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SUZUKI

SJ413

SERVICE MANUAL

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99500-83010-01E
(英)

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RELATED SERVICE MANUAL

SERVICE MANUAL RELATED TO THIS MANUAL 99500-83010	APPLICABILITY
SJ413 SUPPLEMENTARY SERVICE MANUAL 99501-83020-18E	Vehicles equipped with carburetor, oxygen sensor and catalyst
SJ413 SUPPLEMENTARY SERVICE MANUAL 99501-83020-25E	Vehicles equipped with catalyst (but not oxygen sensor)
SJ413 SUPPLEMENTARY SERVICE MANUAL 99501-83310	Vehicles after body Nos. listed below. For European Market & Australian Market (X) JSAOSJ70000103001 (X) ~ (X) JSAOSJ70V00103001 (X) ~ (X) JSAOSJ50000190003 (X) ~ (X) JSAOSJ50V00150003 (X) ~ For Other Market SJ50-138999 ~
SJ413 SUPPLEMENTARY SERVICE MANUAL 99501-83321	Vehicles equipped with electronic fuel injection system
SJ413 SUPPLEMENTARY SERVICE MANUAL 99501-83330	Vehicles after body Nos. listed below For European/Australian Markets (X) JSAOSJ70000400001 (X) (X) JSAOSJ70V00400001 (X) For Other Markets SJ70-400001 ~

For vehicles from the very beginning of the production up to body Nos. as listed in "FOREWARD", refer to SJ413 Service Manual 99500-83000.

SERVICE MANUAL RELATED TO S/M 99500-83000	APPLICABILITY
SJ413 SUPPLEMENTARY SERVICE MANUAL 99501-83001	Vehicles equipped with oxygen sensor and catalyst
SJ413 SUPPLEMENTARY SERVICE MANUAL 99501-83010	Vehicles equipped with catalyst (but not oxygen sensor)

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FOREWORD

This service manual is applicable to vehicle not equipped with catalytic converter.

This manual contains procedures for diagnosis, maintenance adjustments, service operations, replacement of components (Service) and for disassembly and assembly of major components.

The contents are classified into sections each of which is given a section number as indicated in the Table of Contents on next page. And on the first page of each individual section is an index of that section.
This manual should be kept in a handy place for ready reference of the service work. Strict observance of the so specified items will enable one to obtain the full performance of the vehicle.

When replacing parts or servicing by disassembling, it is recommended to use SUZUKI genuine parts, tools and service materials (lubricants, sealants, etc.) as specified in each description.

All information, illustrations and specifications contained in this literature are based on the latest product information available at the time of publication approval. The right is reserved to make changes at any time without notice. And used as the main subject of description is the vehicle of standard specifications among others. Therefore, note that illustrations and photos may differ from the vehicle being actually serviced.

IMPORTANT:
It is important to note that, during any vehicle maintenance procedures, replacement fasteners must have the same measurements as those removed.
Mismatched or incorrect fasteners can result in vehicle damage or malfunction, or possible personal injury.
Therefore, fasteners removed from the vehicle should be saved for re-use whenever possible.
Where the fasteners are not satisfactory for re-use, care should be taken to select a replacement that matches the original.
Additional information concerning this subject will be found in the section 0 (METRIC INFORMATION).

This service manual is applicable to vehicles of and after the following body number.
Effective body No.:

For European Market	For Other Market
JSAOSJ70000102001	SJ50 – 135001
JSAOSJ70V00102001	SJ51 – 110001
JSAOSJ71000102001	
JSAOSJ50000170001	
JSAOSJ50V00140001	
JSAOSJ51000115001	

SUZUKI MOTOR CORPORATION
TECHNICAL DEPARTMENT
AUTOMOBILE SERVICE DIVISION

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TABLE OF CONTENTS

SECTION 0

GENERAL, SPECIAL TOOLS AND SERVICE MATERIALS

CONTENTS

0-1. LOCATIONS OF BODY NUMBER AND ENGINE NUMBER

The body number is punched on the chassis inside the tire housing on the right front side.

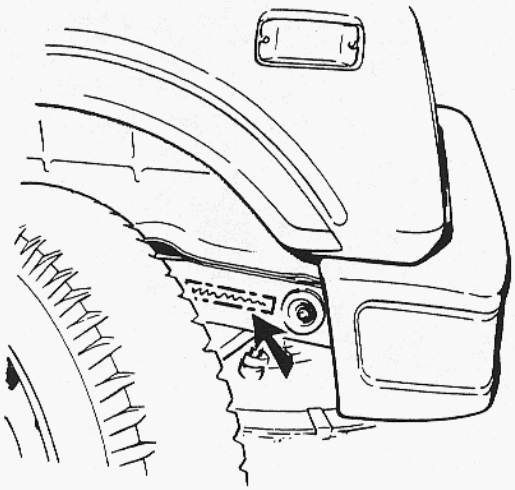


Fig. 0-1 Location of Body No.

The engine number is punched on the rear portion of the left-hand skirt part of cylinder block.

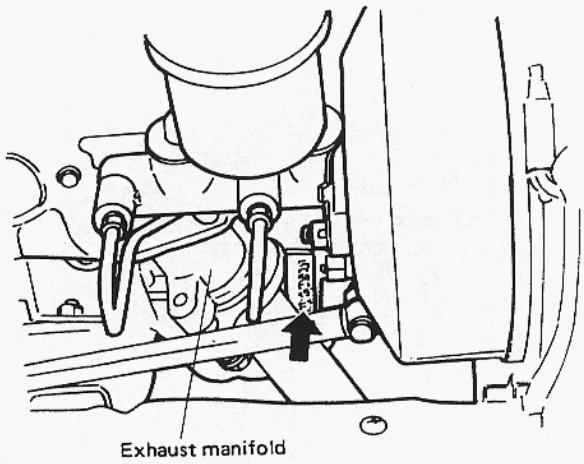


Fig. 0-2 Location of Engine No.

0-2. STANDARD SHOP PRACTICES

1. Protect painted surfaces of the body, and avoid staining or tearing seats. When working on fenders and seats, be sure to cover them up with sheets.
2. Disconnect negative terminal connection of the battery when working on any electrical part or component. This is necessary for avoiding electrical shocks and short-circuiting, and is very simple to accomplish: merely loosen wing nut on negative terminal and separate cable from terminal post.
3. In raising front or rear car end off the floor by jacking, be sure to put the jack against differential portion of axle housing.

NOTE:
Don't get on the car, get under it or service it in this state.

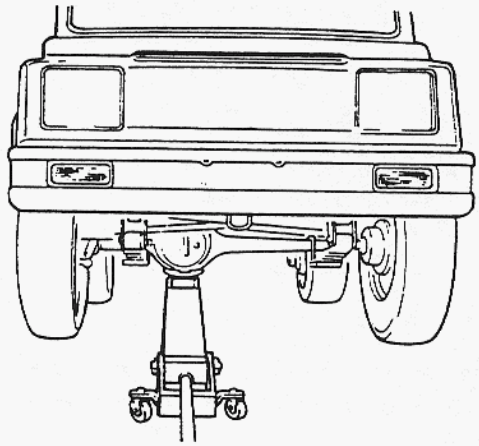


Fig. 0-3 Front Side

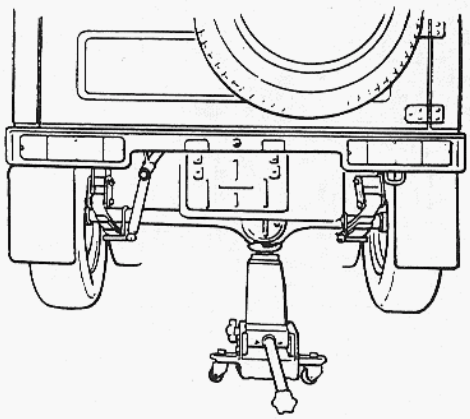


Fig. 0-4 Rear Side

4. To perform service with either front or rear car end jacked up, be sure to place safety stands under chassis frame so that body is securely supported. Refer to below figures for where to place safety stands. And then check to ensure that chassis frame does not slide on safety stands and the car is held stable for safety's sake.

WARNING:
Place chocks against both right and left wheels on the ground from both front and rear.

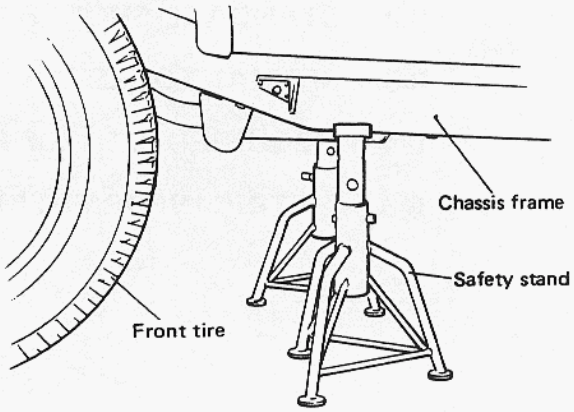


Fig. 0-5 Front Side

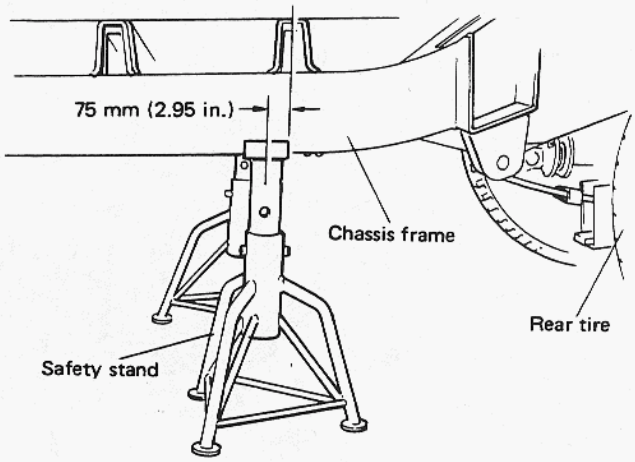


Fig. 0-6 Rear Side

5. Fig. 0-7 and 0-8 show how to lift the car by using a hoist.

WARNING:
- **When using frame contact hoist, apply hoist as shown below (right and left at the same position). Lift up the car rill 4 tires are a little off the ground and make sure that the car will not fall off by trying to move car body in both ways. Work can be started only after this confirmation.**
- **Before applying hoist to underbody, always take car balance throughout service into consideration. Car balance on hoist may change depending of what part to be removed.**
- **For suspention parts removal, follow previous steps 3 and 4.**
- **Make absolutely sure to lock hoist after car is hoisted up.**

When using frame contact hoist:

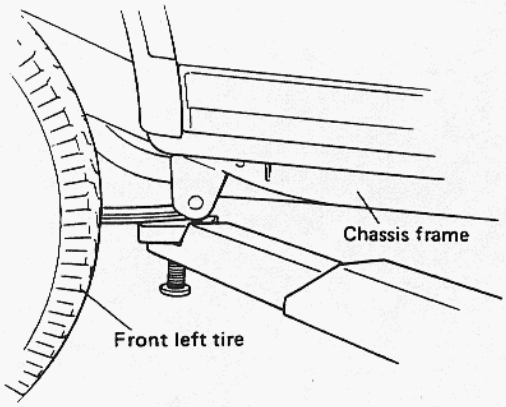


Fig. 0-7 Front Support Location

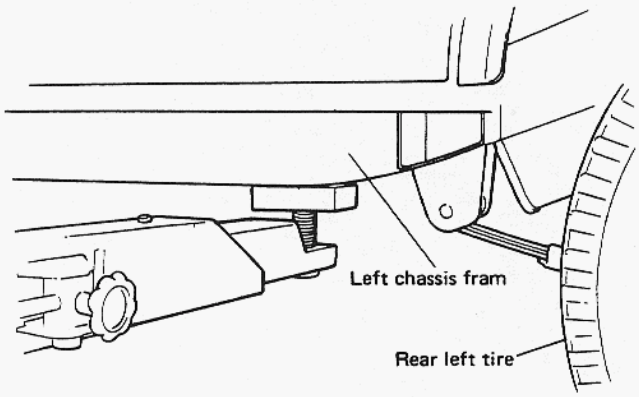


Fig. 0-8 Rear Support Location

6. Orderliness is a key to successful overhauling. Trays, pans and shelves are needed to set aside disassembled parts in groups or sets in order to avoid confusion and misplacement. This is particularly important for engine overhauling.
7. Have on hand liquid packing—SUZUKI BOND No. 1215 (99000-31110) – for ready use. This packing dope is an essential item to assure leak-free (water and oil) workmanship.
8. Each bolt must be put back to where it was taken from or for which it is intended. Do not depend on your hunch in tightening bolts for which tightening torque values are specified: be sure to use torque wrenches on those bolts.
9. It is advisable to discard and scrap gaskets and "O" rings removed in disassembly. Use new ones in reassembly, and try not to economize gaskets and "O" rings.
10. Use of genuine SUZUKI parts is imperative. Use of imitation parts is a big gamble on safety and performance. Use genuine SUZUKI parts and live up to the trust your customer places on you.
11. Special tools save time and ensure good workmanship: They are available from SUZUKI. Use them where their use is specified. Moreover, your own safety is assured by the use of special tools in many of the disassembly and reassembly steps.

12. Refer to the contents of this MANUAL as often as practical, and do each job properly as prescribed.

NOTE:

Engine cylinders are identified by numbers. See Fig. 0-9. Counting from the front end, the cylinders are referred to as No. 1, No. 2, No. 3 and No. 4 cylinders.

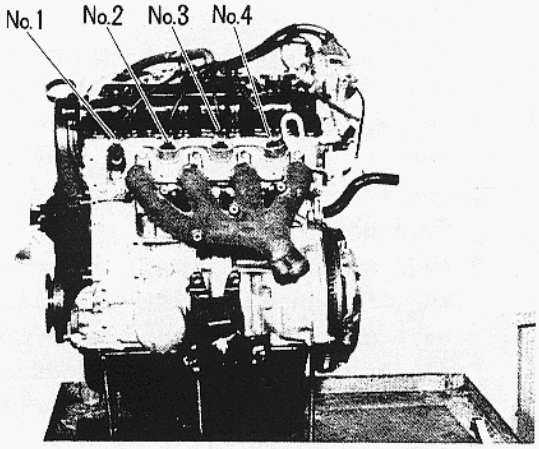
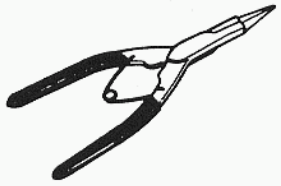
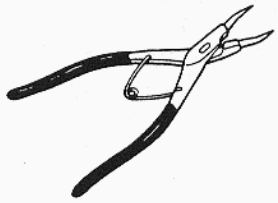
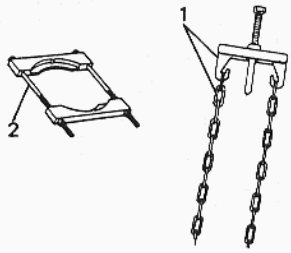
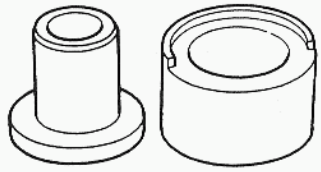
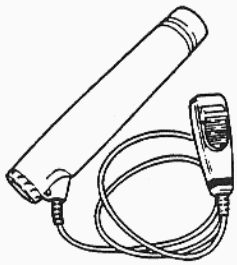
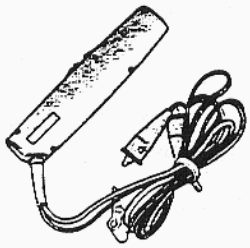
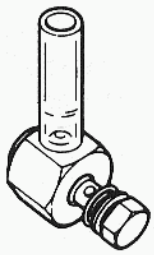
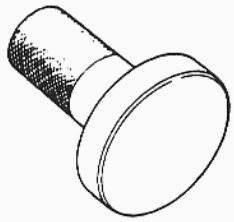
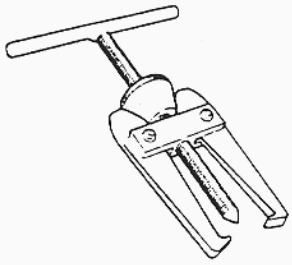
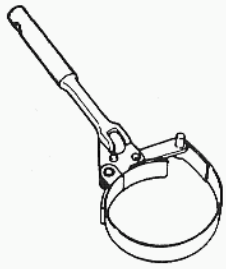
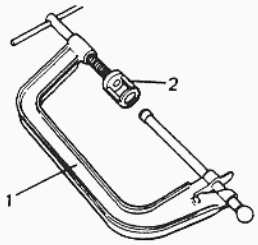
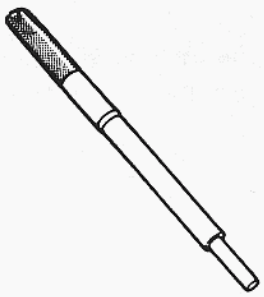


Fig. 0-9 Engine Cylinder Numbers

0-3. SPECIAL TOOLS

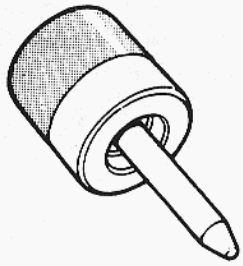
Special tools assure three things: 1) improved workmanship; 2) speedy execution of jobs for which they are meant; and 3) protection of parts and components against damage. Here are the special tools prescribed for this Model:

 09900-06107 Snap ring plier (opening type)	 09900-06108 Snap ring plier (closing type)	 1. 09927-18410 Universal puller 2. 09921-57810 Bearing remover	 09926-48010 Universal joint assembler
 09900-27311 Timing light (Dry cell type)	 09900-27301 Timing light (D.C. 12V)	 09932-28211 Carburetor float level gauge	 09913-75510 Differential rear outer race installer
 09913-60910 Bearing puller	 09918-38310 Carburetor adjuster set	 09915-47310 Oil filter wrench	 1. 09916-14510 Valve lifter 2. 09916-48210 Valve lifter attachment

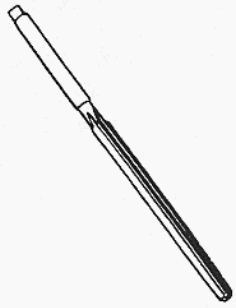


09916-44511
Valve guide remover

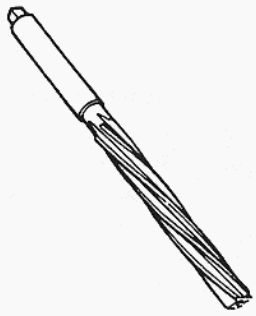
09917-88210
Valve guide installer



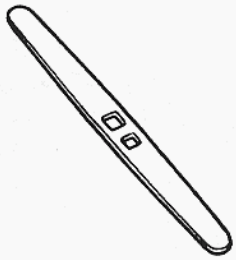
09917-98210
Valve stem seal installer



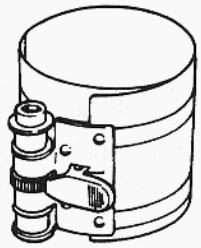
09916-34520
Reamer (7 mm)



09916-37310
Reamer (12 mm)

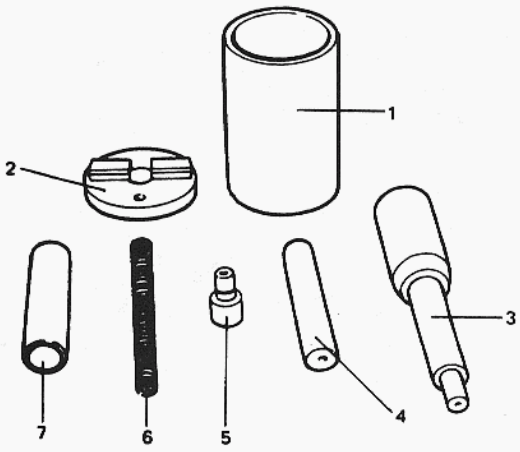


09916-34541
Reamer handle



09916-77310
Piston ring compressor

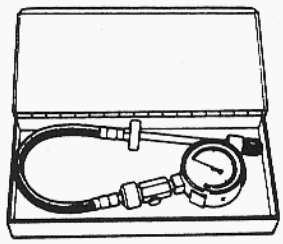
09916-84510
Forceps



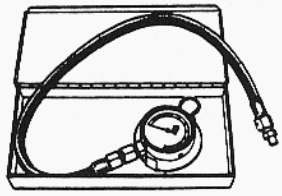
09910-38210
Piston pin remover and installer

1. Base
2. Base cap
3. Driver handle
4. Piston pin guide for installation
5. Piston pin guide for removal
6. Spring
7. Spring guide

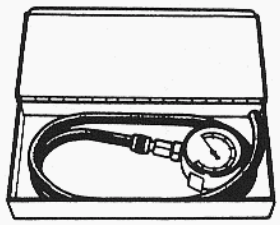
09916-57321
Valve guide installer handle



09915-64510
Compression gauge

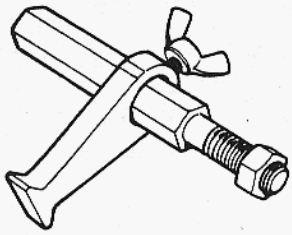


09915-77310
Oil pressure gauge

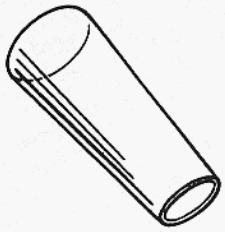


09915-67310
Vacuum gauge

09917-68210
Camshaft lock holder

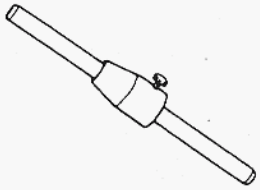


09924-17810
Flywheel holder

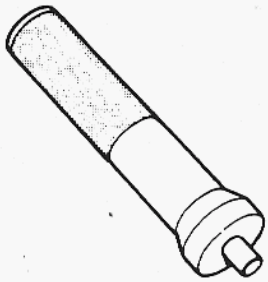


09926-18210
Oil seal guide (Vinyl resin)

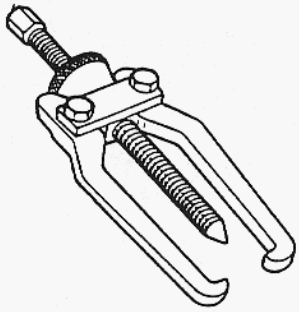
09917-58010
Bearing remover
(for input shaft bearing)



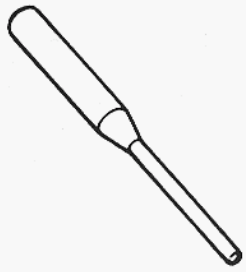
09923-36330
Clutch center guide



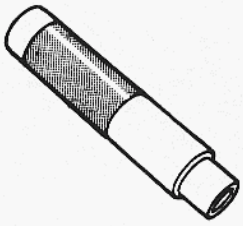
09925-98210
Input shaft bearing
installer



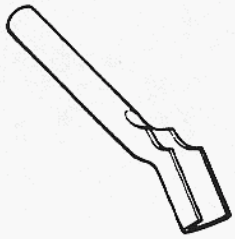
09913-65135
Transmission and transfer
bearing and gear remover



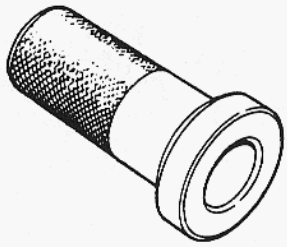
09922-85811
Spring pin remover
(4.5 mm)



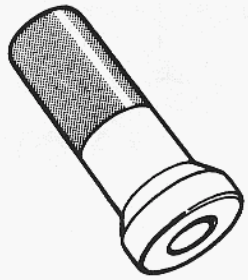
09925-18010
Transmission gear, bush
and bearing installer



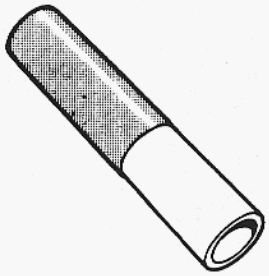
09925-48210
Clutch release bush
remover



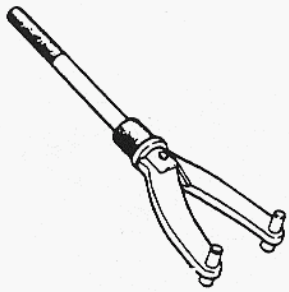
09913-75810
Transfer bearing installer



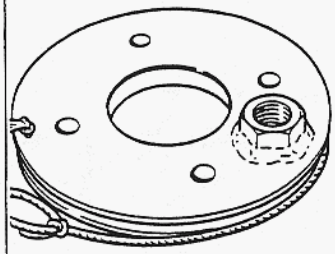
09913-76010
Transfer bearing installer



09913-84510
Transfer bearing installer

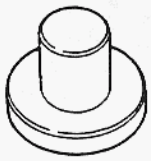


09930-40113
- Transfer flange lock holder
- Differential side bearing adjuster

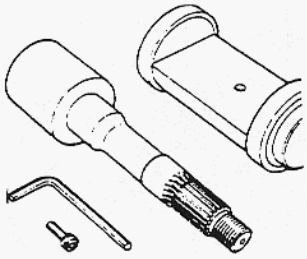


09922-75221
- Center brake drum lock holder
- Differential bearing preload checking tool

09926-58010
Bearing puller attachment (transfer)

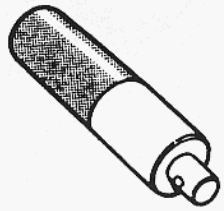


09913-85230
Differential side bearing remover jig

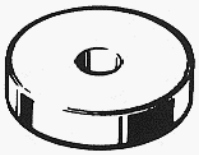


09926-78310
Differential bevel pinion mounting dummy

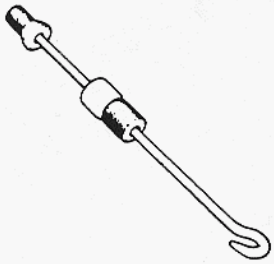
09940-53111
Differential side bearing installer



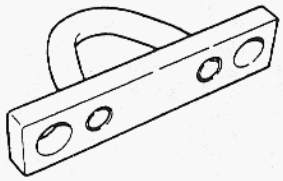
09924-74510
Bearing installer attachment



09926-68310
Differential pinion bearing installer

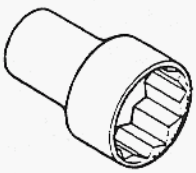


09942-15510
Sliding hammer

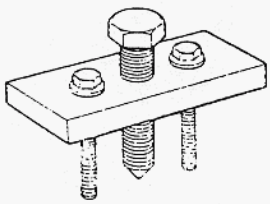


09922-66010
Rear axle shaft remover

09943-35511
Brake drum remover



09941-58010
50 mm socket wrench



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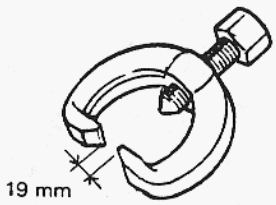
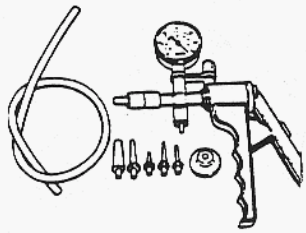
Steering wheel remover

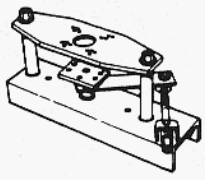


09913-65210
Tie-rod end remover

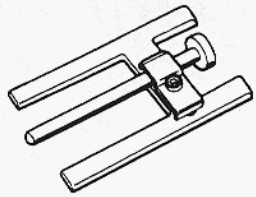


09917-47910
Vacuum pump gauge

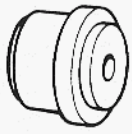
09950-78210
Flare nut wrench (10 mm)



09950-88210
Booster overhaul tool set



09950-98210
Booster piston rod gauge



No. 1
09951-08210

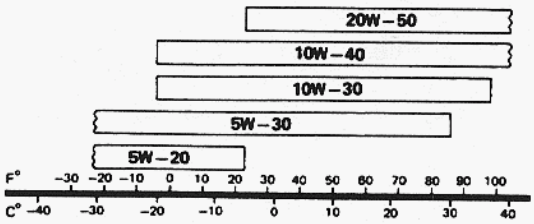
No. 2
09951-18210

Booster No. 2 body
Oil seal remover &
Installer No. 1, No. 2

0-4. REQUIRED SERVICE MATERIALS

The materials listed below are needed for maintenance work on these cars, and should be kept on hand for ready use. In addition, such standard materials as cleaning fluids, lubricants, etc., should also be available. Methods and time of use are discussed in the text of this manual on later pages.

Ref. No.	Material		Use
1.	GOLDEN CRUISER 1200 "Anti-freeze/Anti-corrosion Coolant"		Additive to engine cooling system for improving cooling efficiency and for protection of wet walls against rusting.
2.	SUZUKI SUPER GREASE A (99000-25010)		• For locations indicated in the section dealing with the starter motor. • Clutch release bearing retainer. • Clutch release shaft bushing. • Transmission oil seal. • Differential oil seal. • Wheel bearings. • Gear shifting control lever bushing & seat. • Door window regulators. • For other locations specifically indicated in the test of this manual.
3.	SUZUKI GREASE SUPER H (99000-25120)		Special grease intended for use on constant velocity joints.
4.	SUZUKI BOND NO. 1215 (99000-31110)		• For top and bottom mating faces of transmission case. • For other locations specifically indicated in the text of this manual.

5.	CHASSIS GREASE	• For grease nipples on propeller shafts. • For propeller shaft splines.
6.	GEAR OIL SAE 90, 80W or 75W 80 – 85 for cars used in such areas where the ambient temperature becomes lower than –15°C (5°F) during the coldest season, it is recommended that oils be changed with SAE80W or 75W/80 – 85 oils on such occasion of service as periodic maintenance.	• Transmission case 1.3 ltr. (2.7/2.3 US/Imp. pt.) • Transmission gear and bearing • Transfer case 0.8 ltr. (1.7/1.4 US/Imp. pt.) • Steering gear box • Differential gear box (Hypoid gear oil) Rear 1.5 ltr. (3.2/2.6 US/Imp. pt.) Front 2.0 ltr. (4.2/3.5 US/Imp. pt.)
7.	SEALANT (99000-31150)	• For mating surfaces of engine oil pan and cylinder block.
8.	4-STROKE ENGINE OIL It is recommended to use engine oil of SD, SE or SF class. **Proper Engine Oil Viscosity Chart**  **Temperature**	• For engine oil pan: (For periodical oil change) • Crank journal bearings and thrust plate. • Connecting-rod big-end and small-end bearings. • Camshaft journals. • Rocker shafts. • Oil pump gears. • Pistons and piston rings. • Engine oil seals. • Valve stems. • Accelerator, choke (if equiped) and clutch cables. • Parking brake cable. • Accelerator, brake and clutch pedal shafts. • Door locks and hinges. • Distributor gear.

9.	SEALING COMPOUND "CEMEDINE" 366E (Water tight sealant) (99000-31090) 180 mℓ		• King pin shim face. • For steering knuckle (rear axle housing) and brake packing plate mating surface. • For other locations specifically indicated in the text of this manual.
10.	THREAD LOCK CEMENT SUPER 1333B (99000-32020)		• Transmission reverse gear shift lim bolt. • Gear shift lever locating bolt. • Differential drive bevel gear bolt.
11.	BRAKE FLUID "DOT3" or SAE J1703		• To fill master cylinder reservoir. • To clean and apply to inner parts of master cylinder, caliper and wheel cylinder when they are disassembled.
12.	SILICONE GREASE (Furnished in repair kit)		• To apply to brake booster inner parts where application is instructed in this manual.
13.	THREAD LOCK CEMENT "1342" (99000-32050)		• King pin bolt
14.	SUZUKI SUPER GREASE I (99000-25210)		• Transmission input shaft
15.	SUZUKI SUPER GREASE C (99000-25030)		• Propeller shaft spider bearing

0-5. METRIC INFORMATION

METRIC FASTENERS

Most of the fasteners used for this vehicle are metric. When replacing any fasteners, it is most important that replacement fasteners be the correct diameter, thread pitch and strength.

FASTENER STRENGTH IDENTIFICATION

Most commonly used metric fastener strength property classes are 4T, 7T and radial line with the class identification embossed on the head of each bolt. Some metric nuts will be marked with punch mark strength identification on the nut face. Fig. 0-10 shows the different strength markings.

When replacing metric fasteners, be careful to use bolts and nuts of the same strength or greater than the original fasteners (the same number marking or higher). It is likewise important to select replacement fasteners of the correct size. Correct replacement bolts and nuts are available through the parts division.

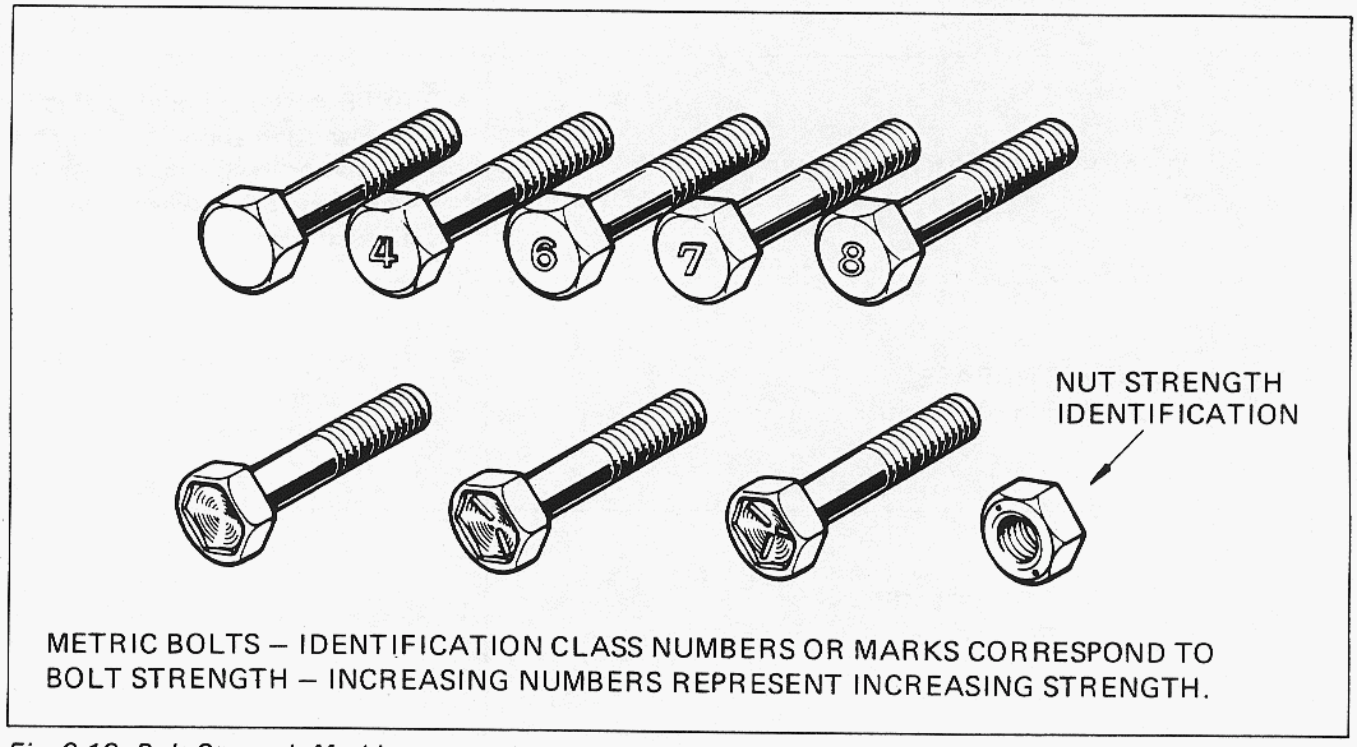


Fig. 0-10 Bolt Strength Markings

STANDARD TIGHTENING TORQUE

Each fastener should be tightened to the torque specified in each section of this manual. If no description or specification is provided, refer to the following tightening torque chart for the applicable torque for each fastener. When a fastener of greater strength than the original one is used, however, use the torque specified for the original fastener.

NOTE:

- **For the flanged bolt and nut, add 10% to the tightening torque given in the below chart.**
- **The below chart is applicable only where the fastened parts are made of steel or light alloy.**

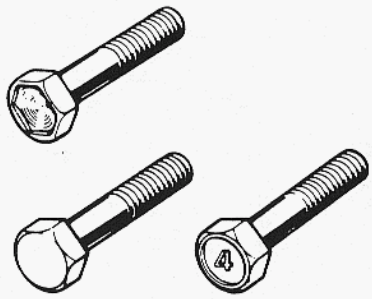
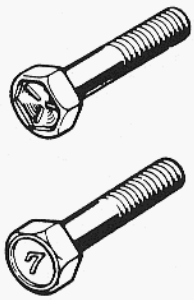
STRENGTH / THREAD DIAMETER (mm)	 Conventional bolt "4T" bolt			 "7T" bolt		
	N·m	kg-m	lb-ft	N·m	kg-m	lb-ft
4	1 – 2	0.1 – 0.2	0.7 – 1.0	1.5 – 3.0	0.15 – 0.30	1.5 – 2.0
5	2 – 4	0.2 – 0.4	1.5 – 3.0	3 – 6	0.3 – 0.6	2.5 – 4.0
6	4 – 7	0.4 – 0.7	3.0 – 5.0	8 – 12	0.8 – 1.2	6.0 – 8.5
8	10 – 16	1.0 – 1.6	7.5 – 11.5	18 – 28	1.8 – 2.8	13.5 – 20.0
10	22 – 35	2.2 – 3.5	16.0 – 25.0	40 – 60	4.0 – 6.0	29.0 – 43.0
12	35 – 55	3.5 – 5.5	25.5 – 39.5	70 – 100	7.0 – 10.0	51.0 – 72.0
14	50 – 80	5.0 – 8.0	36.5 – 57.5	110 – 160	11.0 – 16.0	80.0 – 115.5
16	80 – 130	8.0 – 13.0	58.0 – 94.0	170 – 250	17.0 – 25.0	123.0 – 180.5
18	130 – 190	13.0 – 19.0	94.5 – 137.0	200 – 280	20.0 – 28.0	145.0 – 202.5

Fig. 0-11 Tightening Torque Chart

SECTION 1

PERIODIC MAINTENANCE SERVICE

CONTENTS

1-1. MAINTENANCE SCHEDULE

Interval: This interval should be judged by odometer reading or months, whichever comes first.		This table includes services as scheduled up to 80,000 km (48,000 miles) mileage. Beyond 80,000 km (48,000 miles), carry out the same services at the same intervals respectively.								
	km (x 1,000)	1	10	20	30	40	50	60	70	80
	miles (x 1,000)	1	6	12	18	24	30	36	42	48
	months	1	6	12	18	24	30	36	42	48
ENGINE										
1. Water pump (fan) drive belt (tension, damage)		I	–	I	–	R	–	I	–	R
*2. Camshaft timing belt		–	–	–	–	I	–	–	–	I
3. Valve lash (clearance)		I	–	I	–	I	–	I	–	I
4. Engine bolts (All cylinder head and manifold fixings)		–	–	–	–	T	–	–	–	T
5. Engine oil filter		R	R	R	R	R	R	R	R	R
6. Engine oil	API Grade SD, SE or SF	R	Replace every 10,000 km (6,000 miles)							
	API Grade SC	R	Replace every 5,000 km (3,000 miles)							
7. Engine coolant		–	–	–	–	R	–	–	–	R
8. Cooling system hoses and connections		–	–	I	–	I	–	I	–	I
9. Exhaust pipes and mountings (leakage, damage, tightness)		–	–	I	–	I	–	I	–	I
IGNITION										
10. Ignition wiring (high tension cords)		–	–	I	–	I	–	I	–	I
11. Distributor cap and rotor (crack, wear)		–	–	I	–	I	–	I	–	I
12. Spark plugs		–	R	R	R	R	R	R	R	R
13. Ignition timing		I	I	I	I	I	I	I	I	I
14. Distributor advance		–	–	I	–	I	–	I	–	I
FUEL SYSTEM										
15. Air cleaner filter element	Paved-road	Clean every 10,000 km (6,000 miles)								
	Dusty condition	Clean every 2,500 km (1,500 miles) or as required Replace every 40,000 km (24,000 miles) More frequent replacement if under dusty driving conditions.								
16. Carburetor choke system		–	I&L	I&L	I&L	I&L	I&L	I&L	I&L	I&L
17. Fuel tank cap, gas lines and connections		I	–	–	–	I	–	–	–	I
18. Fuel filter		–	–	–	–	R	–	–	–	R
19. Idle speed and idle mixture		I	–	I	–	I	–	I	–	I

**Item 2 is applicable to the car whose owner's manual specifies to inspect about this item in its periodic maintenance schedule.*

Interval. This interval should be judged by odometer reading or months, whichever comes first.	This table includes services as scheduled up to 80,000 km (48,000 miles) mileage. Beyond 80,000 km (48,000 miles), carry out the same services at the same intervals respectively.									
	km (x 1,000)	1	10	20	30	40	50	60	70	80
	miles (x 1,000)	1	6	12	18	24	30	36	42	48
	months	1	6	12	18	24	30	36	42	48
EMISSION CONTROL SYSTEM										
20. Crankcase ventilation hoses and connections		–	–	I	–	I	–	I	–	I
*21. PCV valve		–	–	–	–	I	–	–	–	I
22. Fuel vapor storage system, hoses and connections		–	–	I	–	I	–	I	–	I
ELECTRICAL										
23. Wiring harness connections and headlights		–	–	I	–	I	–	I	–	I
CHASSIS AND BODY										
24. Clutch pedal (travel and height)		I	I	I	I	I	I	I	I	I
25. Brake discs and pads (wear, damage) Brake drums and shoes (wear, damage)		–	I	I	I	I	I	I	I	I
26. Brake hoses and pipes (leakage, damage, clamp)		–	I	I	I	I	I	I	I	I
27. Brake fluid		I	I	I	I	R	I	I	I	R
28. Brake pedal		I	I	I	I	I	I	I	I	I
29. Brake lever and cable		I	I	I	I	I	I	I	I	I
30. Tires (abnormal wear and pressure)		–	I	I	I	I	I	I	I	I
31. Wheels, wheel nuts [and free wheeling hubs (Optional parts)]		I	I	I	I	I	I	I	I	I
32. Shock absorbers		I	I	I	I	I	I	I	I	I
33. Propeller shafts		–	–	I&L	–	I&L	–	I&L	–	I&L
34. Transmission, (transfer) and differential oil (leakage, level)		R	I	I	I	R	I	I	I	R
*35. Axle hub oil seals		–	R	R	R	R	R	R	R	R
36. Suspension (Tightness, damage, rattle)		T	–	T	–	T	–	T	–	T
37. Steering condition (Tightness, damage, breakage, rattle)		I	I	I	I	I	I	I	I	I
38. Test drive		Test drive on completion of each service								

** Item 21 is applicable to the car equipped with a PCV valve on the intake manifold.*

** Item 35 is applicable to the car driven under severe conditions (off-road or muddy conditions).*

NOTE:

"R" : Replace or Change

"I" : Inspect and correct or replace if necessary

"T" : Tighten to the specified torque

"L" : Lubricate

1-2. ENGINE

1. WATER PUMP BELT INSPECTION

1) Disconnect negative battery lead at battery.
2) Inspect belt for cracks, cuts, deformation, wear and cleanliness. Check belt for tension. The belt is in proper tension if it deflects 6 to 9 mm (0.24 – 0.35 in.) under thumb pressure (about 10 kg or 22 lb.).

Belt tension specification	6 – 9 mm (0.24 – 0.35 in.) as deflection

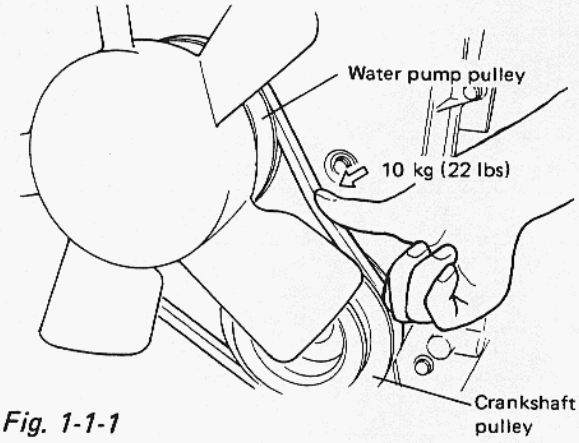


Fig. 1-1-1

3) If the belt is too tight or too loose, adjust it to specification by adjusting alternator position.

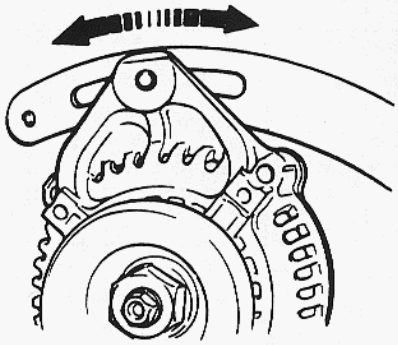


Fig. 1-1-2

4) Tighten alternator adjusting bolt and pivot bolt.
5) If belt replacement is necessary, refer to p. 6-5 of SECTION 6 for the procedure.
6) Connect negative battery lead to battery.

WARNING:
All adjustments noted above are to be performed with ENGINE NOT RUNNING.

2. CAMSHAFT TIMING BELT INSPECTION

1) Disconnect negative battery lead at battery.
2) Loosen fan drive belt, and remove 4 bolts securing radiator shroud panel and 4 nuts securing engine cooling fan. Then remove radiator shroud and cooling fan at the same time.

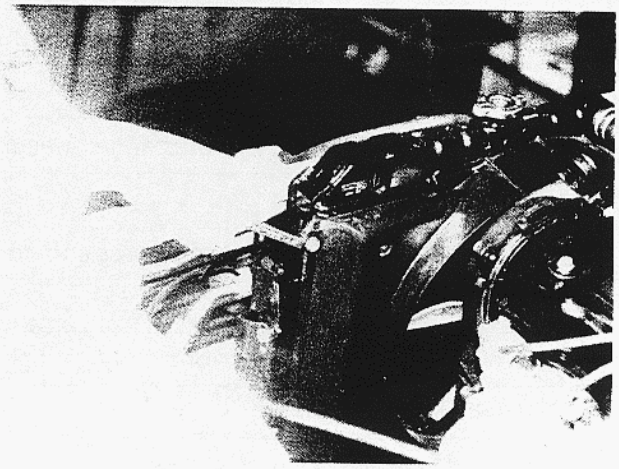
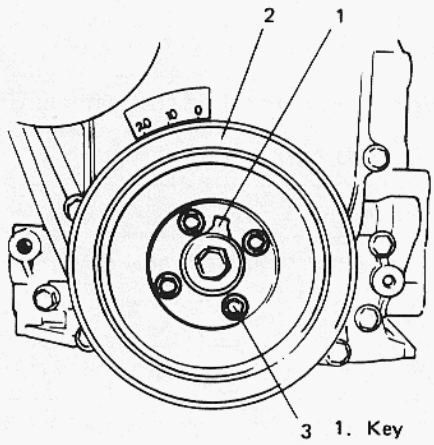


Fig. 1-2-1

3) Remove water pump belt and pump pulley.
4) Remove crankshaft pulley by removing 4 pulley bolts. The crankshaft timing belt pulley bolt at the center need not be loosened.



1. Key
2. Crankshaft pulley
3. Pulley bolt

Fig. 1-2-2

5) Remove timing belt outside cover. Inspect the belt for damage or wear. When any damage or wear is found on the belt, replace it.
   If belt replacement is necessary, be sure to install the belt properly, referring to p. 3-48 to p. 3-51 for installation procedure.
   Tighten each bolt and nut to specified torque.
6) Install timing belt outside cover and torque bolts and nut to specification. (Refer to p. 3-58 for torque data.)
7) Install crankshaft pulley and torque bolts to specification. (Refer to p. 3-58 for torque data.)
8) Install water pump pulley and belt.
9) Install radiator shroud and cooling fan.
10) Adjust water pump belt tension to specification. (Refer to p. 1-4.)
11) Connect negative battery lead to battery.

3. VALVE LASH INSPECTION

1) Remove cylinder head cover.
2) Inspect intake and exhaust valve lash and adjust as necessary.

		When cold (Coolant temperature is 15 – 25°C or 59 – 77°F)	When hot (Coolant temperature is 60 – 68°C or 140 – 154°F)
Valve lash (gap A) specification	Intake	0.13 - 0.17 mm (0.0051 - 0.0067 in)	0.23 - 0.27 mm (0.009 - 0.011 in)
	Exhaust	0.16 - 0.20 mm (0.0063 - 0.0079 in)	0.26 - 0.30 mm (0.0102 - 0.0118 in)

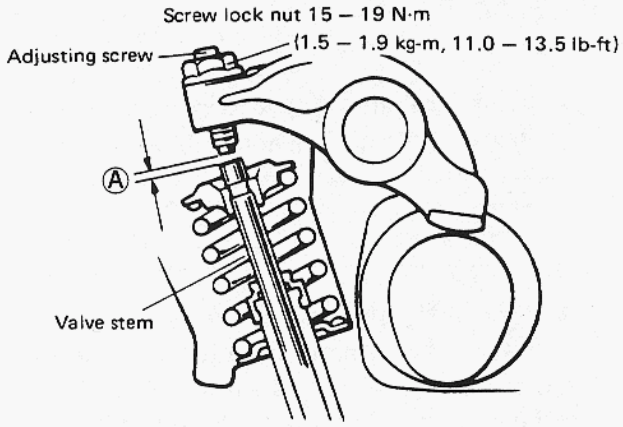


Fig. 1-3-1

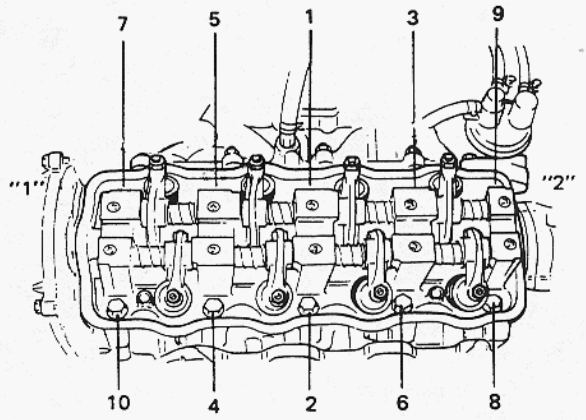
3) Refer to 3-53 of SECTION 3 for valve lash inspection and adjustment procedures.
4) Install cylinder head cover and tighten bolts to specification. (Refer to item 4)

4. ENGINE BOLTS (ALL CYLINDER HEAD AND MANIFOLD FIXINGS)

1) To check cylinder head bolts, head cover must be removed. The tightening torque for the cylinder head bolts is as follows.

Tightening torque for cylinder head bolts	N·m	kg-m	lb-ft
	63–70	6.3–7.0	46.0–50.5

2) When securing cylinder head or when retightening these bolts, torque each bolt in such a way as to equalize the pressure throughout gasketed surface. The tightening sequence is as shown below.



"1" Camshaft pulley side
"2" Distributor side

Fig. 1-4-1 Tightening Sequence of Cylinder Head Bolts

3) Cylinder-head cover bolt should be tightened to the following torque:

Tightening torque for cylinder head cover bolts	N·m	kg-m	lb-ft
	4 – 5	0.4 – 0.5	3.0 – 3.5

4) Check the intake and exhaust manifold nuts for tightness and retighten them as necessary.

Tightening torque

	N·m	kg-m	lb-ft
Exhaust manifold nut	18–28	1.8–2.8	13.5–20.0
Intake manifold nut	18–28	1.8–2.8	13.5–20.0

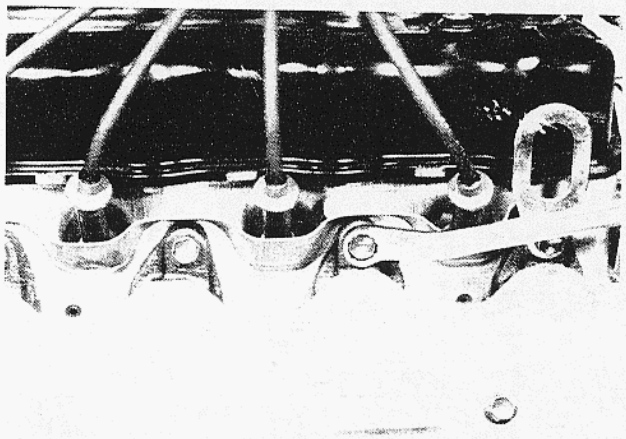


Fig. 1-4-2

5. ENGINE OIL FILTER CHANGE

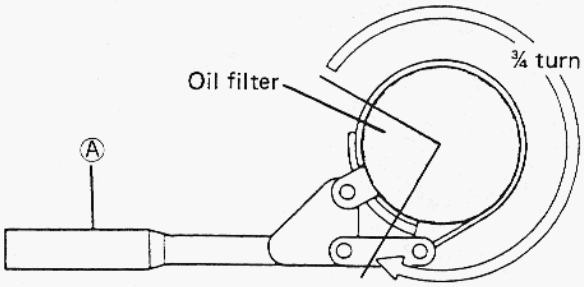
1) Loosen oil filter by using oil filter wrench "A" (special tool 09915-47310).

NOTE:
Before fitting new oil filter, be sure to oil its "O" ring Use engine oil for this purpose.

2) Screw new filter on oil filter stand by hand until the filter"O"ring contacts the mounting surface.

CAUTION:
To tighten the oil filter properly, it is important to accurately identify the position at which the filter "O" ring first contacts the mounting surface.

3) Tighten the filter ¾ turn from the point of contact with the mounting surface using an oil filter wrench Ⓐ.



Oil filter wrench Ⓐ (09915-47310)

CAUTION:
To prevent oil leakage, make sure that the oil filter is tight, but do not overtighten it.

4) After installing oil filter, start engine and check oil filter for oil leakage.

6. ENGINE OIL CHANGE

Before draining engine oil, check engine for oil leakage. If any evidence of leakage is found, make sure to correct defective part before proceeding to the following work.

1) Drain engine oil by removing drain plug.

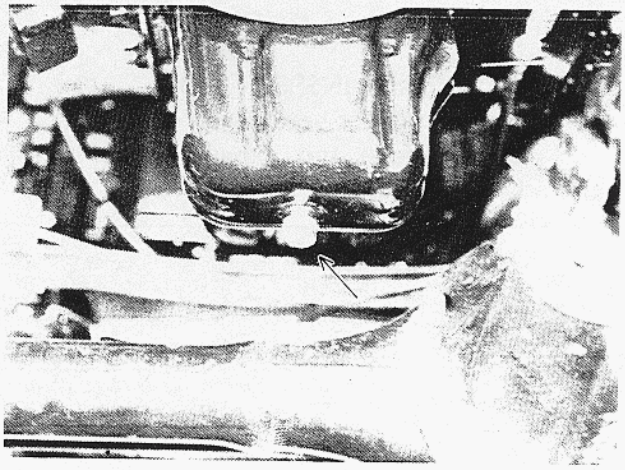


Fig. 1-6-1

2) After draining oil, wipe drain plug clean. Reinstall drain plug, and tighten it securely.

Tightening torque for oil drain plug	N·m	kg-m	lb-ft
	30–40	3.0–4.0	22.0–28.5

3) Replenish oil until oil level is brought to FULL level mark on dipstick. (about 3.5 liters or 7.4/6.2 US/Imp pt.). The filler inlet is atop the cylinder head cover.

4) Start engine and run it for three minutes. Stop engine and wait another three minutes before checking oil level. Add oil, as necessary, to bring oil level to FULL level mark on dip stick.

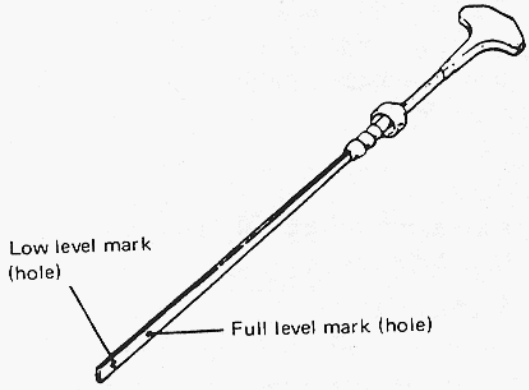


Fig. 1-6-2

NOTE:
Steps 1) – 3) outlined above must be performed with ENGINE NOT RUNNING. For step 4), be sure to have adequate ventilation while engine is running.

It is recommended to use engine oil of SD, SE or SF class.

Proper Engine Oil Viscosity Chart

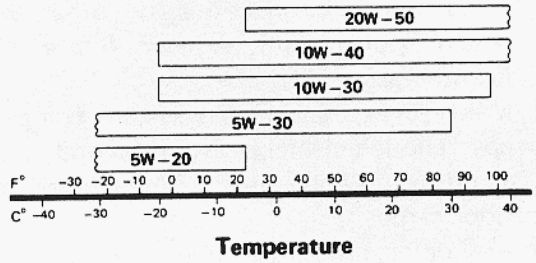


Fig. 1-6-3 Engine Oil Viscosity Chart

Engine oil capacity

Oil pan capacity	3.5 liters (7.4/6.2 US/Imp pt.)
Oil filter capacity	0.2 liters (0.4/0.3 US/Imp pt.)
Others	0.3 liters (0.6/0.5 US/Imp pt.)
Total	4.0 liters (8.4/7.0 US/Imp pt.)

7. ENGINE COOLANT CHANGE

WARNING:
To help avoid danger of being burned, do not remove radiator cap while engine and radiator are still hot. Scalding fluid and steam can be blown out under pressure if the cap is taken off too soon.

1) Remove radiator cap when engine is cool:
2) Loosen radiator drain plug ① to drain coolant.
3) Remove reservoir tank ②, which is on the side of radiator, and drain.
4) Reinstall plug ① securing it properly in place. Also reinstall reservoir tank.

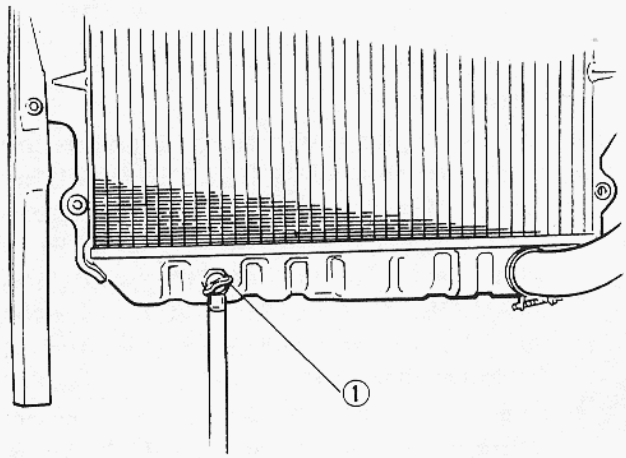


Fig. 1-7-1

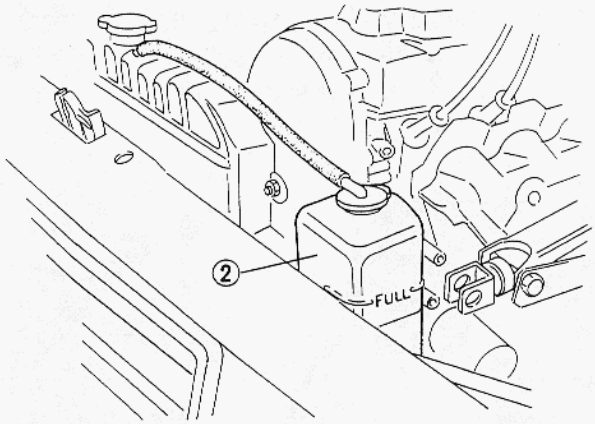


Fig. 1-7-2

5) Fill radiator with specified amount of coolant, and run engine for 2 or 3 minutes at idle. This drives out any air which may still be trapped within cooling system. STOP ENGINE. Add coolant as necessary until coolant level reaches the filler throat of radiator. Reinstall radiator cap.
6) Add coolant to reservoir tank so that the level aligns with Full mark.

COOLANT CAPACITY	
Engine, radiator and heater	4.4 liters (9.3/7.7 US/Imp pt.)
Reservoir tank	0.6 liters (1.3/1.1 US/Imp pt.)
Total	5.0 liters (10.6/8.8 US/Imp pt.)

CAUTION:
When changing engine coolant, use mixture of 50% water and 50% GOLDEN CRUISER 1200 for the market where ambient temperature falls lower than −16°C (3°F) in winter and mixture of 70% water and 30% GOLDEN CRUISER 1200 for the market where ambient temperature doesn't fall lower than −16°C (3°F).
Even in a market where no freezing temperature is anticipated, mixture of 70% water and 30% GOLDEN CRUISER 1200 should be used for the purpose of corrosion protection and lubrication.

8. COOLING SYSTEM HOSES INSPECTION

1) Visually inspect cooling system hoses for any evidence of leakage and cracks. Examine them for damage, and check connection clamps for tightness.

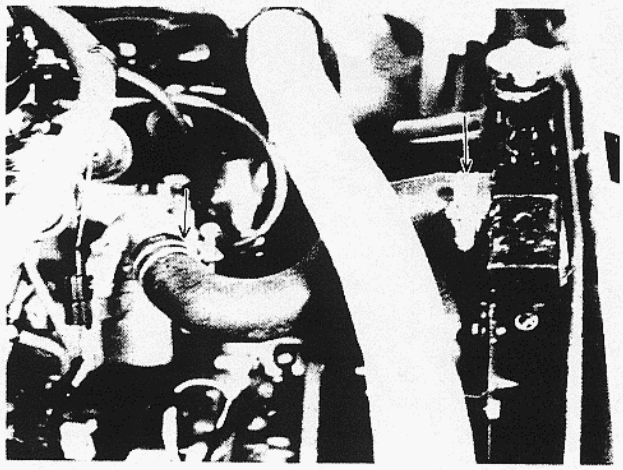


Fig. 1-8-1

2) Replace all hoses which show evidence of leakage, cracks or other damage. Replace all clamps which cannot maintain proper tightness.

9. EXHAUST PIPES AND MOUNTINGS INSPECTION

WARNING:
To avoid danger of being burned, do not touch exhaust system when system is hot. Any service on exhaust system should be performed when system is cool.

When carrying out periodic maintenance, or the car is raised for other service, check exhaust system as follows:

- Check rubber mountings for damage, deterioration, and out of position.
- Check exhaust system for leakage, loose connections, dents, and damages.
  If bolts or nuts are loose, tighten them to specification. Refer to below chart for torque specification.
- Check nearby body areas for damaged, missing, or mispositioned parts, open seams, holes, loose connections or other defects which could permit exhaust fumes to seep into the car.
- Make sure that exhaust system components have enough clearance from the underbody to avoid overheating and possible damage to the floor carpet.
- Any defects should be fixed at once.

Bolts and nut	Tightening torque
Exhaust pipe bolts	40 – 60 N·m 4.0 – 6.0 kg-m 29.0 – 43.0 lb-ft
Muffler nuts	18 – 28 N·m 1.8 – 2.8 kg-m 13.5 – 20.0 lb-ft

1-3. IGNITION SYSTEM

10. IGNITION WIRING (High Tension Cords) INSPECTION

1) Inspect high-tension cords for cracks and check that their connections are secure.
2) Measure resistance of high-tension cords by using a circuit tester (special tool 09900-25002).

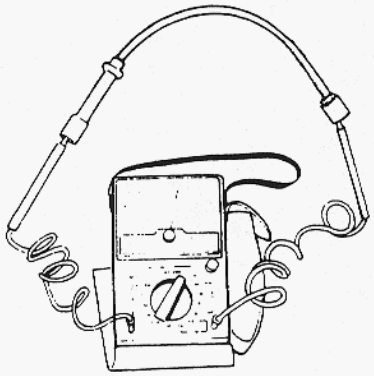


Fig. 1-10-1

3) Replace high-tension cords that show evidence of deterioration.

NOTE:
Check to make sure that each of the high tension cord terminals and connections is secure and fully inserted into its mating component. Any burnt fitting must be replaced.

HIGH-TENSION CORD RESISTANCE	
Standard	16 kΩ/3.3 ft (1 m)
Service limit	20 kΩ/pc.

11. DISTRIBUTOR CAP AND ROTOR INSPECTION

1) Inspect distributor cap and rubber caps for cracks.
2) Inspect center electrode and terminals for wear.

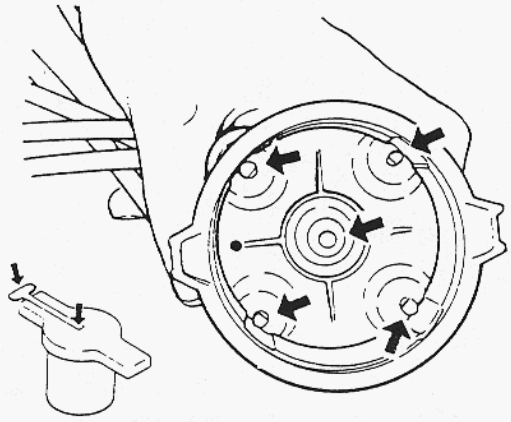


Fig. 1-11-1

3) Inspect rotor for cracks, and its electrode for wear.
4) Check to see that there are no excessive closes in ventilation plug hole.
5) Repair or replace as necessary any component which is found to be in malcondition as described above.

NOTE:
Dust and stains found within distributor can be cleaned by using a dry, soft cloth.

12. SPARK PLUGS REPLACEMENT

1) Disconnect high-tension cords from spark plugs. Make sure to pull only on spark plug caps.

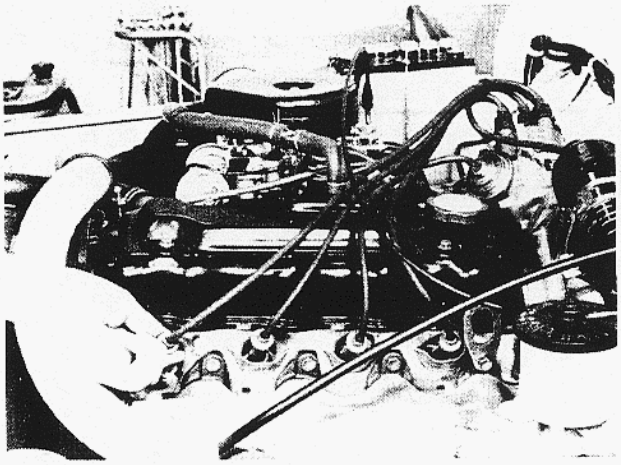


Fig. 1-12-1

2) Using a spark plug wrench, loosen and remove plugs.

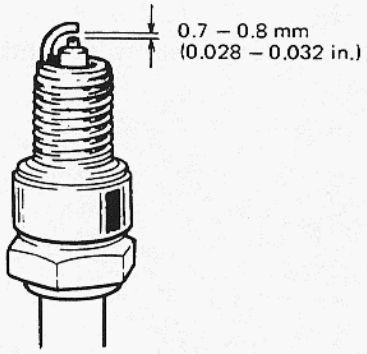


Fig. 1-12-2

NOTE:
When replacing plugs, make sure to use new plugs of specified heat range and size.

PLUG SPECIFICATION

Maker	Heat range Standard type
NGK	BP5ES (BPR5ES)
Nippon Denso	W16EX-U (W16EXR-U)

As can be seen in the above table, there are two types of spark plugs for this car, one without R included in its code and the other with R as in parenthesis. Which one is used depends on countries. Look at the label attached to the car. If originally equipped plug was with R included in its code, replacement plug should have R in its code, too.

3) Install new spark plugs. Tighten plugs to specification.
4) Connect high tension cords to spark plugs. DO NOT push cords for connection. Push boots.

Spark plug tightening torque	20 – 30 N·m 2.0 – 3.0 kg-m 14.5 – 21.5 lb-ft

13. IGNITION TIMING INSPECTION

Check to make sure that ignition timing is set properly. If out of specification, adjust it.
Refer to p. 8-9 of SECTION 8 for inspection and adjustment procedure.

14. DISTRIBUTOR ADVANCE INSPECTION

Check advance for proper operation. Refer to p. 8-9 of SECTION 8 for checking procedure.

1-4. FUEL SYSTEM

15. AIR CLEANER ELEMENT CLEANING AND REPLACEMENT

Replacement

1) Remove air cleaner cap.
2) Take cleaner element ① out of air cleaner case.
3) Install new cleaner element ① into cleaner case.

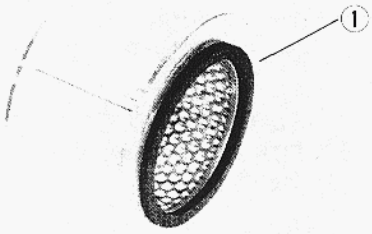


Fig. 1-15-1

Inspection and cleaning

(Applicable when used under severe conditions).
After driving in a dusty area, check element for dust. If found dusty, clean it as follows.

1) Blow off dust with compressed air from inside of element.

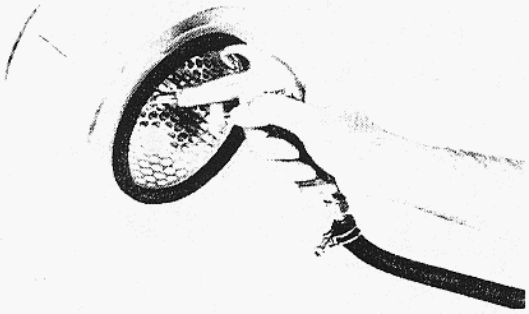


Fig. 1-15-2

2) Install cleaner element into air cleaner case.

16. CARBURETOR CHOKE SYSTEM LUBRICATION AND INSPECTION

[Manual choke type]

1) Remove air intake case and lubricate rotating parts.
2) Check if choke valve operates smoothly to open and close fully when choke knob is pulled and pushed back respectively. Correct if it doesn't operate as described above.
3) With choke knob pulled, start engine and run it at idle speed. Then check choke valve. It should not be fully closed but a little open. If faulty, check choke opener or its jet.

[Auto choke type]

1) Remove air intake case, and lubricate rotating parts.
2) Check choke for proper operation, referring to CHOKE INSPECTION in MAINTENANCE SERVICE (p. 4-20) of SECTION 4.

17. FUEL TANK CAP, GAS LINES AND CONNECTIONS INSPECTION

1) Visually inspect fuel lines and connections for evidence of fuel leakage, hose cracking, and damage. Make sure all clamps are secure.
   Repair leaky joints, if any.
   Replace hoses that are suspected of being cracked.
2) Visually inspect packing of fuel tank cap. If it is damaged or deteriorated, replace it with new one.

18. FUEL FILTER CHANGE

The entire filter unit is replaced at regular scheduled intervals. The method of replacement is as follows:

1) Fuel filter is located at the front part of fuel tank, inside the right-hand side of chassis. The filter is removed from the car by disconnecting inlet and outlet hoses from the filter.
2) Position the new filter in place, and connect inlet and outlet hoses to it.

NOTE:
The top connection is for the outlet hose, the lower one for the inlet hose.

WARNING:
The above procedure must be performed in a well ventilated area and away from any open flames (such as gas hot water heaters).

19. ENGINE IDLE SPEED AND IDLE MIXTURE INSPECTION

Check idle speed and idle mixture, and adjust them as necessary. Refer to MAINTENANCE SERVICE (p. 4-18) of SECTION 4 for procedures to check and adjust idle speed/idle mixture.

1-5. EMISSION CONTROL SYSTEM

20. CRANKCASE VENTILATION HOSES AND CONNECTIONS INSPECTION

Refer to the following item 21, PCV VALVE INSPECTION.

21. PCV (Positive Crankcase Ventilation) VALVE INSPECTION

Check crankcase ventilation hoses and PCV hoses for leaks, cracks or clog, and PCV valve for stick or clog. Refer to MAINTENANCE SERVICE (p. 5-9) of SECTION 5 for PCV valve checking procedure.

22. FUEL VAPOR STORAGE SYSTEM, HOSES AND CONNECTIONS INSPECTION

1) Visually inspect hoses for cracks, damage, or excessive bends. Inspect all clamps for damage and proper position.
2) If any of these is defective, repair or replace.

Charcoal Canister

[Applicable to the car equipped with canister in engine compartment.]

1) Disconnect rubber hose from charcoal canister, which is located in engine compartment.
2) When air is blown into pipe A, there should be no restriction of current through pipes B and C.
3) When air is blown into pipe B, air should not pass through either pipe A or C.
4) If operation differs from above description, charcoal canister must be replaced.
5) The canister is cleaned by blowing 3 kg/cm² (40 psi) of air into pipe A while sealing pipe B with a finger.

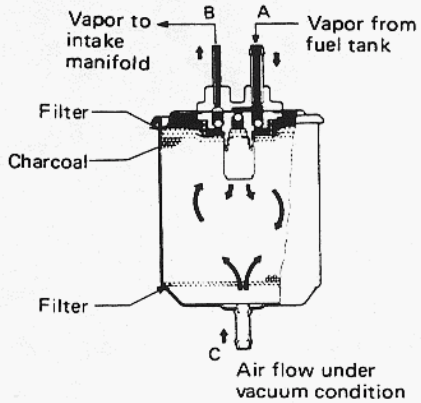


Fig. 1-22-1

Product: Suzuki SJ413 Car Service Repair Workshop Manual
Full Download: https://www.arepairmanual.com/downloads/suzuki-sj413-car-service-repair-workshop-manual/

23. WIRING HARNESS CONNECTIONS AND HEADLIGHTS INSPECTION

[Wiring harness and connections]

1) Visually inspect all wires located in engine compartment for evidence of breakage. Inspect the condition of the insulation (cracks). All clips and clamps should have solid connections to wires.
2) Replace any wires in a deteriorated or otherwise defective condition.

[Headlights]

1) Check vertical beam alignment.
2) Check horizontal beam alignment.

Refer headlight (p. 21-5) of SECTION 21 for above 1) and 2) checking procedures.

NOTE:
In the countries where statutory regulations define headlight alignments, adjust in conformity with such regulations.

24. CLUTCH PEDAL INSPECTION

1) Check clutch pedal height. It should be the same as brake pedal height.
2) Check clutch pedal free travel.

Clutch pedal free travel	20 – 30 mm (0.8 – 1.1 in.)

For the details of the above steps 1) and 2), refer to MAINTENANCE SERVICE (p. 11-8) of SECTION 11.

25. BRAKE DISCS, PADS, BRAKE DRUMS AND SHOES INSPECTION

Brake Discs and Pads

1) Remove wheel and caliper but don't disconnect brake hose from caliper.
2) Check front disc brake pads and discs for excessive wear, damage and deflection. Replace parts as necessary. For the details, refer to p. 19-16 and 19-17 of SECTION 19. Be sure to torque caliper bolts to specification for reinstallation.

Brake Drums and Shoes

1) Remove wheel and brake drum.
2) Check rear brake drums and brake linings for excessive wear and damage, while wheels and drums are removed. Also check wheel cylinders for leaks, at the same time. Replace these parts as necessary.

   For the details, refer to p. 19-21 and p. 19-22 of SECTION 19.

26. BRAKE HOSES AND PIPES INSPECTION

Check brake hoses and pipes for proper hook-up, leaks, cracks, chafing and other damage. Replace any of these parts as necessary.

CAUTION:
After replacing any brake pipe or hose, be sure to carry out air purge operation.

Sample of manual. Download All 458 pages at:
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