Gauge
5	GAUGE Fuse
6	Brake Fluid Level Warning Switch and Parking Brake Switch
7	EFI Computer (With EFI)
8	Oil Pressure Sender Gauge or Oil Pressure Switch
9	IGN Fuse
10	CHARGE Fuse
11	–
12	Dimmer Switch Terminal H_U
13	Vacuum Switch
14	–
15	Ignition Coil
16	Ground
17	Chime
18	EFI Computer (With EFI)
19	Ground
20	DOME Fuse
21	Door
22	Seat Belt Warning
23	Hazard Warning
24	Fuel Level Warning
25	Fuel Sender Gauge
26	Ground
27	Turn Signal Switch Terminal T_L
28	Turn Signal Switch Terminal T_R

Combination Meter and Gauges (RHD)





COMBINATION METER CIRCUIT

No	Wiring Connector Sides
1	Turn Signal Switch Terminal T_L
2	Turn Signal Switch Terminal T_R
3	Fuel Sender Gauge
4	Brake Fluid Level Warning Switch and Parking Brake Switch (except Australia) or Brake Fluid Level Warning Switch and Bulb Check Relay (Australia only)
5	Parking Brake Switch (Australia only)
6	DOME Fuse
7	EFI Computer (With EFI)
8	Door
9	Fuel Level Warning
10	Ground
11	–
12	
13	–
14	–
15	GAUGE Fuse
16	Ignition Coil
17	IGN Fuse
18	CHARGE Fuse
19	Ground
20	Dimmer Switch Terminal H_U
21	–
22	EFI Computer (With EFI)
23	Oil Pressure Sender Gauge or Oil Pressure Switch
24	–
25	Water Temperature Sender Gauge
26	Ground
27	TAIL Fuse
28	Rheostat or Ground

Speedometer

ON-VEHICLE INSPECTION OF SPEEDOMETER

(a) Using a speedometer tester, inspect the speedometer for allowable indicating error and check the operation of the odometer

NOTE Tire wear and tire over or under inflation will increase the indicating error

(b) Check the speedometer for pointer vibration and abnormal noises.

NOTE: Pointer vibration can be caused by a loose speedometer cable.

Standard indication (km/h)	Allowable error (km/h)
20	21 – 25
40	41 5 – 46
60	62 5 – 67
80	83 – 88
100	104 – 109
120	125 – 130 5
140	145 5 – 151 5
160	166 – 173

Standard ind cation (mph)	Allowable error (mph)
20	21 – 23 5
40	41 5 – 44
60	62 5 – 66
80	83 – 87
100	104 – 108 5

Tachometer

ON-VEHICLE INSPECTION OF TACHOMETER

(a) Connect a tune-up test tachometer and start the engine.

(b) Compare the tester and tachometer indications

If the error is excessive, replace the tachometer

CAUTION:

- **Reversing the connection of the tachometer will damage the transistors and diodes inside.**
- **When removing or installing the tachometer, be careful not to drop or subject it to severe shocks**

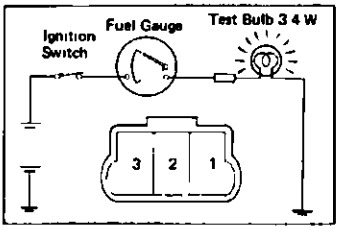
Temp \ rpm	1000	3000	5000	7000
25°C DC13V	±100	±200	±200	±300

Fuel Gauge

INSPECTION OF FUEL GAUGE

1 INSPECT RECEIVER GAUGE OPERATION

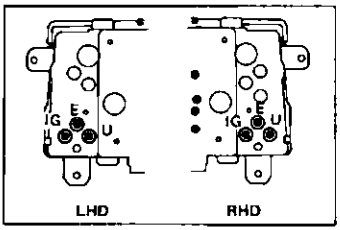
(a) Disconnect the connector from the fuel sender gauge Turn the ignition switch on and check that the receiver gauge needle moves to empty position



(b) Connect the 3 4W test bulb between terminal 1 and body ground Check that the bulb light and the receiver gauge needle operates

NOTE Because of the silicon oil in the gauge, it will take about 90 seconds for the needle to stabilize

If indications are not correct, remove and test the receiver gauge



2 MEASURE RECEIVER GAUGE RESISTANCE BETWEEN TERMINALS

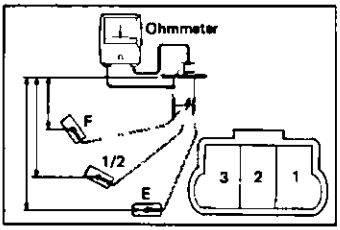
Between terminals	Res stance (Ω)
IG – U	Approx 102
U – E	Approx 101
IG – E	Approx 203

If each resistance value is not as shown in the table above, replace the receiver gauge

3. MEASURE RESISTANCE OF SENDER GAUGE

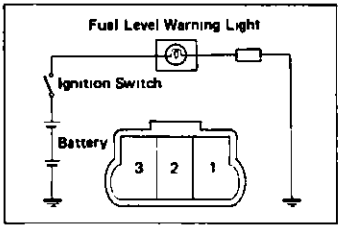
(a) Check that resistance changes as the float is moved from the top to bottom position

(b) Measure the resistance between terminal 1 and the sender gauge body for each float position



Float position mm (in)		Resistance (Ω)
F	64 7 – 70 7 (2 547 – 2 783)	3 ± 2 1
½	153 (6 024)	32 5 ± 4 8
E	205 5 – 211 5 (8 091 – 8 327)	110 ± 7 7

If each resistance value is not as shown in the table above, replace the sender gauge.



Fuel Level Warning

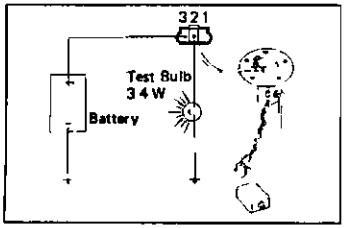
INSPECTION OF FUEL LEVEL WARNING

1. INSPECT WARNING LIGHT OPERATION

(a) Disconnect the connector from the switch Connect the switch terminal 1 and body ground

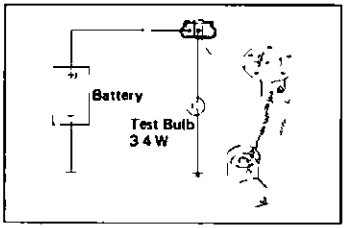
(b) Turn the ignition switch on Check that the bulb lights

If operation is not correct, remove and test the bulb



2. INSPECT LEVEL WARNING SWITCH OPERATION

(a) Apply battery voltage between terminals 2 and 3 through a 3.4W bulb. Check that the bulb lights.

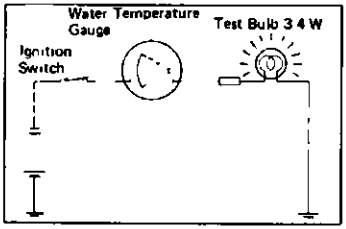


(b) Submerge the switch in gasoline or water. Check that the bulb goes out.

If operation is not correct, replace the sender gauge.

Water Temperature Gauge

INSPECTION OF WATER TEMPERATURE GAUGE

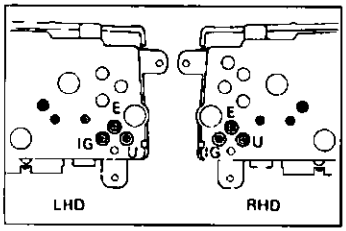


1 INSPECT RECEIVER GAUGE OPERATION

(a) Disconnect the connector from the sender gauge. Ground the terminal through a 3.4W bulb as shown.

(b) Turn the ignition switch on. Check that the bulb lights up and that the receiver gauge needle rises to the upper position.

If indications are not correct, remove and test the receiver gauge.



2 MEASURE RESISTANCE OF RECEIVER GAUGE

Using an ohmmeter, measure the resistance between terminals.

If each resistance value is not as shown in the table below, replace the receiver gauge.

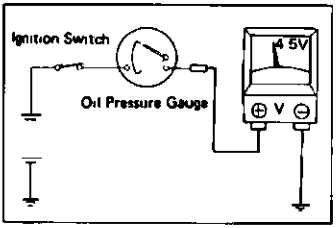
Between terminals	Resistance (Ω)
IG – U	Approx. 99
U – E	Approx. 156
IG – E	Approx. 255

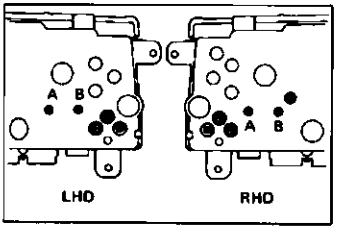
3 MEASURE RESISTANCE OF SENDER GAUGE

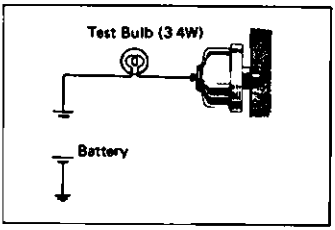
Using an ohmmeter, measure the resistance between the terminal and ground.

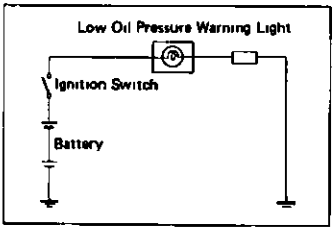
If each resistance value is not as shown in the table below, replace the sender gauge.

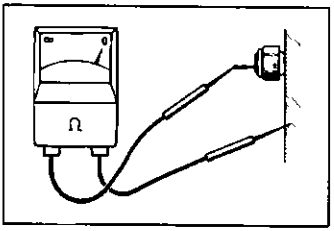
Water temperature °C (°F)	Resistance (Ω)
50 (122)	226 $^{+33.6}_{-36.6}$
115 (239)	26.4 $^{+1.71}_{2.21}$











Oil Pressure Gauge

INSPECTION OF OIL PRESSURE GAUGE

1. INSPECT RECEIVER GAUGE OPERATION

(a) Disconnect the connector from the sender gauge Connect the positive (+) lead from the voltmeter to the terminal and the negative (−) lead to body ground

(b) Turn the ignition switch on Check that the meter needle vibrates near the 4.5V position

If the voltage value is not correct, remove and test the receiver gauge

2 MEASURE RESISTANCE OF RECEIVER GAUGE

Using an ohmmeter, measure the resistance between terminals A and B

Resistance: Approx. 42 Ω

If resistance value is not correct, replace the receiver gauge

3 INSPECT SENDER GAUGE OPERATION

(a) Disconnect the connector from the sender gauge

(b) Connect a 12V battery to the sender gauge terminal in series with a 3.4W bulb Check that the bulb does not light when the engine is stopped, and flashes when the engine is running The number of flashes should vary with engine speed

If operation is not correct, replace the sender gauge

Low Oil Pressure Warning

INSPECTION OF LOW OIL PRESSURE WARNING

1. INSPECT WARNING LIGHT OPERATION

(a) Disconnect the connector from the switch Connect the switch terminal and body ground

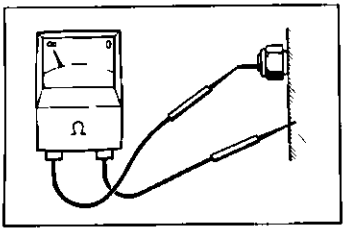
(b) Turn the ignition switch on Check that the bulb lights

If operation is not correct, remove and test the bulb

2. INSPECT SWITCH OPERATION

Check the continuity between the terminal and ground

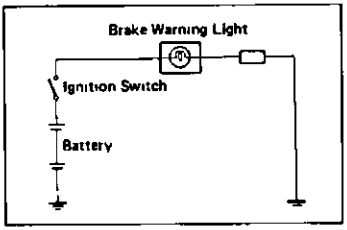
(a) Check that there is continuity with the engine stopped



(b) Check that there is no continuity with the engine running

NOTE After the engine has started, oil pressure should rise over 0.4 kg/cm² (5.7 psi)

If operation is not correct, replace the switch



Brake Warning

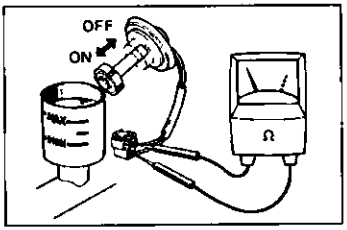
INSPECTION OF BRAKE WARNING

1. INSPECT WARNING LIGHT OPERATION

(a) Disconnect the connector from the brake fluid level warning switch. Connect the switch terminal and body ground.

(b) Turn the ignition switch on. Check that the bulb lights.

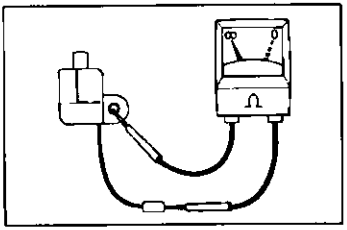
If operation is not correct, remove and test the bulb.



2 INSPECT OPERATION OF BRAKE FLUID LEVEL WARNING SWITCH

Inspect the switch operation when the switch is OFF (float up) and when the switch is ON (float down).

If operation is not correct, replace the switch.



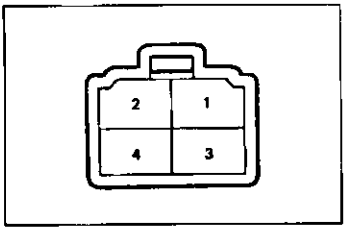
3 INSPECT OPERATION OF PARKING BRAKE SWITCH (except Australia)

Using an ohmmeter, inspect the continuity between the terminal and bolt hole (ground).

(a) Check that there is continuity when the switch is free (parking brake lever up).

(b) Check that there is no continuity when the switch pin is pushed (parking brake lever down).

If operation is not correct, replace the switch.



Bulb Check Relay (Australia only)

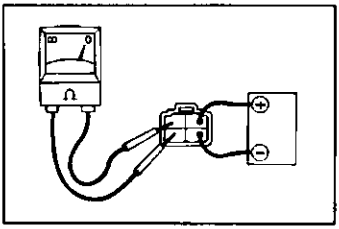
INSPECTION OF BULB CHECK RELAY

1. INSPECT RELAY CONTINUITY

(a) Check that there is continuity between terminals 1 and 3.

(b) Check that there is no continuity between terminals 2 and 4.

If continuity is not as specified, replace the relay.



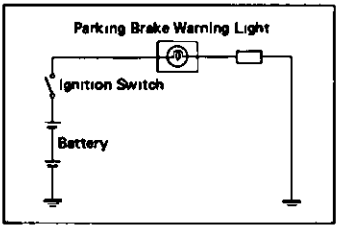
2. INSPECT RELAY OPERATION

Connect the positive (+) lead from the battery to terminal 1 and connect the negative (–) lead from the battery to terminal 3. Then, check that there is continuity between terminals 2 and 4.

If operation is not correct, replace the relay.

Parking Brake Warning (Australia only)

INSPECTION OF PARKING BRAKE WARNING

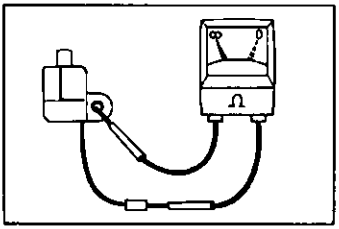


1. INSPECT WARNING LIGHT OPERATION

(a) Disconnect the connector from the parking brake switch. Connect the switch terminal and body ground.

(b) Turn the ignition switch on. Check that the bulb lights.

If operation is not correct, remove and test the bulb.



2. INSPECT OPERATION OF PARKING BRAKE SWITCH

Using an ohmmeter, inspect the continuity between the terminal and bolt hole.

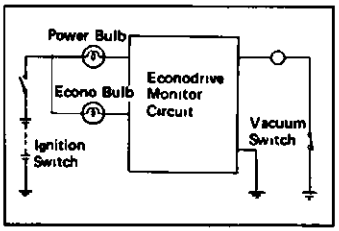
(a) Check that there is continuity when the switch is free (parking brake lever up).

(b) Check that there is no continuity when the switch pin is pushed (parking brake lever down).

If operation is not correct, remove and test the bulb.

Econodrive Monitor

INSPECTION OF ECONODRIVE MONITOR

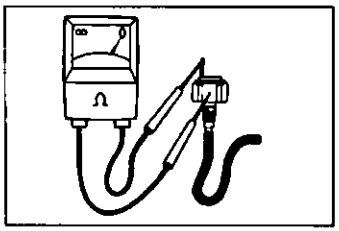


1 INSPECT INDICATOR LIGHT OPERATION

(a) Turn the ignition switch on. Check that the POWER bulb lights.

(b) Disconnect the connector from the switch. Check that the ECONO bulb lights.

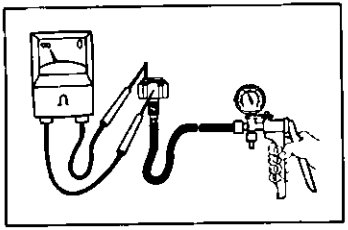
If operation is not correct, remove and test the bulb.



2 INSPECT SWITCH CONTINUITY

Check that there is continuity between the switch terminal and body.

If continuity is not as specified, replace the switch.



3. **INSPECT SWITCH OPERATION**

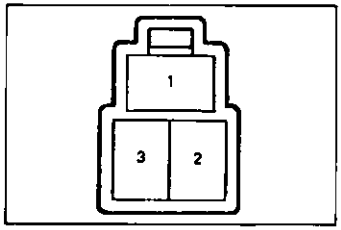
With a vacuum of 100 ± 25 mmHg (3.94 ± 0.98 in Hg) or above, check that there is no continuity between the switch terminal and body

If operation is not correct, replace the switch

REAR WINDOW DEFOGGER

Troubleshooting

Problem	Possible cause	Remedy	Page
Rear window defogger does not work	Circuit breaker OFF	Reset breaker and check for short	BE-4
	Defogger relay faulty	Check relay	BE 31
	Defogger switch faulty	Check switch	BE 31
	Defogger wire broken	Check wires	BE 32
	Wiring and ground faulty	Repair as necessary	



Rear Window Defogger Switch

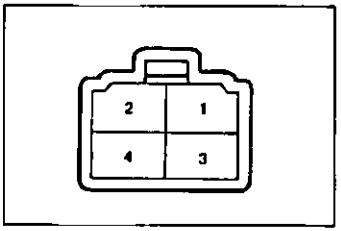
INSPECTION OF REAR WINDOW DEFOGGER SWITCH

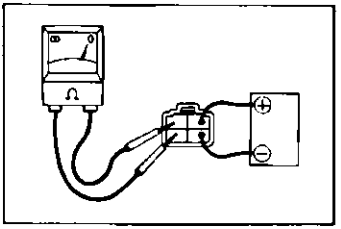
INSPECT SWITCH CONTINUITY

Inspect continuity between the terminals

Switch position \ Terminal	1	3	2
OFF		○	○
ON	○	○	○

If there is no continuity as shown above, replace the switch or bulb





Rear Window Defogger Relay

INSPECTION OF REAR WINDOW DEFOGGER RELAY

1 **INSPECT RELAY CONTINUITY**

(a) Check that there is continuity between terminals 1 and 3

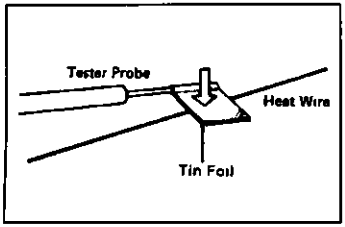
(b) Check that there is no continuity between terminals 2 and 4

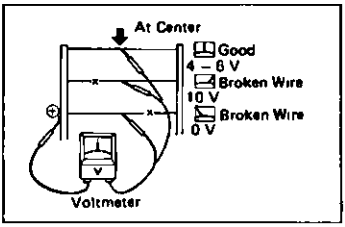
If continuity is not as specified, replace the relay

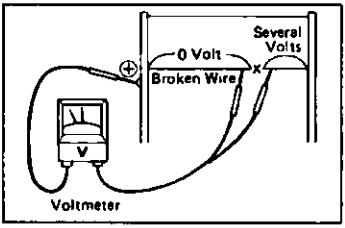
2. **INSPECT RELAY OPERATION**

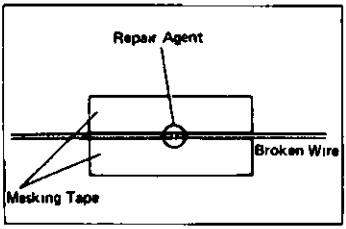
Connect the positive (+) lead from the battery to terminal 1 and connect the negative (–) lead from the battery to terminal 3. Then, check that there is continuity between terminals 2 and 4.

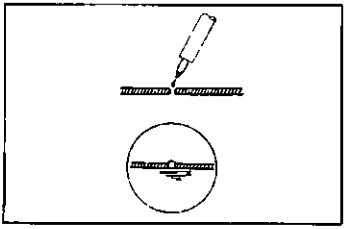
If operation is not as described, replace the relay











Rear Window Defogger Wires

CAUTION:

- **When cleaning the glass, use a soft, dry cloth, and wipe the glass in the direction of the wire. Take care not to damage the wires**
- **Do not use detergents or glass cleaners with abrasive ingredients.**
- **When measuring voltage, wind a piece of tin foil around the tip of the negative probe and press the foil against the wire with your finger, as shown**

INSPECTION OF REAR WINDOW DEFOGGER WIRES

1. INSPECT FOR WIRE BREAKAGE

(a) Turn the defogger switch on

(b) Inspect the voltage at the center of each heat wire.

Voltage	Criteria
Approx. 5V	Good (No break in wire)
Approx. 10V or 0V	Broken wire

NOTE If there is 10V, the wire is broken between the center of the wire and positive (+) end If there is no voltage, the wire is broken between the center of the wire and ground

2 INSPECT FOR WIRE BREAKAGE POINT

(a) Place the voltmeter positive (+) lead against the defogger positive (+) terminal

(b) Place the voltmeter negative (–) lead with the foil strip against the heat wire at the positive (+) terminal end and shift it toward the negative (–) terminal end

(c) The point where the voltmeter deflects from zero to several volts is the place where the heat wire is broken.

NOTE If the heat wire is not broken, the voltmeter will indicate 0V at the positive (+) end of the heat wire but gradually increase to 12V as the meter probe is moved to the other end.

REPAIR OF REAR WINDOW DEFOGGER WIRES

1 CLEAN BROKEN WIRE WITH WHITE GASOLINE

2. PLACE MASKING TAPE ALONG BOTH SIDES OF WIRE TO BE REPAIRED

(a) Thoroughly mix the repair agent (Dupont paste No 4817)

(b) Using a fine tip brush, apply a small amount to the wire

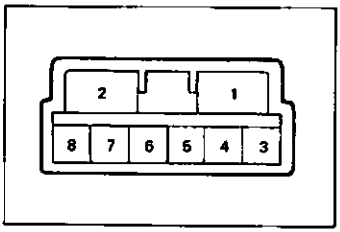
(c) After a couple of minutes, remove the masking tape

(d) Allow to stand at least 24 hours

HEATER

Troubleshooting

Problem	Possible cause	Remedy	Page
Blower does not work when fan switch is on	Circuit breaker OFF	Reset breaker and check for short	BE-4
	Heater main relay faulty	Check relay	BE 33
	Heater blower switch faulty	Check switch	BE 33
	Heater blower resistor faulty	Check resistor	BE 34
	Heater blower motor faulty	Replace motor	
	Wiring or ground faulty	Repair as necessary	
Incorrect temperature output	Control cables broken or binding	Check cables	BE 34
	Heater hoses leaking or clogged	Replace hose	
	Water valve faulty	Replace valve	
	Air dampers broken	Repair dampers	
	Air ducts clogged	Repair ducts	
	Heater radiator leaking or clogged	Replace radiator	
	Heater control unit faulty	Repair control unit	



Heater Switch

INSPECTION OF HEATER BLOWER SWITCH

INSPECT SWITCH CONTINUITY

Inspect heater blower switch continuity

Switch position \ Terminal	2	3	5	6	1	7 *	8 *
OFF						○ — ○	
LO	○ — ○					○ — ○	
•	○ — ○	○ — ○				○ — ○	
●	○ — ○	○ — ○	○			○ — ○	
HI	○ — ○	○ — ○	○	○		○ — ○	

* For illumination light

If continuity is not as specified, replace the switch

Heater Relay

INSPECTION OF HEATER RELAY

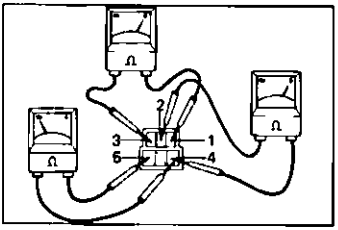
1. INSPECT RELAY CONTINUITY

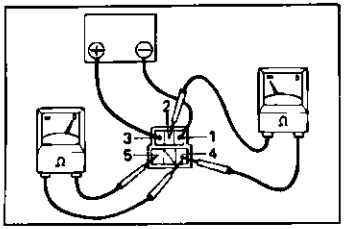
(a) Check that there is continuity between terminals 1 and 3

(b) Check that there is continuity between terminals 2 and 4

(c) Check that there is no continuity between terminals 4 and 5

If continuity is not as specified, replace the relay





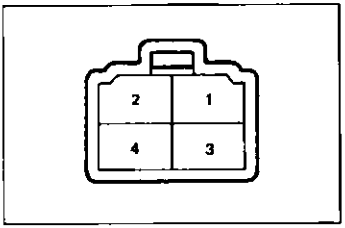
2. INSPECT RELAY OPERATION

(a) Apply battery voltage across terminals 1 and 3

(b) Check that there is continuity between terminals 4 and 5

(c) Check that there is no continuity between terminals 2 and 4

If operation is not as described, replace the relay



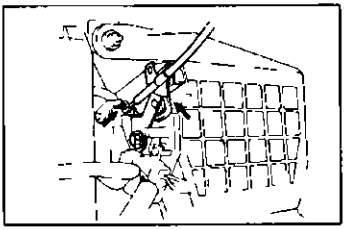
Heater Blower Resistor

INSPECTION OF HEATER BLOWER RESISTOR

INSPECT RESISTOR CONTINUITY

Check that there is continuity between terminals 1 and 3

If there is no continuity, replace the resistor

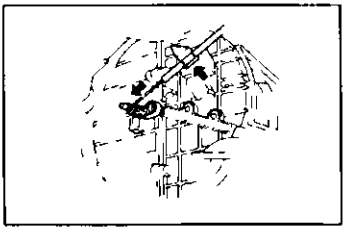


Heater Control

ADJUSTMENT OF HEATER CONTROL

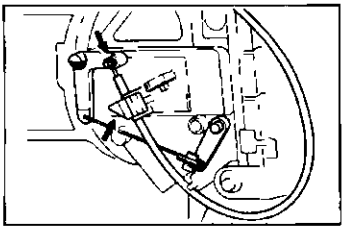
SET AIR INLET DAMPER

Set the air inlet damper and control lever to "Fresh Air"



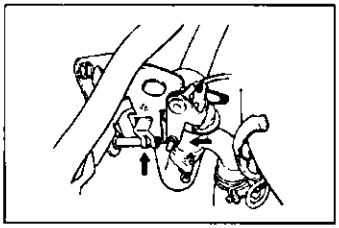
SET MODE SELECTOR DAMPER

Set the mode selector damper and control lever to "Vent"



SET AIR MIX DAMPER

Set the air mix damper and control lever to "Cool"

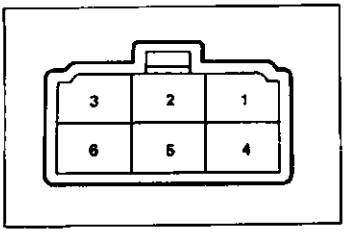


SET WATER VALVE

Set the water valve and control lever to "Cool"

TEST CONTROL CABLE OPERATION

Move the control levers back and forth and check for stiffness and binding through full range of the levers



SUN ROOF

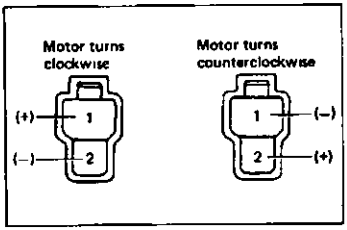
Sun Roof Switch

INSPECTION OF SUN ROOF SWITCH

INSPECT SWITCH CONTINUITY

Switch position \ Terminal	3	1	4	5
OPEN	○	○	○	○
OFF		○	○	○
CLOSE	○		○	
		○		○

If continuity is not as specified, replace the switch



Sun Roof Motor

INSPECTION OF SUN ROOF MOTOR

INSPECT MOTOR OPERATION

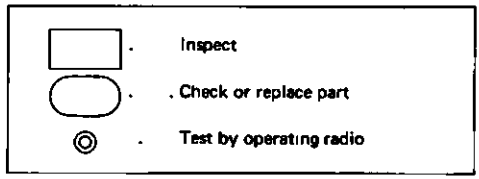
Apply 12V to both terminals of the connector and check that the motor runs
Then, reverse the polarity, and check that the motor revolution is reversed

If there is no motor operation, replace the motor

RADIO, STEREO TAPE PLAYER AND ANTENNA

Troubleshooting

DESCRIPTION OF SYMBOLS



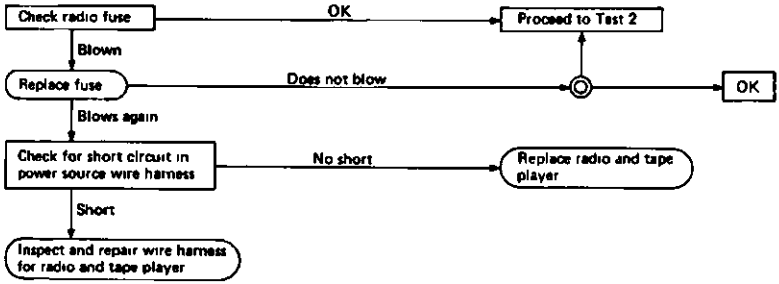
1 DEAD RADIO AND TAPE PLAYER

(a) No power to radio or tape player, or power but no sound

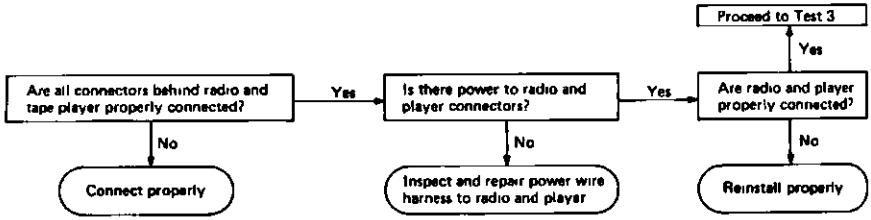
Possible causes

- Blown radio fuse
- Short circuit or broken wire in power source wire harness
- Loose connectors behind radio and tape player
- Loose speaker connector
- Defective speaker
- Broken wire in speaker wire harness
- Improperly installed radio or tape player
- Defective radio or tape player

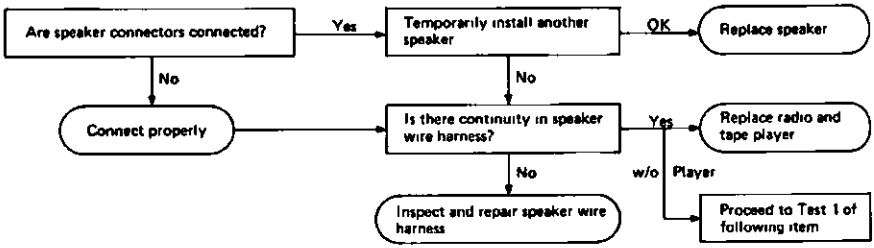
TEST 1



TEST 2


Proceed to Test 3
Yes
Are all connectors behind radio and tape player properly connected?
Yes
Is there power to radio and player connectors?
Yes
Are radio and player properly connected?
No
No
No
Connect properly
Inspect and repair power wire harness to radio and player
Reinstall properly

TEST 3

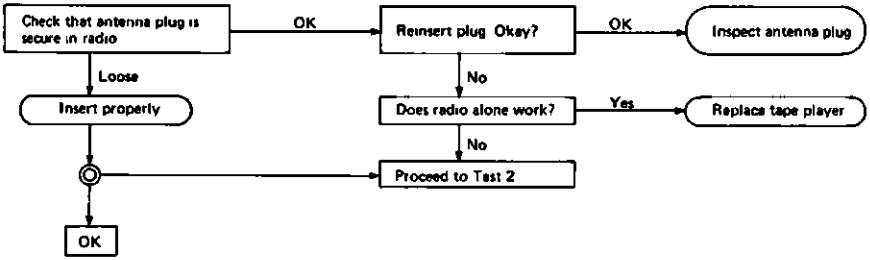

Are speaker connectors connected?
Yes
Temporarily install another speaker
OK
Replace speaker
No
No
Connect properly
Is there continuity in speaker wire harness?
Yes
Replace radio and tape player
No
w/o Player
Inspect and repair speaker wire harness
Proceed to Test 1 of following item

(b) Tape player okay but no sound from AM and/or FM

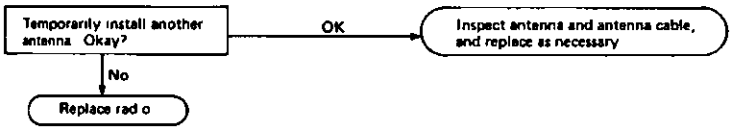
Possible causes

- Antenna disconnected
- Antenna plug not properly connected
- Defective antenna
- Defective radio or tape player
- Blown RADIO fuse

TEST 1



TEST 2

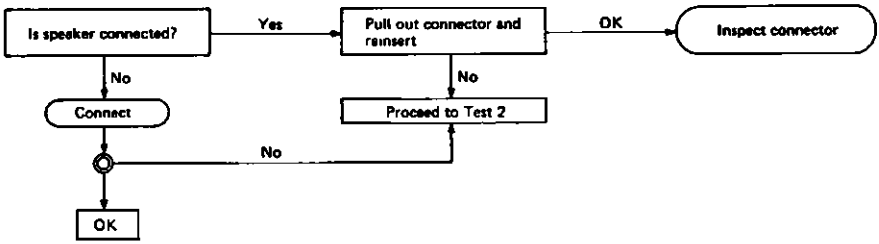


(c) No sound from one speaker

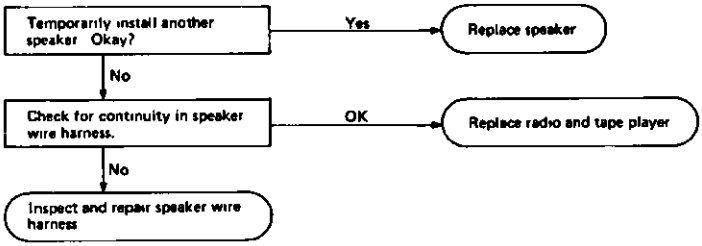
Possible causes

- Loose speaker connector
- Broken wire in speaker wire harness
- Defective speaker
- Defective radio and tape player

TEST 1



TEST 2

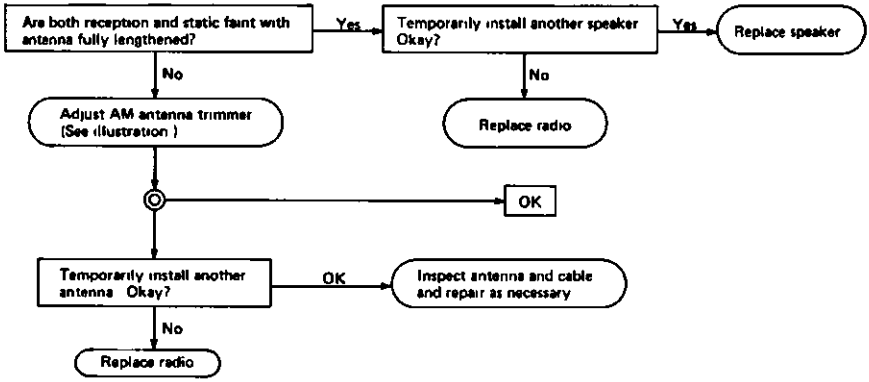


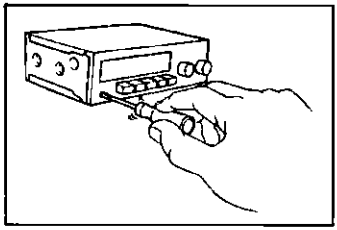
2. FAINT RECEPTION

Possible causes:

- Incorrectly adjusted antenna trimmer
- Defective antenna cable
- Defective speaker
- Defective radio

TEST





NOTE Adjustment of antenna trimmer

(1) Fully lengthen the antenna

(2) With volume and tone at maximum, turn the dial to around 1400 kHz where there is no reception.

(3) Adjust the trimmer to where static is loudest

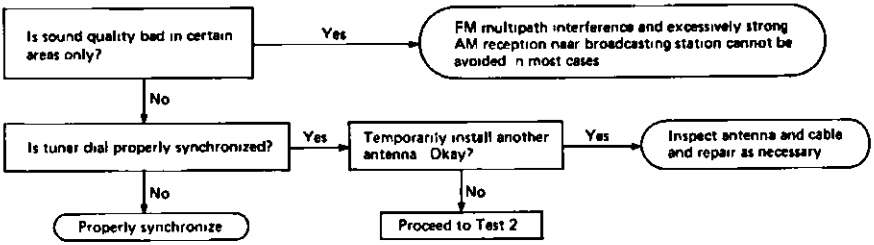
3. BAD SOUND QUALITY

(a) Sound quality bad when radio played

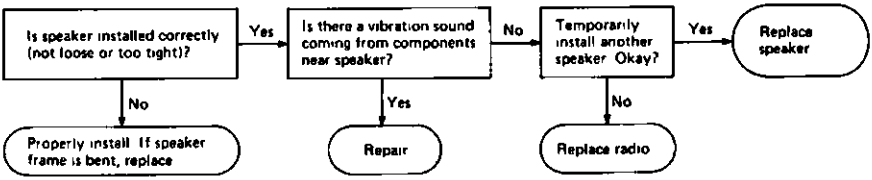
Possible causes

- Multipath interference or excessive interception
- Tuner dial not synchronized with station
- Defective antenna and cable
- Speaker improperly installed
- Vibration sound from components near speaker
- Defective speaker
- Defective radio

TEST 1



TEST 2

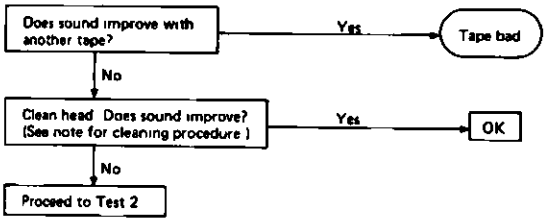


(b) Sound quality bad when tape player played

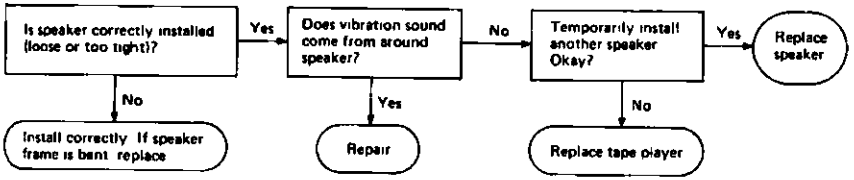
Possible causes.

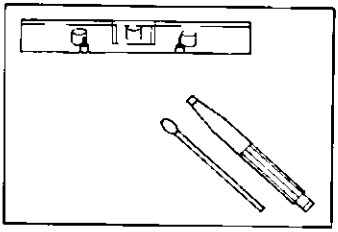
- Bad tape
- Dirty head
- Incorrectly installed speaker
- Vibration noise from around speaker
- Defective speaker
- Defective tape player

TEST 1



TEST 2





NOTE Head cleaning procedure

(1) Raise the cassette door with your finger Next, using a pencil or like object, push in the guide.

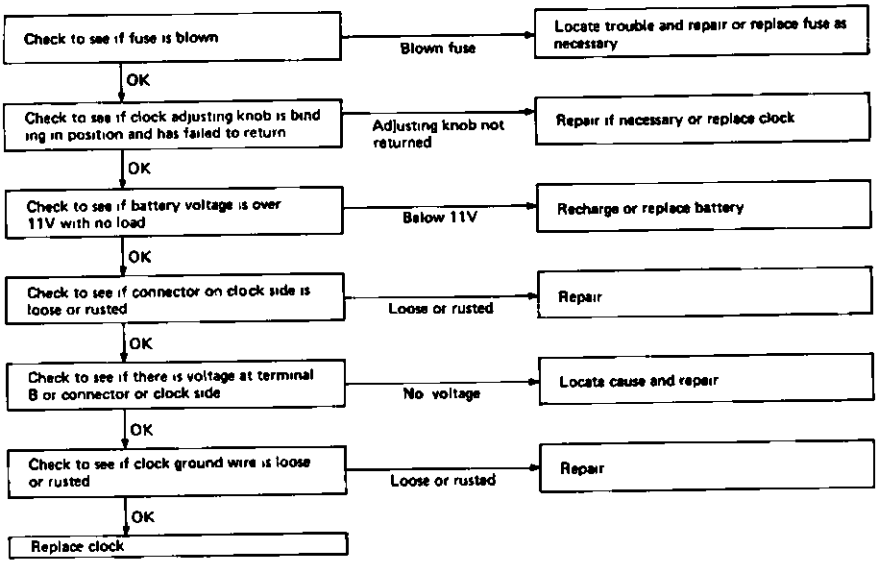
(2) Using a cleaning pen or cotton applicator soaked in alcohol, clean the head surface, pinch rollers and capstans

(3) Push in the eject button

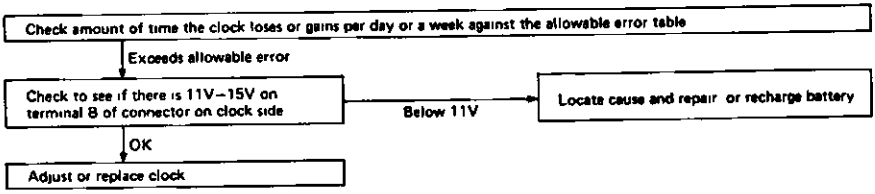
CLOCK

Troubleshooting

CLOCK WILL NOT OPERATE



CLOCK LOSES OR GAINS TIME

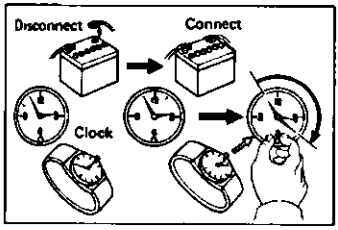


1. **INSPECT ALLOWABLE ERROR OF CLOCK**

Type	Allowable Error (per day)
3-hand quartz	±4.0 seconds
Digital quartz	±2.5 seconds

2. **ADJUSTMENT OF CLOCK**

Adjustment of the quartz clock requires a precise digital counter. Adjustment must be made in a shop specified by the manufacturer.



3. **STARTING OF CLOCK**

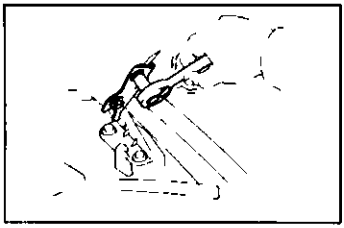
(a) Connect the battery terminal.

(b) Check the clock to see that it is running, and then set it to the correct time.

NOTE: Whenever the battery terminal is disconnected, make sure to set the clock to the correct time after reconnecting it.

BODY

	Page
HOOD	BO 2
FRONT DOOR	BO-3
LUGGAGE COMPARTMENT LID AND BACK DOOR	BO-12
MOULDING	BO-14
WINDSHIELD	BO-24
QUARTER WINDOW GLASS	BO-30
BACK DOOR GLASS	BO 34
REAR WINDOW GLASS	BO-38
SUN ROOF	BO-40
SAFETY PAD	BO-46
FUEL TANK AND LINE	BO-50
BODY DIMENSIONS	BO 51

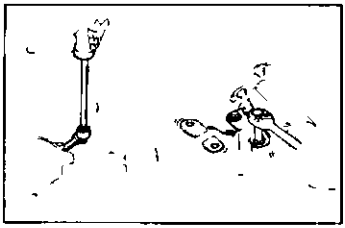


HOOD

ADJUSTMENT OF HOOD

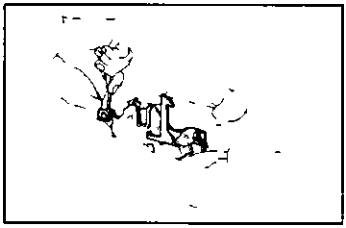
1. **ADJUST HOOD IN FORWARD/REARWARD AND LEFT/RIGHT DIRECTIONS**

   Loosen the hood side hinge bolts to adjust



2. **ADJUST FRONT EDGE OF HOOD IN VERTICAL DIRECTION**

   Adjust the hood by turning the cushions.

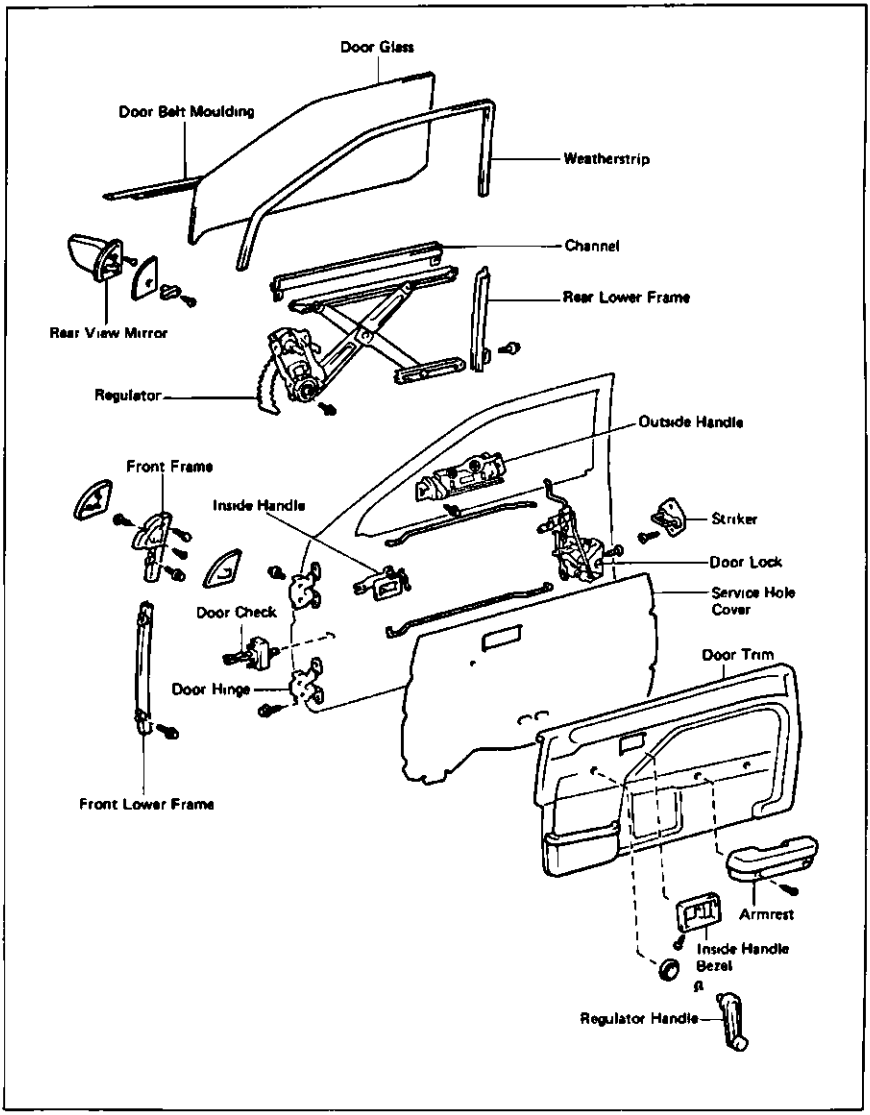


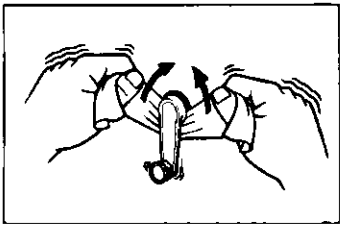
3. **ADJUST HOOD LOCK**

   Loosen the mounting bolts to adjust

FRONT DOOR

COMPONENTS



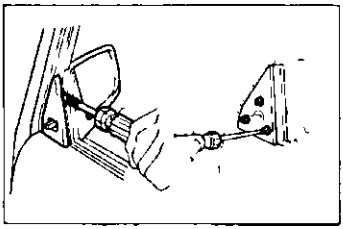


DISASSEMBLY OF FRONT DOOR

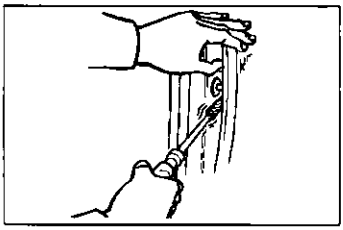
(See page BO-3)

1. **REMOVE FOLLOWING PARTS:**
   (a) Door inside handle bezel
   (b) Armrest

2. **REMOVE WINDOW REGULATOR HANDLE**
   Pull off the snap ring with a cloth and remove the regulator handle



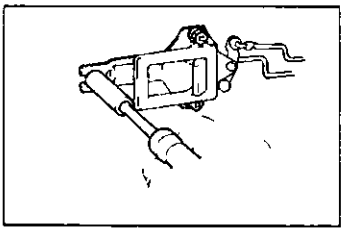
3. **REMOVE REAR VIEW MIRROR**
   (a) Remove the setting screws and knob
   (b) Pry loose the retainer and remove the cover
   (c) Remove the three setting screws and the mirror



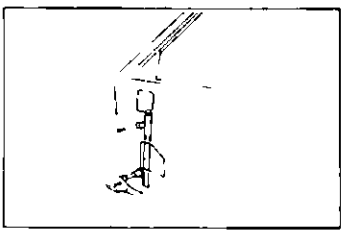
4 **REMOVE DOOR TRIM**
Pry loose the retainers with a screwdriver and remove the trim

NOTE Tape the screwdriver tip before use

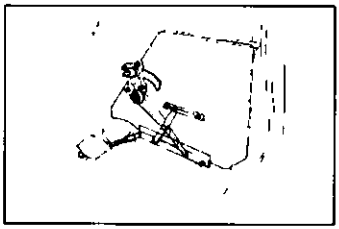
5 **REMOVE SERVICE HOLE COVER**



6 **REMOVE DOOR INSIDE HANDLE**
   (a) Remove the three screws
   (b) Disconnect the control links from the door lock and remove the handle

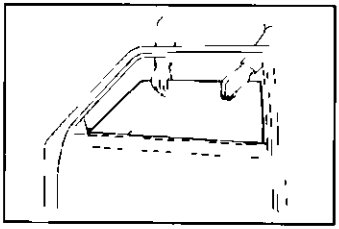


7 **REMOVE FRONT LOWER FRAME**
   (a) Remove the two mounting bolts.
   (b) Remove the lower frame from the front frame

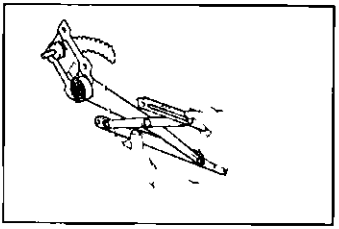


8 REMOVE DOOR GLASS

(a) Remove the two glass channel mounting bolts



(b) Remove the door glass by pulling it upward

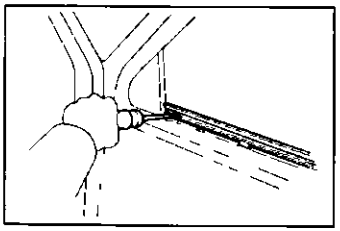


9. REMOVE WINDOW REGULATOR

(a) Remove the regulator mounting bolts

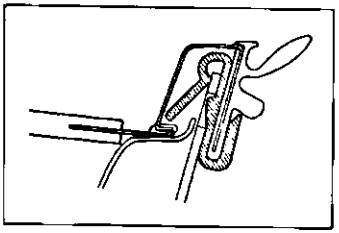
(b) Remove the equalizer arm bracket mounting bolts

(c) Remove the regulator through the service hole

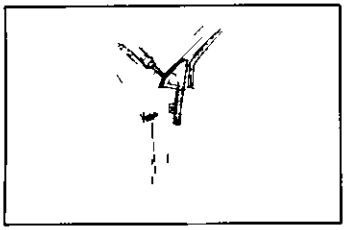


10. REMOVE DOOR BELT MOULDING

(a) Remove the moulding setting screw

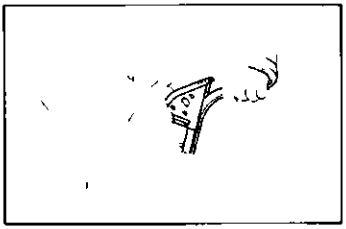


(b) Pry loose the clips from the edge of the panel and remove the moulding

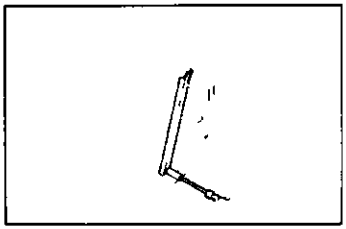


11. REMOVE FRONT FRAME

(a) Remove the bolt and screw



(b) Remove the front frame



12. REMOVE REAR LOWER FRAME

(a) Remove the mounting bolt

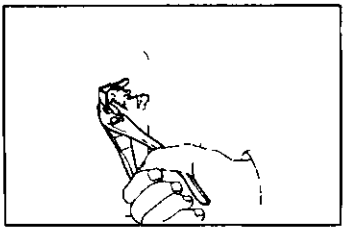
(b) Remove the frame from the glass run

13. DISCONNECT FOLLOWING LINKAGES:

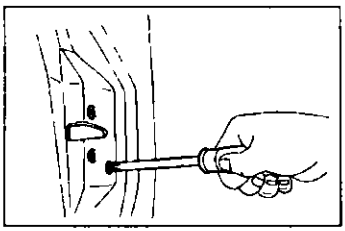
(a) Door inside opening control link

(b) Door outside opening control link

(c) Door outside locking control link

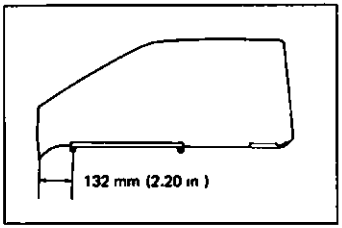


14. REMOVE DOOR LOCK CYLINDER



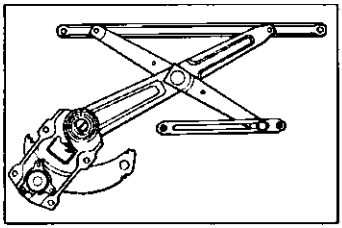
15. REMOVE DOOR LOCK

16. REMOVE DOOR OUTSIDE HANDLE



REPLACEMENT OF GLASS

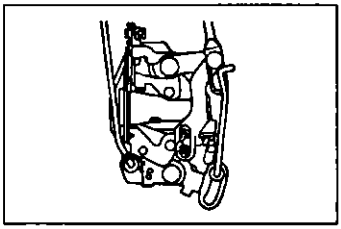
1. REMOVE GLASS CHANNEL WITH SCREWDRIVER OR SUCH
2. APPLY SOAPY WATER TO INSIDE OF WEATHERSTRIP
3. INSTALL CHANNEL BY TAPPING IT WITH PLASTIC HAMMER



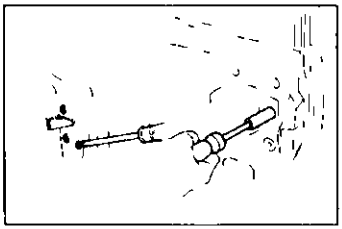
ASSEMBLY OF FRONT DOOR

(See page BO-3)

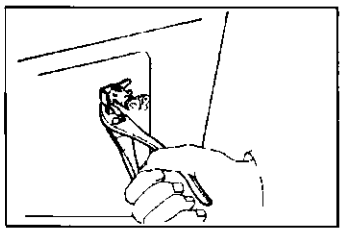
1. BEFORE INSTALLING PARTS, COAT THEM WITH MP GREASE
   (a) Coat the sliding surface, spring and gears of the window regulator with MP grease



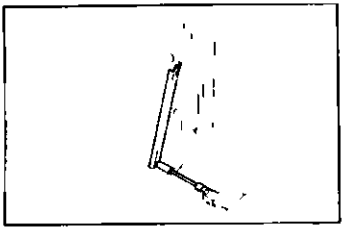
   (b) Coat the sliding surface of the door lock with MP grease



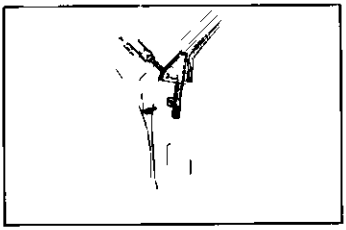
2. INSTALL DOOR OUTSIDE HANDLE
3. INSTALL DOOR LOCK
   (a) Install the door lock with three screws
   (b) Install the control link adjusting bolt and connect the control link



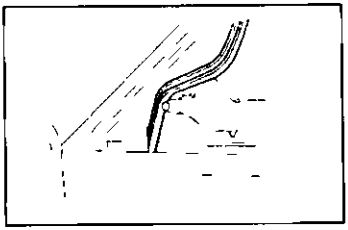
4. INSTALL DOOR LOCK CYLINDER
   Install the lock cylinder with the retainer and connect the control link



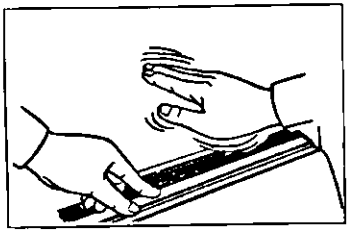
5. INSTALL REAR LOWER FRAME
   (a) Attach the glass run into the frame
   (b) Install the frame with the bolt



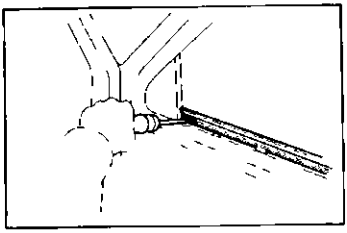
6. INSTALL FRONT FRAME
   (a) Place the frame in the door cavity
   (b) Install the screw and bolt



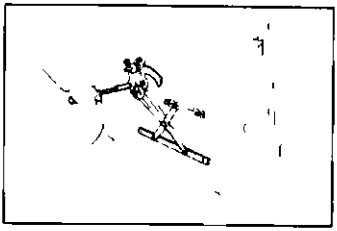
   (c) Attach the glass run into the frame



7. INSTALL DOOR BELT MOULDING
   (a) Tap the moulding onto the clips by hand

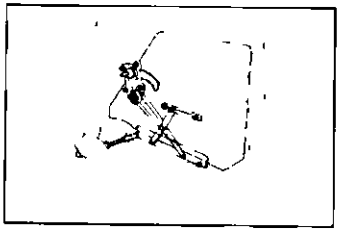


   (b) Install the moulding setting screw



8. INSTALL WINDOW REGULATOR

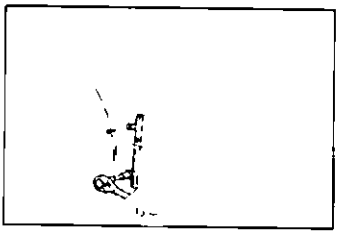
Place the regulator through the service hole and install the six mounting bolts



9. INSTALL DOOR GLASS

(a) Place the glass in the door cavity

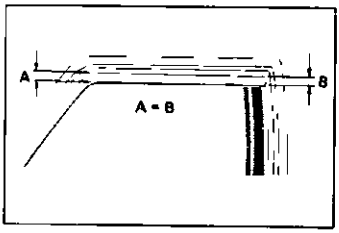
(b) Install the glass to the regulator with the two mount ing bolts



10. INSTALL FRONT LOWER FRAME

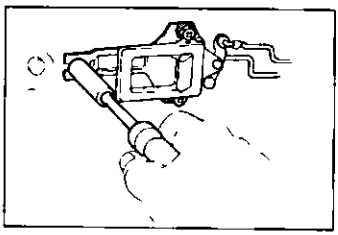
(a) Attach the glass run into the frame

(b) Install the frame with the bolts



11. ADJUST DOOR GLASS

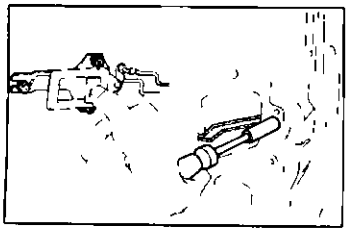
Adjust the equalizer arm up or down and tighten it where dimensions A and B, as shown, are equal



12. INSTALL DOOR INSIDE HANDLE

(a) Connect the control links.

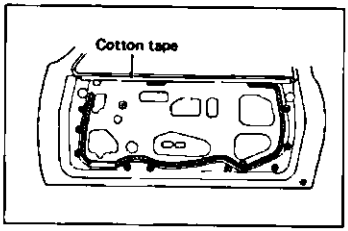
(b) Install the handle with three screws



13. ADJUST DOOR INSIDE LOCK

(a) Loosen the adjusting bolt

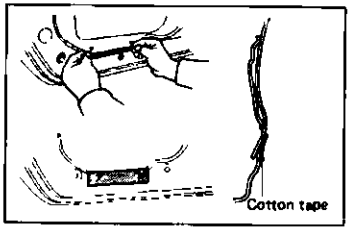
(b) Lock the inside handle locking knob and tighten the adjusting bolt



14. INSTALL SERVICE HOLE COVER

(a) Seal the service hole cover with adhesive

(b) Install the cotton tape

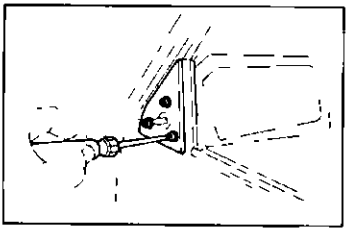


(c) Insert the lower edge of the service hole cover into the panel slit

(d) Seal the panel slit with cotton tape.

CAUTION: Do not block the trim clip seating with the tape.

15. INSTALL DOOR TRIM

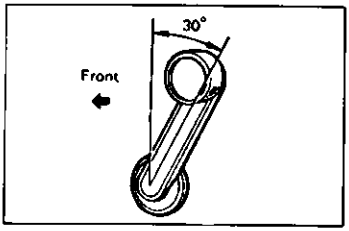


16. INSTALL REAR VIEW MIRROR

(a) Install the mirror with three screws.

(b) Push on the cover

(c) Install the knob with the screw



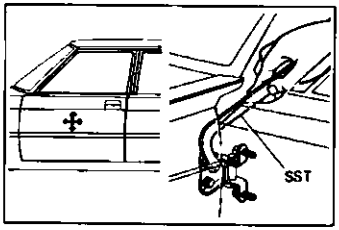
17. INSTALL WINDOW REGULATOR HANDLE

With door window fully closed, install the window regulator handle, as shown, with a snap ring

18. INSTALL FOLLOWING PARTS

(a) Armrest

(b) Door inside handle bezel

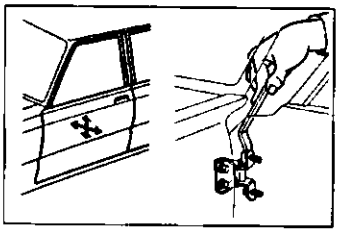


ADJUSTMENT OF FRONT DOOR

1 **ADJUST DOOR IN FORWARD/REARWARD AND VERTICAL DIRECTIONS**

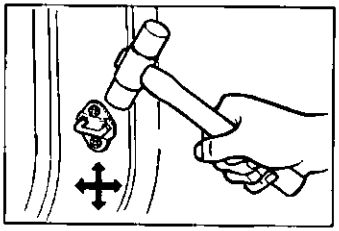
Using SST, loosen the body side hinge bolts

SST 09812-00010



2. **ADJUST DOOR IN LEFT/RIGHT AND VERTICAL DIRECTIONS**

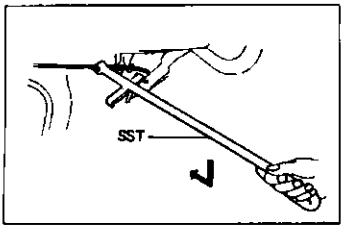
Using a wrench, loosen the door side hinge bolts.



3. **ADJUST DOOR LOCK STRIKER**

(a) Check that the door fit and door lock linkages are adjusted correctly

(b) Adjust the striker by loosening the striker mounting screws



LUGGAGE COMPARTMENT LID AND BACK DOOR

REMOVAL OF TORSION BAR

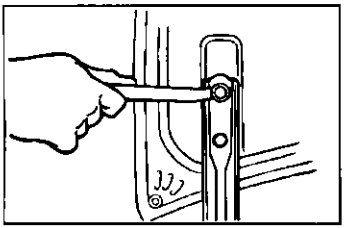
Using SST, remove the torsion bar.

SST 09804-13021

INSTALLATION OF TORSION BAR

Using SST, install the torsion bar

SST 09804-13021

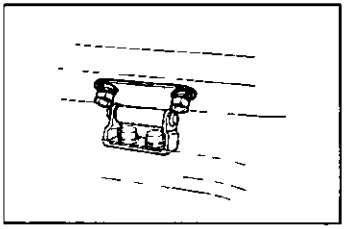


ADJUSTMENT OF LUGGAGE COMPARTMENT LID

[2-Door Coupe]

(a) For forward/rearward and left/right adjustments, loosen the bolts

(b) For vertical adjustment of front end of the lid, increase or decrease the number of washers

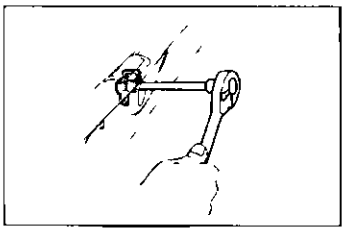


ADJUSTMENT OF BACK DOOR

[3-Door Coupe]

(a) For forward/rearward and left/right adjustments, loosen the bolts

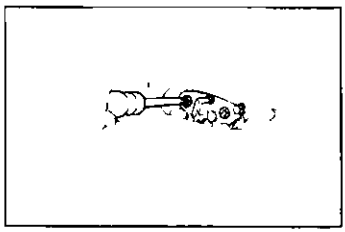
(b) For vertical adjustment of the door front edge, increase or decrease the number of washers



ADJUSTMENT OF LOCK AND STRIKER

[2-Door Coupe]

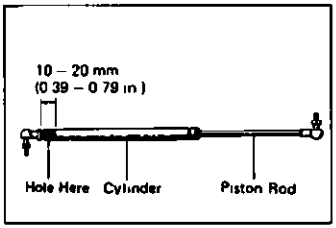
Loosen the mounting bolts to adjust the lock and striker



[3-Door Coupe]

(a) Remove the lower back panel cover

(b) Loosen the mounting bolts to adjust the lock and striker



Back Door Damper Stay

CAUTION: Handling the damper.

(a) Do not disassemble the damper because the cylinder is filled with gas.

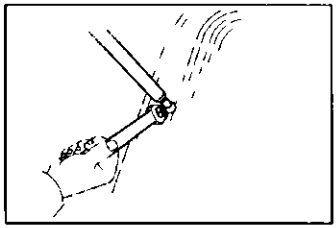
(b) If the damper is to be replaced, drill a 2.0 – 3.0 mm (0.079 – 0.118 in.) hole in the bottom of the removed damper cylinder to completely release the high-pressure gas before disposing of it.

(c) When drilling, chips may fly out so work carefully.

(d) The gas is colorless, odorless and not poisonous.

(e) When working, handle the damper carefully. Never score or scratch the exposed part of the piston rod, and never allow paint or oil to get on it.

(f) Do not turn the piston rod and cylinder with the damper fully extended.



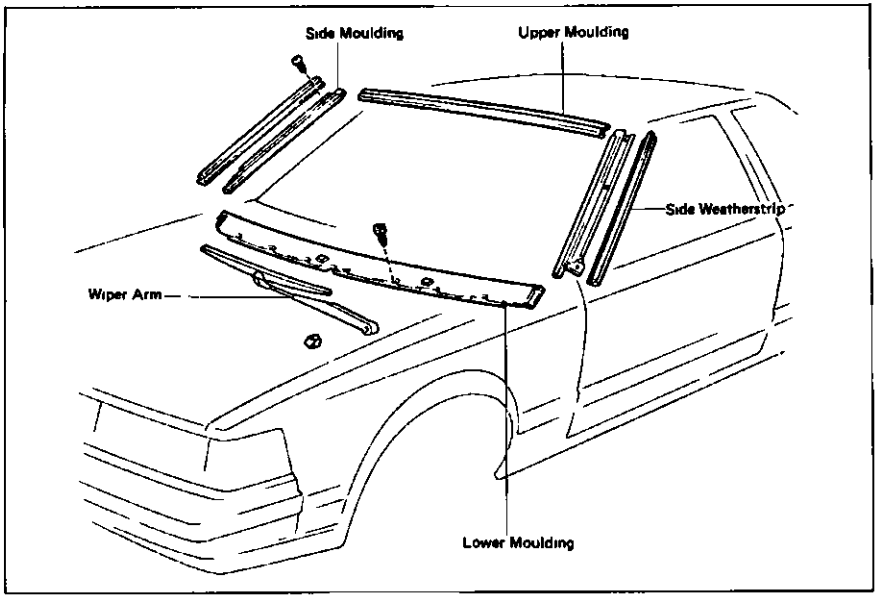
REMOVAL OF DAMPER STAY

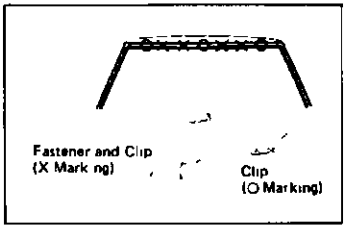
1. DISCONNECT DAMPER STAY UPPER END FROM BACK DOOR
2. REMOVE DAMPER STAY LOWER END FROM BODY

INSTALLATION OF DAMPER STAY

1. INSTALL DAMPER STAY UPPER END TO BACK DOOR
2. CONNECT DAMPER STAY LOWER END TO BODY

MOULDING
Windshield Outside Moulding
COMPONENTS



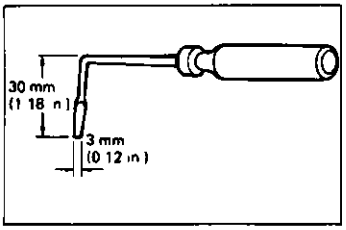


REMOVAL OF OUTSIDE MOULDING

There are two types of clips for moulding installation

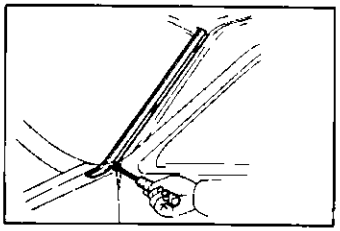
Locations of these clips and fasteners are as shown in the figure

Carefully apply adhesive tape to protect the body



1 **PREPARE SMALL SCREWDRIVER**

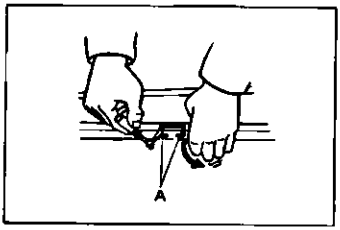
Bend the screwdriver at right angle



2 **REMOVE SIDE MOULDING**

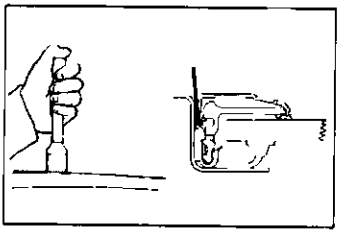
(a) Remove the side weatherstrip

(b) Remove the three setting screws and remove the side moulding.

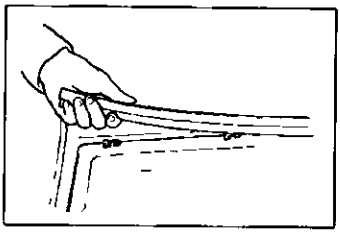


3. **REMOVE UPPER MOULDING**

(a) Insert the tip of the screwdriver between the moulding and clip, and twist it to pry loose the clasps (A) on the window side.



(b) Pry loose the fasteners and clips and remove the moulding



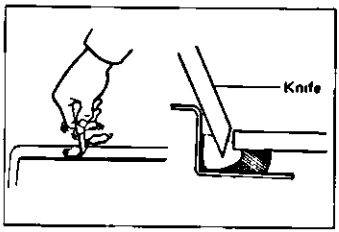
(c) Slide the moulding out

CAUTION: Do not bend the moulding.

4. **REMOVE LOWER MOULDING**

(a) Remove the wiper arms

(b) Remove the six screws and the moulding



REPLACEMENT OF FASTENER AND CLIP

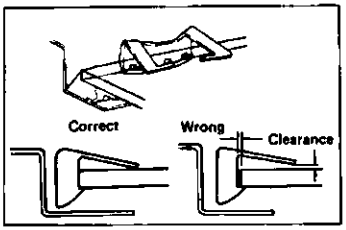
If any fastener or clip is damaged, replace it

1. **REMOVE DAMAGED CLIP**

2. **CUT OLD ADHESIVE OFF AROUND CLIP INSTALLATION AREA**

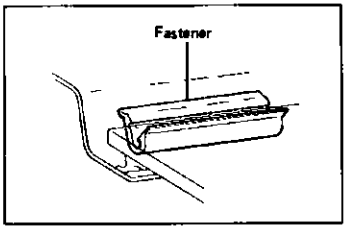
3. **INSTALL CLIP**

(a) Grind a notch into the clip so it latches onto the glass edge



(b) Temporarily install the clip and insure that it is firmly attached to the glass

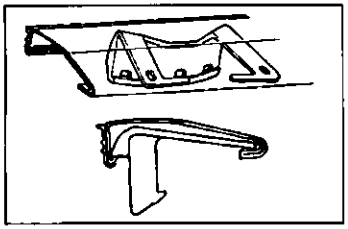
If the clip is loose, replace it.



4. **REMOVE ANY DAMAGED FASTENER**

5. **CUT OLD ADHESIVE OFF AROUND FASTENER INSTALLATION AREA**

6. **INSTALL FASTENER ONTO BODY WITH DOUBLE-STICK TAPE**



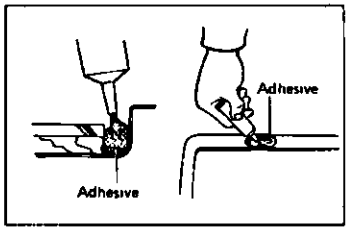
INSTALLATION OF OUTSIDE MOULDING

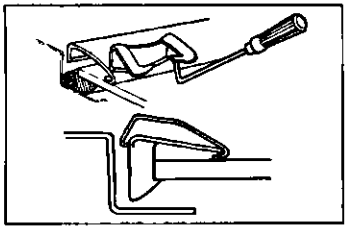
(See page BO-14)

1. **INSTALL LOWER MOULDING**
   (a) Install the moulding and six screws
   (b) Install the wiper arms

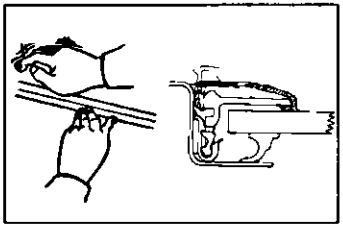
2. **INSTALL NEW CLIP INTO MOULDING**
   Install the moulding to the body so that the clips and fasteners are not in a position where they will make contact with each other

3. **APPLY ADHESIVE AT CLIP INSTALLATION AREA**



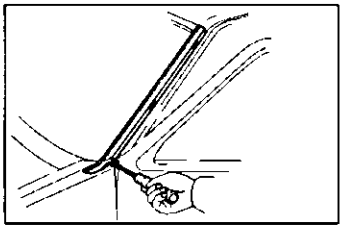


4. **INSTALL UPPER MOULDING**
   (a) Place the moulding onto the body
   (b) Pry up the clips on the body side and install them to the moulding.



(c) Tap the moulding with your hand to fasten the clasps at the glass edge.

At the same time, tap on the fasteners by hand



5. **INSTALL SIDE MOULDING**

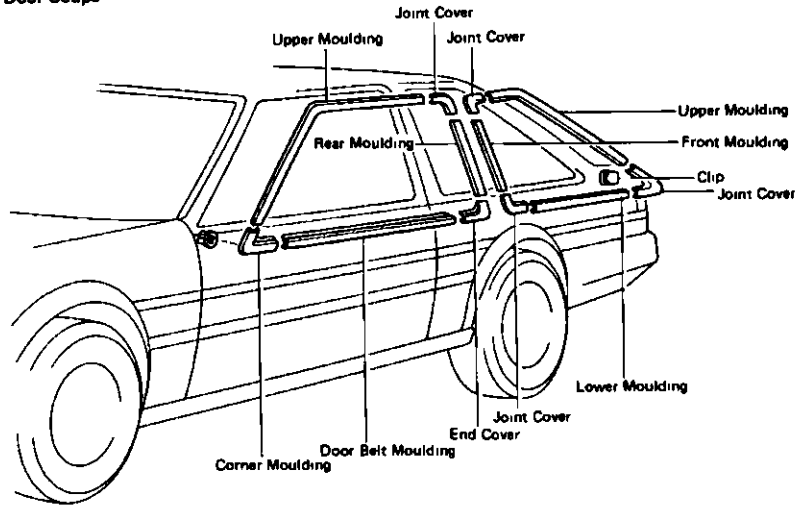
(a) Install the side moulding and the three setting screws.

(b) Install the side weatherstrip

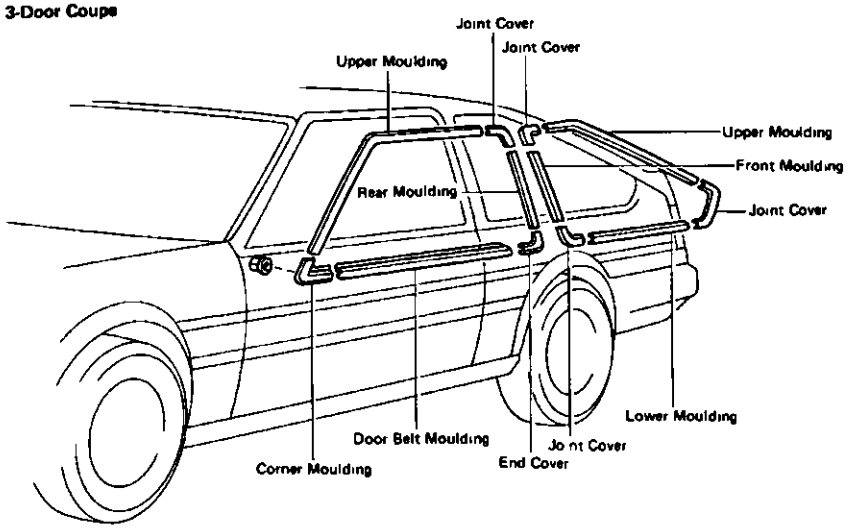
Side Moulding

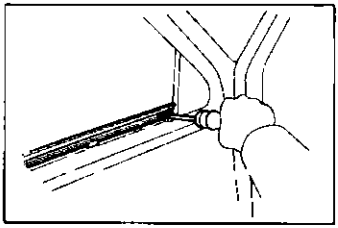
COMPONENTS

2 Door Coupe



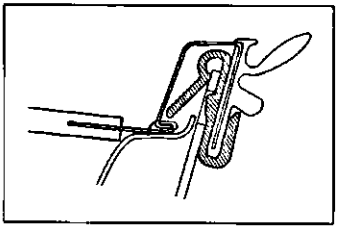
3-Door Coupe



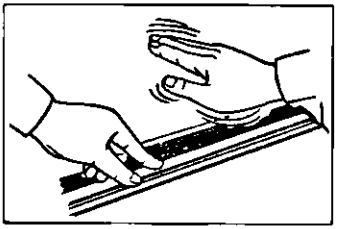


REMOVAL OF DOOR BELT MOULDING

1. **REMOVE DOOR GLASS (See page BO-4)**
2. **REMOVE DOOR BELT MOULDING**
   (a) Remove the moulding set screw

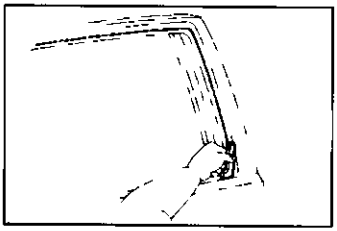


(b) Pry loose the clips from the edge of the panel and remove the moulding



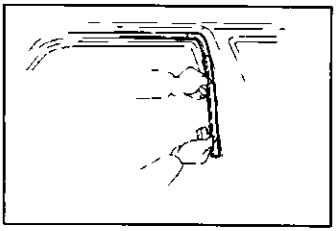
INSTALLATION OF DOOR BELT MOULDING

1. **INSTALL BELT MOULDING**
   (a) Tap the moulding onto the clips by hand
   (b) Install the moulding set screw.
2. **INSTALL DOOR GLASS (See page BO 9)**

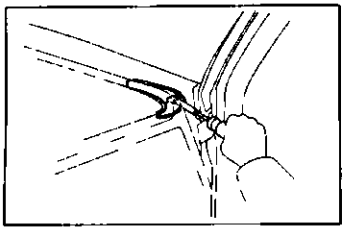


REMOVAL OF DOOR FRAME MOULDING

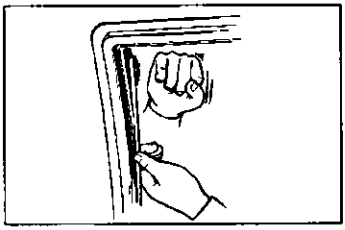
1. **REMOVE DOOR BELT MOULDING (See page BO-19)**
2. **REMOVE FRONT FRAME (See step 11 on page BO-6)**
3. **REMOVE DOOR FRAME MOULDING**
   (a) Pull out the end cover



(b) Pull out the rear moulding, joint cover and upper moulding

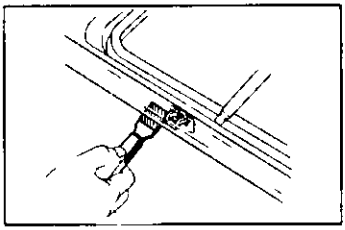


(c) Remove the set nut and remove the corner moulding.



INSTALLATION OF DOOR FRAME MOULDING

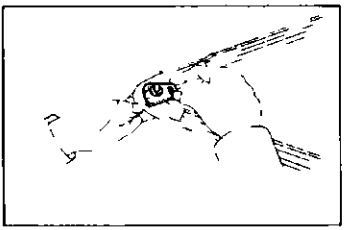
1. INSTALL DOOR FRAME MOULDING
   (a) Install the corner moulding and nut
   (b) Align it with the frame and tap it in by hand.
2. INSTALL FRONT FRAME (See step 7 on page BO-8)
3. INSTALL DOOR BELT MOULDING (See page BO-19)



REMOVAL OF QUARTER WINDOW MOULDING

REMOVE QUARTER WINDOW MOULDING

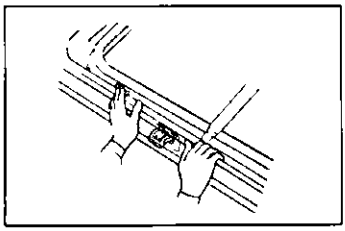
Insert a scraper and pry loose the clips



INSTALLATION OF QUARTER WINDOW MOULDING

INSTALL QUARTER WINDOW MOULDING

(a) Install the clip to the joint cover (2 Door Coupe only)



(b) Attach the upper edge of the moulding to the clips

(c) Fit the lower edge of the moulding, pushing it on with your hands.

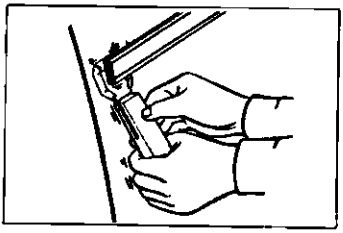
Side Body Moulding

TOOLS AND SUPPLIES

Part No	Part name		Quantity
08850-00051	Adhesive (Super special)	20g (0.70 oz.)	1
08852-00050	Primer T	10g (0.35 oz.)	1
	Unleaded gasoline (for cleaning body) Alcohol (for removing body oil stains) Heat lamp		

Precautions for storing moulding material

- Store in cool place, avoiding direct sunlight, high temperature and dust
- The moulding is of polyvinyl chloride, so do not allow it to come in contact with thinner or other solvent, open flame, or boiling water
- The storage time for the moulding, adhesive and Primer T is limited to about 9 months

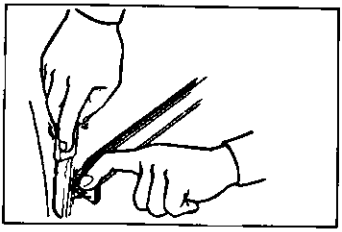


REMOVAL OF SIDE BODY MOULDING

1. REMOVE ENDS OF MOULDING

Using a scraper, pry the moulding loose about 20 mm (0.79 in.) from the ends.

NOTE Apply tape to the scraper blade to prevent scratching the vehicle body



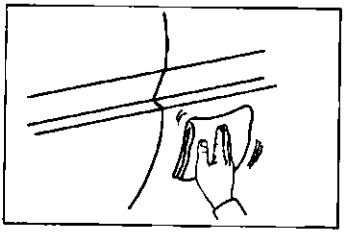
2. REMOVE MOULDING AND ADHESIVE

(a) Pull off the mouldings by cutting the adhesive with a knife

(b) Scrape off adhesive from the body with a cutter or sandpaper.

CAUTION

- **30 – 80 mm (1.18 – 3.15 in.) of the ends of the moulding are glued tightly with a strong adhesive.**
- **Do not reuse mouldings.**

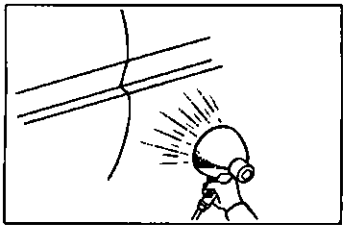


INSTALLATION OF SIDE BODY MOULDING

1. CLEAN MOULDING MOUNTING SURFACES

(a) Wipe off stains with unleaded gasoline

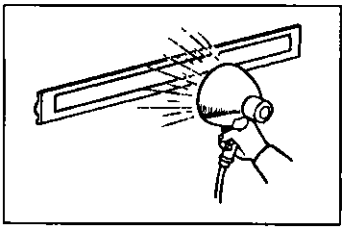
(b) Wipe off the unleaded gasoline with an alcohol saturated rag



2. **HEAT BODY MOUNTING SURFACE**

Using a heat lamp, heat the body mounting surfaces to 30 – 50°C (86 – 122°F)

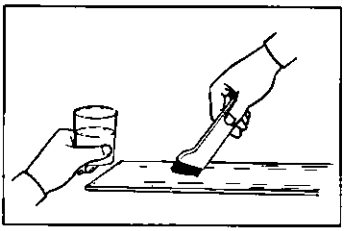
CAUTION: When the moulding is installed, the temperature of the mounting surface should be 20°C (68°F) or higher.



3. **HEAT MOULDING**

Using a heat lamp, heat the moulding to 30 – 60°C (86 – 140°F)

CAUTION: Do not heat the moulding excessively The temperature should not be higher than 80°C (176°F).

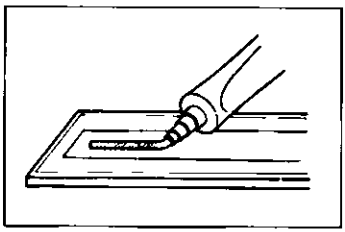


4. **COAT MOULDING WITH PRIMER "T"**

Using a brush, coat both of the punched out ends of the moulding tape with Primer T

CAUTION:

- **Let Primer T dry for 30 seconds or more.**
- **Do not touch the Primer T coating.**



5. **APPLY ADHESIVE TO MOULDING**

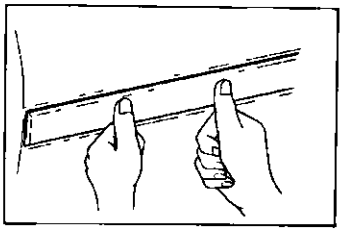
Apply adhesive to both of punched out ends of the moulding

CAUTION: Install the moulding within 7 minutes after applying the adhesive

6. **LIFT MOULDING RELEASE SHEET FROM FACE OF MOULDING**

CAUTION:

- **When the moulding release sheet is removed, be sure that no dirt or dust can get onto the uncovered area.**

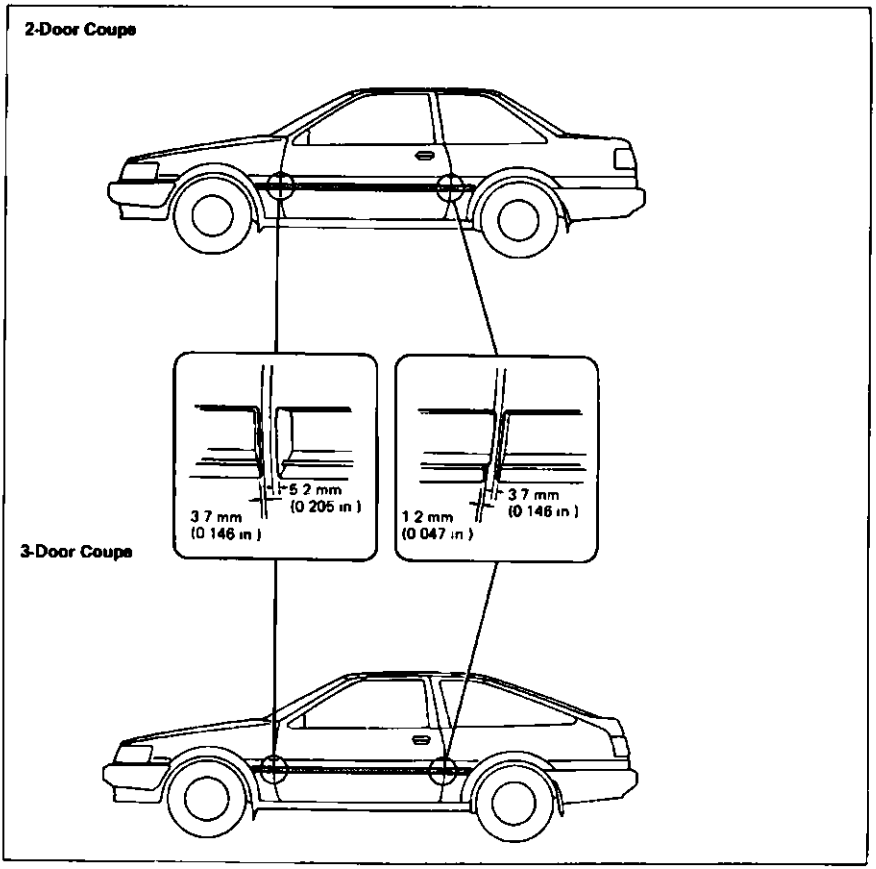


7. INSTALL MOULDING ALONG BODY PRESS LINE

Fit the moulding along the body press line, leaving the spaces shown in the illustration

CAUTION

- Be sure that the body and moulding are heated to the proper temperature.
- Do not depress adhesive coated parts excessively: just hold them down with your thumb.
- Scrape off any overflowing adhesive with a plastic spatula and clean the surface with a dry rag
- After installation do not wash the vehicle for 24 hours.



WINDSHIELD

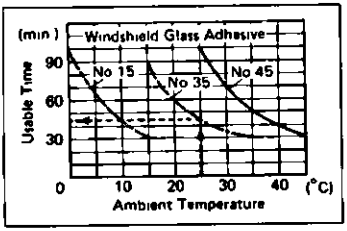
TOOLS AND SUPPLIES

Part name and Part No	Contents of set	Quantity
Adhesive set 08850-00070 [0 – 15°C (32 – 59°F)] 08850-00080 [15 – 35°C (59 – 95°F)] 08850-00090 [35 – 45°C (95 – 113°F)]	Main agent 500 g (17.5 oz.) Hardening agent 75 g (2.63 oz.) Primer G [for glass] 20 g (0.70 oz.) Primer M [for body] 20 g (0.70 oz.) Sponge for applying primer Piano wire 0.6 mm dia. x 1 m (0.024 in. dia. x 39.37 in.) Cartridge	1 can 1 ea 1 ea 1 ea 1 ea 1 ea 1 ea
Dam kit 04582 30030	Dam Double stick tape (for sticking on dam)	
	Sealant gun (for applying adhesive) Glass or steel sheet (for mixing adhesive) Putty spatula (for mixing adhesive and correcting adhered parts) Solvent (Alcohol, lead free gasoline) (for cleaning adhering surfaces)	

Ambient temperature	Part No	Part name
0 – 15°C (32 – 59°F)	08850-00070	Windshield glass adhesive set No. 15
15 – 35°C (59 – 95°F)	08850-00080	Windshield glass adhesive set No. 35
35 – 45°C (95 – 113°F)	08850-00090	Windshield glass adhesive set No. 45

1 CHOOSE SUITABLE ADHESIVE SET

Use an adhesive set suitable for the ambient temperature.

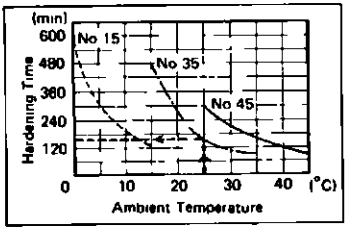


2. CHECK ADHESIVE USABLE TIME

After mixing the main and hardening agents, finish glass installation within the specified time as shown.

Example

For glass installation in an ambient temperature of 25°C (77°F), apply adhesive set No. 35 within 45 minutes.



3 CHECK ADHESIVE HARDENING TIME

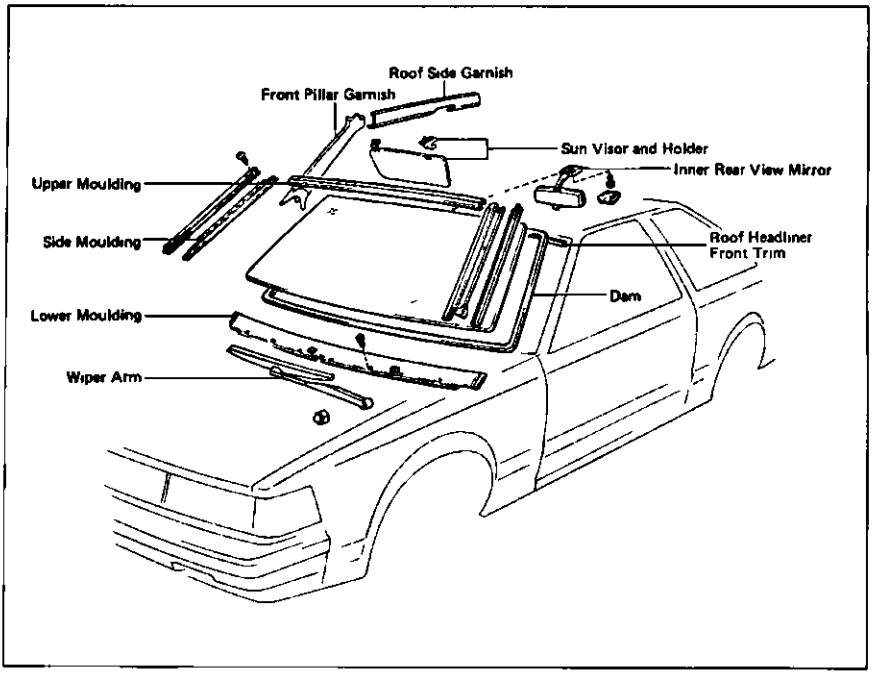
First, mix the main and hardening agents. Then, perform a leak test only after the hardening time has elapsed.

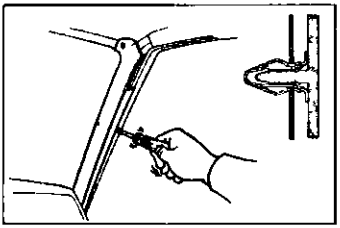
Example

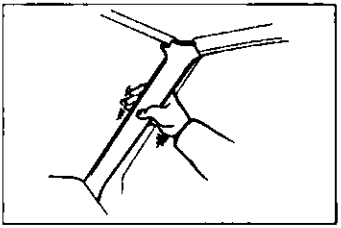
The hardening time for adhesive set No. 35 with an ambient temperature of 25°C (77°F) is 2½ hours.

CAUTION. Do not drive the vehicle until at least double the hardening time has elapsed.

COMPONENTS







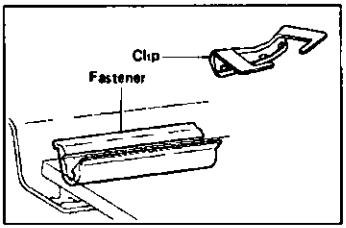
REMOVAL OF WINDSHIELD

1. **REMOVE ROOF SIDE GARNISH**
2. **REMOVE FRONT PILLAR GARNISH**
   (a) Pry out the clips with a screwdriver

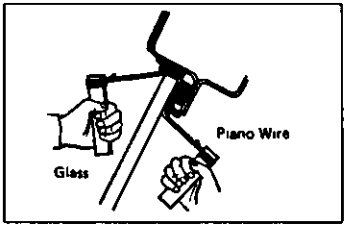
   (b) Pull the garnish upward to remove it

3. **REMOVE FOLLOWING PARTS:**
   (a) Sun visor and holder
   (b) Inner rear view mirror
   (c) Roof headliner front trim

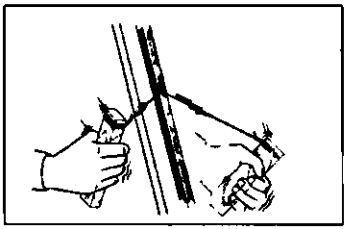
4. **REMOVE WINDSHIELD MOULDING** (See page BO 14)



5. **REMOVE CLIPS**
   Be careful not to damage the clips when removing them from around the glass
   NOTE It is not necessary to remove the fasteners but damaged fasteners should be replaced



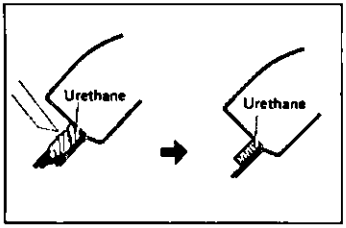
6. **REMOVE WINDSHIELD GLASS**
   (a) Push piano wire through from the interior
   (b) Tie both wire ends to a wooden block or equivalent.
   CAUTION. When separating, take care not to damage the paint or interior and exterior ornaments.

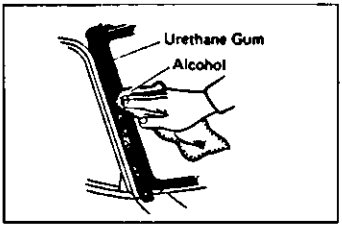


   (c) Cut the adhesive by pulling the piano wire around it
   (d) Remove the glass.
   CAUTION: Cut off the glass, leaving as much of the urethane layer on the body as possible.

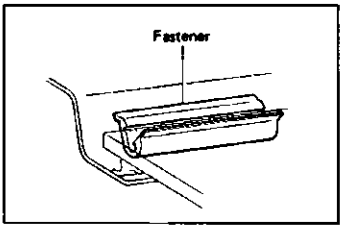
INSPECTION AND CLEANING

1. **CLEAN CONTACT SURFACE OF BODY**
   (a) Remove any dam remaining on the body
   NOTE Leave as much urethane layer on the body as possible

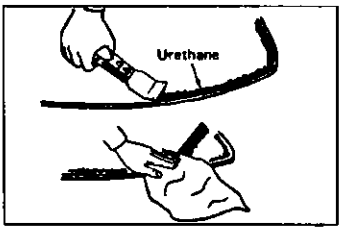




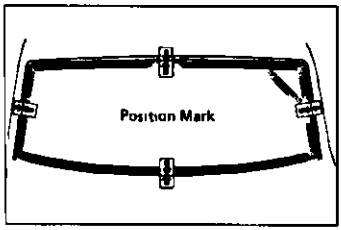
(b) Clean the cutting surface of the urethane gum with a piece of cloth saturated in solvent (alcohol)



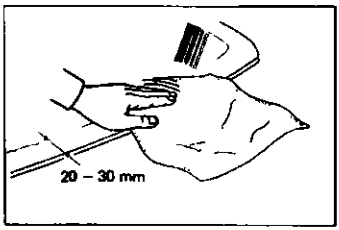
2. **IF FASTENERS ARE DAMAGED**
   (a) Remove any damaged fastener
   (b) Cut off the old adhesive around the fastener installation area
   (c) Install a new fastener



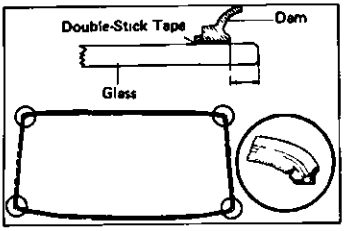
3. **CLEAN REMOVED GLASS BEFORE INSTALLATION**
   (a) Using a scraper, remove the urethane gum sticking to the glass.
   (b) Clean the glass with alcohol

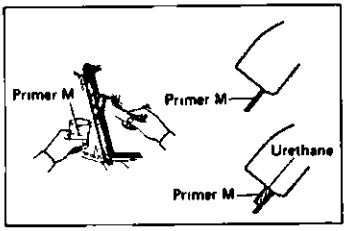


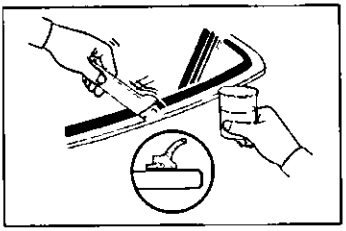
4. **POSITION GLASS**
   (a) Place the glass in correct position
   (b) Check that all contacting parts of the glass rim are perfectly even and do not make contact with the fasteners.
   (c) Make reference marks between the glass and body
   (d) Remove the glass

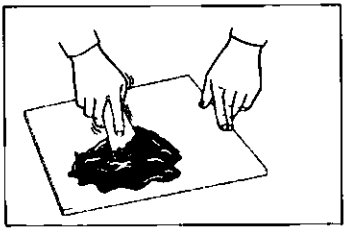


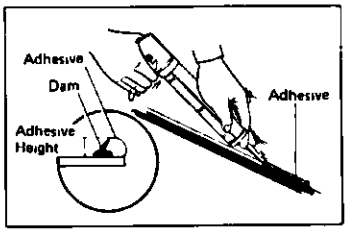
5. **CLEAN CONTACT SURFACE OF GLASS**
   Using alcohol or similar solvent, clean the contact surface 20 – 30 mm (0.79 – 1.18 in.) wide around the entire glass rim.











INSTALLATION OF WINDSHIELD

1. INSTALL DAM

(a) Apply double stick tape as follows
For laminated glass, 9 mm (0.35 in.) from upper and side rim and 7.5 mm (0.30 in.) from bottom rim
For reinforced glass, 9 mm (0.35 in.) from upper and side rim and 30.5 mm (1.20 in.) from bottom rim

(b) Place the dam on the double stick tape.

NOTE Cut a V wedge into the corner folds of the dam

CAUTION: Do not touch the glass face after cleaning it.

2 COAT CONTACT SURFACE OF BODY WITH PRIMER "M"

Using a brush, coat the contact surface on the body with Primer M

CAUTION

- **Let the Primer coating dry for 10 minutes or more Make sure that the installation of the glass is finished within 2 hours**
- **Use care not to leave any part of the contact surface uncoated or excessively coated as Primer M and G serve to boost the adhesive power of urethane to glass or body**
- **Do not keep any of the opened Primer M and G for later use.**

3. COAT CONTACT SURFACE OF GLASS WITH PRIMER "G"

(a) Using a bursh or sponge, coat the edge of the glass and the contact surface with Primer G

(b) Before the Primer dries, wipe it off with a clean cloth

CAUTION: Be sure that installation of the glass is finished within 70 minutes

4. MIX ADHESIVE COATING

CAUTION:

- **Be sure that installation of the glass is finished within usable time**
  (See step 2 on page BO-24)
- **Mixture should be made in 5 minutes or less**

(a) Thoroughly clean the glass plate and putty spatula with solvent

(b) Using a putty spatula, thoroughly mix the main 500g (17.6 oz) and hardening agents 75g (2.65 oz) on a glass plate or such

5. APPLY ADHESIVE

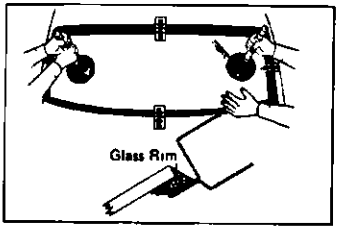
(a) Cut off the tip of the cartridge nozzle, making a hole 5 mm (0.20 in.) in diameter Fill the cartridge with adhesive

(b) Load the cartridge into the sealer gun

(c) Coat the glass with adhesive on all contact surfaces along the ridge

Adhesive height:

If there is adhesive on body	**3.5 – 5.0 mm (0.138 – 0.197 in.)**
If there is no adhesive on body	**8 – 10 mm (0.31 – 0.40 in.)**



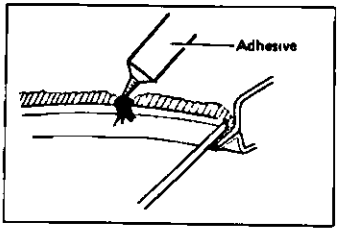
6 **INSTALL GLASS**

(a) Position the glass so that reference marks are lined up, and press in gently along the rim

(b) Using a spatula, apply adhesive to the glass rim

(c) Use a spatula to remove any excess or protruding adhesive

(d) Fasten the glass securely until the adhesive sets



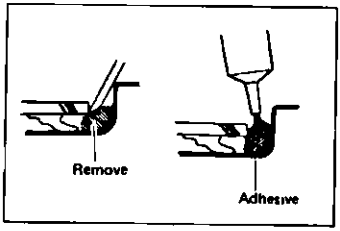
7. **INSPECT FOR LEAKS AND REPAIR**

(a) Perform a leak test after the hardening time has elapsed

(b) Seal any leak with adhesive or auto glass sealer

Part No 08705-00010

CAUTION: Wait at least twice the hardening time before driving the car.

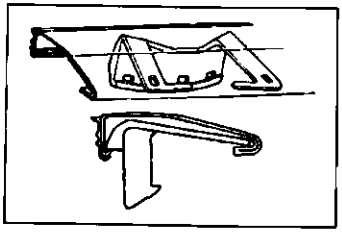


8. **INSTALL UPPER MOULDING**

(a) Using a knife, remove the adhesive around the installation area of the clips

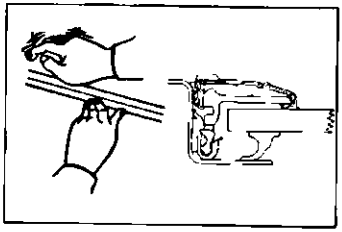
(b) Apply adhesive to the installation area of the clips

NOTE Loosely install the clip and confirm that the clip arm is not protruding above the surface



(c) Install the clips into the moulding
When installing the moulding, be sure that the clips and fasteners on the body side do not make contact

(d) Fit on the upper moulding and tap the fasteners on by hand



9. **INSTALL LOWER AND SIDE MOULDING**

10. **INSTALL FOLLOWING PARTS.**

(a) Roof headliner front trim

(b) Inner rear view mirror

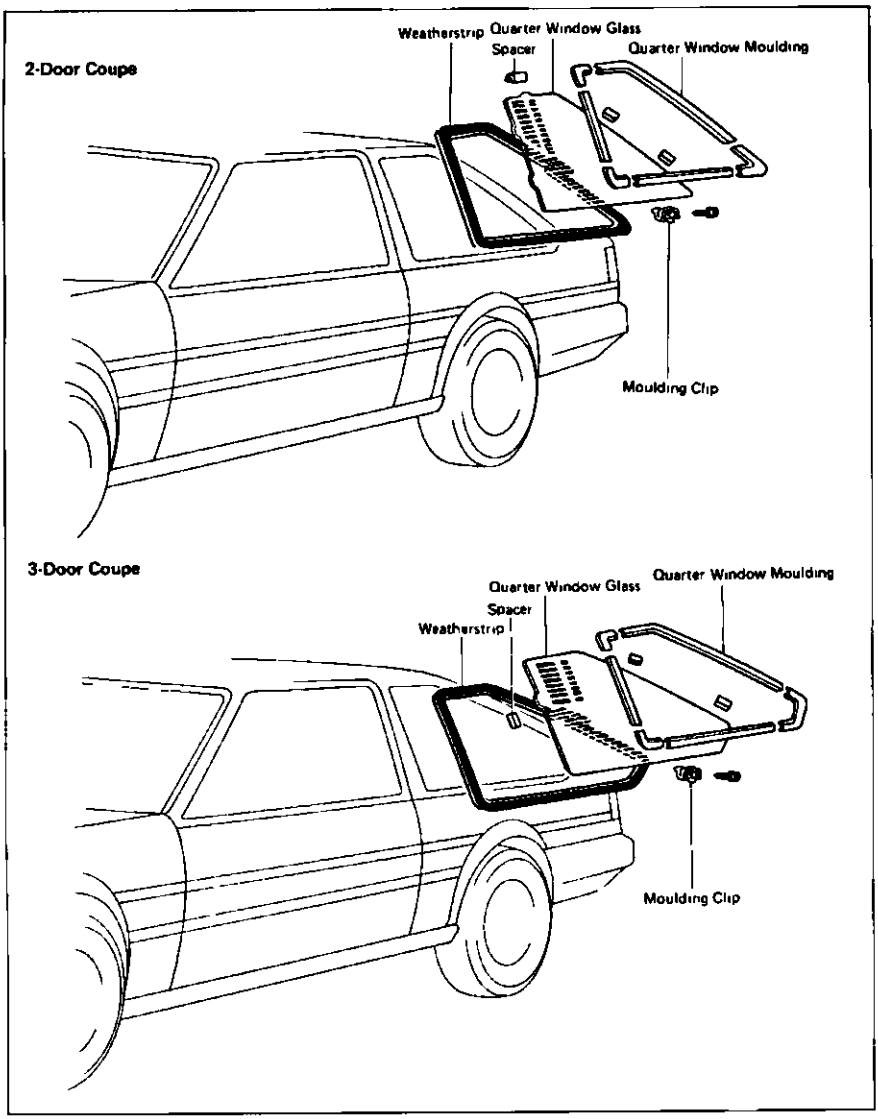
(c) Sun visor and holder

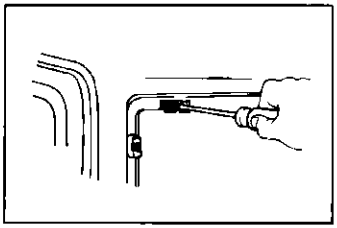
11 **INSTALL FRONT PILLAR GARNISH**

12. **INSTALL ROOF SIDE GARNISH**

QUARTER WINDOW GLASS

COMPONENTS

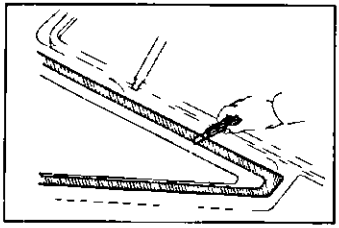




REMOVAL OF QUARTER WINDOW GLASS

1 REMOVE QUARTER WINDOW MOULDING
(See page BO-20)

2. REMOVE MOULDING CLIP
   (a) Using a screwdriver, remove the moulding clip set screws.
   (b) Remove the clips.

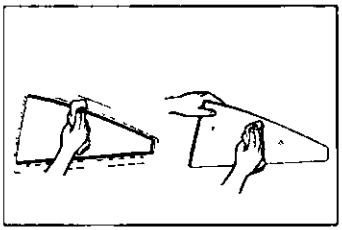


3. REMOVE QUARTER WINDOW GLASS
   (a) Using a knife, cut loose the adhesive
   (b) Remove the glass

INSTALLATION OF QUARTER WINDOW GLASS

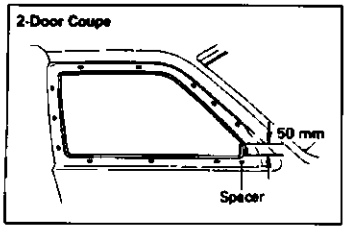
1. PREPARE ITEMS LISTED

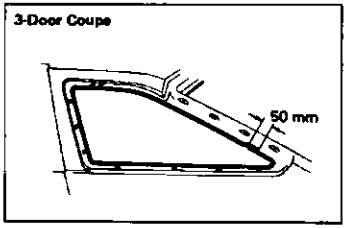
Part Name and Part No	Contents of Set
Butyl tape set (08850 – 00065)	Butyl tape 9 mm dia x 2 500 mm (0 35 x 98 43 in) Primer 5 cc Sponge (for applying Primer) Piano wire 1 mm dia x 600 mm (0 04 x 23 62 in) (for cutting around glass)
Materials required	Solvent (Alcohol unleaded gasoline) (for cleaning adhering surfaces)
Weatherstrip (62741 12130) (62741 12120)	For 2 Door Coupe For 3-Door Coupe



2 CLEAN BODY OR GLASS

Wipe off any adhesive left on the body or glass with alcohol or unleaded gasoline



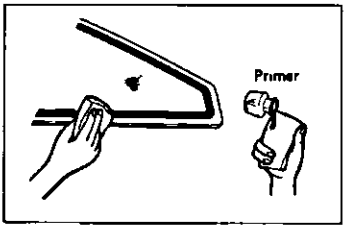


3. INSTALL WEATHERSTRIP TO BODY

(a) Install the weatherstrip to the body.

NOTE Apply weatherstrip over 50 mm (1.97 in.) of the rear area.

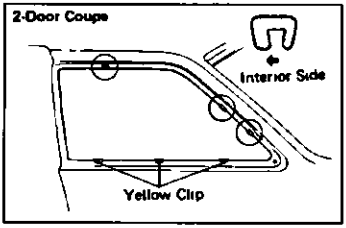
(b) Install the spacer to the body (2-Door Coupe only)



4. INSTALL QUARTER GLASS

(a) Using a sponge, coat the glass adhering surface with primer

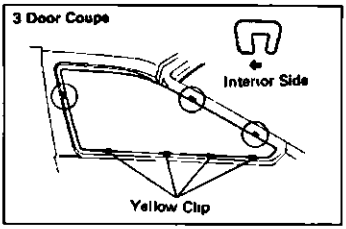
(b) Let the primer coating dry for 10 minutes

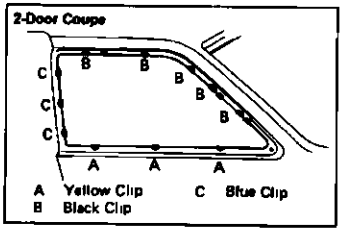


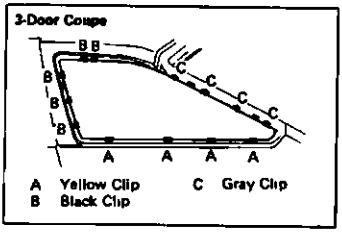
(c) Install the spacer to the glass

(d) Install the moulding clips (yellow) to the glass lower side.

(e) Install the glass.





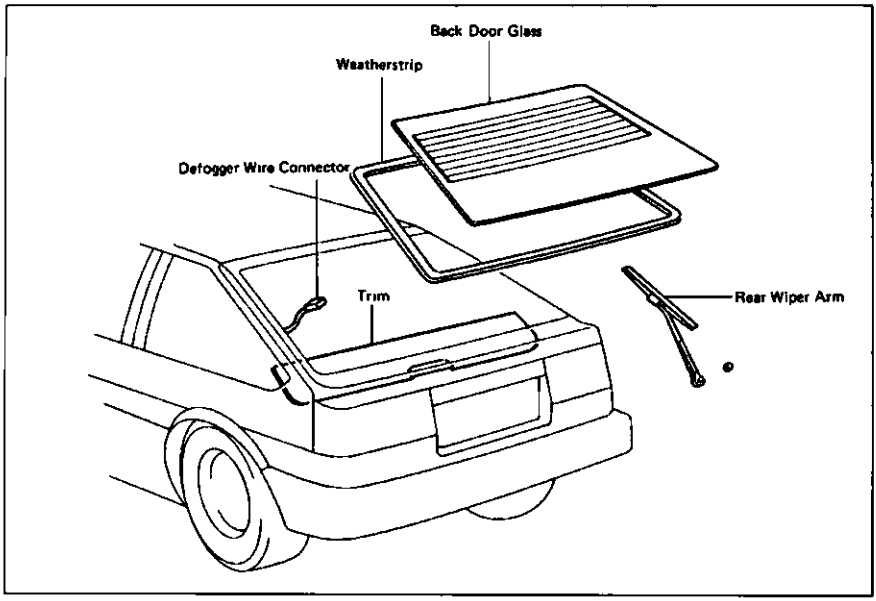


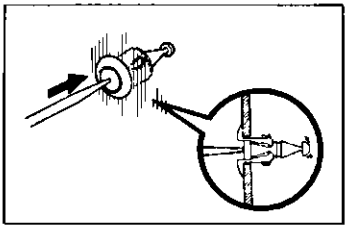
(f) Install the moulding clips to the body

(g) Using a screwdriver, install the moulding setting screws

5. **INSTALL QUARTER WINDOW MOULDING**
(See page BO 20)

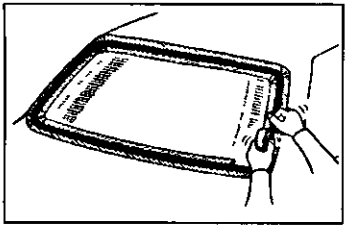
BACK DOOR GLASS
(3-Door Coupe)
COMPONENTS



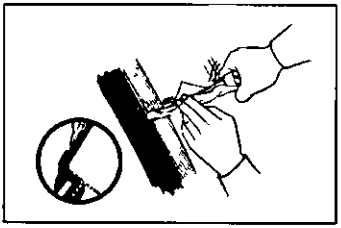


REMOVAL OF BACK DOOR GLASS

1. **REMOVE TRIM**
   Push on the center of the clip with a thin object to remove it
2. **REMOVE REAR WIPER ARM**
3. **DISCONNECT DEFOGGER WIRE CONNECTOR**



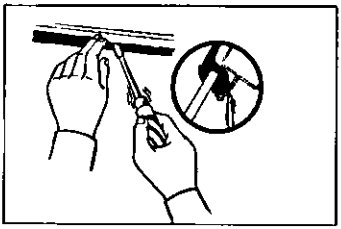
4. **APPLY ADHESIVE TAPE TO PROTECT BODY**



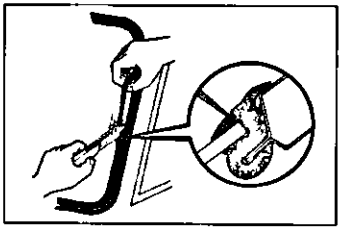
5. REMOVE GLASS

If reusing weatherstrip.

(a) Working from the vehicle outside with a screwdriver, loosen the weatherstrip lip from the body



(b) Force the weatherstrip lip from the interior to the outside body flange. Pull the glass outwards and remove it with the weatherstrip.

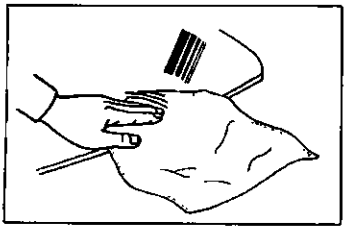


If not reusing weatherstrip:

(a) From the outside, cut off the weatherstrip lip with a knife.

(b) From the vehicle interior, push the glass with an even force.

(c) Pull off the weatherstrip from the body.

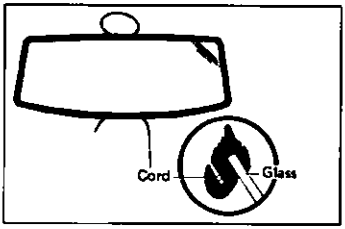


INSTALLATION OF BACK DOOR GLASS

(See page BO 34)

1 CLEAN BODY AND GLASS

Wipe off any adhesive left on the body or glass with alcohol

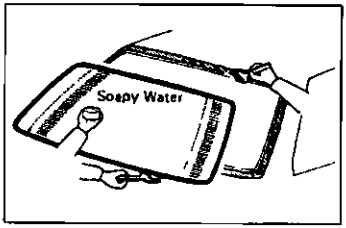


2. INSTALL WEATHERSTRIP ON GLASS

(a) Attach the weatherstrip to the glass

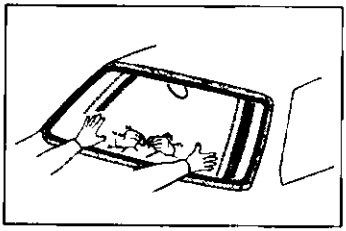
CAUTION: If the weatherstrip has hardened, it may develop water leaks. Use a new one if possible.

(b) Apply a working cord along the weatherstrip groove as shown



3. INSTALL GLASS

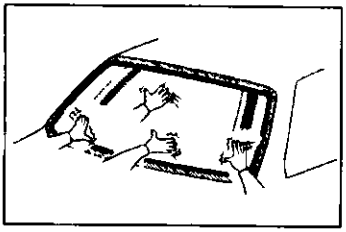
(a) Apply soapy water to the contact face of the weatherstrip lip and to the body flange



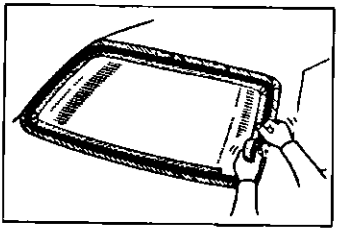
NOTE Begin installation from the lower center part of the glass

(b) Hold the glass in position on the body

(c) Install the glass by pulling the string from the interior, while pushing on the outside of the weatherstrip with your open hand

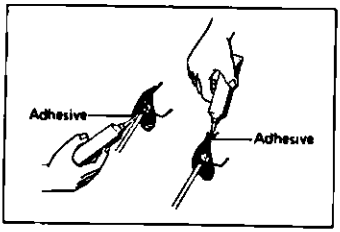


(d) To snug the glass in place, tap from the outside with your open hand



4. APPLY ADHESIVE

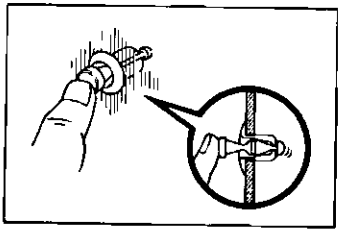
(a) Put masking tape around the weatherstrip to protect the paint and glass



(b) Apply adhesive between the weatherstrip and glass and between the weatherstrip and body

Part No 08704-00020

NOTE When the adhesive is dry, remove the masking tape



5. INSTALL TRIM

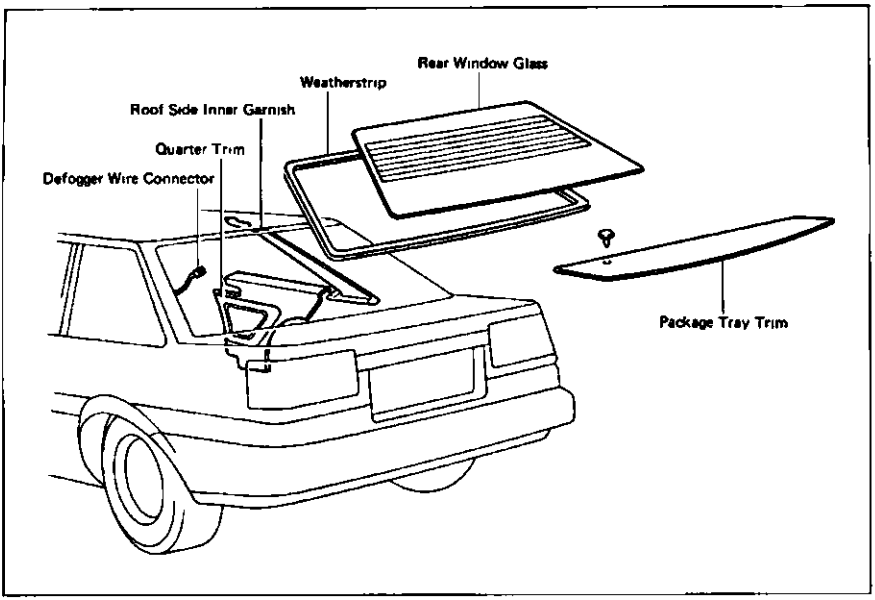
Install the clip to the trim and then push in the clip pin

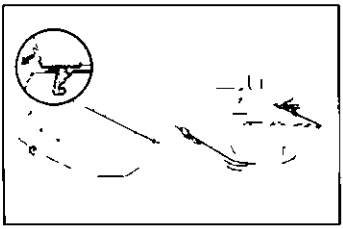
6. INSTALL FOLLOWING PARTS·

(a) Window defogger wire connector

(b) Rear wiper arm

REAR WINDOW GLASS
(2-Door Coupe)
COMPONENTS





REMOVAL OF REAR WINDOW GLASS

1 REMOVE REAR SEAT CUSHION

(a) Pull the hook levers forward and pull up the front of the seat cushion

(b) Push down on the rear of the seat cushion and pull it forward

2 REMOVE FOLLOWING PARTS.

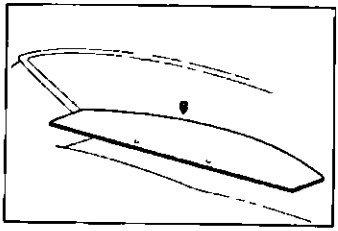
(a) Rear seat back and hinge

(b) Quarter trim

(c) Roof side inner garnish

(d) Roof headliner rear trim

3 DISCONNECT DEFOGGER WIRE CONNECTOR



4. REMOVE PACKAGE TRAY TRIM BOARD
   (a) From the trunk, push up the trim board clip and remove it
   (b) Remove the trim board.

SEE
BACK DOOR GLASS SECTION

5. REMOVE REAR WINDOW GLASS

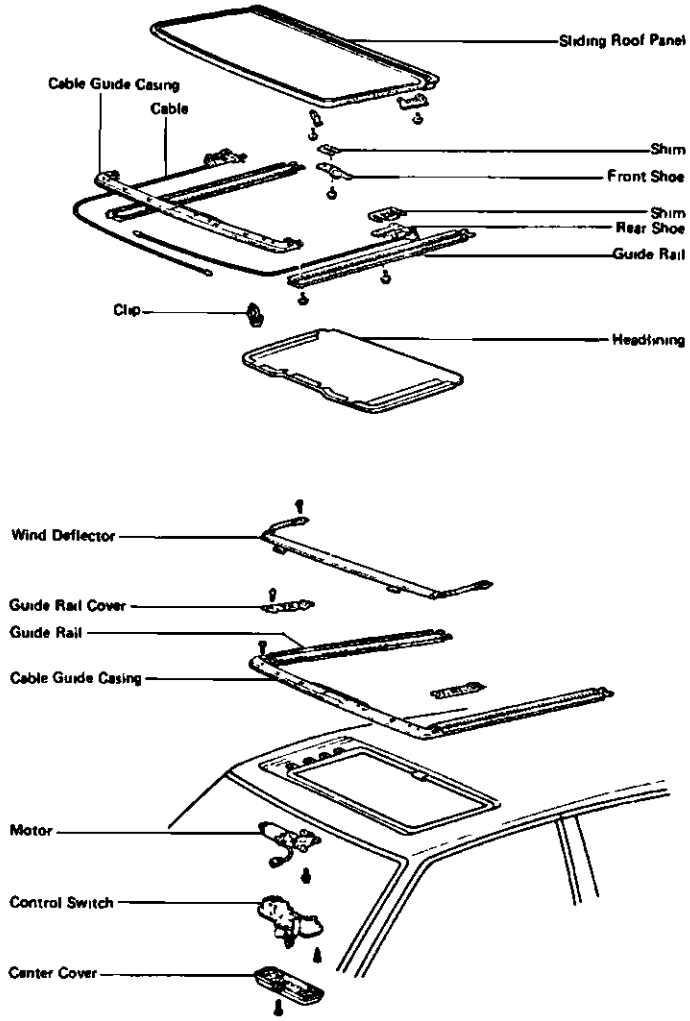
INSTALLATION OF REAR WINDOW GLASS

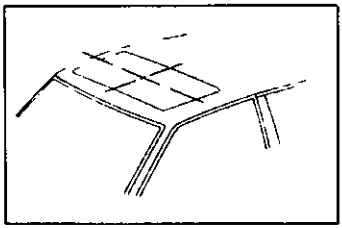
1 INSTALL REAR WINDOW GLASS
(See page BO-36)

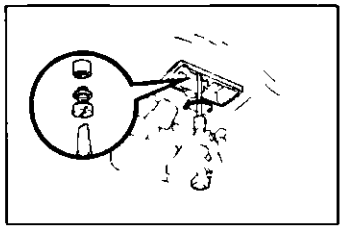
2. INSTALL PACKAGE TRAY TRIM BOARD
   (a) Install the trim board
   (b) Install the clip.
3. CONNECT DEFOGGER WIRE CONNECTOR
4 INSTALL FOLLOWING PARTS·
   (a) Roof headliner rear trim
   (b) Roof side inner garnish
   (c) Quarter trim
   (d) Rear seat back and hinge
   (e) Rear seat cushion

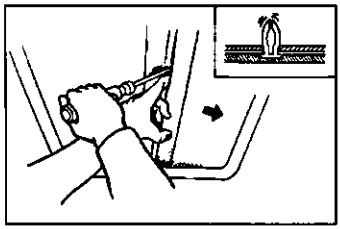
SUN ROOF

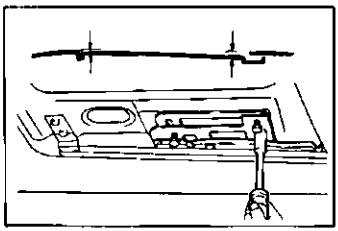
COMPONENTS

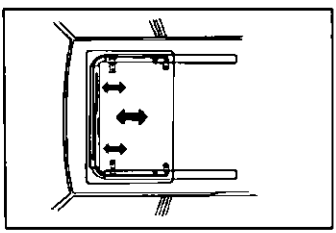












ON-VEHICLE INSPECTION

(a) Start the engine and check the operation time of the sun roof

Operation time: Approx. 5 secs.

(b) Check for abnormal noise or binding during operation.

(c) With the sun roof fully closed, check for water leakage

(d) Check for a level difference between the sliding panel and roof panel.

Front side: 0 ± 1.5 mm (0 ± 0.059 in.)

Rear side: $0 \begin{smallmatrix}+1.5\\-2.0\end{smallmatrix}$ mm ($0 \begin{smallmatrix}+0.059\\-0.079\end{smallmatrix}$ in.)

Left and right side: $0 \begin{smallmatrix}+1.5\\-2.0\end{smallmatrix}$ mm ($0 \begin{smallmatrix}+0.059\\-0.079\end{smallmatrix}$ in.)

If the sliding roof does not operate

(a) Remove the center cover of the control box

(b) Remove the screw inside

CAUTION: Be careful not to lose the spring washer or washer.

(c) Manually operate the sun roof by inserting a screw driver into the hole and turning the drive shaft

ADJUSTMENT OF SLIDING ROOF

1 REMOVE HEADLINING

Before making adjustments, pull loose the clips and slide the headlining to the rear

NOTE When checking adjustment, reattach the headlining before sliding the roof

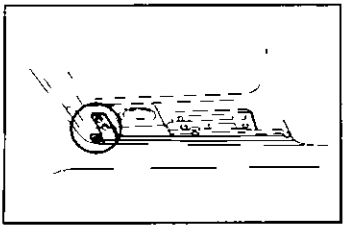
2. TO ADJUST LEVEL DIFFERENCE

Adjust by increasing or decreasing the number of shims

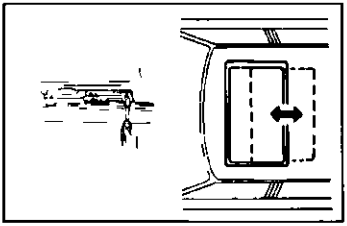
NOTE If the front end is high, even without a shoe shim, check to see if the front shoes are in contact with the stoppers

3. TO ADJUST FORWARD OR REARWARD

Adjust by moving the front shoe on both sides

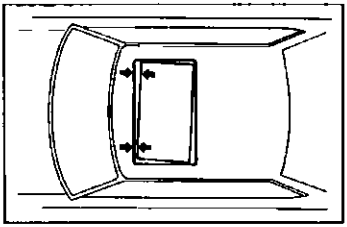


NOTE When the sliding roof is fully closed, confirm that the front shoes are in contact with the stopper



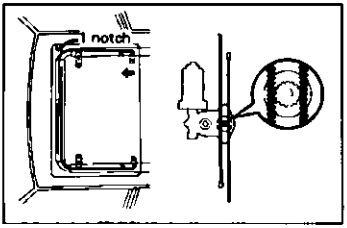
4. TO ADJUST RIGHT OR LEFT

Adjust by loosing the rear shoe bolts and moving the sliding roof to the right and left



5. TO ADJUST CLEARANCE

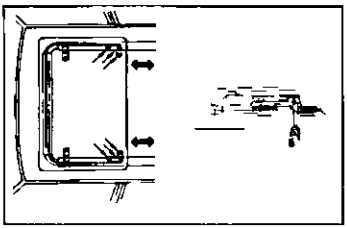
(Difference in left and right front clearance)



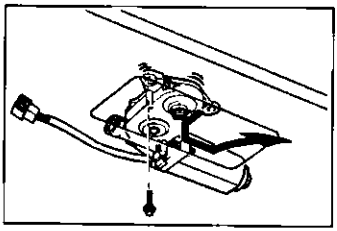
If the difference is about 2 mm (0.08 in.)

(a) Remove the drive motor and shift the cable one notch on the side with the larger clearance

(b) Reinstall the motor

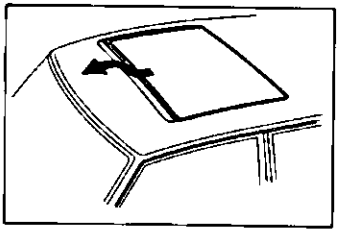


If the difference is about 1 mm (0.04 in.)
Loosen the rear shoe bolts and readjust the sliding roof to the proper position.

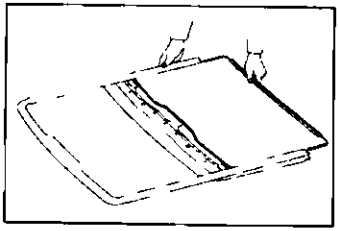


REMOVAL OF SUN ROOF

1. DISCONNECT BATTERY CABLE FROM BATTERY
2. REMOVE CENTER COVER OF CONTROL BOX
3. REMOVE CONTROL SWITCH
4. REMOVE MOTOR THROUGH SERVICE HOLE



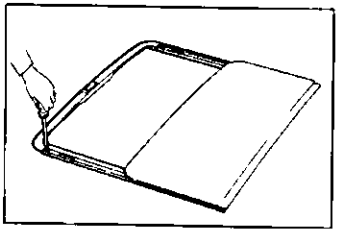
5. REMOVE WIND DEFLECTOR
6. REMOVE GUIDE RAIL COVER
7. REMOVE SLIDING ROOF AND GUIDE RAIL
   (a) Apply adhesive tape to protect the body
   (b) Pull the sliding roof with the guide rail upward and forward to remove



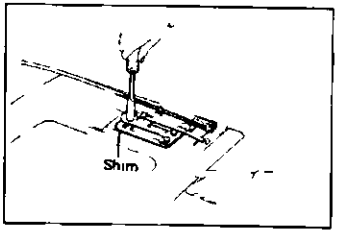
DISASSEMBLY OF SUN ROOF

(See page BO-40)

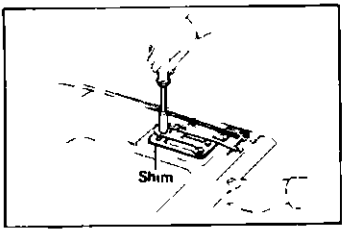
1. REMOVE SLIDING ROOF HEADLINING
   (a) Pry off the clip
   (b) Pull the sliding roof headlining rearward to remove



2 REMOVE GUIDE RAIL AND CABLE GUIDE CASING
   (a) Loosen the screw
   (b) Pull the guide rail rearward to remove
   (c) Pull the cable guide casing forward to remove



3. NOTE THE NUMBER OF SHIMS ON THE FRONT AND REAR
4 REMOVE FRONT SHOE
5. REMOVE DRIVE CABLE AND REAR SHOE
6 REMOVE DRIVE CABLE FROM CABLE GUIDE CASING

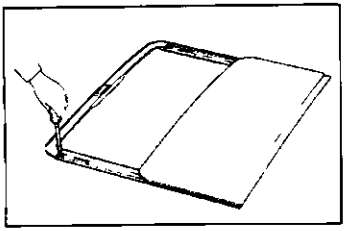


ASSEMBLY OF SUN ROOF

(See page BO-40)

1. APPLY MP GREASE TO DRIVE CABLE
2. PLACE DRIVE CABLES INTO GUIDE CASING
3. INSTALL FRONT AND REAR SHOES ONTO ROOF PANEL

   At this time just finger tighten the front shoe bolts Tighten down the rear shoe bolts



4. INSTALL GUIDE RAILS ON BOTH SIDES
   (a) Install both side guide rails through the rear and front shoes
   (b) Install the guide rail and guide casing with screws.

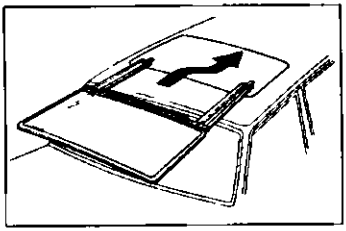


(c) Use butyl tape to cover the cut portion of the weatherstrip at the connection between the guide case and guide rail.



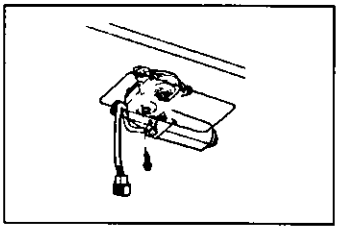
5 ASSEMBLE SLIDING ROOF HEADLINING
   (a) Run the headlining through the guide rail.
   (b) Do not clip the headlining

   NOTE Securely install the headlining after adjustment of the sun roof

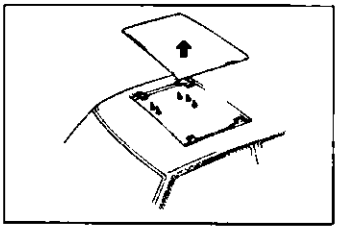


INSTALLATION OF SUN ROOF

1. INSTALL SLIDING ROOF WITH GUIDE RAIL ONTO ROOF
   (a) Install the sliding roof assembly onto the roof
   (b) Tighten the guide rail and cover with the screws
2. INSTALL WIND DEFLECTOR



3. INSTALL DRIVE MOTOR
   (a) Fully close the sliding roof manually and tighten down the front shoe bolts to where they make contact with the stopper on the rail side
   (b) Install the drive motor to the roof
   (c) Install the center cover of the control box
4. ADJUST SLIDING ROOF OPERATION



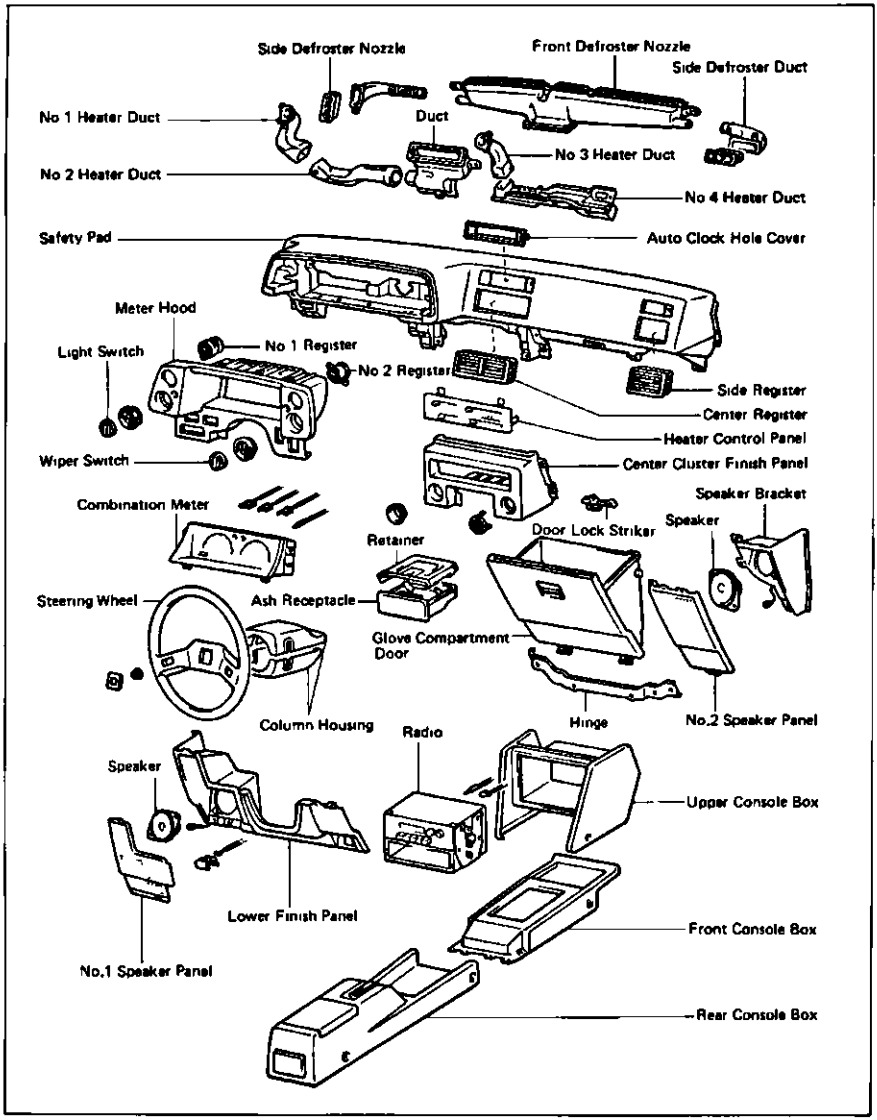
REMOVAL OF SLIDING ROOF PANEL

TO REMOVE ONLY SLIDING ROOF PANEL

(a) Pull loose the clips and slide the headlining rearward
(b) Remove the front and rear shoe bolts.
(c) Remove the roof panel.

SAFETY PAD

COMPONENTS

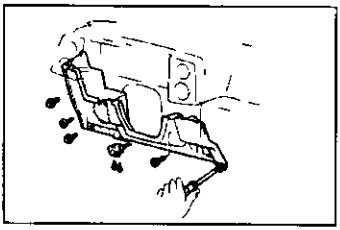




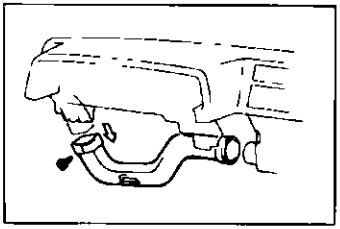
REMOVAL OF SAFETY PAD

(See page BO-46)

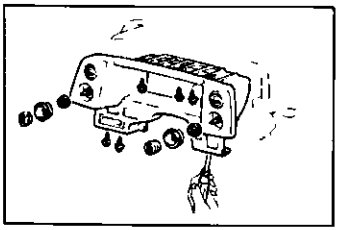
1. REMOVE STEERING WHEEL
2. REMOVE NO 1 SPEAKER PANEL
   (a) Remove the screw
   (b) Pull loose the clip and remove the panel
3. REMOVE ENGINE HOOD RELEASE LEVER



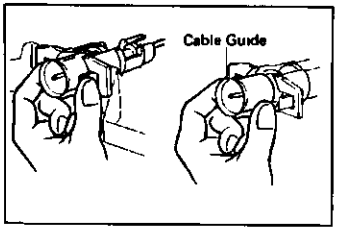
4. REMOVE LOWER FINISH PANEL
   (a) Remove the two bolts and three screws
   (b) Remove the finish panel with the speaker



5. REMOVE NO 2 HEATER DUCT
   Remove the screw and No 2 heater duct

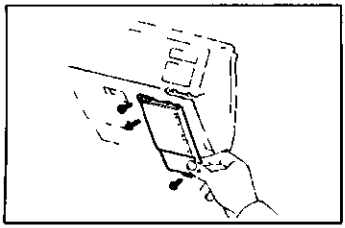


6. REMOVE METER HOOD
   (a) Pull out the light and wiper switches
   (b) Remove the light and wiper switch mounting nuts
   (c) Remove the five screws and pull out the hood
7. REMOVE COMBINATION METER
   (a) Disconnect the connectors
   (b) Remove the four mounting screws and meter



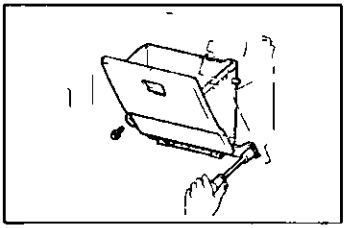
8. REMOVE SPEEDOMETER CABLE
   (a) Push on the pawls on the right and left of the meter bracket
   (b) Pull the meter bracket from the safety pad.

   NOTE When reinstalling, first pull on the cable guide
9. REMOVE UPPER CONSOLE BOX



10. REMOVE NO 2 SPEAKER PANEL

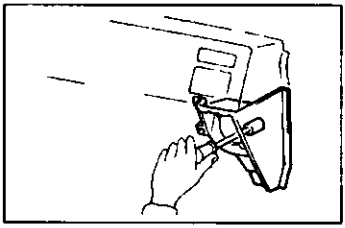
Remove the two screws and speaker panel



11. REMOVE GLOVE COMPARTMENT DOOR

Remove the two bolts and compartment door with the hinge.

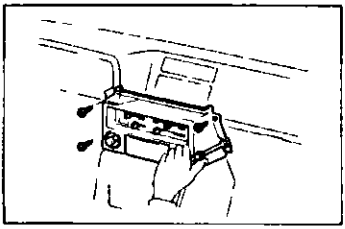
12. REMOVE GLOVE COMPARTMENT DOOR LOCK STRIKER



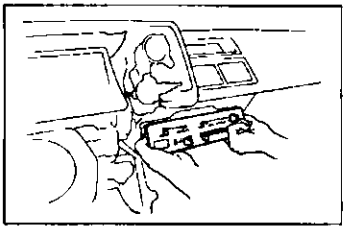
13. REMOVE SPEAKER BRACKET

(a) Remove the screw

(b) Remove the bracket with the speaker



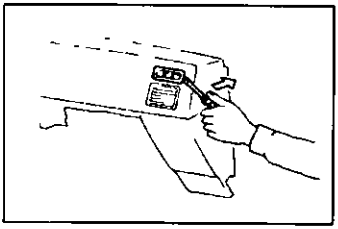
14 REMOVE CENTER CLUSTER FINISH PANEL



15. REMOVE HEATER CONTROL PANEL

(a) Remove the four screws

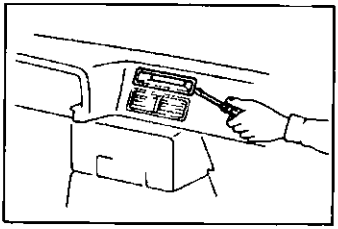
(b) Push on the pawls and remove the heater control panel from the safety panel



16. REMOVE SIDE DEFROSTER NOZZLE

Using a screwdriver, pry between the defroster nozzle and safety pad

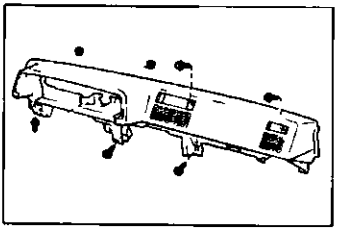
CAUTION: Be careful not to scratch the safety pad.



17. REMOVE AUTO CLOCK COVER

Using a screwdriver, pry between the auto clock cover and safety pad

CAUTION: Be careful not to scratch the safety pad.



18. REMOVE SAFETY PAD

(a) Remove the three bolts, two nuts and screws.

(b) Pull out the safety pad

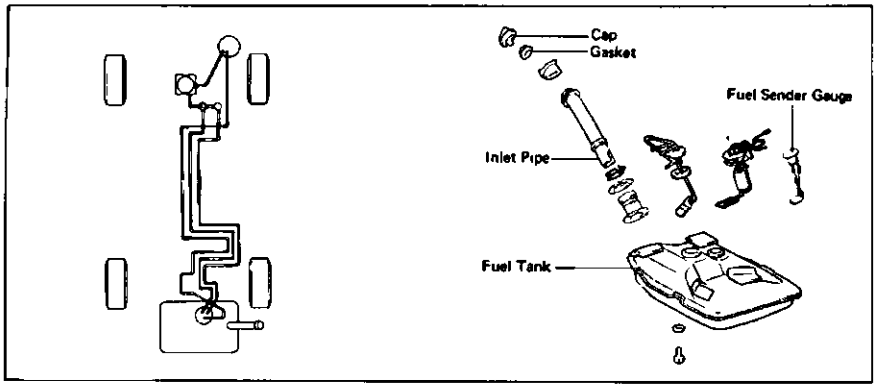
INSTALLATION OF SAFETY PAD

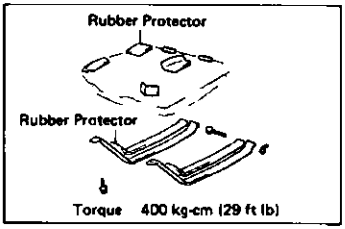
(See page BO-46)

INSTALL SAFETY PAD IN REVERSE SEQUENCE OF REMOVAL

FUEL TANK AND LINE

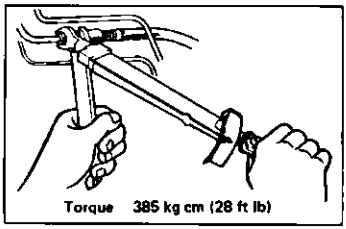
COMPONENTS





PRECAUTIONS

1. Always use new gaskets when replacing the fuel tank or component parts
2. When re-installing, be sure to include the rubber protectors on the upper surfaces of the fuel tank and tank band.
3. Apply the proper torque to all tightening parts.



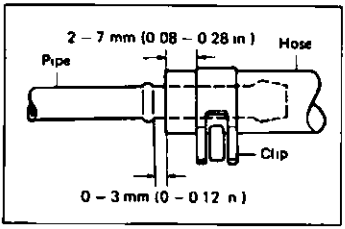
INSPECT FUEL LINES AND CONNECTIONS

(a) Inspect the fuel lines and connections for cracks, leakage or deformation

(b) Inspect the fuel tank vapor vent system hoses and connections for looseness, sharp bends or damage

(c) Inspect the fuel tank for deformation, cracks, fuel leakage or tank band looseness

(d) Inspect the filler neck for damage or fuel leakage.



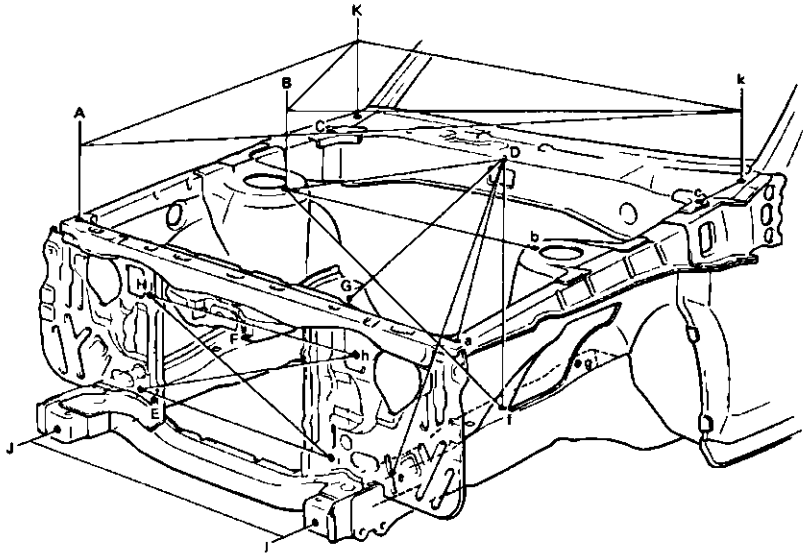
(e) Hose and tube connections are as shown in the illustration.

If problem is found, repair or replace the parts as necessary

BODY DIMENSIONS

Symbol	Nomenclature	Hole dia	Symbol	Nomenclature	Hole dia
A, a	Fender front installation nut	6ϕ	P p	Suspension member rear side lower installation hole	13ϕ
B, b	Front spring support inner hole	10ϕ	Q q	Front floor under reinforcement standard hole	17ϕ
C c	Fender rear installation nut	6ϕ	R r	Front floor under reinforcement standard hole	15ϕ
D	Cowl top panel center mark	–	S s	Lower control link bracket inner hole	12.5ϕ
E e	Front side member standard hole	15ϕ	T t	Rear floor side member standard hole	13ϕ
F f	Suspension member rear side upper installation hole	15ϕ	U u	Upper control link bracket inner hole	12.5ϕ
G g	Front side member standard hole	11ϕ	V, v	Rear floor side member standard hole	11ϕ
H	Radiator support upper hole	nonagon	W w	Rear floor side member standard hole	13ϕ
h	Radiator support upper hole	7ϕ	X	Upper back reinforcement center mark (2 Door Coupe)	3R
I ı	A/C condenser installation nut	6ϕ	Y	Back door opening frame center mark (3 Door Coupe)	2.5R
J, j	Front side member bumper installation nut	12ϕ	Z, z	Rear floor pan punch mark	2.5R
K, k	Cowl top side panel standard hole	11ϕ			
L, l	Front side member bumper installation hole	19ϕ			
M, m	Strut bar bracket front side inner installation nut	10ϕ			
N, n	Strut bar bracket rear side rear installation nut	10ϕ			
O, o	Suspension member front side lower installation hole	15ϕ			

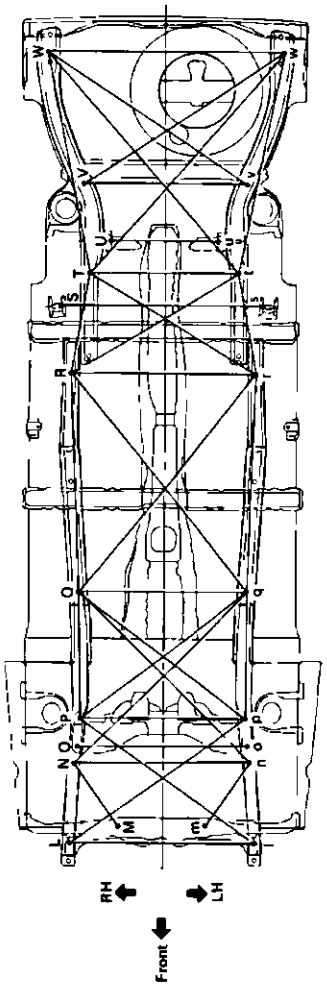
Engine Body Compartment

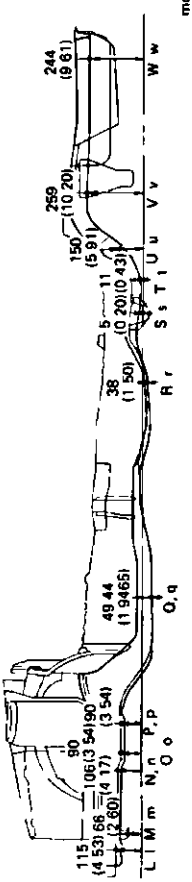


mm (in)

A – a	A – K	A – k	B – b	B – D	B – f	B K	B – k	D – a	D – e
1 259 (49 57)	944 (37 17)	1 619 (63 74)	890 (35 04)	510 (20 08)	915 (36 02)	502 (19 76)	1 214 (47 80)	981 (38 62)	940 (37 01)
D – f	D – G	H – h	H – i	I – h	i – i	J – j	K – k	c – k	
644 (25 35)	552 (21 73)	728 (28 66)	696 (27 40)	765 (30 12)	671 (26 42)	854 (33 62)	1 374 (54 09)	212 (8 35)	

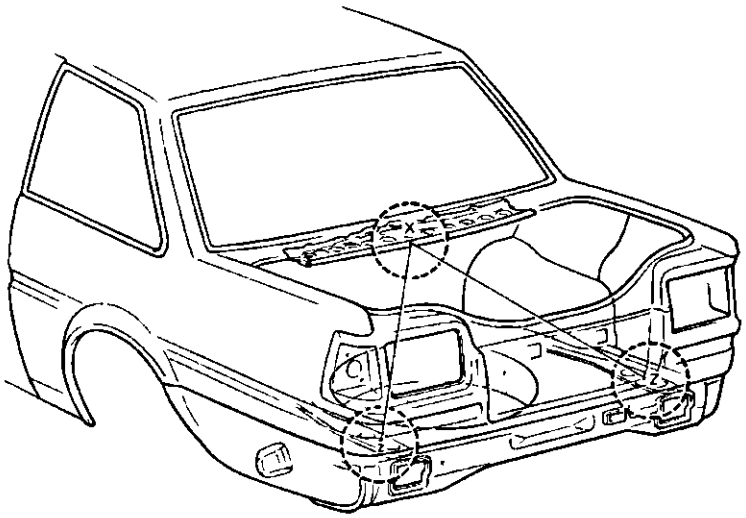
Under Body



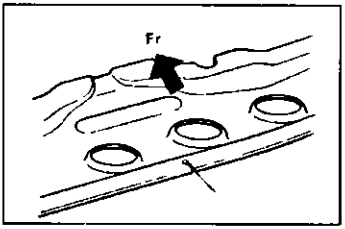


Point Symbol	Reference length mm (in)
L – l	823 (32 40)
L – p l – P	986 (38 82)
M – N m – n	352 (13 86)
N – n	781 (30 75)
N – q	1118 (44 02)
n – Q	1117 (43 98)
O – o	778 (30 63)
P – p	761 (29 96)
P – q	962 (37 87)
p – Q	983 (37 91)
P – Q	587 (23 11)
p – q	586 (23 07)
Q – q	765 (30 12)
Q – R q – r	994 (39 13)
Q – r q – R	1,260 (50 39)
R – r	850 (33 46)
R – T r – t	489 (19 25)
R t r T	909 (35 79)
S – s	892 (35 12)
T – t	690 (27 17)
T – W t – w	1 082 (42 59)
T – w t – W	1 379 (54 29)
U – u	490 (19 29)
V – v	760 (29 92)
V w v – W	1 101 (43 35)
W – w	1 060 (41 73)

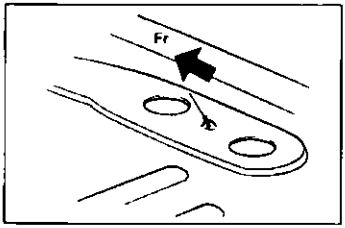
Luggage Compartment (2-Door Coupe)



X



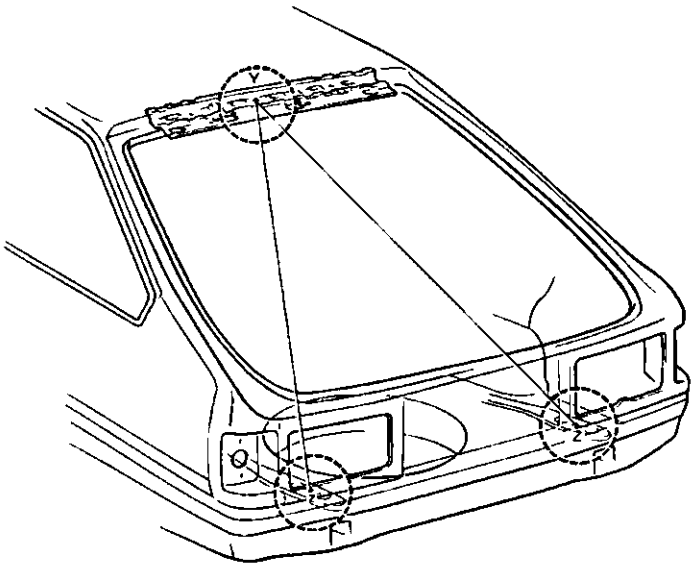
Z, z



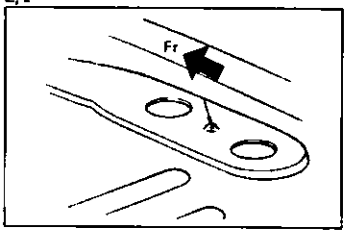
NOTE The luggage compartment measurement is performed between the two dot marked points as shown in the figure above.

Point symbol	Reference length mm (in.)
X – Z	744 (29.29)
X – z	733 (28.86)

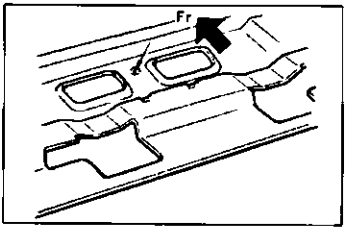
Luggage Compartment (3-Door Coupe)



Z, z



Y



NOTE: The luggage compartment measurement is performed between the two dot-marked points as shown in the figure above.

Point symbol	Reference length mm (in.)
Y – Z	1,360 (53.54)
Y – z	1,354 (53.31)

AIR CONDITIONING SYSTEM

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AC

PRECAUTIONS

1. **The following precautions should be observed when handling refrigerant (R-12):**
   (a) Always wear eye protection
   (b) Keep the refrigerant container (service drum) below 40°C (104°F)
   (c) Do not handle refrigerant in an enclosed area where there is an open flame
   (d) Discharge refrigerant slowly when purging the system.
   (e) Be careful that the liquid refrigerant does not get on your skin

2. **If liquid refrigerant gets in the eyes or on the skin:**
   (a) Do not rub
   (b) Wash the area with a lot of cool water.
   (c) Apply clean petroleum jelly to the skin.
   (d) Rush to a physician or hospital for immediate professional treatment
   (e) Do not attempt to treat yourself

3. **When tubing:**
   (a) Apply a few drops of compressor oil to the seats of the O ring fittings
   (b) Use two wrenches to tighten the nuts to prevent twisting the tube
   (c) Tighten the O-ring fitting to the specified torque

Tightening torque for O ring fittings

Fitting size	Torque
3/8 in Tube	120–150 kg-cm (9–10 ft-lb)
1/2 in Tube	200–250 kg-cm (15–18 ft-lb)
5/8 in Tube	300–350 kg-cm (22–25 ft lb)

TROUBLESHOOTING

Problem	Possible cause	Remedy	Page
No cooling or warm air	Magnetic clutch does not engage		
	(a) A/C fuse blown	Replace fuse and check for short	AC-10
	(b) Magnetic clutch faulty	Check magnetic clutch	AC-18
	(c) A/C switch faulty	Check switch	AC-27
	(d) Thermistor faulty	Check thermistor	AC 28
	(e) A/C amplifier faulty	Check amplifier	AC 29
	(f) Wiring or ground faulty	Repair as necessary	AC 9
	(g) Refrigerant empty	Check refrigerant pressure	AC 11
	(h) Heater relay faulty	Check heater relay	AC 9
	(i) Circuit braker faulty	Check circuit breaker	AC 9
	(j) Pressure switch faulty	Check pressure switch	AC 28
	Compressor does not rotate properly		
	(a) Drive belt loose or broken	Adjust or replace drive belt	AC 10
	(b) Compressor faulty	Check compressor	
	Expansion valve faulty	Check expansion valve	AC 26
	Leak in system	Test system for leaks	AC 13
	Fusible plug on receiver blown or clogged screen	Check receiver	AC 11

TROUBLESHOOTING (Cont'd)

Problem	Possible cause	Remedy	Page
No cooling or warm air (Cont'd)	Blower does not operate		
	(a) A/C fuse blown	Replace fuse and check for short	AC 10
	(b) A/C switch faulty	Check A/C switch	AC 27
	(c) Circuit breaker faulty	Check circu t breaker	AC 9
	(d) Heater relay faulty	Check heater relay	AC 9
	(e) Blower motor faulty	Check blower motor	
	(f) Wiring faulty	Repair as necessary	AC 9
Cool air comes out intermittently	Magnetic clutch slipping	Check magnetic clutch	AC 18
	Expansion valve faulty	Check expansion valve	AC 25
	Wiring connection faulty	Repair as necessary	AC 9
	Excessive moisture in system	Evacuate and charge system	AC 4, 12
Limited amount of cool air at high speed	Therm stor faulty	Check thermistor	AC 28
Cool air comes out only at high speed	Condenser clogged	Check condenser	AC 21
	Drive belt slipping	Check or replace drive belt	AC 10
	Compressor faulty	Check compressor	
	Insufficient or too much refrigerant	Check refrigerant charge	AC 6
	Air in system	Evacuate and charge system	AC 7 12
Insufficient cooling	Condenser clogged	Check condenser	AC 21
	Drive belt slipping	Check or replace drive belt	AC 10
	Magnetic clutch faulty	Check magnetic clutch	AC 18
	Compressor faulty	Check compressor	
	Expansion valve faulty	Check expansion valve	AC 25
	Thermistor faulty	Check thermistor	AC 28
	Control amplifier faulty	Check amplifier	AC 29
	Insufficient or too much refrigerant	Check refrigerant charge	AC 6
	Air or excessive compressor oil in system	Evacuate and charge system	AC 4 12
	Receiver clogged	Check receiver	AC-21
	Temperature control resistor faulty	Check resistor	AC-27
Insufficient velocity of cool air	Evaporator clogged or frosted	Clean evaporator fins or filters	AC 25
	Air leakage from cooling unit or air duct	Repair as necessary	AC 17
	Air inlet blocked	Repair as necessary	
	Blower motor faulty	Replace blower motor	AC- 9

Checking of Refrigeration System with Manifold Gauge

This is a method in which the trouble is located by using a manifold gauge

Read the manifold gauge pressure with the following established conditions

(a) Temperature at the air inlet 30–35°C (86–95°F)

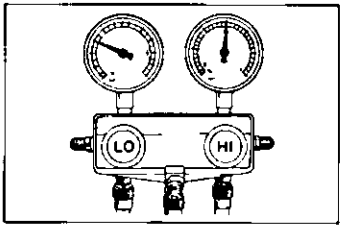
(b) Engine running at 2 000 rpm

(c) Blower speed set at high

(d) A/C switch ON

(e) Temperature control lever set at cool

NOTE Gauge indications may vary slightly due to ambient temperature conditions

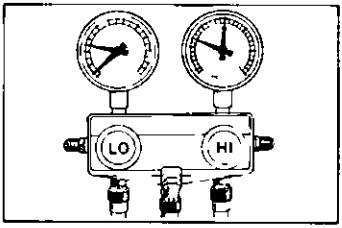


1. NORMALLY FUNCTIONING REFRIGERATION SYSTEM

Gauge reading:

Low pressure side
1.5 – 2.0 kg/cm² (21 – 28 psi)

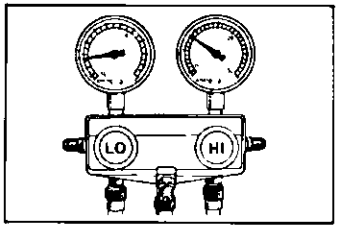
High pressure side
14.5 – 15.0 kg/cm² (206 – 213 psi)



2 MOISTURE PRESENT IN REFRIGERATION SYSTEM

Condition. Periodically cools and then fails to cool

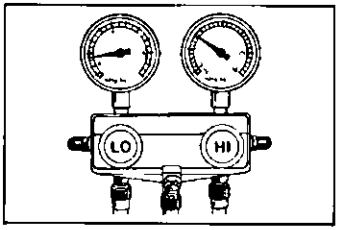
Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
During operation pressure at low pressure side some times becomes a vacuum and sometimes normal	Moisture entered refrigeration system freezes at expansion valve orifice and temporarily stops cycle but normal state is restored after a time when the ice melts	Drier in oversaturated state ↓ Moisture in refrigeration system freezes at expansion valve orifice and blocks circulation of refrigerant	(1) Replace receiver and drier (2) Remove moisture in cycle through repeated vacuum purging. (3) Charge refrigerant to proper amount



3. INSUFFICIENT REFRIGERANT

Condition: Insufficient cooling

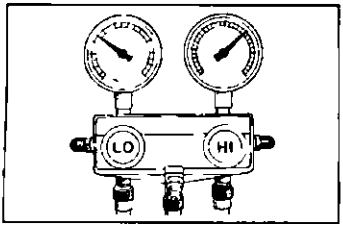
Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
Pressure low at both low and high pressure sides Bubbles seen in sight glass Insufficient cooling performance	Gas leakage some place in refrigeration system	Insufficient refrigerant in system ↓ Refrigerant leaking	(1) Check with leak tester and repair (2) Charge refrigerant to proper amount



4. POOR CIRCULATION OF REFRIGERANT

Condition: Insufficient cooling

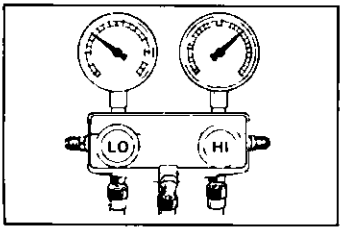
Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
Pressure low at both low and high pressure sides Frost on tubes from receiver to unit	Refrigerant flow obstructed by dirt in receiver	Receiver clogged	Replace receiver



5. REFRIGERANT OVERCHARGE OR INSUFFICIENT COOLING OF CONDENSER

Condition. Does not cool sufficiently

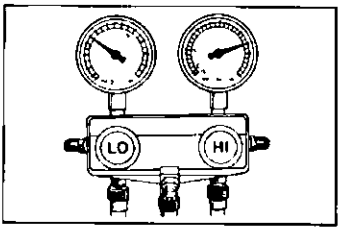
Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
Pressures too high at both low and high pressure sides	Unable to develop sufficient performance due to excessive refrigerant in system	Excessive refrigerant in cycle → refrigerant overcharged	(1) Clean condenser (2) Check fan motor operation (3) If (1) and (2) are in normal state, check amount of refrigerant **Note** Vent out refrigerant through gauge manifold low pressure side by gradually opening valve
	Condenser cooling insufficient	Condenser cooling insufficient → condenser fins clogged or fan motor faulty	



6. EXPANSION VALVE IMPROPERLY MOUNTED/ HEAT SENSING TUBE DEFECTIVE (OPENS TOO WIDE)

Condition: Insufficient cooling

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
Pressures too high at both low and high pressure sides Frost or large amount of dew on piping at low pressure side	Trouble in expansion valve or heat sensing tube not installed correctly Refrigerant flow out of adjustment	Excessive refrigerant in low pressure piping ↓ Expansion valve opened too wide	(1) Check heat sensing tube installation (2) If (1) is normal test expansion valve in unit, and replace if defective

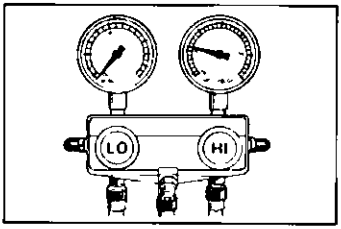


7. AIR PRESENT IN REFRIGERATION SYSTEM

Condition: Does not cool down sufficiently

NOTE These gauge indications are shown when the refrigeration system has been opened and the refrigerant charged without vacuum purging

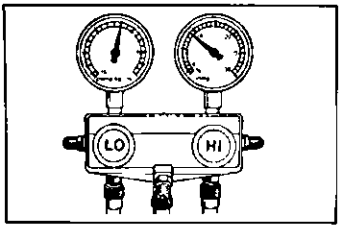
Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
Pressures too high at both low and high pressure s des	Air entered refrigeration system	Air present in refrigeration system ↓ Insufficient vacuum purging	(1) Replace receiver and drier (2) Check for dirty or insuf ficient compression oil (3) Vacuum purge and charge new refrigerant



8. REFRIGERANT DOES NOT CIRCULATE

Condition: Does not cool (Cools from time to time in some cases)

Symptom seen in refrigerat on system	Probable cause	Diagnosis	Remedy
Vacuum indicated at low pressure side very low pressure indicated at high pressure side Frost or dew seen on piping before and after receiver and dr er or ex pansion valve	Refrigerant flow ob structed by moisture or dirt in refrigerant freezing or adher ng to expansion valve orifice Refr gerant flow ob structed by gas leakage from expansion valve heat sensing tube	Expansion valve orifice clogged ↓ Refrigerant does not flow	Allow to stand for sometime and then restart operation to determine if trouble is caused by moisture or dirt If caused by moisture refer to step 2 on page AC-4 If caused by dirt, remove ex pansion valve and clean off dirt by blowing with air If unable to remove dirt, replace valve Vacuum purge and charge new refrigerant to proper amount If gas leakage from heat sens ing tube, replace expansion valve



9. DEFECTIVE COMPRESSION COMPRESSOR

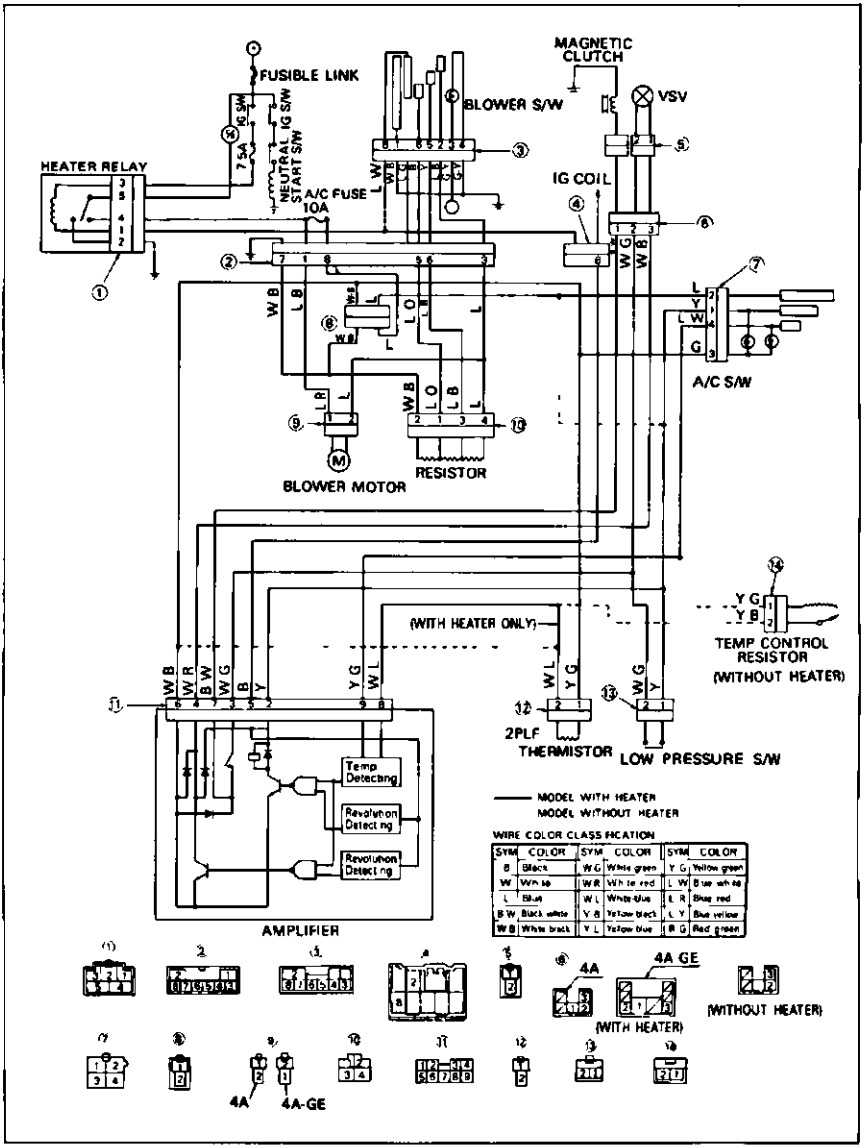
Condition: Does not cool

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
Pressure too high at low pressure side Pressure too low at high pressure side	Internal leak in compressor	Compression defective ↓ (Valves sliding parts, piston, cylinder, gasket, etc.)	Replace or repair compressor

SPECIAL TOOLS AND EQUIPMENT

Tool	SST No.	Use
Manifold gauge set	07110 78010	To evacuate and charge system
Ohmmeter		To electrical diagnosis
Testing nozzle	07115 71010	To test expansion valve

AIR CONDITIONING SYSTEM CIRCUIT



SYM	COLOR	SYM	COLOR	SYM	COLOR
B	Black	W G	White green	Y G	Yellow green
W	White	W R	White red	L W	Blue white
L	Blue	W L	White blue	L R	Blue red
B W	Black white	Y B	Yellow black	L Y	Blue yellow
W B	White black	Y L	Yellow blue	R G	Red green

ON-VEHICLE INSPECTION

1. **CHECK CONDENSER FINS FOR BLOCKAGE OR DAMAGE**

   If the fins are clogged, clean them with pressurized water.

   CAUTION: Be careful not to damage the fins.

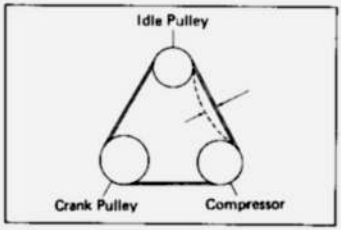
2. **CHECK TENSION OF DRIVE BELTS**

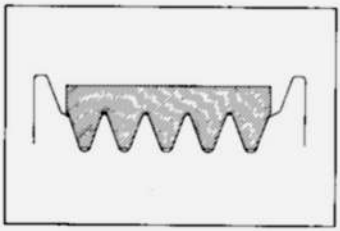
   Drive belt tension at 10 kg (22.0 lb):

   [4A engine]
   New belt 7 – 9 mm (0.28 – 0.35 in.)
   Used belt 9 – 12 mm (0.35 – 0.47 in.)

   [4A-GE engine]
   New belt 5.5 – 7 mm (0.22 – 0.28 in.)
   Used belt 8 – 9.5 mm (0.31 – 0.37 in.)

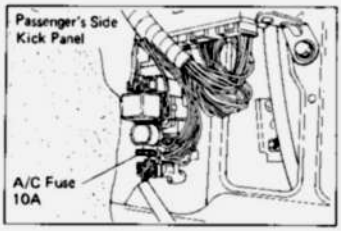
   NOTE:
   - "New belt" refers to a brand new belt which has never before been used.
   - "Used belt" refers to a belt which has been used on a running engine for 5 minutes or more.





3. **MAKE SURE DRIVE BELT IS INSTALLED CORRECTLY (4A-GE engine)**

   After installing the drive belt, check that it fits properly in the ribbed grooves.



4. **START ENGINE**

5. **TURN ON A/C SWITCH**

   Check that the A/C operates at each position of the blower switch.

   If blower does not operate, check A/C fuse.

6. **CHECK MAGNETIC CLUTCH OPERATION**

7. **CHECK THAT IDLE INCREASES**

   When the magnetic clutch engages, engine revolution should increase.

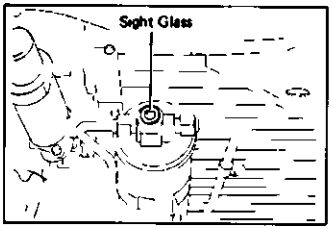
   Standard idle up rpm: 900 – 1,000 rpm

8. **CHECK AMOUNT OF REFRIGERANT**

   If you can see bubbles in the sight glass, additional refrigerant is needed. (See page AC-11)

9. **IF NECESSARY, INSPECT FOR LEAKAGE**

   Using a gas leak tester, inspect each component of the refrigeration system. (See page AC-17)



REFRIGERATION SYSTEM

Checking of Refrigerant Charge

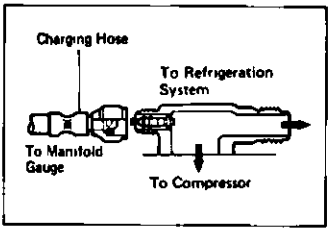
1 **RUN ENGINE AT FAST IDLE**

2. **OPERATE AIR CONDITIONER AT MAXIMUM COOLING FOR A FEW MINUTES**

3 **CHECK AMOUNT OF REFRIGERANT**

Observe the sight glass on the receiver

Item	Symptom	Amount of refrigerant	Remedy
1	Bubbles present in sight glass	Insufficient	Check for leak with gas leak tester
2	No bubbles present in sight glass	None sufficient or too much	Refer to item 3 and 4
3	No temperature difference between compressor inlet and outlet	Empty or nearly empty	Evacuate and charge system Then check for leak with gas leak tester
4	Temperature between compressor inlet and outlet is noticeably different	Proper or too much	Refer to item 5 and 6
5	Immediately after air conditioner is turned off refrigerant in sight glass stays clear	Too much	Discharge excess refrigerant to specified amount
6	When air conditioner is turned off refrigerant foams and then stays clear	Proper	



Installation of Manifold Gauge Set

NOTE Fittings for attaching the manifold gauge set are located on the compressor service valves

1. **CLOSE BOTH HAND VALVES OF MANIFOLD GAUGE SET**

2. **INSTALL CHARGING HOSES OF GAUGE SET TO SERVICE VALVES**

Connect the low pressure hose to the suction service valve and the high pressure hose to the discharge service valve Tighten the hose nuts by hand

NOTE Do not apply compressor oil to the seat of the connection.

Discharging of Refrigeration System

1. **CONNECT MANIFOLD GAUGE SET TO COMPRESSOR**
2. **PLACE FREE END OF CENTER HOSE IN A SHOP TOWEL**
3. **DISCHARGE SYSTEM**

(a) Slowly open the high pressure hand valve to adjust the refrigerant flow. Do not open the valve very much

CAUTION: If refrigerant is allowed to escape too fast, compressor oil will be drawn out of the system

(b) Check the shop towel to make sure no oil is being discharged

If oil is present, partially close the hand valve

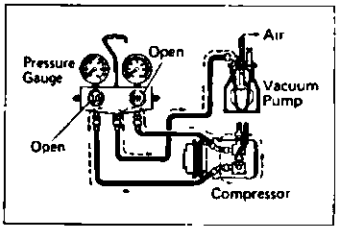
(c) After the manifold gauge reading drops below 3.5 kg/cm² (50 psi), slowly open the low pressure valve

(d) As the system pressure drops, gradually open both high and low valves until both gauges read 0 kg/cm² (0 psi)

Evacuating and Charging of Refrigeration System

NOTE

- Whenever the air conditioning system has been exposed to the atmosphere, it must be evacuated
- After installation of a component, the system should be evacuated for approximately 15 minutes. A component in service that has been opened for repair should be evacuated for 30 minutes



1 **EVACUATE SYSTEM**

(a) Connect a manifold gauge set (See page AC 11)

(b) Install the center hose of the gauge set to the vacuum pump inlet

(c) Run the vacuum pump, and then open both hand valves

(d) After about ten minutes, check that the low pressure gauge reads more than 600 mmHg (23.62 in. Hg) of vacuum

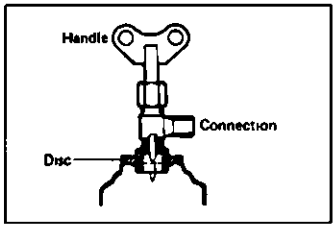
If the reading is not more than 600 mmHg (23.62 in. Hg), close both valves and stop the vacuum pump. Check the system for leaks and repair as necessary.

If no leaks are found, continue evacuating the system.

(e) After the low pressure gauge indicates more than 700 mmHg (27.56 in. Hg) of vacuum, continue evacuating for 15 minutes.

(f) Close both hand valves, and stop the vacuum pump. Disconnect the hose from the vacuum pump.

The system is now ready for charging.



2 INSTALL REFRIGERANT CAN TAP VALVE

CAUTION Observe the precautions listed in the front of this section.

(a) Before installing the valve on the refrigerant container, turn the handle counterclockwise until the valve needle is fully retracted

(b) Turn the disc counterclockwise until it reaches its highest position

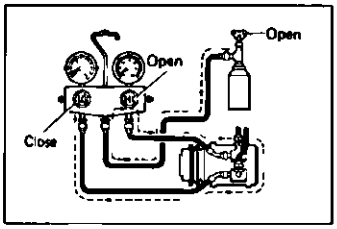
Screw down the valve on the refrigerant container

(c) Connect the center hose to the valve fitting Turn the disc fully clockwise by hand

(d) Turn the handle clockwise to make a hole in the sealed tap.

(e) Turn the handle fully counterclockwise to fill the center hose with gas. Do not open the high and low pressure valves

(f) Loosen the center hose nut connected to the center fitting of the manifold gauge until a hiss can be heard Allow air to escape for a few seconds, and then tighten the nut



3. TEST SYSTEM FOR LEAKS

NOTE: After evacuating the system, check for leaks

(a) Install the refrigerant can tap valve as described in step 2

(b) Open the high pressure valve to charge the system with refrigerant vapor

(c) When the low pressure gauge reads 1 kg/cm² (14 psi), close the high pressure valve

(d) Using a halide gas leak detector, propane torch, or electric leak detector, check the system for leaks

If a leak is found, repair the faulty component or connection

(e) After checking and repairing the system, perform the following

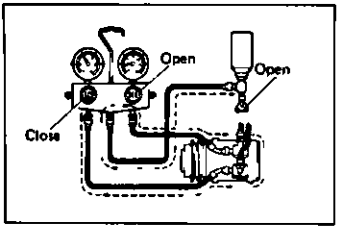
- Turn the can tap handle fully clockwise
- Disconnect the center hose from the can valve fitting
- Evacuate the system for at least 15 minutes (See step 1 on page AC 12)

4. CHARGE EMPTY SYSTEM (LIQUID)

NOTE This step is to charge an empty system through the high pressure side with refrigerant in a liquid state When the refrigerant container is held upside down, refrigerant will enter the system as a liquid

CAUTION:

- **Never run the engine when charging the system through the high pressure side**
- **Do not open the low pressure valve when the system is being charged with liquid refrigerant.**



(a) Close both high and low pressure valves completely after the system is evacuated

(b) Install the refrigerant can tap valve as described in step 2

(c) Open the high pressure valve fully, and keep the container upside down

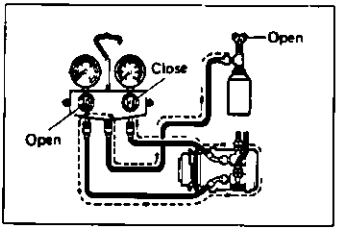
(d) Charge the system with more than one can (400 g, 0.9 lb) to the specified amount Then, close the high pressure valve

Specified amount. 650 – 750g (1.4 – 1 7 lb)

NOTE
- A fully charged system is indicated by the receiver sight glass being free of any bubbles
- If the low pressure gauge does not show a reading, the system is clogged and must be repaired

5. CHARGE EMPTY SYSTEM OR PARTIALLY CHARGED SYSTEM (VAPOR)

NOTE
- This step is to charge the system through the low pressure side with refrigerant in a vapor state When the refrigerant container is placed rightside up, refrigerant will enter the system as a vapor
- Put the refrigerant container in a pan of warm water (maximum temperature 40°C (104°F) to keep vapor pressure in the container slightly higher than vapor pressure in the system



(a) Install the refrigerant can tap valve as described in step 2

(b) Open the low pressure valve Adjust the valve so that the low pressure gauge does not read over 4 2 kg/cm² (60 psi)

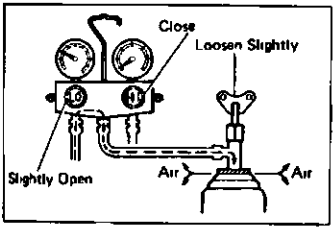
(c) Run the engine at fast idle, and operate the air conditioner

CAUTION Be sure to keep the container in the upright position to prevent liquid refrigerant being charged into the system through the suction side, resulting in possible damage to the compressor

(d) Charge the system with more than one container (400g, 0 9 lb) to the specified amount Then, close the low pressure valve

Specified amount· 650 – 750g (1 4 – 1 7 lb)

NOTE A fully charged system is indicated by the receiver sight glass being free of any bubbles.



6. **IF NECESSARY, CHARGE SYSTEM WITH ANOTHER REFRIGERANT CONTAINER**
   (a) When the refrigerant container is empty, close the pressure valves
   (b) Remove the can tap valve from the container
   (c) Attach the can tap valve to a new refrigerant container
   (d) Purge the air from the center hose by slightly opening the low pressure valve and loosening the valve disc
   (e) Make a hole in the sealed tap of the new container and charge the system

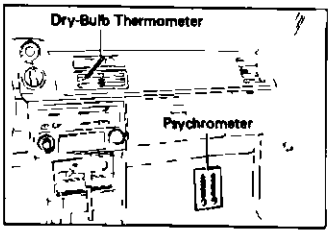
   CAUTION: Be careful not to overcharge the refrigerant as it may cause failure of the bearings and belt

7. **WHEN SYSTEM IS FULLY CHARGED, DISCONNECT MANIFOLD GAUGE SET**
   (a) Close both low and high pressure valves
   (b) Close the valve of the refrigerant container. If using one pound container of R-12, allow remaining refrigerant to escape by slowly removing the charge line
   (c) Turn off the engine
   (d) Using a shop rag, quickly remove both hoses from the compressor service valves

   WARNING: Care must be taken to protect eyes and skin when removing the high pressure hoses
   (e) Put the cap nuts on the service valve fittings

Performance Test

1. **INSTALL MANIFOLD GAUGE SET**
   (a) Close the HI and LO hand valves
   (b) Connect the high pressure hose to the discharge service valve of the compressor
   (c) Connect the low pressure hose to the suction service valve of the compressor



2. **RUN ENGINE AND OPERATE AIR CONDITIONER**
   (a) Run the engine at 2,000 rpm
   (b) Set the blower switch at HI, temperature control at COOL, and air flow control at VENT
   (c) Keep all windows and doors open.

3. **POSITION THERMOMETERS**
   (a) Place a dry bulb thermometer in the cool air outlet
   (b) Place a psychrometer close to the inlet of the cooling unit.

4. WAIT UNTIL AIR CONDITIONING SYSTEM STABILIZES

(a) Check that the reading on the high pressure gauge is 14.0 – 15.5 kg/cm² (199 – 220 psi).

If the reading is too high, pour water on the condenser. If the reading is too low, cover the front of the condenser.

(b) Check that the reading on the dry-bulb thermometer at the air inlet is 25 – 35°C (77 – 95°F).

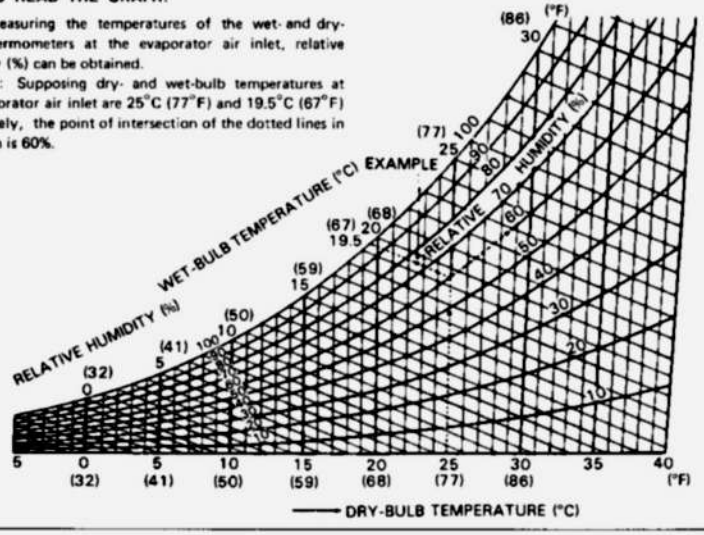
5. CHECK PERFORMANCE OF AIR CONDITIONING SYSTEM

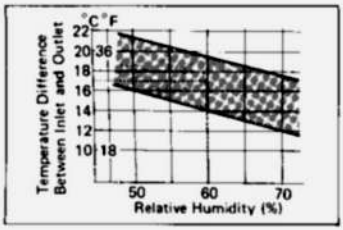
(a) Calculate the relative humidity from the psychrometric graph by comparing the wet- and dry-bulb readings of the psychrometer at the air inlet.

HOW TO READ THE GRAPH:

After measuring the temperatures of the wet- and dry-bulb thermometers at the evaporator air inlet, relative humidity (%) can be obtained.

Example: Supposing dry- and wet-bulb temperatures at the evaporator air inlet are 25°C (77°F) and 19.5°C (67°F) respectively, the point of intersection of the dotted lines in the graph is 60%.



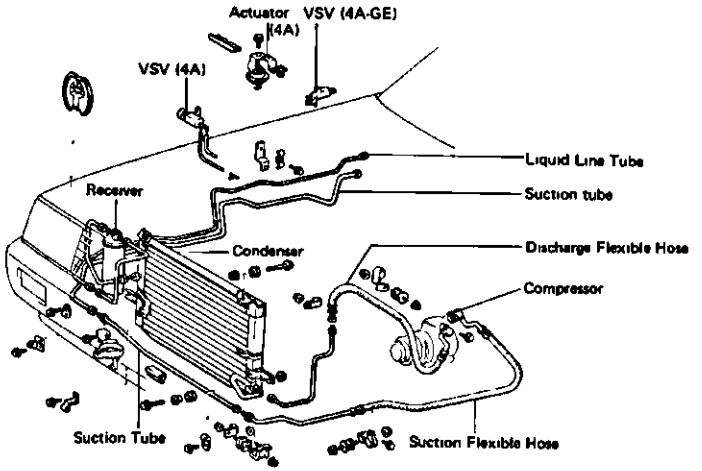


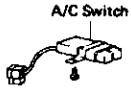
(b) Measure the dry-bulb temperature at the cool air outlet, and calculate the difference between the inlet dry bulb and outlet dry-bulb temperatures.

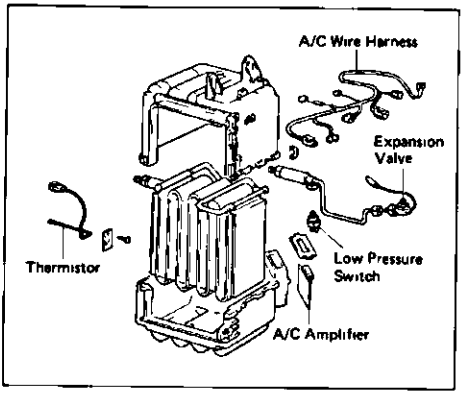
(c) Check that the intersection of the relative humidity and temperature difference is between the two hatched lines.

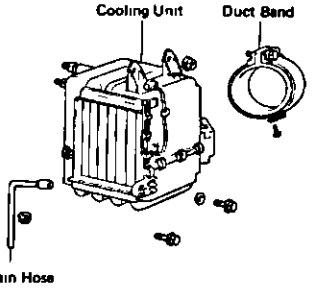
If the intersection is within the two lines, cooling performance is satisfactory.

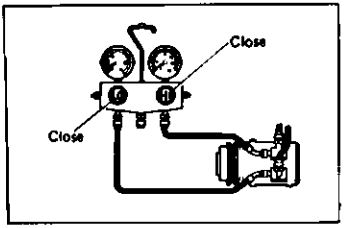
SYSTEM COMPONENTS











COMPRESSOR

ON-VEHICLE INSPECTION

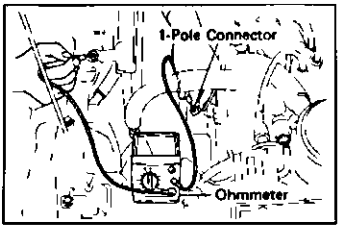
1. **INSTALL MANIFOLD GAUGE SET**
   (a) Close the HI and LO hand valves
   (b) Connect the high pressure hose to the discharge service valve of the compressor
   (c) Connect the low pressure hose to the suction service valve of the compressor

2. **RUN ENGINE AT FAST IDLE**

3. **CHECK COMPRESSOR FOR FOLLOWING:**
   (a) High pressure gauge reading is not low and low pressure gauge reading is not higher than normal
   (b) Metallic sound
   (c) Leakage from shaft seal

   If defects are found, repair the compressor

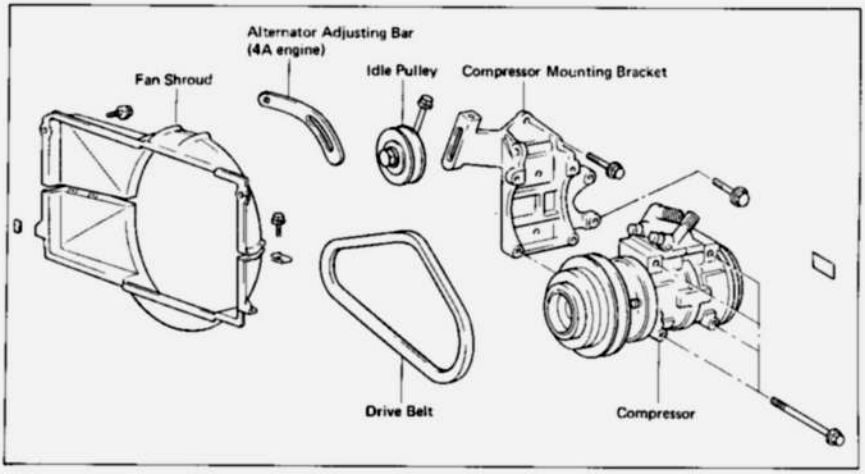
4. **CHECK MAGNETIC CLUTCH**
   (a) Inspect the pressure plate and the rotor for signs of oil
   (b) Check the clutch bearings for noise and grease leakage



(c) Using an ohmmeter, measure the resistance of the stator coil between the clutch lead wire and ground

If the resistance is not within tolerance, replace the coil

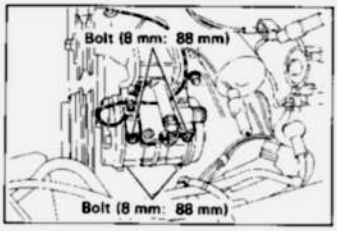
Standard resistance. **at 20°C (68°F)**
3.7 ± 0.2 Ω



REMOVAL OF COMPRESSOR

1. **RUN ENGINE AT IDLE FOR 10 MINUTES WITH AIR CONDITIONING ON**
2. **DISCONNECT NEGATIVE CABLE FROM BATTERY**
3. **DISCONNECT CLUTCH LEAD WIRE FROM WIRING HARNESS**
4. **DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM** **(See page AC-12)**
5. **DISCONNECT TWO FLEXIBLE HOSES FROM COMPRESSOR SERVICE VALVES**

   Cap the open fitting immediately to keep moisture out of the system.
6. **REMOVE COMPRESSOR**
   (a) Remove the fan shroud.
   (b) Loosen the drive belt.
   (c) Remove the compressor mounting bolts and the compressor.



INSTALLATION OF COMPRESSOR

(See page AC 19)

1 INSTALL COMPRESSOR WITH THREE MOUNTING BOLTS

2. INSTALL DRIVE BELT

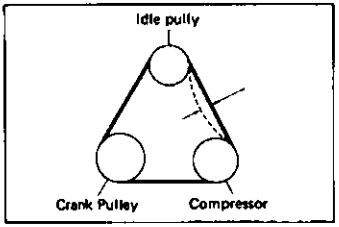
(a) Install the drive belt to the pulley

(b) Tighten the belt with the adjusting bolts

Drive belt tension at 10 kg (22 0 lb)

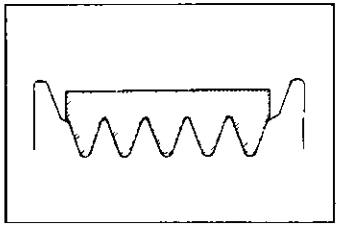
[4A engine]
New belt 7 – 9 mm (0.28 – 0 35 in.)
Used belt 9 – 12 mm (0.35 – 0.47 in.)

[4A-GE engine]
New belt 5.5 – 7 mm (0.22 – 0 28 in.)
Used belt 8 – 9.5 mm (0.31 – 0.37 in.)



NOTE

- "New belt" refers to a brand new belt which has never before been used
- "Used belt" refers to a belt which has been used on a running engine for 5 minutes or more



3. MAKE SURE DRIVE BELT IS INSTALLED CORRECTLY (4A-GE engine)

After installing the drive belt, check that it fits properly in the ribbed grooves

4. CONNECT TWO FLEXIBLE HOSES TO COMPRESSOR SERVICE VALVES

Torque:	Discharge line	200 – 250 kg-cm (15 – 18 ft-lb)
	Suction line	300 – 350 kg-cm (22 – 25 ft lb)

5 CONNECT CLUTCH LEAD WIRE TO WIRING HARNESS

6. CONNECT NEGATIVE CABLE TO BATTERY

7. EVACUATE AND CHARGE AIR CONDITIONING SYSTEM (See page AC-12)

CONDENSER

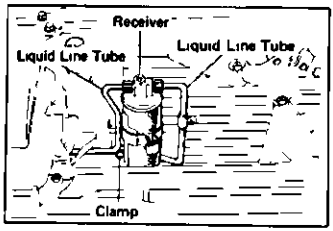
ON-VEHICLE INSPECTION

1. CHECK CONDENSER FINS FOR BLOCKAGE OR DAMAGE

   If the fins are clogged, wash them with water and dry with compressed air

   CAUTION: Be careful not to damage the fins

   If the fins are bent, straighten them with a screwdriver or pliers



2. CHECK CONDENSER FITTINGS FOR LEAKAGE

   Repair as necessary

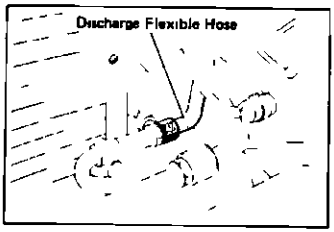
REMOVAL OF CONDENSER

(See page AC-17)

1. DISCHARGE AIR CONDITIONING SYSTEM
   (See page AC-12)

2. REMOVE FRONT GRILLE, ENGINE LOWER COVER AND HOOD LOCK BRACE

3. DISCONNECT DISCHARGE FLEXIBLE HOSE FROM CONDENSER INLET FITTING



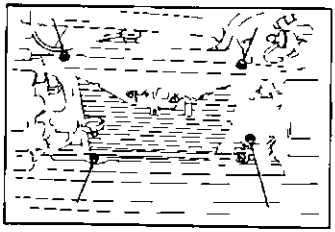
4. DISCONNECT LIQUID LINE TUBE FROM CONDENSER OUTLET FITTING

   NOTE Cap the open fittings immediately to keep moisture out of the system

5. REMOVE RECEIVER

6. REMOVE CONDENSER

   Remove the four bolts



INSTALLATION OF CONDENSER

(See page AC-17)

1. INSTALL CONDENSER

   Install the four bolts, making sure the rubber cushions fit on the mounting flanges correctly

2. CONNECT LIQUID LINE TUBE AND DISCHARGE FLEXIBLE HOSE TO CONDENSER

   Torque:

Liquid line tube	120–150 kg-cm (9–10 ft lb)
Discharge flexible hose	200–250 kg-cm (15–18 ft-lb)

3. INSTALL FRONT GRILLE, ENGINE LOWER COVER AND HOOD LOCK BRACE

4. IF CONDENSER WAS REPLACED, ADD COMPRESSOR OIL TO COMPRESSOR

   Add 40 – 50 cc (1 4 – 1.7 oz)

5. EVACUATE, CHARGE AND TEST AIR CONDITIONING SYSTEM (See page AC 12)

RECEIVER

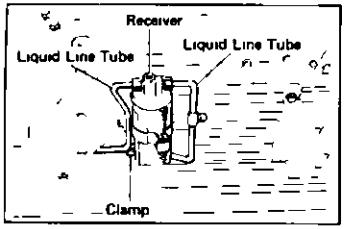
ON-VEHICLE INSPECTION

CHECK SIGHT GLASS, FUSIBLE PLUG AND FITTINGS FOR LEAKAGE

Use a gas leak tester Repair as necessary

REMOVAL OF RECEIVER

(See page AC-17)



1. **DISCHARGE AIR CONDITIONING SYSTEM** (See page AC 12)

2. **DISCONNECT TWO LIQUID LINE TUBES FROM RECEIVER**

   NOTE Cap the open fittings immediately to keep moisture out of the system

3 **REMOVE RECEIVER FROM RECEIVER HOLDER**

INSTALLATION OF RECEIVER

(See page AC-17)

1 **INSTALL RECEIVER IN RECEIVER HOLDER**

NOTE Do not remove the blind plugs until ready for connection

2 **CONNECT TWO LIQUID LINE TUBES TO RECEIVER**

Torque. 120 – 150 kg-cm (9 – 10 ft-lb)

3. **IF RECEIVER WAS REPLACED, ADD COMPRESSOR OIL TO COMPRESSOR**

Add 20 cc (0 7 oz)

4 **EVACUATE, CHARGE AND TEST AIR CONDITIONING SYSTEM** (See page AC-12)

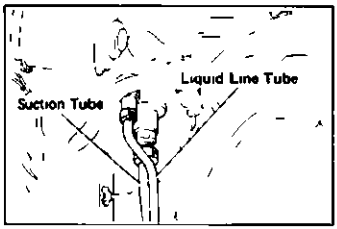
COOLING UNIT

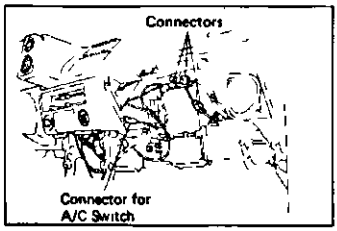
ON-VEHICLE INSPECTION OF EXPANSION VALVE

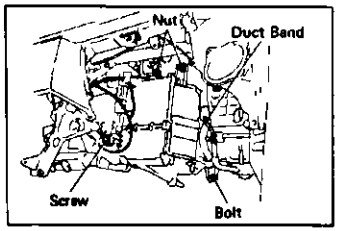
1. CONENCT MANIFOLD GAUGE TO COMPRESSOR
2. CHECK EXPANSION VALVE OPERATION
   (a) Run the engine at fast idle with the air conditioning on.
   (b) Check that the low pressure reading is between 0.5 – 5.0 kg/cm² (7 – 71 psi)

   If the reading is too low, check and replace the expansion valve and/or receiver

   If the reading is too high, tighten the heat sensing tube and/or replace the expansion valve







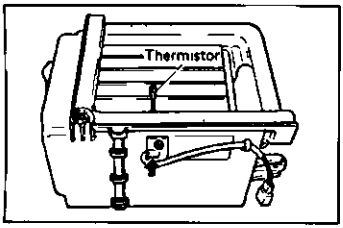
REMOVAL OF COOLING UNIT

1. DISCONNECT NEGATIVE CABLE FROM BATTERY
2. DISCHARGE AIR CONDITIONING SYSTEM (See page AC-12)
3. DISCONNECT SUCTION TUBE FROM COOLING UNIT OUTLET FITTING
4. DISCONNECT LIQUID LINE TUBE FROM COOLING UNIT INLET FITTING

   NOTE Cap the open fittings immediately to keep moisture out of the system
5. REMOVE GROMMETS FROM INLET AND OUTLET FITTINGS
6. REMOVE FOLLOWING COMPONENTS:

   Glove box and undercover
7. DISCONNECT CONNECTORS
   (a) Disconnect the A/C switch connector
   (b) Disconnect the three connectors.
8. REMOVE COOLING UNIT

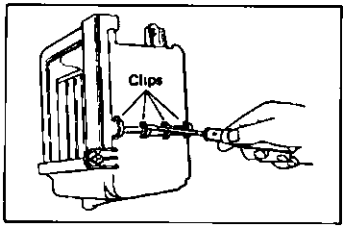
   Remove the two nuts and four bolts



DISASSEMBLY OF COOLING UNIT

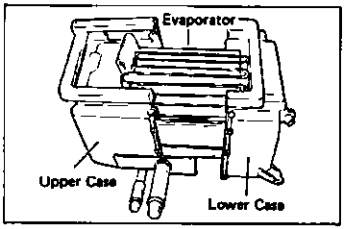
1 **REMOVE THERMISTOR**

Unscrew the tapping screws

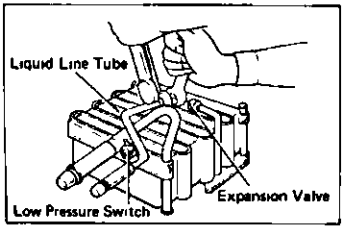


2. **REMOVE UPPER AND LOWER CASES FROM EVAPORATOR**

(a) Remove the clamps and two screws.



(b) Remove upper and lower cases from the evaporator



3. **REMOVE COMPONENTS FROM EVAPORATOR**

(a) Remove the packing and the clamp from the outlet tube of the evaporator

(b) Disconnect the liquid line tube from the inlet fitting of the expansion valve.

(c) Disconnect the expansion valve from the inlet fitting of the evaporator

(d) Remove the pressure switch, if necessary

Evaporator

INSPECTION OF EVAPORATOR

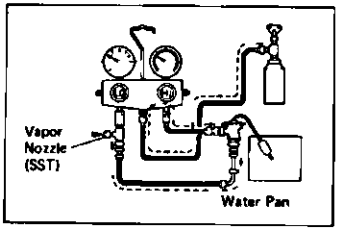
1 CHECK EVAPORATOR FINS FOR BLOCKAGE

If the fins are clogged, clean them with compressed air.

CAUTION: Never use water to clean the evaporator.

2. CHECK FITTINGS FOR CRACKS OR SCRATCHES

Repair as necessary



Expansion Valve

INSPECTION OF EXPANSION VALVE

1 CONNECT MANIFOLD GAUGE

Connect the manifold gauge set to the expansion valve, testing nozzle (SST) and refrigerant container as shown

SST 07115-71010

2. CHECK EXPANSION VALVE

(a) Close both manifold gauge hand valves

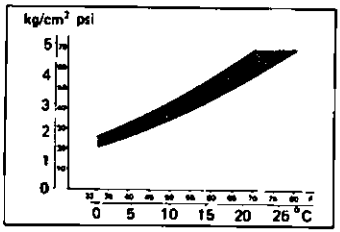
(b) Pierce the refrigerant container to release the pressure

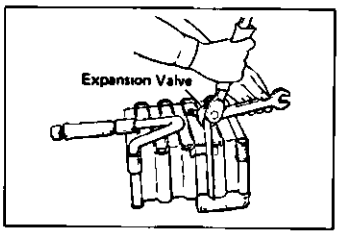
(c) Open the high pressure hand valve and adjust the high side pressure to approximately 5 kg/cm² (71 psi).

(d) Dip the heat sensing tube of the expansion valve in a pan of water While varying the temperature of the water, read the low pressure gauge and, at the same time, measure the temperature of the water with a thermometer

(e) Compare the two readings on the chart.

If the intersection is not between the two lines, replace the expansion valve





ASSEMBLY OF COOLING UNIT

1 INSTALL COMPONENTS ON EVAPORATOR

(a) Connect the expansion valve to the inlet fitting of the evaporator Torque the nut

Torque: 300 – 350 kg-cm (22 – 25 ft-lb)

(b) Connect the liquid line tube to the inlet fitting of the expansion valve. Torque the nut

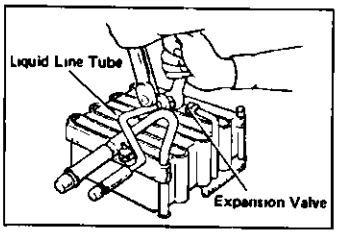
Torque: 120 – 150 kg-cm (9 – 10 ft-lb)

(c) Install the pressure switch, if removed.

Torque. 120 – 150 kg-cm (9 – 10 ft-lb)

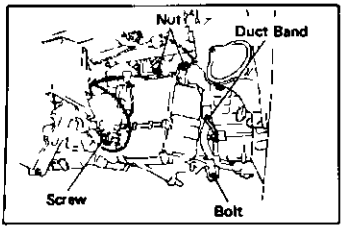
(d) Using the clamp, install the heat sensing tube

(e) Install the packing



2. INSTALL UPPER AND LOWER CASES ON THE EVAPORATOR

3. INSTALL COVER AND THERMISTOR

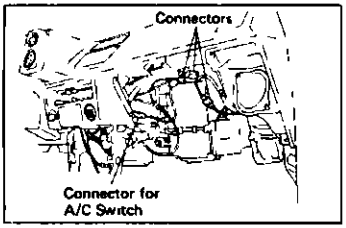


INSTALLATION OF COOLING UNIT

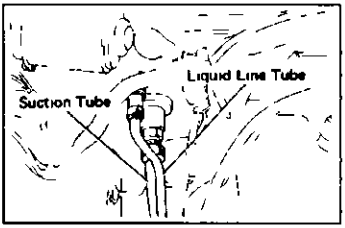
1. **INSTALL COOLING UNIT**

   Install the cooling unit with two nuts, a screw and a bolt

   CAUTION: Be careful not to pinch the wiring harness while installing the cooling unit.



2. **CONNECT CONNECTORS**
   (a) Connect the three connectors.
   (b) Connect the A/C switch connector
3. **INSTALL FOLLOWING COMPONENTS:**
   (a) Side air duct
   (b) Glove box assembly
4. **INSTALL GROMMETS ON INLET AND OUTLET FITTINGS**



5. **CONNECT LIQUID LINE TUBE TO COOLING UNIT INLET FITTING**
6. **CONNECT SUCTION TUBE TO COOLING UNIT OUTLET FITTING**
7. **IF EVAPORATOR WAS REPLACED, ADD COMPRESSOR OIL TO COMPRESSOR**

   Add 40 – 50 cc (1.4 – 1.7 oz)
8. **CONNECT NEGATIVE CABLE TO BATTERY**
9. **EVACUATE, CHARGE AND TEST AIR CONDITIONING SYSTEM (See page AC-12)**

REFRIGERANT LINES

ON-VEHICLE INSPECTION

1. **INSPECT HOSES AND TUBES FOR LEAKAGE**
   Use a gas leak tester Replace, if necessary
2. **CHECK THAT HOSE AND TUBE CLAMPS ARE NOT LOOSE**
   Tighten or replace as necessary

REPLACEMENT OF REFRIGERANT LINES

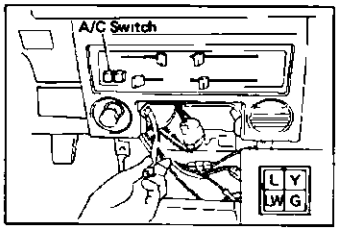
(See page AC-17)

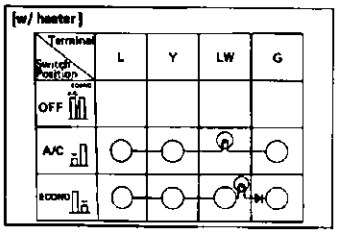
1. **DISCHARGE AIR CONDITIONING SYSTEM** (See page AC-12)
2. **REPLACE FAULTY TUBE OR HOSE**
   NOTE Cap the open fittings immediately to keep moisture out of the system

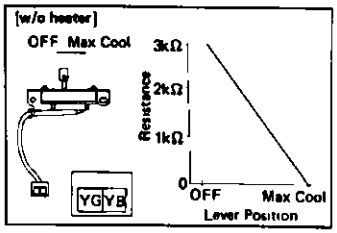
Tightening torque for O r ng fittings

Fitting size	Torque
3/8 in tube for liquid line	120 – 150 kg-cm (9 – 10 ft lb)
1/2 in tube for discharge line	200 – 250 kg-cm (15 – 18 ft lb)
5/8 in tube for suction line	300 – 350 kg-cm (22 – 25 ft lb)

3. **EVACUATE, CHARGE AND TEST AIR CONDITIONING SYSTEM** (See page AC-12)



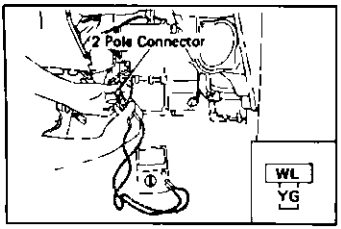


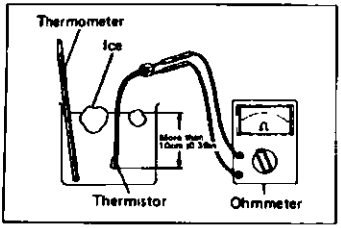


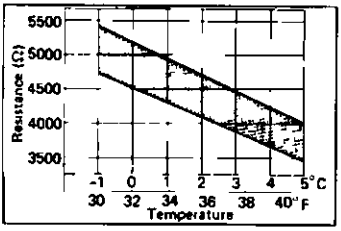
A/C SWITCH

ON-VEHICLE INSPECTION

1. **DISCONNECT NEGATIVE CABLE FROM BATTERY**
2. **REMOVE CENTER CLUSTER AND COVERS**
3. **DISCONNECT A/C SWITCH (TEMP CONTROL RESISTOR) CONNECTOR**
4. **CHECK A/C SWITCH FOR CONTINUITY**
   Using an ohmmeter, check continuity between the terminals for each switch position shown in the table
   If there is no continuity, replace the A/C switch
5. **CONNECT A/C SWITCH CONNECTOR**
6. **INSTALL CENTER CLUSTER AND COVERS**
7. **CONNECT NEGATIVE CABLE TO BATTERY**







THERMISTOR

(See page AC-17)

REMOVAL OF THERMISTOR

1 DISCONNECT NEGATIVE CABLE FROM BATTERY

2. REMOVE GLOVE BOX AND UNDERCOVER

3 REMOVE THERMISTOR

(a) Disconnect connector

(b) Remove screw and thermistor from cooling unit

INSPECTION OF THERMISTOR

CHECK THERMISTOR OPERATION

(a) Place the thermistor in cold water While varying the temperature of the water, measure the resistance at the connector and, at the same time, measure the temperature of the water with a thermometer.

(b) Compare the two readings on the chart

If the intersection is not between the two lines, replace the thermistor

INSTALLATION OF THERMISTOR

1 INSTALL THERMISTOR

(a) Install thermistor with a screw

(b) Connect connector

2. INSTALL GLOVE BOX AND UNDERCOVER

3. CONNECT NEGATIVE CABLE TO BATTERY

LOW PRESSURE SWITCH

(See page AC-17)

INSPECTION OF LOW PRESSURE SWITCH

1. CHECK REFRIGERANT PRESSURE

(a) Connect the hoses of the manifold gauge set to the compressor service valves and observe the gauge reading

(b) The gauge reading must be more than 2 1 kg/cm² (30 psi) when the ambient temperature is higher than 0°C (32°F)

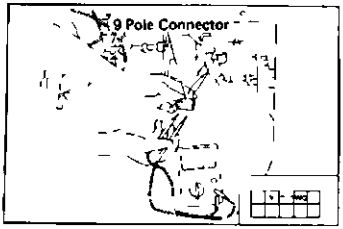
If the pressure is less than 2.1 kg/cm² (30 psi), charge with refrigerant (See page AC-12)

2 CHECK PRESSURE SWITCH

(a) Remove the glove box and the undercover

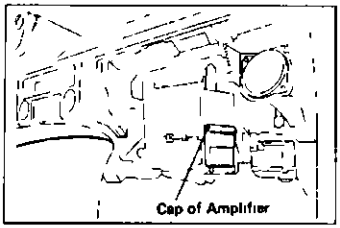
(b) Disconnect the lead wires of the amplifier

(c) Using an ohmmeter, check the continuity between the two terminals of the low pressure switch
The ohmmeter must indicate zero ohm



If there is no continuity, replace the low pressure switch (See page AC 24)

3. **REINSTALL REMOVED PARTS IN REVERSE ORDER**



AIR CONDITIONER AMPLIFIER

(See page AC-17)

INSPECTION OF AIR CONDITIONER AMPLIFIER

1. CHECK ENGINE SPEED DETECTING CIRCUIT

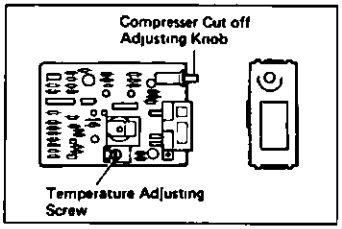
(a) Run the engine, and operate the air conditioner

(b) Check that the magnetic clutch disengages at the specific engine revolution

Cut-off rpm: 600 – 700 rpm

If the cut-off rpm is too high, turn the rpm knob clockwise to adjust

If the cut-off rpm is too low, turn the rpm knob counter clockwise to adjust



2. CHECK TEMPERATURE DETECTING CIRCUIT

(a) Remove the glove box

(b) Disconnect the thermistor connector and connect variable resistor

(c) Run the engine and operate the air conditioner to get maximum cooling

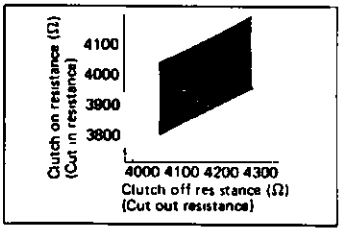
- Air intake control: RECIRC
- Air flow control: VENT
- Temperature control: COOL
- Blower control: HI

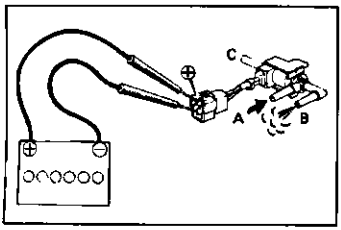
(d) Measure the resistance of the variable resistor when the magnetic clutch engages and disengages

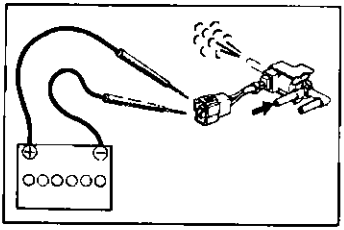
If the resistance is not between the two lines, adjust the amplifier

If the resistance is too high, turn the TEMP setting resistor clockwise

If the resistance is too low or the evaporator is frosted, turn the TEMP setting resistor counterclockwise until the magnetic clutch engages at the standard resistance.







VACUUM SWITCHING VALVE (VSV) (4A Engine)

(See page AC-17)

INSPECTION OF VACUUM SWITCHING VALVE

1 CHECK VACUUM CIRCUIT CONTINUITY IN VSV BY BLOWING AIR INTO PIPES

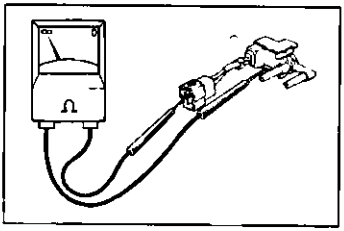
(a) Connect the VSV terminals to the battery terminals as illustrated

(b) Blow into pipe "A" and check that air comes out of pipe "B"

(c) Disconnect the battery

(d) Blow into pipe "A" and check that air comes out of filter "C"

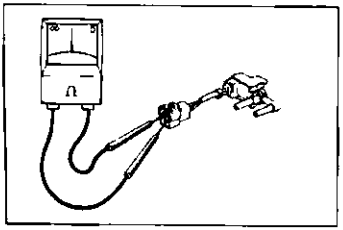
If a problem is found, repair or replace the VSV



2. CHECK FOR SHORT CIRCUIT

Using an ohmmeter, check that there is no continuity between each terminal and the VSV body.

If there is continuity, replace the VSV

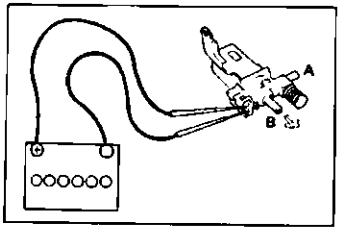


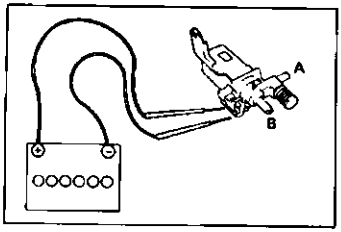
3 CHECK FOR OPEN CIRCUIT

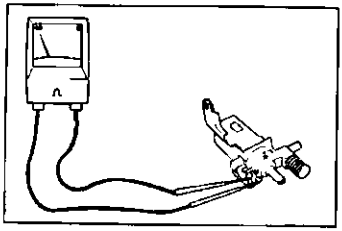
Using an ohmmeter, measure the resistance between the positive (+) terminal and the other terminals

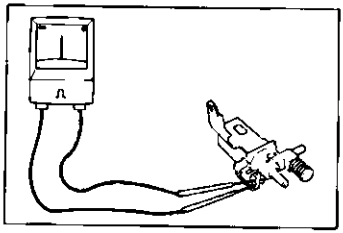
Resistance. at 20°C (68°F)
38 – 44 Ω

If resistance is not within specification, replace the VSV









VACUUM SWITCHING VALVE (VSV) (4A-GE Engine)

(See page AC-17)

INSPECTION OF VACUUM SWITCHING VALVE

1. CHECK VACUUM CIRCUIT CONTINUITY IN VSV BY BLOWING AIR INTO PIPES

   (a) Connect the VSV terminals to the battery terminals as illustrated

   (b) Blow into pipe "A" and check that air comes out of pipe "B"

   (c) Disconnect the battery

   (d) Blow into pipe "A" and check that air does not come out of pipe "B"

   If a problem is found, repair or replace the VSV.

2 CHECK FOR SHORT CIRCUIT

Using an ohmmeter, check that there is no continuity between each terminal and the VSV body.

If there is continuity, replace the VSV

3. CHECK FOR OPEN CIRCUIT

Using an ohmmeter, measure the resistance between the positive (+) terminal and the other terminals.

Resistance, at 20°C (68°F)
24 – 30 Ω

If resistance is not within specification, replace the VSV

SERVICE SPECIFICATIONS

	Page
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AUTOMATIC TRANSMISSION	A-5
PROPELLER SHAFT	A-6
FRONT AXLE AND SUSPENSION	A-7
REAR AXLE AND SUSPENSION	A-8
BRAKE SYSTEM	A-10
STEERING	A-12
LUBRICANT	A-14

CLUTCH

Specifications

Pedal height (from asphalt sheet)		LHD	161 – 171 mm	6 34 – 6 73 in
		RHD	162 – 172 mm	6 38 – 6 77 in
Push rod play at pedal top			1 0 – 5 0 mm	0 039 – 0 197 in
Pedal freeplay			13 – 23 mm	0 51 – 0 91 in
Release fork end play			None adjustable type	
Disc rivet head depth		Limit	0 3 mm	0 012 in
Disc runout		Limit	0 8 mm	0 031 in
Diaphragm spring out of alignment		Limit	0 5 mm	0 020 in
Diaphragm spring finger wear	Depth	Limit	0 6 mm	0 024 in
	Width	Limit	5 0 mm	0 197 in
Flywheel runout		Limit	0 2 mm	0 008 in

Tightening Torque

Tightening part	kg-cm	ft lb
Clutch cover x Flywheel	195	14
Master cylinder set bolt	130	9
Release cylinder set bolt	130	9
Clutch pedal setting nut (LHD) or bolt (RHD)	375	27
Clutch tube union nut	155	11
Flexible hose	235	17

MANUAL TRANSMISSION

Specifications

Manual transmission (T50)	Output shaft				
	2nd and 3rd gear journal diameter		Limit	37 8 mm	1 488 in
	Flange thickness		Limit	4 0 mm	0 157 in
	Runout		Limit	0 08 mm	0 0024 in
	Gear thrust clearance	1st	STD	0 150 – 0 275 mm	0 0059 – 0 0108 in
			Limit	0 5 mm	0 020 in
		2nd	STD	0 150 – 0 250 mm	0 0059 – 0 0098 in
			Limit	0 5 mm	0 020 in
		3rd	STD	0 150 – 0 300 mm	0 0059 – 0 0118 in
			Limit	0 6 mm	0 024 in
		5th	STD	0 100 – 0 930 mm	0 0039 – 0 0366 in
			Limit	1 0 mm	0 039 in
		Reverse	STD	0 200 – 0 325 mm	0 0079 – 0 0128 in
			Limit	0 6 mm	0 024 in
		Reverse idle	STD	0 05 – 0 50 mm	0 0020 – 0 0197 in
			Limit	1 0 mm	0 039 in

Specifications (Cont'd)

Manual transmission (T50) (Cont'd)	Gear journal oil clearance			
	1st 5th and Reverse	Limit	0.150 mm	0.0059 in.
	2nd	Limit	0 150 mm	0 0059 in
	3rd and Reverse idle	Limit	0 200 mm	0 008 in
	Shift fork to hub sleeve clearance	Limit	0 8 mm	0 031 in
	Synchronizer ring to gear clearance	STD	1 0 – 2 0 mm	0 039 – 0 079 in
		Limit	0 8 mm	0 031 in
	Front bearing oil seal depth		2 5 mm	0 098 in
	Reverse idle gear bushing bore	Limit	16 1 mm	0 634 in
	Reverse idler gear shaft diameter	Limit	15 9 mm	0 626 in
	Extension housing bushing inner diameter		32 005 – 32 030 mm	1 2600 – 1 2610 in
	Extension housing bushing and output shaft clearance		0 014 – 0 065 mm	0 0006 – 0 0025 in
	Extension housing bushing installing temperature		80 – 100°C	176 – 212°F
	Input shaft snap ring thickness			
		Mark		
		A	2 35 – 2 40 mm	0 0925 – 0 0945 in
		B	2 40 – 2 45 mm	0 0945 – 0 0965 in
		C	2 45 – 2 50 mm	0 0965 – 0 0984 in
		D	2 50 – 2 55 mm	0 0984 – 0 1004 in
		E	2 55 – 2 60 mm	0 1004 – 0 1024 in
	Input bearing spacer thickness			
		Mark		
		1	1 825 – 1 875 mm	0 0719 – 0 0738 in
		2	1 935 – 1 985 mm	0 0762 – 0 0781 in
		3	2 045 – 2 095 mm	0 0805 – 0 0825 in
		4	2 155 – 2 205 mm	0 0848 – 0 0868 in
		5	2 265 – 2 315 mm	0 0892 – 0 0911 in
		6	2 375 – 2 425 mm	0 0935 – 0 0956 in
	Output shaft snap ring thickness (Clutch hub No 2)			
		Mark		
		0	1 95 – 2 00 mm	0 0768 – 0 0787 in
		1	2 00 – 2 05 mm	0 0787 – 0 0807 in
		2	2 05 – 2 10 mm	0 0807 – 0 0827 in
		3	2 10 – 2 15 mm	0 0827 – 0 0846 in
		4	2 15 – 2 20 mm	0 0846 – 0 0866 in
	Output shaft snap ring thickness (Clutch hub No 3)			
		Mark		
		A	2 60 – 2 65 mm	0 1024 – 0 1043 in
		B	2 65 – 2 70 mm	0 1043 – 0 1063 in
		C	2 70 – 2 75 mm	0 1063 – 0 1083 in
		D	2 75 – 2 80 mm	0 1083 – 0 1102 in
		E	2 80 – 2 85 mm	0 1102 – 0 1122 in
		F	2 85 – 2 90 mm	0 1122 – 0 1142 in
		G	2 90 – 2 95 mm	0 1142 – 0 1161 in

Specifications (Cont'd)

Manual transmission (T50) (Cont'd)		H	2.95 – 3.00 mm	0.1161 – 0.1181 in
		J	3.00 – 3.05 mm	0.1181 – 0.1201 in
		K	3.05 – 3.10 mm	0.1201 – 0.1220 in
		L	3.10 – 3.15 mm	0.1220 – 0.1240 in
		M	3.15 – 3.20 mm	0.1240 – 0.1260 in
		N	3.20 – 3.25 mm	0.1260 – 0.1280 in
		P	3.25 – 3.30 mm	0.1280 – 0.1299 in
		Q	3.30 – 3.35 mm	0.1299 – 0.1319 in
	Output shaft snap ring thickness (Center bearing)			
		Mark		
		a	2.70 – 2.75 mm	0.1063 – 0.1083 in
		b	2.75 – 2.80 mm	0.1083 – 0.1102 in
		d	2.80 – 2.85 mm	0.1102 – 0.1122 in
		e	2.85 – 2.90 mm	0.1122 – 0.1142 in
		f	2.90 – 2.95 mm	0.1142 – 0.1161 in
		g	2.95 – 3.00 mm	0.1161 – 0.1181 in
		h	3.00 – 3.05 mm	0.1181 – 0.1201 in
		i	3.05 – 3.10 mm	0.1201 – 0.1220 in
		k	3.10 – 3.15 mm	0.1220 – 0.1240 in
		l	3.15 – 3.20 mm	0.1240 – 0.1260 in
	Output shaft snap ring thickness (Rear bearing)			
		Mark		
		1	2.35 – 2.40 mm	0.0925 – 0.0945 in
		2	2.40 – 2.45 mm	0.0945 – 0.0965 in
		3	2.45 – 2.50 mm	0.0965 – 0.0984 in
		4	2.50 – 2.55 mm	0.0984 – 0.1004 in
		5	2.55 – 2.60 mm	0.1004 – 0.1024 in
		6	2.60 – 2.65 mm	0.1024 – 0.1043 in
		7	2.65 – 2.70 mm	0.1043 – 0.1063 in
	Counter gear snap ring thickness			
		Mark		
		1	2.00 – 2.05 mm	0.0787 – 0.0807 in
		2	1.80 – 1.85 mm	0.0709 – 0.0728 in
		3	1.60 – 1.65 mm	0.0630 – 0.0650 in

Tightening Torque

Manual transmission (T50)	Tightening part	kg-cm	ft lb
	Transmission case RH x LH	200	14
	Extension housing x Transmission case	375	27
	Restrict pin x Extension housing	400	29
	Shift lever retainer x Extension housing	130	9
	Front bearing retainer x Clutch housing	185	13
	Clutch housing x Transmission case	375	27

AUTOMATIC TRANSMISSION (A42DL)

Specifications

Governor pressure				
Output shaft rpm	(Vehicle speed reference)			
1 000	(approx 27 km/h 17 mph)		0 9 – 1.5 kg/cm²	13 – 21 psi
1,800	(approx 48 km/h 30 mph)		1 6 – 2 2 kg/cm²	23 – 31 psi
3 500	(approx 94 km/h 58 mph)		4 1 – 5.3 kg/cm²	58 – 75 psi
Line pressure (wheel locked)				
Idling		D range	3 5 – 4 4 kg/cm²	50 – 63 psi
		R range	5 0 – 6 4 kg/cm²	71 – 91 psi
Stall		D range	9 6 – 11 0 kg/cm²	137 – 156 psi
		R range	13 7 – 17 0 kg/cm²	195 – 242 psi
Engine stall revolution			2,050 ± 150 rpm	
Time lag	N range →	D range	Less than 1 2 seconds	
	N range →	R range	Less than 1 5 seconds	
Engine idle speed (A/C OFF)				
	w/o PS	N range	800 rpm	
	w/o PS	D range	750 rpm	
	w/ PS	N range	900 rpm	
	w/ PS	D range	850 rpm	
Throttle cable adjustment				
Throttle valve fully opened			Between boot end face and inner cable stopper	
			0 – 1 mm	0 – 0 04 in
Torque converter runout		Limit	0 30 mm	0 0118 in
Drive plate runout		Limit	0 20 mm	0 0079 in

Shift point schedule km/h (mph)	Differential gear ratio	"D" range (throttle valve fully open)					
		1 → 2	2 → 3	3 → OD	OD → 3	3 → 2	2 → 1
	4 100	47 – 62 (29 – 39)	87 – 102 (54 – 63)	*1	*2	83 – 98 (52 – 61)	37 – 48 5 (23 – 30)

*1 3 → OD shift up point with closed throttle valve is at 37 – 48 km/h (23 – 30 mph)
*2 OD → 3 down shift possible up to maximum speed
*3 Lock-up ON point with closed throttle valve is at 62 – 70 km/h (39 – 43 mph)
*4 Lock-up OFF point with closed throttle valve is at 57 – 65 km/h (35 – 40 mph)

Tightening Torque

Tightening part	kg-cm	ft lb
Engine x Transmission	650	47
Extension housing	345	25
Rear support member x Rear mounting	130	9
Rear support member x Body	530	38
Drive plate	650	47
Torque converter	185	13
Valve body	100	7
Oil strainer	55	48 in lb
Oil pan	45	39 in lb

Tightening Torque (Cont'd)

Tightening part	kg-cm	ft lb
Cooler pipe union nut	350	25
Drain plug	205	15
Parking lock pawl bracket	75	65 in lb

PROPELLER SHAFT

Specifications

Bearing axial play	Solid type	Limit	Less than 0.05 mm (0.0020 in.)	
	Shell type		0	
Runout		Limit	0.8 mm	0.031 in
Hole snap ring thickness		Color		
		None	2.375 – 2.425 mm	0.0936 – 0.0956 in
		Brown	2.425 – 2.475 mm	0.0955 – 0.0974 in
		Blue	2.475 – 2.525 mm	0.0974 – 0.0894 in
		None	2.525 – 2.575 mm	0.0994 – 0.1014 in
Snap ring thickness (Flexible coupling)				
			1.40 – 1.44 mm	0.0551 – 0.0567 in
			1.43 – 1.47 mm	0.0563 – 0.0579 in
			1.46 – 1.50 mm	0.0575 – 0.0591 in
			1.49 – 1.53 mm	0.0587 – 0.0602 in
			1.52 – 1.56 mm	0.0598 – 0.0614 in

Tightening Torque

Tightening part	kg-cm	ft lb
Universal joint flange yoke x Companion flange	350	25
Center bearing flange x Universal joint flange yoke	350	25
Center bearing bracket x Body	375	27
Intermediate shaft x Center bearing x Joint flange		
1st	1,700 – 2,000	123 – 144
2nd	Loosen nut	
3rd	300	22
Sleeve yoke x Flexible coupling x Intermediate shaft	900	65

FRONT AXLE AND SUSPENSION

Specifications

Cold tire inflation pressure		1.7 kg/cm² 24 psi						
Front wheel alignment		Inspection STD			Adjustment STD			
	Toe-in	1 ± 4 mm (0.04 ± 0.16 in.)			1 ± 1 mm (0.04 ± 0.04 in.)			
	Camber	Australia	Others		Australia	Others		
		15' ± 45'	20' ± 45'		15' ± 30'	20' ± 30'		
	Left-right error	30'	30'		30'	30		
	Steering axis inclination	Australia	Others		Australia	Others		
		8°50' ± 45'	8°45' ± 45'		8°50' ± 30'	8°45' ± 30'		
	Left-right error	30'	30		30'	30'		
	Caster	4A, 4A-C w/PS	4A, 4A-C w/o PS	4A GE w/o PS	4A, 4A-C w/PS	4A, 4A-C w/o PS	4A GE w/o PS	
		3°40'±45'	2°45'+45'	3°40'±45'	3°40' ±30'	2°45' +30'	3°40'±30'	
	Left-right error	30'	30'	30'	30'	30'	30	
	Side slip	Less than 3.0 mm/m (0.118 in./3.3 ft)						
	Wheel angle				4A, 4A-C w/PS	4A, 4A-C w/o PS	4A GE w/o PS	
		Max	Inside wheel		38°30' ± 2°	38°30' ± 2°	38°30' ± 2°	
			Outside wheel (Reference)		33°	33°30'	33°30'	
		at 20°	Inside wheel		21°			
			Outside wheel		20°			

Disc wheel lateral runout	Max. limit	1.0 mm	0.039 in.
Wheel bearing preload (turning lost at hub in addition to rotation friction force of the oil seal)		0 – 1,050 g	0 – 2.3 lb
Hub axial play	Max. limit	0.05 mm	0.0020 in.
Ball joint vertical play	Max. limit	2.5 mm	0.098 in.

Tightening Torque

Tightening part	kg-cm	ft lb
Shock absorber piston rod x Suspension support	475	34
Shock absorber shell x Ring nut	1,250	90
Lower arm x Suspension member	800	58
Lower ball joint x Steering knuckle arm	800	58
Strut bar x Strut bar bracket	925	67
Steering knuckle arm x Tie rod	600	43
Strut bar x Lower arm	475	34
Strut bar bracket x Body	925	67
Stabilizer bar x Lower arm	180	13
Stabilizer bar bracket x Strut bar bracket	130	9
Suspension support x Fender apron	185	13
Shock absorber x Knuckle arm	800	58
Suspension member x Body	800	58
Wheel nut x Front wheel hub	1,050	76
Disc brake caliper x Disc brake dust cover	650	47

REAR AXLE AND SUSPENSION

Specifications

Rear axle	Rear axle shaft bearing inner retainer installing temperature		150°C	302°F
	Rear axle shaft runout	Limit	1 5 mm	0 059 in
	Rear axle shaft flange runout	Limit	0 1 mm	0 004 in
Differential	Drive pinion bearing preload	at Starting		
		New bearing	10 – 16 kg-cm	8 7 – 13 9 in lb
		Reused bearing	5 – 8 kg-cm	4 3 – 6 9 n lb
	Total preload	at Starting	Add drive pinion bearing preload	
		6 7 in and LSD	3 – 5 kg-cm	2 6 – 4 3 in lb
		6 38 in	2 – 4 kg-cm	1 7 – 3 5 in-lb
	Drive pinion to ring gear backlash		0.13 – 0 18 mm	0 0051 – 0 0071 in
	Pinion gear to side gear backlash	6 7 in and LSD	0 05 – 0 20 mm	0 0020 – 0 0079 in
		6 38 in	0 02 – 0.20 mm	0 0008 – 0 0079 in
	Ring gear runout	Limit	0 07 mm	0 0028 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
	Oil seal drive in depth	6 7 in and LSD	4 0 mm	0 157 in
		6 38 in	0 5 mm	0 020 in
	Side gear thrust washer thickness			
	(5 7 in)		0 95 mm	0 0374 in
			1 00 mm	0 0394 in
			1 05 mm	0 0413 in
			1 10 mm	0 0433 in
			1 15 mm	0 0453 in
			1 20 mm	0 0472 in
	(6 38 in)		1 48 – 1 52 mm	0 0583 – 0 0598 in
			1 53 – 1 57 mm	0 0602 – 0 0618 in
			1 58 – 1 62 mm	0 0622 – 0 0638 in.
			1 63 – 1 67 mm	0 0642 – 0 0657 in
			1 68 – 1 72 mm	0 0661 – 0 0677 in
			1 73 – 1 77 mm	0 0681 – 0 0697 in
	Side gear adjusting washer thickness			
	(LSD)		1 60 mm	0 0630 in
			1 65 mm	0 0650 in
			1 70 mm	0 0669 in
			1 75 mm	0 0689 in
			1 80 mm	0 0709 in
			1 85 mm	0 0728 in

Specifications (Cont'd)

Differencial (Cont'd)	Drive pinion adjusting plate washer thickness (6.7 in. and LSD)	2.27 mm	0.0894 in
		2.30 mm	0.0906 in
		2.33 mm	0.0917 in
		2.36 mm	0.0929 in
		2.39 mm	0.0941 in
		2.42 mm	0.0953 in
		2.45 mm	0.0965 in
		2.48 mm	0.0976 in
		2.51 mm	0.0988 in
		2.54 mm	0.1000 in
		2.57 mm	0.1012 in
		2.60 mm	0.1024 in
		2.63 mm	0.1035 in
		2.66 mm	0.1047 in
		2.69 mm	0.1059 in
	(6.38 in.)	2.51 – 2.53 mm	0.0988 – 0.0996 in
		2.54 – 2.56 mm	0.1000 – 0.1008 in
		2.57 – 2.59 mm	0.1012 – 0.1020 in
		2.60 – 2.62 mm	0.1024 – 0.1031 in
		2.63 – 2.65 mm	0.1035 – 0.1043 in
		2.66 – 2.68 mm	0.1047 – 0.1055 in
		2.69 – 2.71 mm	0.1059 – 0.1067 in
		2.72 – 2.74 mm	0.1071 – 0.1079 in
		2.75 – 2.77 mm	0.1083 – 0.1091 in

Tightening Torque

Rear axle shaft	Tightening part	kg-cm	ft-lb
	Bearing retainer x Backing plate	670	48
Differential	Propeller shaft x Companion flange	300	22
	Drive pinion x Companion flange	1,750	127
	Ring gear x Differential case		
	6.7 in. and LSD	985	71
	6.38 in.	750	54
	Side bearing cap x Differential carrier		
	6.7 in. and LSD	800	58
	6.38 in.	600	43
	Side bearing adjusting nut lock	130	9
	Differential carrier x Axle housing	315	23
	Differential case x Differential case cover		
	6.38 in.	315	23
	LSD	450	33

Tightening Torque (Cont'd)

Suspension	Tightening parts	kg-cm	ft-lb
	Shock absorber x Body	250	18
	Shock absorber x Rear axle housing	375	27
	Lateral control rod x Rear axle housing	650	47
	Lateral control rod x Body	1 200	87
	Upper control arm x Rear axle housing	1,200	87
	Upper control arm x Body	1 200	87
	Lower control arm x Rear axle housing	1 200	87
	Lower control arm x Body	1,200	87
	Stabilizer bracket x Rear axle housing	375	27
	Stabilizer link x Stabilizer bar	310	22

BRAKE SYSTEM

Specifications

Brake pedal	Pedal height (from asphalt sheet)	LHD	161 – 171 mm	6 34 – 6 73 in
		RHD	162 – 172 mm	6 38 – 6 77 in
	Pedal freeplay		3 – 6 mm	0 12 – 0 24 in
	Pedal reserve distance	at 50 kg (110 2 lb)	More than 75 mm (2 95 in)	
Brake booster	Booster push rod to piston clearance			
		at Idling vacuum	0 1 – 0 5 mm	0 004 – 0 020 in
		w/SST	0 mm	0 in
Front brake	Disc thickness STD	w/4A-GE and Switzerland 4A C	18 0 mm	0 709 in
		Others	12 5 mm	0 492 in
	Limit	w/4A-GE and Switzerland 4A C	17 0 mm	0 669 in
		Others	11 5 mm	0 453 in
	Disc runout	Limit	0 15 mm	0 0059 in
	Pad lining thickness	STD	10 0 mm	0 394 in
		Limit	1 0 mm	0 039 in
A 10	Drum inside diameter STD	9 in Drum	228 6 mm	9 000 in
		8 in Drum	200 0 mm	7 874 in
	Limit	9 in Drum	230 6 mm	9 079 in
		8 in Drum	202 0 mm	7 953 in
	Lining thickness STD	8 in Drum	4 0 mm	0 157 in
		9 in Drum	5 0 mm	0 197 in
	Lim t		1 0 mm	0 039 in.
	Shoe to parking brake shoe lever clearance		0 – 0.35 mm	0 – 0 0138 in
	Parking brake shoe lever shim thickness		0 2 mm	0.008 in
			0 3 mm	0 012 in.
			0 4 mm	0 016 in.
			0 5 mm	0 020 in
			0 6 mm	0 024 in
			0 9 mm	0 035 in
	Drum to shoe clearance		0 6 mm	0 024 in

Specifications (Cont'd)

Rear brake (Disc)	Disc thickness	STD	10.0 mm	0.394 in
		Limit	9.0 mm	0.354 in
	Disc runout	Limit	0.15 mm	0.0059 in
	Pad lining thickness	STD	9.5 mm	0.374 in
		Limit	1.0 mm	0.039 in
Parking brake	Lever travel at 20 kg (44.1 lb)			
		w/Rear brake drum	5 – 8 clicks	
		w/Rear brake disc	6 – 9 clicks	

Tightening Torque

Tightening parts	kg-cm	ft lb
Brake booster clevis lock nut	260	19
Brake booster x Pedal bracket	130	9
Master cylinder x Brake booster	130	9
Reservoir set bolt x Master cylinder	250	18
Outlet plug x Master cylinder	450	33
Piston stopper bolt x Master cylinder	100	7
Front disc brake torque plate x Dust cover	650	47
Front disc brake cylinder installation bolt	200	14
Dust cover x Steering knuckle	475	34
Flexible hose	235	17
Brake tube union nut	155	11
Bleeder plug	85	74 in. lb
Front disc x Front axle hub	650	47
Rear brake wheel cylinder x Backing plate	100	7
Rear disc brake cylinder mounting x Dust cover	475	34
Rear disc brake cylinder installation bolt	200	14
Brake pedal setting nut (LHD or bolt (RHD))	375	27
Parking brake lever x Body	130	9

STEERING

Specifications

Steering	Steering wheel freeplay		Less than 30 mm (1.18 in.)	
	Steering rack runout	Limit	0.3 mm	0.012 in
	Pinion bearing preload	at Turning	2.3 – 3.3 kg-cm	2.0 – 2.9 in. lb
	Total preload	at Starting	7.5 – 9.5 kg-cm	6.5 – 8.2 in. lb
Power steering	Maximum rise of oil level		Below 5 mm (0.20 in.)	
	Oil pressure	at Idle speed	More than 65 kg/cm^2 (924 psi)	
	Variation in vane pump discharge pressure (at 1,000 rpm and 3,000 rpm)		Less than 5 kg/cm^2 (71 psi)	
	Drive belt tension	at 10 kg (22.0 lb)		
		New belt	7 – 9 mm	0.28 – 0.35 in
		Used belt	9 – 14 mm	0.35 – 0.55 in
	Steering effort	at Steering wheel	Less than 5.5 kg (12.1 lb)	
	Vane plate Height	Limit	8.1 mm	0.319 in
	Thickness	Limit	1.797 mm	0.0707 in
	Length	Limit	14.988 mm	0.5901 in
	Vane plate to rotor groove clearance			
		Limit	0.028 mm	0.0011 in
	Vane plate length			
			14.996 – 14.998 mm	0.5904 – 0.5905 in
			14.994 – 14.996 mm	0.5903 – 0.5904 in
			14.992 – 14.994 mm	0.5902 – 0.5903 in
			14.990 – 14.992 mm	0.5902 – 0.5902 in
			14.988 – 14.990 mm	0.5901 – 0.5902 in
	Shaft to bushing clearance	STD	0.01 – 0.03 mm	0.0004 – 0.0012 in
		Limit	0.07 mm	0.0028 in
	Flow control spring length	STD	50.0 mm	1.969 in
		Limit	47.0 mm	1.850 in
	Pump rotating torque		Less than 2.8 kg-cm (2.4 in.-lb)	
	Steering rack runout	Limit	0.3 mm	0.012 in
	Control valve shaft preload	at Turning	4.0 – 6.5 kg-cm	3.5 – 5.6 in.-lb
	Total preload	at Turning	5.0 – 10.0 kg-cm	4.3 – 8.7 in. lb

Tightening Torque

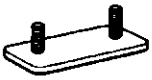
Steering main shaft	Tightening part	kg cm	ft lb
	Steering wheel x Steering main shaft	350	25
	Universal joint	360	26
	Tilt steering support x Body	280	20
	Column upper support x Body	290	21
	Upper bracket x Steering column tube	195	14
	Thrust stopper x Column tube	130	9
Steering gear housing	Pinion bearing adjusting screw lock nut	1,150	83
	Rack guide spring cap lock nut	700	51
	Rack end x Rack	850	61
	Gear housing bracket x Body	375	27
	Tie rod x Knuckle arm	600	43
	Tie rod clamp bolt	175	13
Power steering	Pressure port union x Front housing	700	51
	Reservoir tank x Vane pump 12 mm bolt	130	9
	14 mm bolt	420	30
	Pump mounting bolt	400	29
	Drive pulley x Shaft	440	32
	Pressure tube x Pump	475	34
	Cylinder end stopper nut	1,750	127
	Rack housing x Control valve housing	185	13
	Adjusting plug lock nut	500	36
	Rack guide spring cap lock nut	700	51
	Tie rod clamp bolt	175	13
	Turn pressure tube x Housing	300	22
	Gear housing bracket x Body	375	27
	Return line x Control valve housing	460	33
	Pressure line x Control valve housing	450	33
Tilt steering	Tilt steering pawl set bolt	120	9
	Tilt lever x Adjusting nut	340	25

LUBRICANT

Item	Capacity			Classification
	Liters	US qts	Imp qts	
Manual transmission oil				API GL-4 or GL 5 SAE 90
T50	1 7	1 8	1 5	
Automatic transmiss on fluid				ATF type F
Dry fill	5 7	6 0	5 0	
Drain and refill	2 4	2 5	2 1	
Differential oil				API GL-5 hypoid gear oil
6 38"	1 0	1 1	0 9	w/LSD Use LSD oil only
8 7" and LSD	1 3	1 4	1 1	Above −18°C (0°F) SAE 90 Below −18°C (0°F) SAE 80W 90 or 80W
Power steering fluid	0 65	0 7	0 6	ATF type DEXRON or DEXRON II
Ball joint grease	–			Molybdenum disulphide lithium base NLGI No 1 or No 2
Wheel bearing grease	–			Lithium base multipurpose, NLGI No 2
Brake fluid	–			SAE J1703 DOT 3

STANDARD BOLT TIGHTENING TORQUE

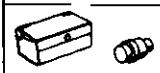
HOW TO DETERMINE BOLT STRENGTH

	Mark	Class		Mark	Class
Hexagon head bolt	 Bolt head No 4– 5– 6– 7–	4T 5T 6T 7T	Stud bolt	 No mark	4T
	 No mark	4T			
Hexagon flange bolt w/washer hexagon bolt	 No mark	4T		 Grooved	6T
Hexagon head bolt	 Two protruding lines	5T			
Hexagon flange bolt w/washer hexagon bolt	 Two protruding lines	6T	Welded bolt		4T
Hexagon head bolt	 Three protruding lines	7T			

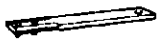
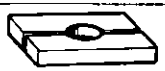
SPECIFIED TORQUE FOR STANDARD BOLTS

Class	Basic diameter mm	Pitch mm	Tightening torque kg-cm (ft-lb)			
			Hexagon head bolt		Hexagon flange bolt	
			Target	Range	Target	Range
4T	6	1	56 (4 0)	44 – 66 (3 2 – 4.8)	60 (4 3)	48 – 72 (3 5 – 5 2)
	8	1 25	130 (9 4)	104 – 156 (7 5 – 11 3)	145 (10 5)	116 – 174 (8 4 – 12 6)
	10	1 25	260 (18 8)	208 – 312 (15 0 – 22 6)	290 (21 0)	232 – 348 (16.8 – 25 2)
	12	1 25	480 (34 7)	384 – 576 (27 8 – 41 7)	540 (39 1)	432 – 648 (31 2 – 46.9)
	14	1 5	760 (55 0)	608 – 912 (44 0 – 66 0)	850 (61 5)	680 – 1,020 (49 2 – 73.8)
	16	1 5	1,150 (83 2)	920 – 1,380 (66 5 – 99 8)		–
5T	6	1	65 (4 7)	52 – 78 (3 8 – 5 6)		–
	8	1 25	160 (11 6)	128 – 192 (9.3 – 13.9)		
	10	1 25	330 (23 9)	264 – 396 (19 1 – 28 6)		–
	12	1 25	600 (43 4)	480 – 720 (34 7 – 52 1)		–
	14	1 5	930 (67 3)	744 – 1,116 (53 8 – 80 7)		–
	16	1 5	1 400 (101 3)	1,120 – 1,680 (81 0 – 121 5)		–
6T	6	1	80 (5 8)	64 – 96 (4 6 – 6 9)	90 (6 5)	72 – 108 (5 2 – 7 8)
	8	1 25	195 (14 1)	156 – 234 (11 3 – 16 9)	210 (15 2)	168 – 252 (12 2 – 18 2)
	10	1 25	400 (28 9)	320 – 480 (23 1 – 34 7)	440 (31 8)	352 – 528 (25 5 – 38 2)
	12	1 25	730 (52.8)	584 – 876 (42 2 – 63.4)	810 (58 6)	648 – 972 (46 9 – 70 3)
	14	1 5	–		1 250 (90 4)	1 000 – 1,500 (72 3 – 108 5)
7T	6	1	110 (8 0)	88 – 132 (6 4 – 9 5)	120 (8 7)	96 – 144 (6 9 – 10 4)
	8	1 25	260 (18 8)	208 – 312 (15 0 – 22 6)	290 (21 0)	232 – 348 (16 8 – 25 2)
	10	1 25	530 (38 3)	424 – 636 (30 7 – 46 0)	590 (42 7)	472 – 708 (34 2 – 51 2)
	12	1 25	970 (70 2)	776 – 1,164 (56 1 – 84 2)	1 050 (75 9)	840 – 1,260 (60 8 – 91 1)
	14	1 5	1 500 (108 5)	1,200 – 1,800 (86 8 – 130 2)	1 700 (123 0)	1 360 – 2,040 (98 4 – 147 6)
	16	1 5	2,300 (166 4)	1,840 – 2,760 (133 1 – 199 6)		–

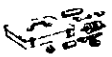
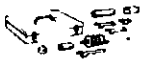
SST (SPECIAL SERVICE TOOLS)

Illustration / Section — • Part No. • Part Name	CL	MT	AT	PR	FA	RA	BR	SR	BO
 09201-60011 (Valve Stem Guide Remover & Replacer)		●							
 09223-22010 (Crankshaft Front Oil Seal Replacer)		●							
 09301-00013 (Diaphragm Aligner Tool Set)	●								
 09301-38010 (Clutch Guide Tool)	●								
 09303-35011 (Input Shaft Front Bearing Puller)	●								
 09304-30012 (Input Shaft Front Bearing Replacer)	●								
 09307-12010 (Extension Housing Bushing Replacer)		●							
 09308-00010 (Oil Seal Puller)		●				●	●		
 09308-10010 (Oil Seal Puller)		●	●			●			
 09315-00010 (Clutch Release Bearing Remover & Replacer)	●								
 09316-60010 (Transmission & Transfer Bearing Replacer)		●							
 09325-12010 (Transmission Oil Plug)		●		●					
 09325-20010 (Transmission Oil Plug)			●	●					
 09330-00020 (Companion Flange Holding Tool)				●		●			

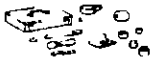
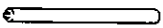
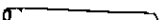
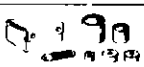
SST (SPECIAL SERVICE TOOLS) (Cont'd)

Illustration / Part No. / Part Name	CL	MT	AT	PR	FA	RA	BR	SR	BO
 09332-25010 (Universal Joint Bearing Remover & Replacer)				●					
 09411-22011 (Side Gear Thrust Washer Adjust Tool)						●			
 09502-10012 (Differential Side Bearing Puller)						●			
 09504-00911 (Differential Side Bearing Adjusting Nut Wrench)						●			
 09506-30911 (Differential Drive Pinion Bearing Cone Replacer)						●			
 09515-20810 (Rear Axle Shaft Bearing Replacer)		●							
 09515-21010 (Rear Axle Shaft Bearing Replacer)						●			
 09515-30010 (Rear Wheel Bearing Replacer)							●		
 09517-12010 (Rear Axle Shaft Oil Seal Replacer)						●			
 09517-30010 (Rear Axle Shaft Oil Seal Replacer)						●			
 09520-00031 (Rear Axle Shaft Puller)						●			
 09527-21011 (Rear Axle Shaft Bearing Remover)						●			
 09527-30010 (Rear Axle Shaft Bearing Remover)						●			
 09550-10012 (*B Replacer Set)						●			

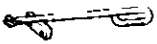
SST (SPECIAL SERVICE TOOLS) (Cont'd)

Illustration • Part No. • Part Name	CL	MT	AT	PR	FA	RA	BR	SR	BO
 09554-22010 (Differential Oil Seal Replacer)						●			
 09556-22010 (Drive Pinion Front Bearing Remover)						●			
 09557-22022 (Companion Flange Remover & Replacer)						●			
 09608-12010 (Front Hub & Drive Pinion Bearing Replacer Set)						●			
 09608-12020 (Front Hub & Drive Pinion Bearing Replacer Set)						●			
 09608-20011 (Front Hub & Drive Pinion Bearing Tool Set)					●	●	●		
 09608-30011 (Front Hub & Drive Pinion Bearing Tool Set)						●			
 09608-30021 (Front Hub Bearing Replacer Set)				●					
 09608-30030 (Differential Drive Pinion Front Bearing Cup)						●			
 09609-20011 (Steering Wheel Puller)								●	
 09611-22012 (Tie Rod End Puller)					●				
 09612-10092 (Steering Gear Housing Overhaul Tool Set)								●	
 09612-24011 (Steering Gear Housing Overhaul Tool Set)								●	
 09616-80010 (Steering Worm Bearing Adjusting Socket)								●	

SST (SPECIAL SERVICE TOOLS) (Cont'd)

Illustration / Part No. / Part Name	CL	MT	AT	PR	FA	RA	BR	SR	BO
 09628-30010 (Steering Gear Box Replacer Set)								●	
 09628-62011 (Ball Joint Puller)								●	
 09630-00010 (Power Steering Gear Housing Overhaul Tool Set)								●	
 09630-24012 (Steering Rack Oil Seal Tool Set)								●	
 09631 12010 (Cylinder End Stopper Nut Wrench)								●	
 09631 12020 (Handle)								●	
 09631-12030 (Oil Seal A Remover)								●	
 09631 12040 (Oil Seal A Replacer)								●	
 09631-12050 (Steering Rack Oil Seal Test Tool)								●	
 09631-18020 (Steering Rack A Cover)								●	
 09631-22020 (Power Steering Hose Nut 14 x 17 Wrench)								●	
 09703-30010 (Brake Shoe Return Spring Tool)							●		
 09704-10010 (Brake Adjusting Tool)							●		
 09710-14012 (Rear Suspension Bushing Tool Set)						●			

SST (SPECIAL SERVICE TOOLS) (Cont'd)

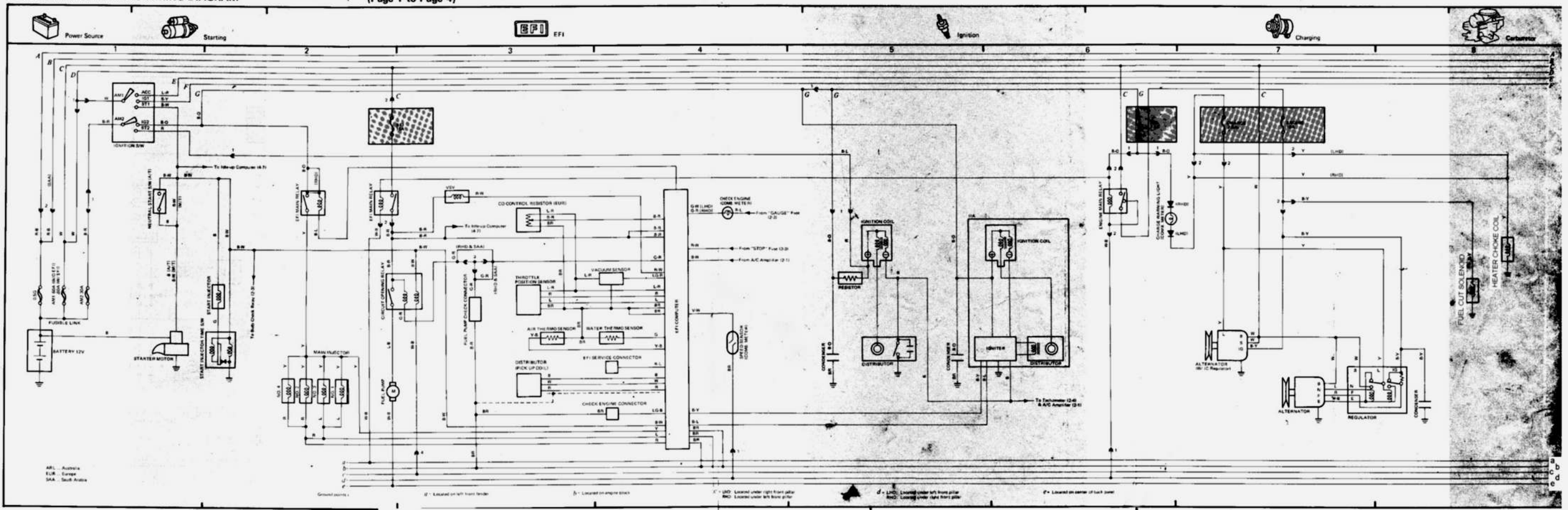
Illustration	• Part No. • Part Name	CL	MT	AT	PR	FA	RA	BR	SR	BO
	09719-14020 (Rear Disc Brake Tool Set)							●		
	09720-00010 (Shock Absorber Overhaul Tool Set)					●				
	09726-12021 (Lower Suspension Arm Bushing Remover & Replacer)					●				
	09727 22031 (Front Coil Spring Compressor)					●				
	09729-22021 (Front Spring Upper Seat Holder)					●				
	09736-27010 (Booster Diaphragm Remover & Replacer)							●		
	09737-00010 (Brake Booster Push Rod Gauge)							●		
	09751-36011 (Brake Tube Union Nut 10 x 12 Wrench)	●				●	●	●		
	09753-09012 (Brake Booster Overhaul Tool)							●		
	09753-48010 (Base Plate)							●		
	09753-48020 (Upper Plate)							●		
	09756-00010 (Adjusting Bolt Guide Nut)							●		
	09804 13021 (Back Door Torsion Spring Tool)									●
	09812-00010 (Door Hinge Set Bolt Wrench Set)									●

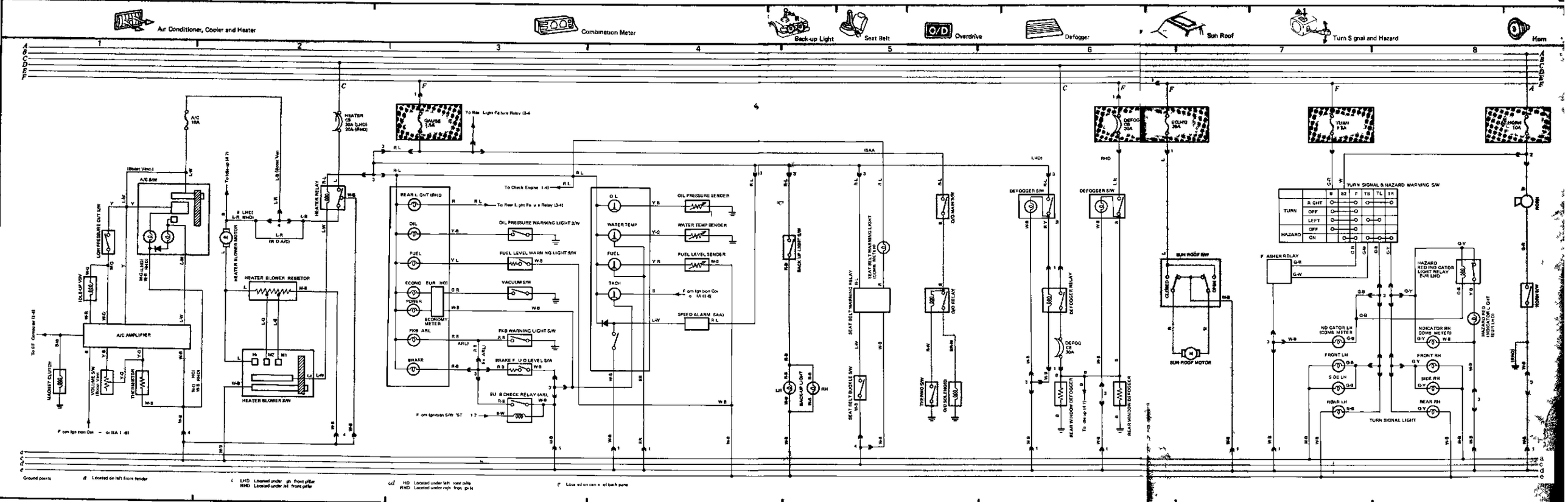
SST (SPECIAL SERVICE TOOLS) (Cont'd)

Illustration • Part No. • Part Name (Section)	CL	MT	AT	PR	FA	RA	BR	SR	BO
 09921-00010 (Spring Tension Tool)		●							
 09922-00010 (Wrench 5 x 12)						●			
 09950-00020 (Bearing Remover)						●			
 09950-20014 (Universal Puller)		●				●		●	
 09992-00093 (Oil Pressure Gauge)			●						

COROLLA FX ELECTRICAL WIRING DIAGRAM

(Page 1 to Page 4)




Air Conditioner, Cooler and Heater
Combination Meter
Back-up Light
Seat Belt
O/D
Overdrive
Defogger
Sun Roof
Turn Signal and Hazard
Horn
A/C 10A
HEATER CB 30A (LHD) 20A (RHD)
DAYTIME 7.5A
To Rear Light Failure Relay (3-6)
To Check Engine (1-4)
To Rear Light Failure Relay (3-4)
To Back-up Lt (3-7)
(Boost Vac.)
A/C S/W
LOW PRESSURE CUT S/W
IDLE-UP VSV
WG (LHD) W-B (RHD)
HEATER BLOWER MOTOR
HEATER BLOWER RESISTOR
HEATER BLOWER S/W
HEATER RELAY
A/C AMPLIFIER
MAGNET CLUTCH
VOLUME S/W (Boost Vac.)
THERMISTOR
To EF Computer (1-6)
From Ignition Coil — or IIA (1-6)
REAR L GHT (RH)
OIL
FUEL
ECONO
POWER
ECONOMY METER
PKB ARL
BRAKE
OIL PRESSURE WARNING LIGHT S/W
FUEL LEVEL WARN NG LIGHT S/W
VACUUM S/W
PKB WARNING LIGHT S/W
BRAKE FLUID LEVEL S/W
SU B CHECK RELAY (ARL)
From Ignition S/W "ST"
WATER TEMP
TACH
OIL PRESSURE SENDER
WATER TEMP SENDER
FUEL LEVEL SENDER
From Ignition Coil (1-6)
SPEED ALARM (SAA)
ISAA
BACK-UP LIGHT S/W
BACK-UP LIGHT
SEAT BELT WARNING RELAY
SEAT BELT WARNING LIGHT (COMB. METER)
SEAT BELT BUCKLE S/W
O/D MAIN S/W
O/D RELAY
THERMO S/W
O/D SOLENOID
DEFOGGER S/W
DEFOGGER RELAY
DEFOG CB 30A
REAR WINDOW DEFOGGER
To Back-up Lt (3-7)
SUN ROOF S/W
SUN ROOF MOTOR
TURN 7.5A
TURN SIGNAL & HAZARD WARNING S/W
TURN
HAZARD
FLASHER RELAY
HAZARD REMINDER LIGHT RELAY (W/R LHD)
INDICATOR LH (COMB. METER)
INDICATOR RH (COMB. METER)
FRONT LH
SIDE LH
REAR LH
FRONT RH
SIDE RH
REAR RH
TURN SIGNAL LIGHT
INDICATOR LIGHT (W/R LHD)
HORN 10A
HORN
Ground points
d Located on left front fender
c LHD Located under gh front pillar
RHD Located under rgh front pillar
cd HD Located under left rear side
RHD Located under right rear side
e Located on center of back pane

Rear Wiper and Washer

Windshield Wiper and Washer

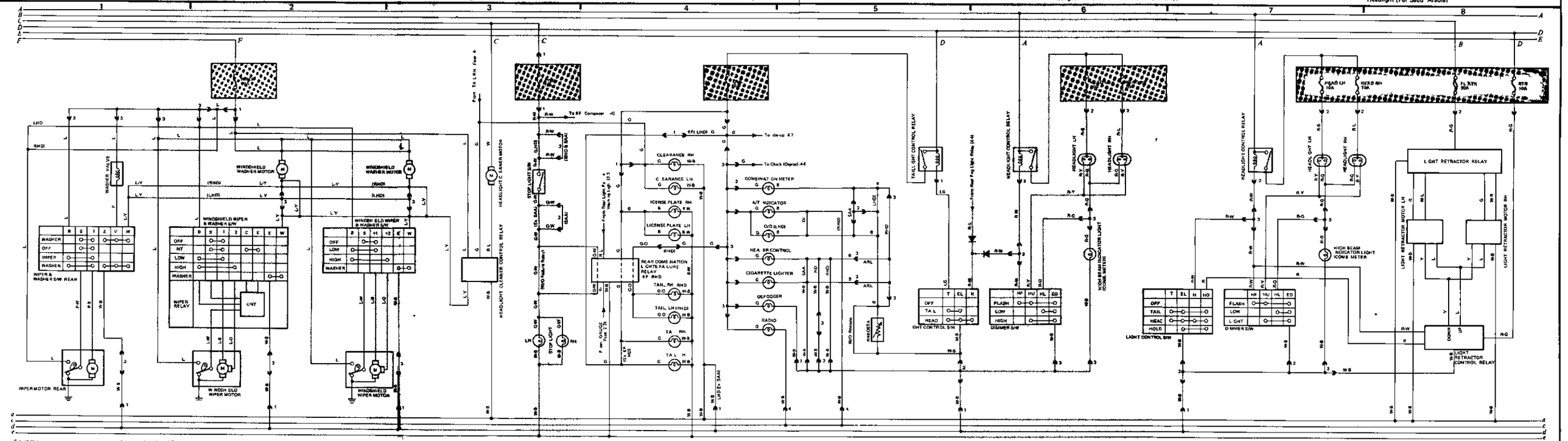
Headlight Cleaner

Stop Light

Tail Light and Illumination (Ex. W. Germany)

Headlight (Ex. Saudi Arabia and W. Germany)

Headlight (For Saudi Arabia)



Ground point

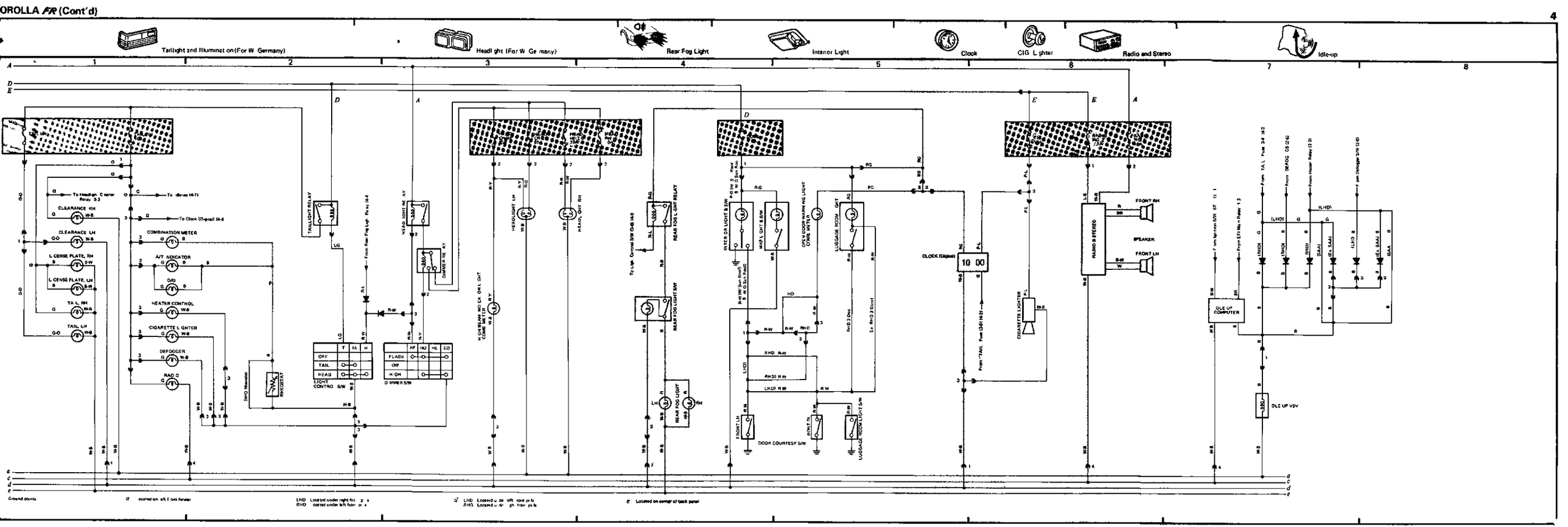
Located on instrument panel

C LHD Located under left front pillar
RHD Located under right front pillar

d LHD Located under left front pillar
RHD Located under right front pillar

Located on center of back panel

Taillight and Illuminat on (For W Germany) | Headl ght (For W Ge many) | Rear Fog Light | Interor Light | Clock | CIG L ghter | Radio and Stereo | Idle-up



Ground points

a Located on left f om fender

LHD Located under right fro p a
RHD Located under left from p a

d LHD Located u de left rear p a
RHD Located u de gh from p a

e Located on corner of back panel

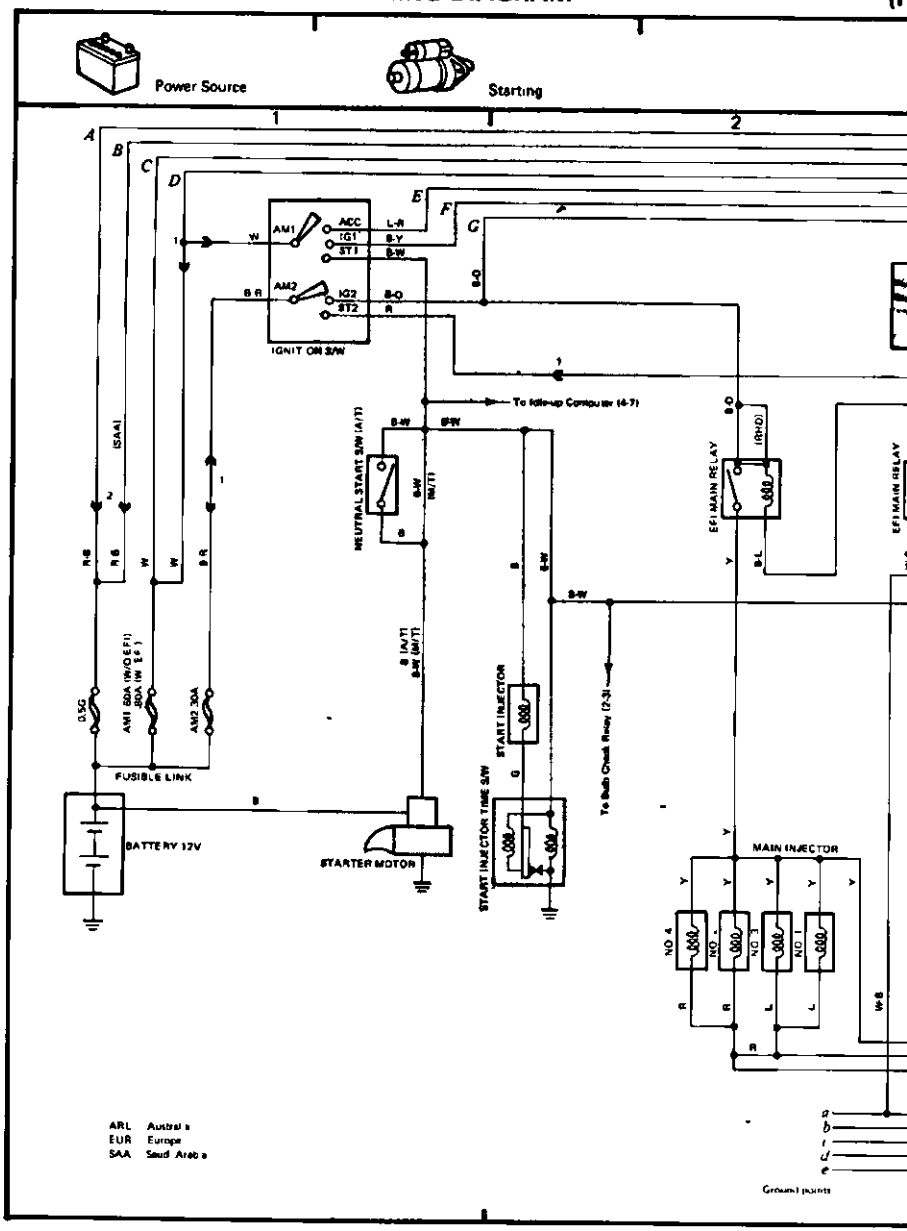
ELECTRICAL WIRING DIAGRAMS

SYSTEM INDEX

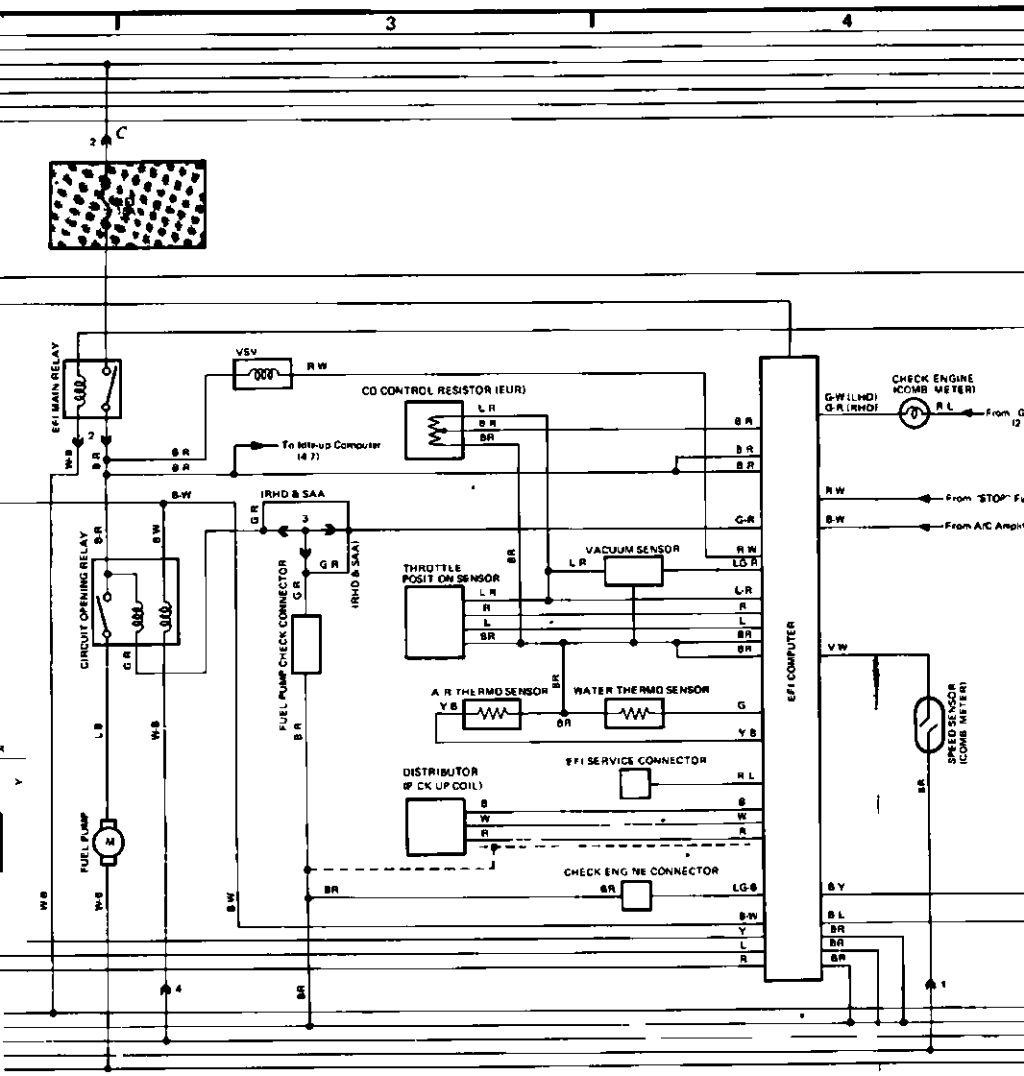
COROLLA FX

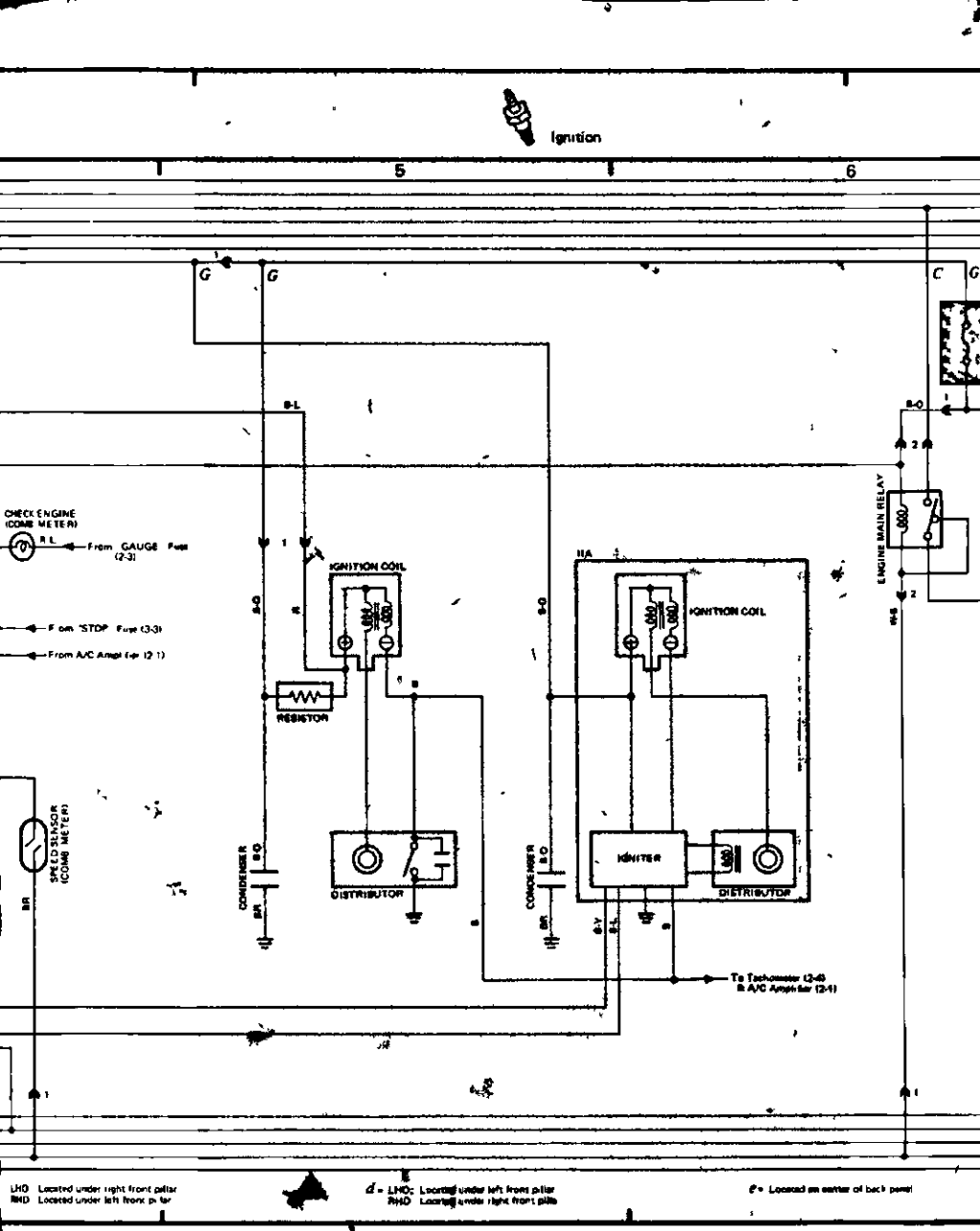
(Page 1 to Page 4)

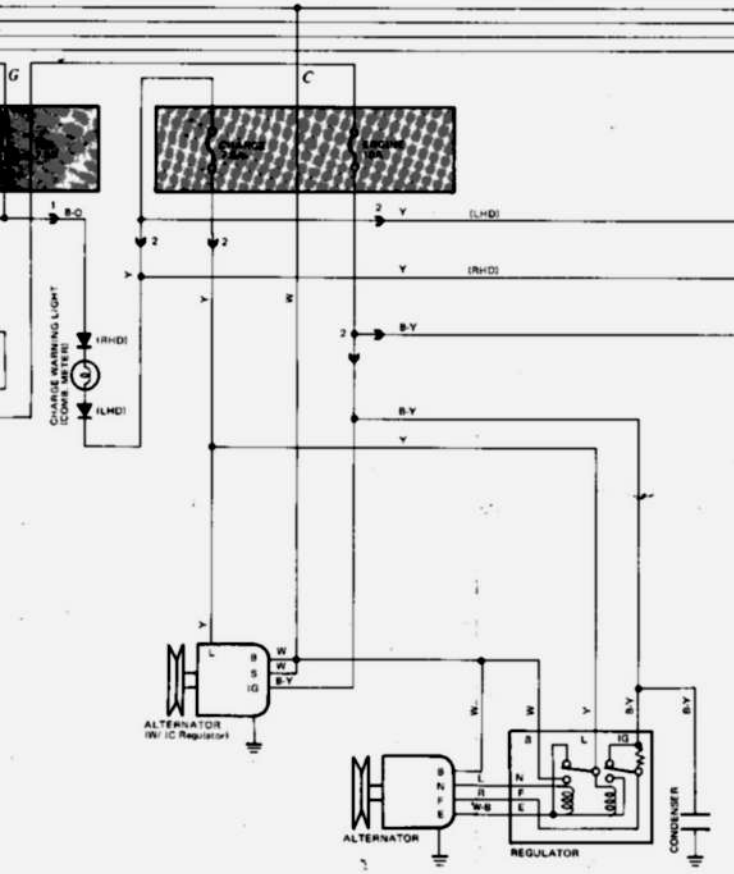
SYSTEMS	LOCATION
Air Conditioner, Cooler and Heater	2 1
Back-up Light	2-5
Carburetor	1-8
Charging	1 7
CIG Lighter	4-6
Clock	4 6
Combination Meter	2 3
Defogger	2-6
EFI	1-3
Headlight	3-6 3-7 4 3
Headlight Cleaner	3 3
Horn	2 8
Idle-up	4 7
Ignition	1-5
Interior Light	4-5
Overdrive	2-5
Power Source	1-1
Radio and Stereo	4-6
Rear Fog Light	4-4
Rear Wiper and Washer	3-1
Seat Belt	2 5
Starting	1 1
Stop Light	3-3
Sun Roof	2 7
Taillight and Illumination	3-4, 4 1
Turn Signal and Hazard	2-7
Windshield Wiper and Washer	3-2


Power Source
Starting
IGNIT ON S/W
AM1
AM2
ACC
IG1
ST1
IG2
ST2
To Idle-up Computer (4-7)
NEUTRAL START S/W (A/T)
EFI MAIN RELAY
FUSIBLE LINK
BATTERY 12V
STARTER MOTOR
START INJECTOR
START INJECTOR TIME S/W
To Back Check Relay (2-3)
MAIN INJECTOR
NO.4
NO.2
NO.3
NO.1
ARL Australia
EUR Europe
SAA Saudi Arabia
Ground points

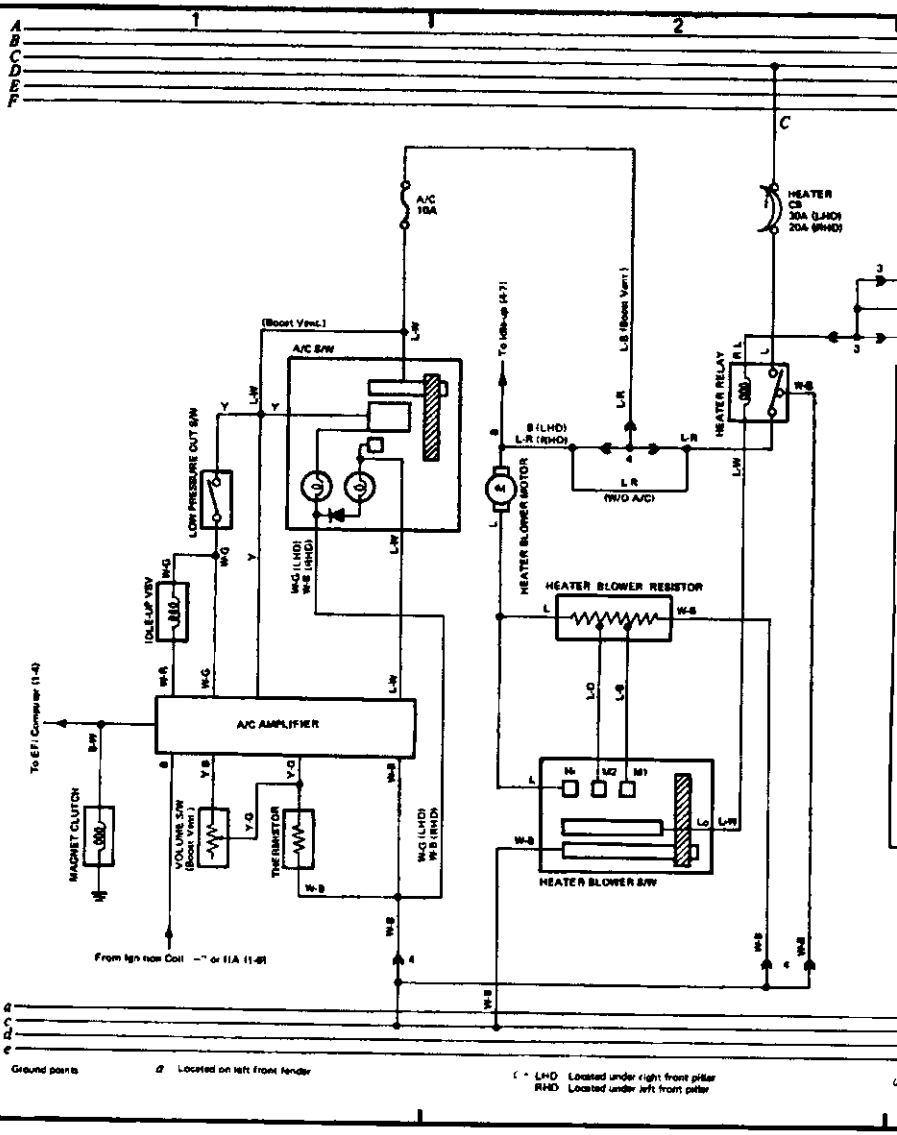
EFI


3
4
C
EFI MAIN RELAY
VSV
R-W
CO CONTROL RESISTOR (EUR)
To Idle-up Computer (4-7)
B-W
IRHD & SAA
CIRCUIT OPENING RELAY
FUEL PUMP CHECK CONNECTOR
THROTTLE POSITION SENSOR
VACUUM SENSOR
A/F THERMO SENSOR
WATER THERMO SENSOR
EFI COMPUTER
CHECK ENGINE (COMB METER)
From "STOP" Fu
From A/C Ampli
SPEED SENSOR (COMB METER)
DISTRIBUTOR (PICK UP COIL)
EFI SERVICE CONNECTOR
FUEL PUMP
CHECK ENGINE CONNECTOR
a Located on left front fender
b Located on engine block
c = LHD Located under right
RHD Located under left


Ignition
5
6
G
G
C
G
B-L
B-O
2
ENGINE MAIN RELAY
IG-S
CHECK ENGINE (COMB METER)
R-L
From GAUGE Fuse (2-3)
From "STOP" Fuse (3-3)
From A/C Amplifier (2-1)
IGNITION COIL
IIA
IGNITION COIL
B-O
R
RESISTOR
CONDENSER
B-O
BR
DISTRIBUTOR
CONDENSER
B-O
BR
IGNITER
DISTRIBUTOR
B-Y
B-L
B
To Tachometer (3-6) & A/C Amplifier (2-1)
SPEED SENSOR (COMB METER)
BR
1
LHD Located under right front pillar
RHD Located under left front pillar
d = LHD: Located under left front pillar
RHD: Located under right front pillar
e = Located on center of back panel

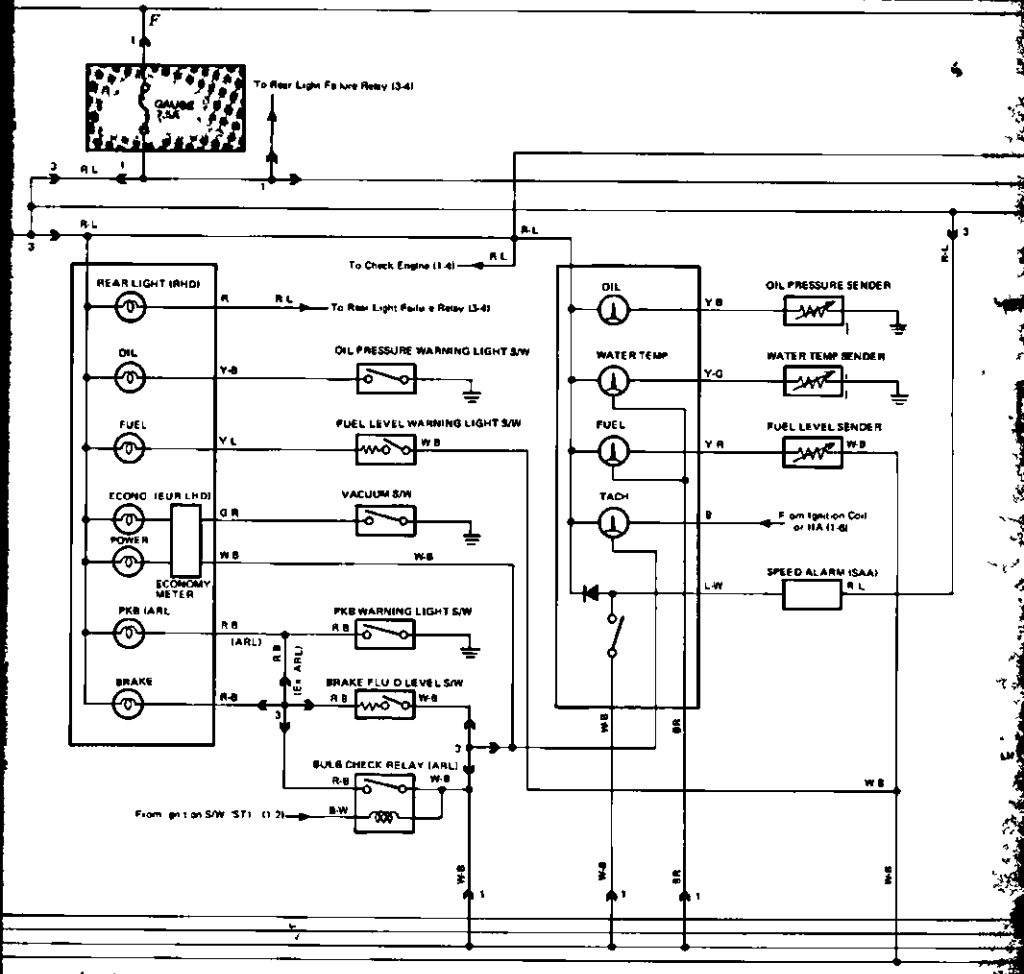

G
C
CHARGE
ENGINE
1
B-O
2
Y
(LHD)
(RHD)
B-Y
CHARGE WARNING LIGHT (COMB. METER)
W
ALTERNATOR (W/ IC Regulator)
ALTERNATOR
REGULATOR
CONDENSER
FUEL CUT SOLENOID
HEATER CHOKE COIL

Air Conditioner, Cooler and Heater





Combination Meter



d = LHD Located under left front pillar
RHD Located under right front pillar

F = Located on center of back panel

Back-up Light

Seat Belt

O/D Overdrive

Defogger

5

6

(SAA)

BACK-UP LIGHT S/W

BACK-UP LIGHT

LH

RH

SEAT BELT WARNING RELAY

SEAT BELT WARNING LIGHT (COMB. METER)

SEAT BELT BUCKLE S/W

O/D MAIN S/W

O/D RELAY

THERMO S/W

O/D SOLENOID

(LHD)

(RHD)

DEFOGGER S/W

DEFOGGER RELAY

DEFOG CB 30A

REAR WINDOW DEFOGGER

To tail-up (4-7)

REAR WINDOW DEFOGGER

C

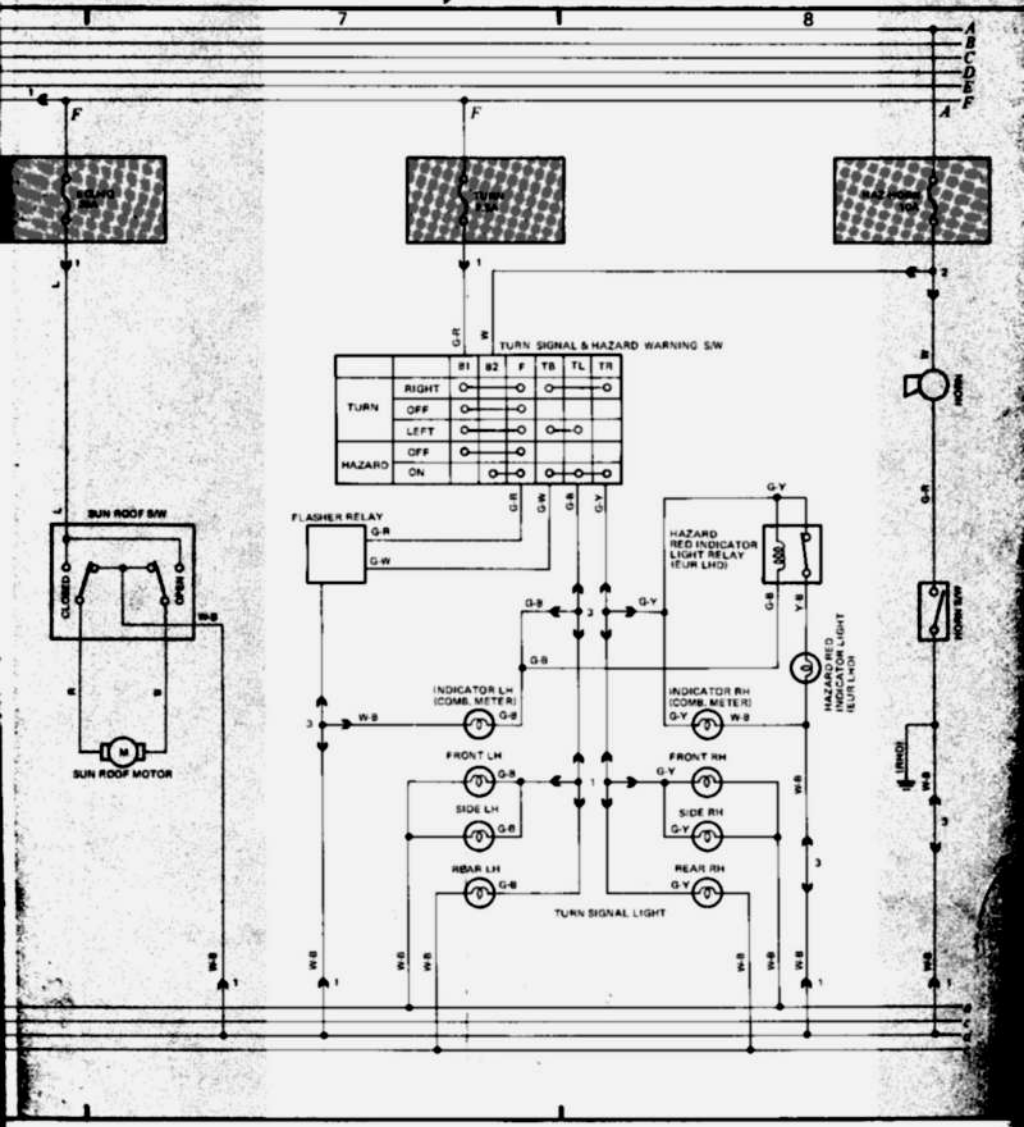
F

CLOSED

Sun Roof

Turn Signal and Hazard

Horn

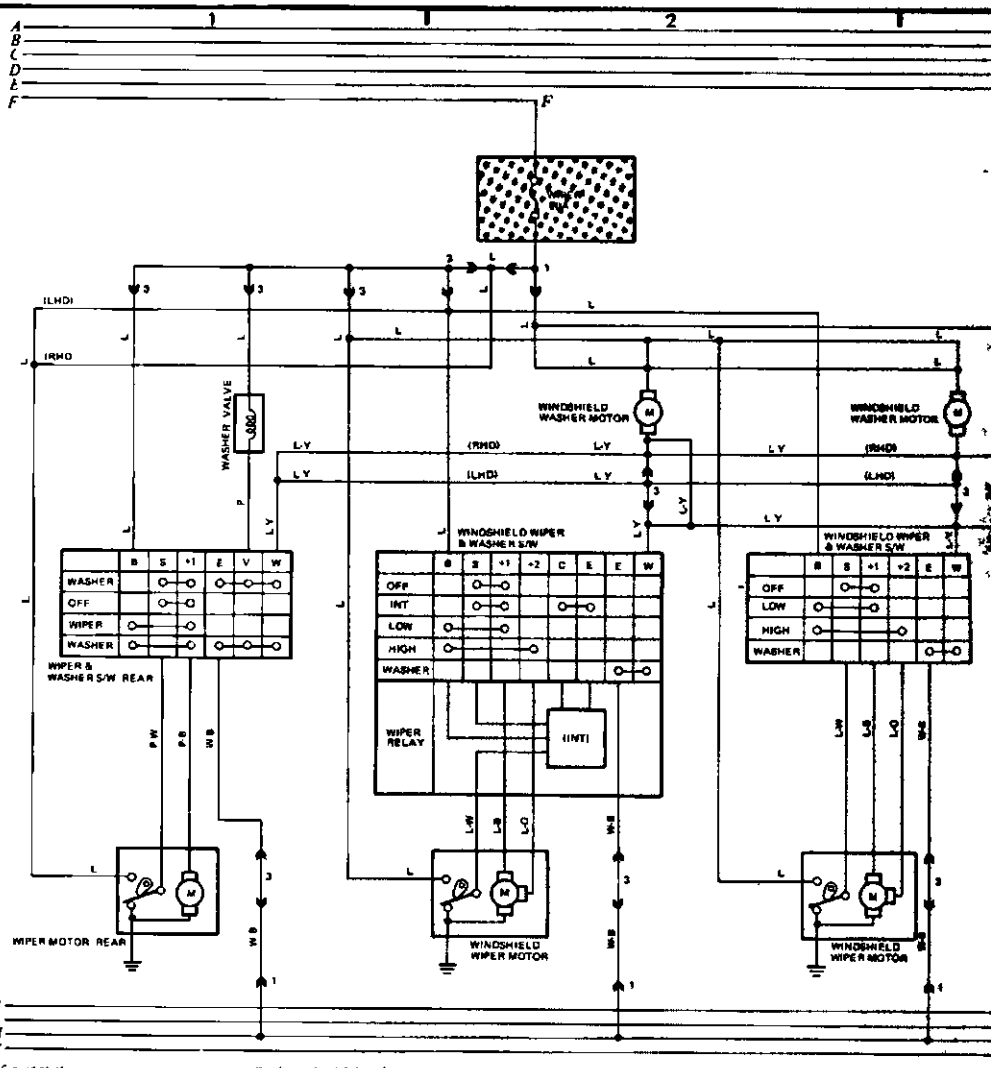




Rear Wiper and Washer



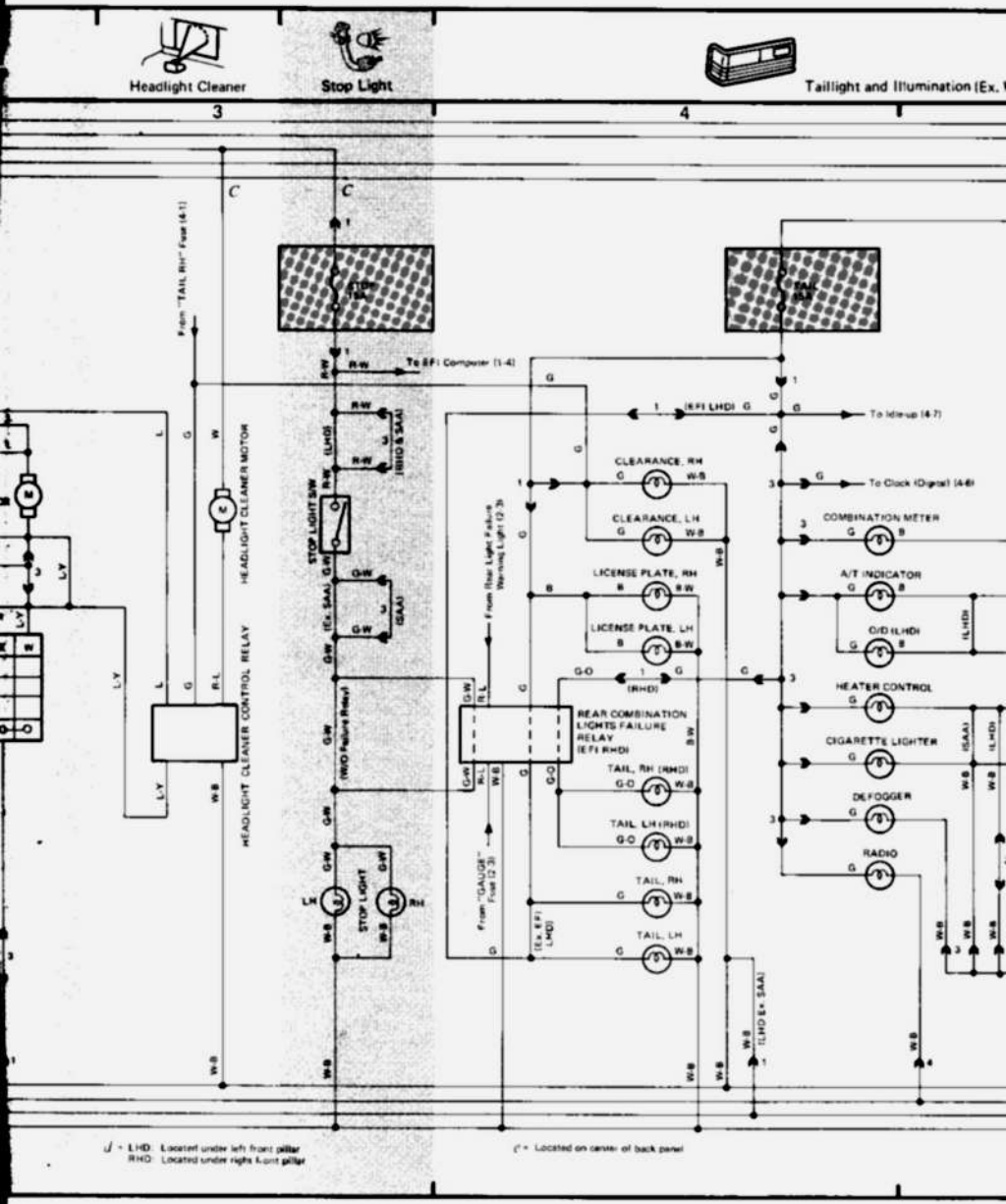
Windshield Wiper and Washer

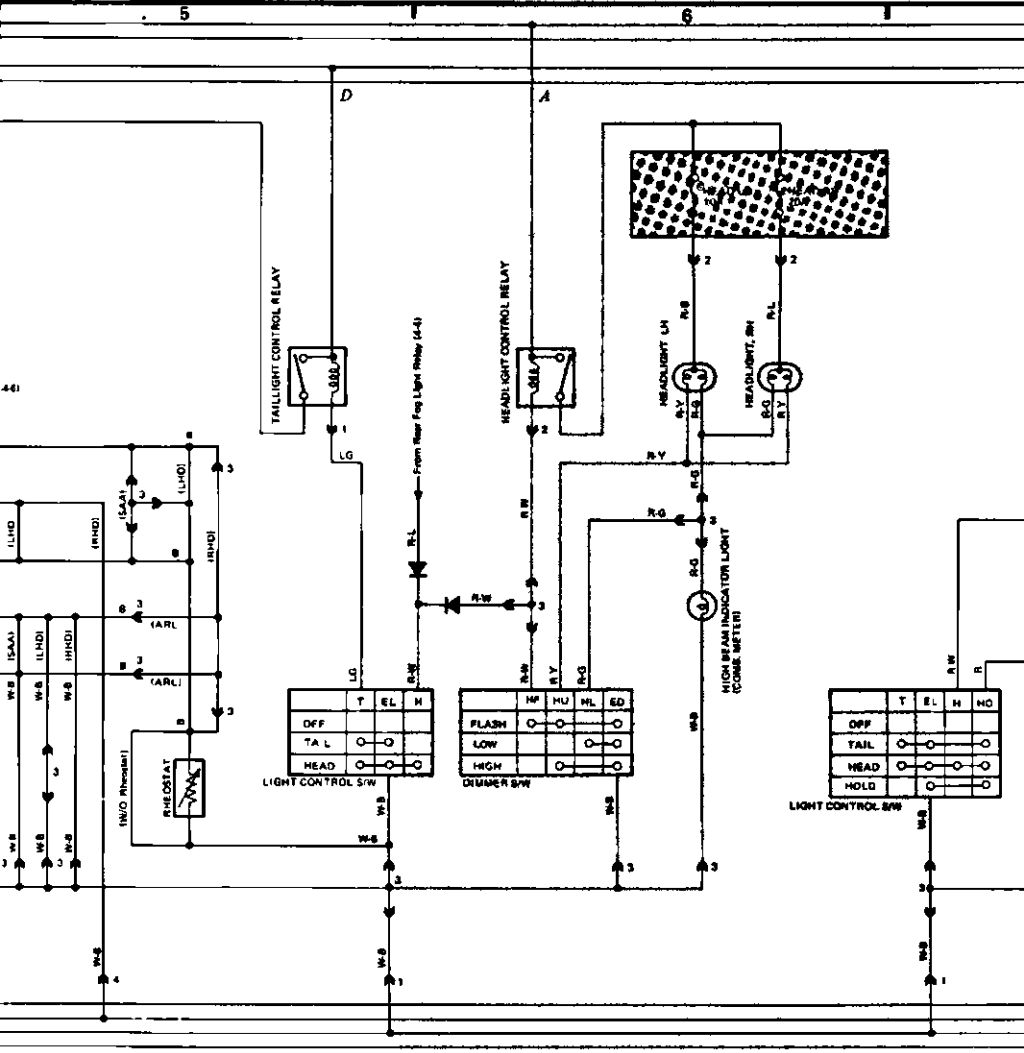


Ground points

: Located on left front fender

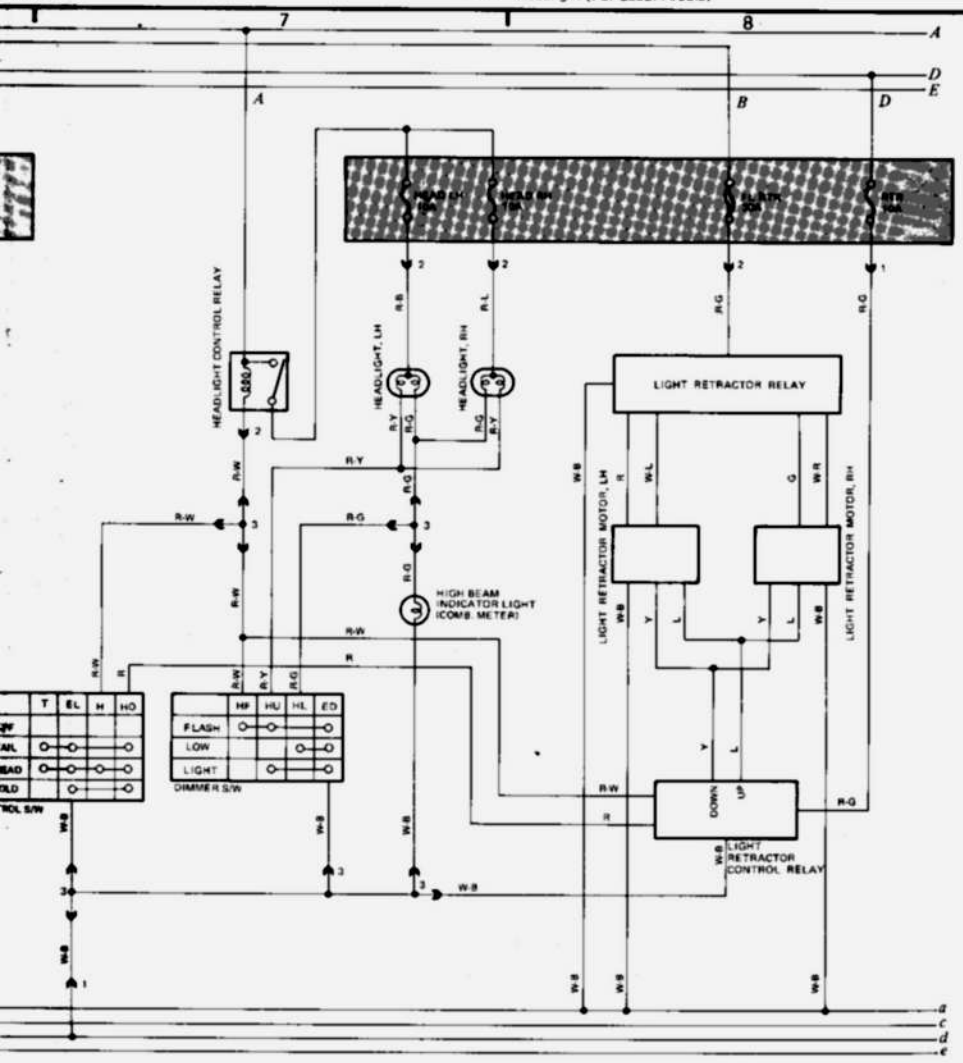
: LHD Located under right front pillar
RHD Located under left front pillar


Headlight Cleaner
Stop Light
Taillight and Illumination (Ex,
3
4
From "TAIL RH" Fuse (4-1)
To EFI Computer (1-4)
STOP LIGHT SW
HEADLIGHT CLEANER MOTOR
HEADLIGHT CLEANER CONTROL RELAY
(W/O Failure Relay)
STOP LIGHT
LH
RH
From "GAUGE" Fuse (2-3)
From Rear Light Failure Warning Light (2-3)
REAR COMBINATION LIGHTS FAILURE RELAY (EFI RHD)
(EX. EFI LHD)
(LHD EX. SAA)
(RHD)
(SAA)
(LHD)
(EX. SAA)
CLEARANCE, RH
CLEARANCE, LH
LICENSE PLATE, RH
LICENSE PLATE, LH
TAIL, RH (RHD)
TAIL, LH (RHD)
TAIL, RH
TAIL, LH
(EFI LHD)
To Idle-up (4-7)
To Clock (Digital) (4-6)
COMBINATION METER
A/T INDICATOR
O/D (LHD)
HEATER CONTROL
CIGARETTE LIGHTER
DEFOGGER
RADIO
J : LHD: Located under left front pillar
RHD: Located under right kick pillar
C : Located on center of back panel


D
A
TAILLIGHT CONTROL RELAY
HEADLIGHT CONTROL RELAY
From Rear Fog Light Relay (4-4)
HEADLIGHT, LH
HEADLIGHT, RH
HIGH BEAM INDICATOR LIGHT (COMBI METER)
LIGHT CONTROL S/W
DIMMER S/W
RHEOSTAT
(W/O Rheostat)
OFF
TAIL
HEAD
HOLD
FLASH
LOW
HIGH
LG
R-L
R-W
R-Y
R-G
W-B

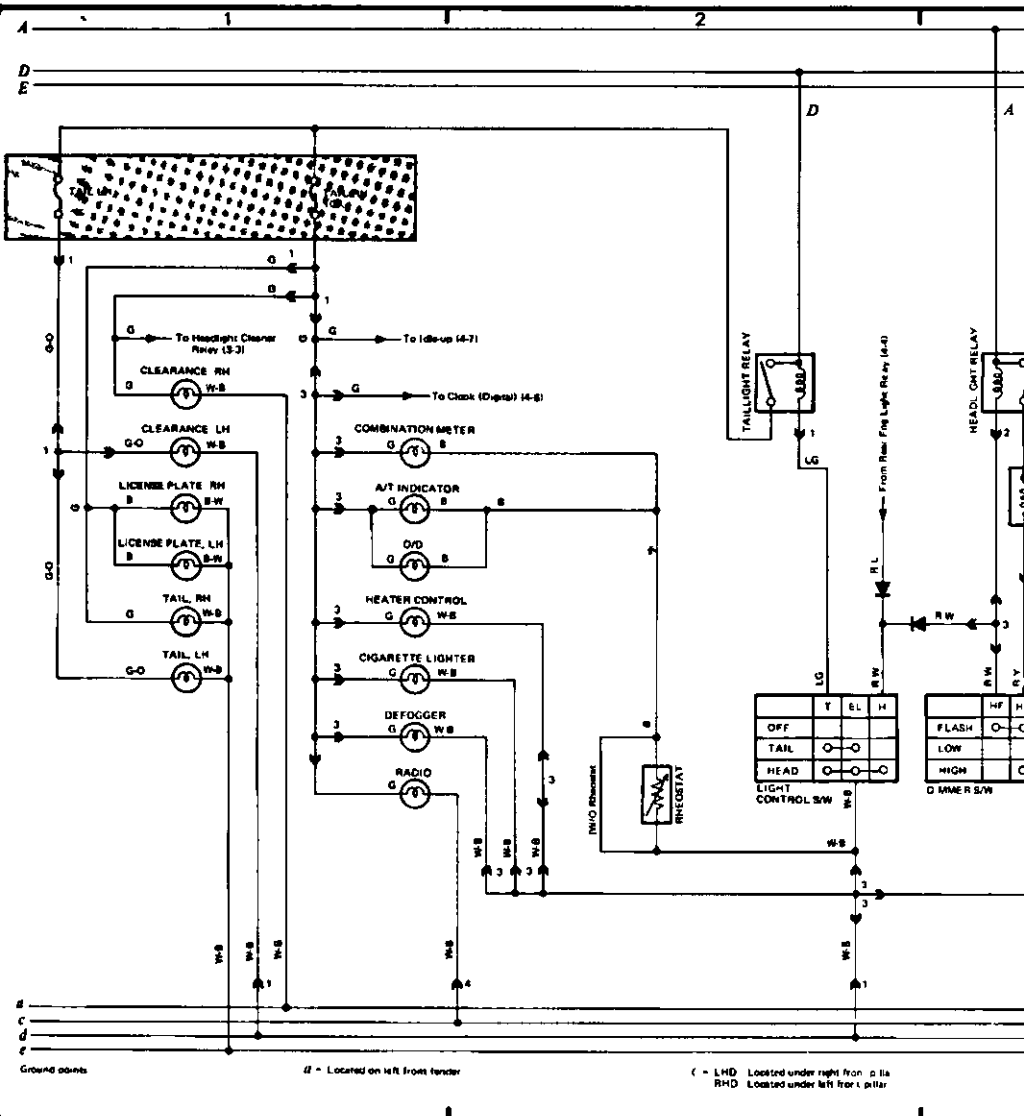
Germany)

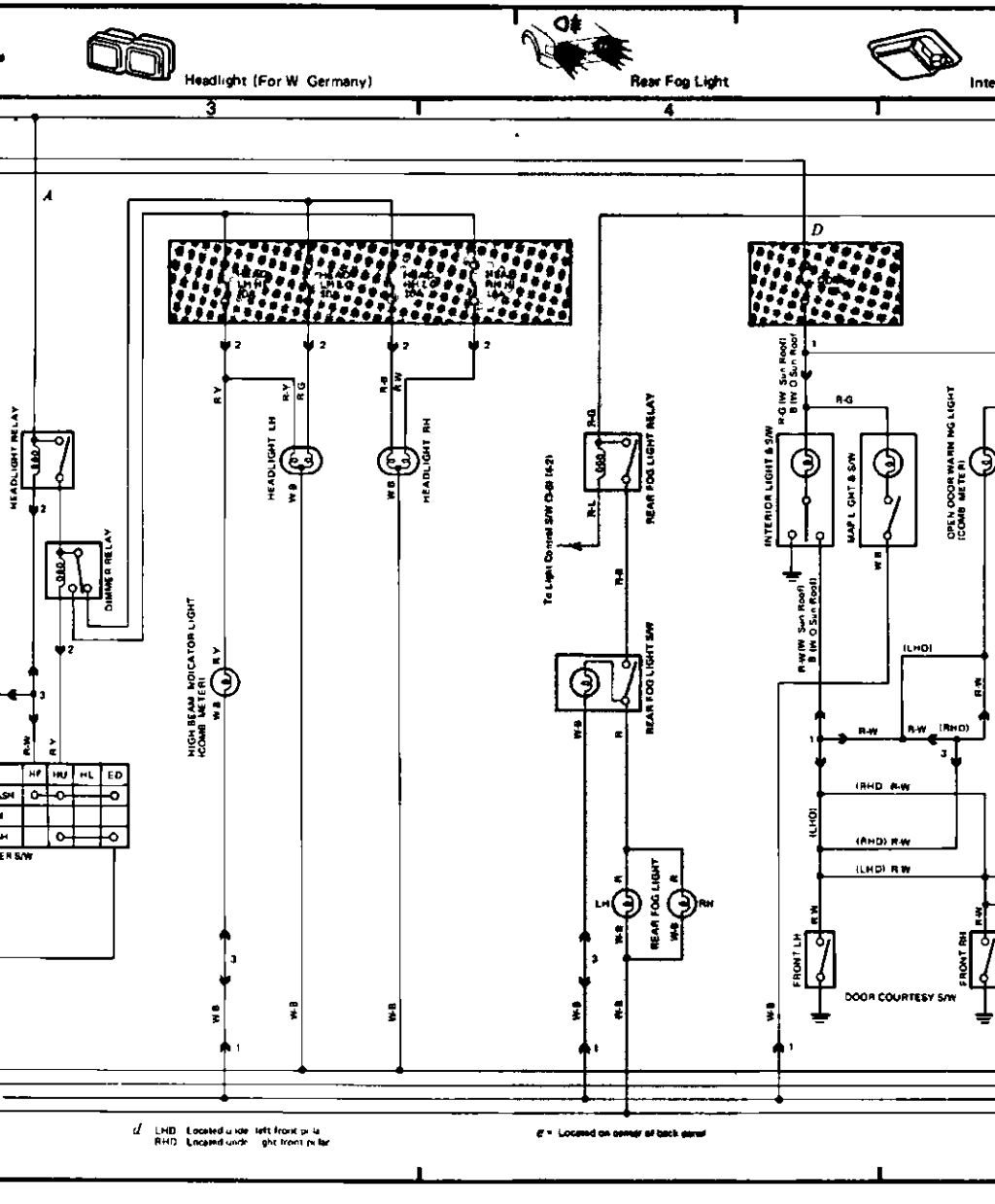
Headlight (For Saudi Arabia)





Taillight and Illumination (For W. Germany)





d LHD Located under left front pillar
RHD Located under right front pillar

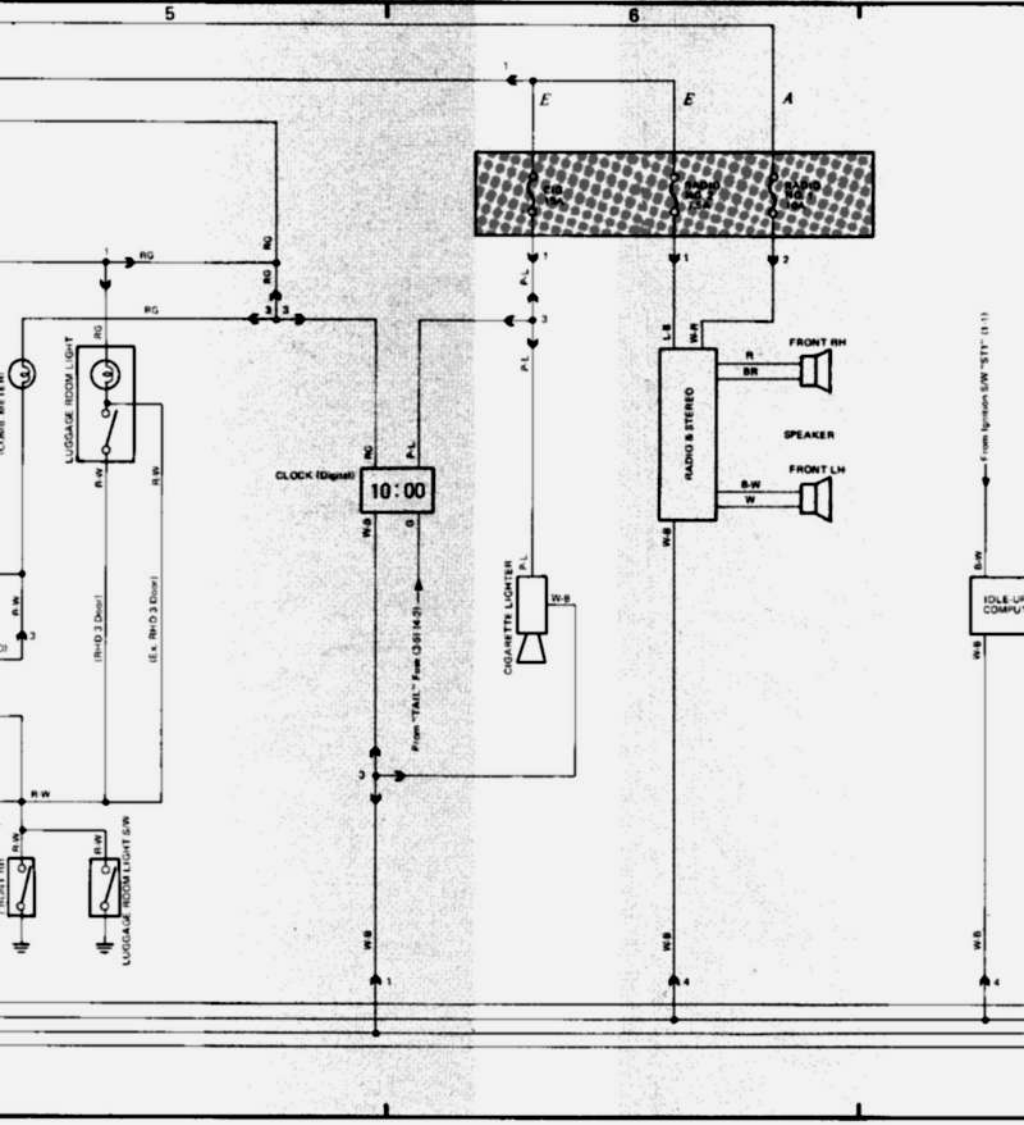
e = Located on corner of back panel

Interior Light

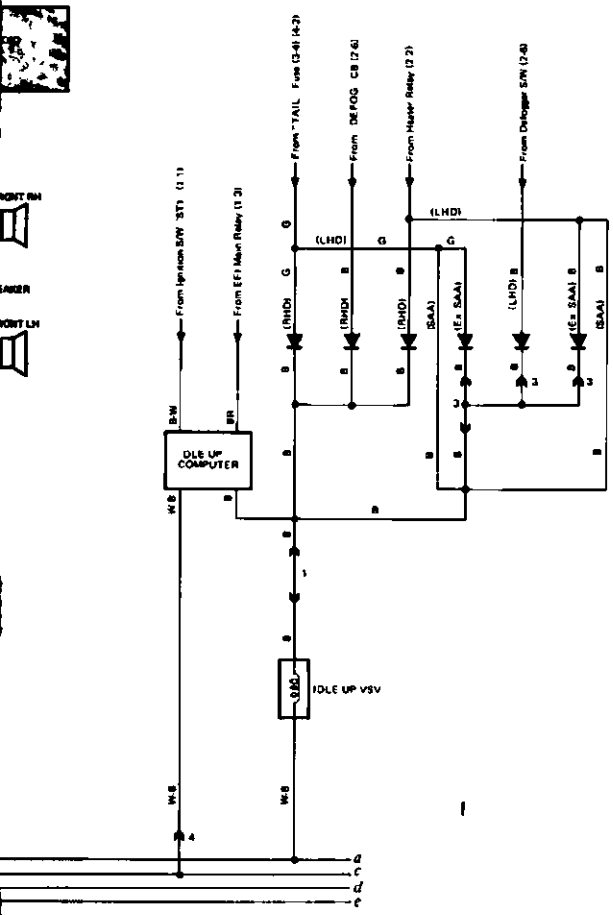
Clock

CIG. Lighter

Radio and Stereo



Idle-up


From Ignition S/W (ST) (1-1)
From EFI Main Relay (1-3)
From "TAIL" Fuse (3-4) (4-2)
From DEFOG CB (2-6)
From Heater Relay (2-2)
From Defogger S/W (2-6)
(LHD)
(RHD)
(SAA)
IDLE UP COMPUTER
IDLE UP VSV
W-B
B/W
BR
a
c
d
e