Mazda 121

Workshop Manual Volume 1 of 2



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Australia

Mazda 121 Workshop Manual

Volume 1 of 2

FOREWORD

This workshop manual is intended for use by service technicians of Authorized Mazda Dealers to help them service Mazda vehicles. It can also be useful to owners and operators of Mazda vehicles in diagnosing some problems and performing limited repair and maintenance on Mazda vehicles.

For proper repair and maintenance, a thorough familiarization with this manual is important, and it should always be kept in a handy place for quick and easy reference.

All the contents of this manual, including drawings and specifications, are the latest available at the time of printing. As modifications affecting repair or maintenance occur, relevant information supplementary to this volume will be made available at Authorized Mazda Dealers. This manual should be kept upto-date.

Mazda Motor Corporation reserves the right to alter the specifications and contents of this manual without obligation or advance notice.

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Mazda Motor Corporation HIROSHIMA, JAPAN

APPLICATION:

This manual is applicable to vehicles beginning with the Vehicle Identification Numbers (VIN) shown on the following page.

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The section Z is published separate from this manual.

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VEHICLE IDENTIFICATION NUMBERS (VIN)

JM0 DB1031 00 100001~

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IMPORTANT INFORMATION

BASIC ASSUMPTIONS

This workshop manual assumes that you have certain special tools that are necessary for the safe and efficient performance of service operations on Mazda vehicles and that you know how to use them properly. It also assumes that you are familiar with automobile systems and basic service and repair procedures. You should not attempt to use this manual unless these assumptions are correct and you understand the consequences described below.

SAFETY RISK

This manual contains certain notes, warnings, and other precautionary information that you should carefully read and follow to reduce the risk of personal injury to yourself or others and the risk of improper service that may damage the vehicle or render it unsafe. If there is no such information in regard to any specific service method, this does not mean there is no possibility that personal safety or vehicle safety will be jeopardized by the use of incorrect methods or tools.

POSSIBLE LOSS OF WARRANTY

The manufacturer's warranty on Mazda vehicles and engines can be voided if improper service or repairs are performed by persons other than those at an Authorized Mazda Dealer.

WARNING ON LUBRICANTS AND GREASES

Avoid all prolonged and repeated contact with mineral oils, especially used oils. Used oils contaminated during service (e.g., engine sump oils) are more irritating and more likely to cause serious effects, including skin cancer, in the event of gross and prolonged skin contact.

Wash skin thoroughly after work involving oil.

Protective hand cleaners may be of value provided they can be removed from the skin with water. Do not use gasoline, paraffin, or other solvents to remove oil from the skin.

Lubricants and greases may be slightly irritating to the eyes.

Repeated or prolonged skin contact should be avoided by wearing protective clothing if necessary. Particular care should be taken with used oils and greases containing lead. Do not allow work clothing to be contaminated with oil. Dry clean or launder such clothing at regular intervals.

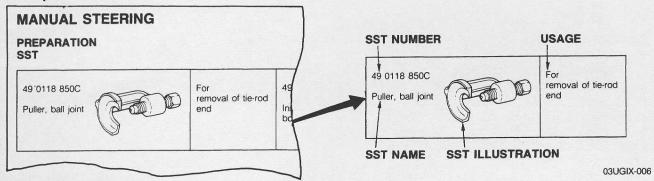
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HOW TO USE THIS MANUAL

PREPARATION

PREPARATION points out the needed **Special Service Tool (SST)** for the service operation that it proceeds. Gather all necessary **SST** before beginning work.

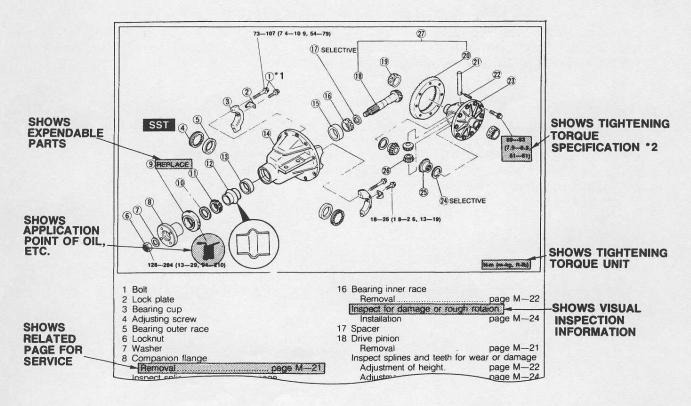
Example:



REPAIR PROCEDURE

- 1. Most repair operations begin with an overview illustration. It identifies the components, shows how the parts fit together, and visual parts inspections. If a damaged or worn part is found, repair or replace it as necessary.
- 2. Expendable parts, tightening torques, and symbols for oil, grease, and sealant are shown in the overview illustration.
- 3. Pages related to service procedures are shown under the illustration. Refer to this information when servicing the related part.

Example:



9MUGIX-034

- *1: The numbering (ex.(1)) shows service procedure.
- *2: Units shown in N·m (m-kg, ft-lb) unless otherwise specified.

HOW TO USE THIS MANUAL/FUNDAMENTAL PROCEDURES

SYMBOLS

There are six symbols indicating oil, grease, and sealant. These symbols show the points of applying such materials during service.

Symbol	Meaning	Kind
OIL OIL	Apply oil	New engine oil or gear oil as appropriate
BRAKE FLUID	Apply brake fluid	Only brake fluid
ATF	Apply automatic transmission fluid	Only ATF
Ode Ass	Apply grease	Appropriate grease
SEALANT	Apply sealant	Appropriate sealant
P	Apply petroleum jelly	Appropriate petroleum jelly

05UGIX-005

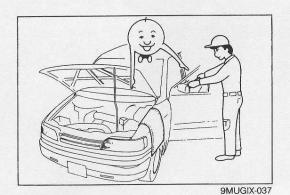
Note

· When special oil or grease is needed, this is shown in the illustration.

NOTES, CAUTIONS, AND WARNINGS

As you read through the procedures, you will come across NOTES, CAUTIONS, and WARNINGS. Each one is therefore a specific purpose. **NOTES** give you **added information** that will help you to complete a particular procedure. **CAUTIONS** are given to prevent you from making an error that could **damage the vehicle. WARNINGS** remind you to be especially careful in those areas where carelessness can cause **personal injury.** The following list contains some general WARNINGS you should follow when you work on a vehicle.

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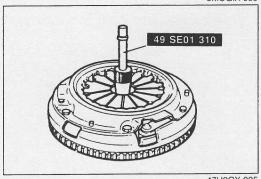
GI-4

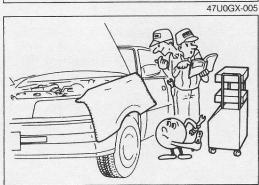
FUNDAMENTAL PROCEDURES

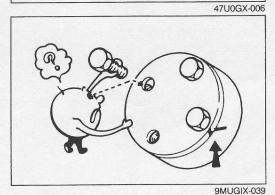
PROTECTION OF THE VEHICLE

Always be sure to cover fenders, seats, and floor areas before starting work.

9MUGIX-003







A WORD ABOUT SAFETY

The following precautions must be followed when jacking up the vehicle.

- 1. Block the wheels.
- 2. Use only the specified jacking positions.
- 3. Support the vehicle with safety stands.

Start the engine only after making certain the engine compartment is clear of tools and people.

PREPARATION OF TOOLS AND MEASURING EQUIPMENT

Be sure that all necessary tools and measuring equipment are available before starting any work.

SPECIAL TOOLS

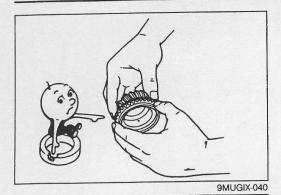
Use special tools when they are required.

REMOVAL OF PARTS

While correcting a problem, try also to determine its cause. Begin work only after first learning which parts and subassemblies must be removed and disassembled for replacement or repair.

DISASSEMBLY

If the disassembly procedure is complex, requiring many parts to be disassembled, all parts should be disassembled in a way that will not affect their performance or external appearance and identified so that reassembly can be performed easily and efficiently.



1. Inspection of parts

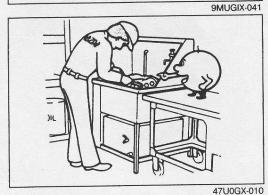
When removed, each part should be carefully inspected for malfunctioning, deformation, damage, and other problems.



2. Arrangement of parts

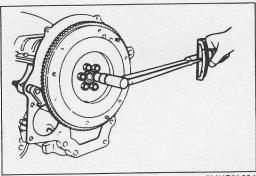
All disassembled parts should be carefully arranged for reassembly.

Be sure to separate or otherwise identify the parts to be replaced from those that will be reused.



3. Cleaning parts for reuse

All parts to be reused should be carefully and thoroughly cleaned in the appropriate method.



REASSEMBLY

Standard values, such as torques and certain adjustments, must be strictly observed in the reassembly of all parts.

Refer to STANDARD BOLT AND NUT TIGHTENING TORQUE in Section TD for tightening torques not mentioned in the main text.

If removed, these parts should be replaced with new ones:

1. Oil seals

2. Gaskets

3. O-rings

- 4. Lock washers
- 5. Cotter pins
- 6. Nylon nuts

9MUGIX-004

9MUGIX-042

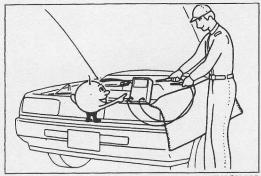
Depending on location:

1. Sealant should be applied to gaskets.

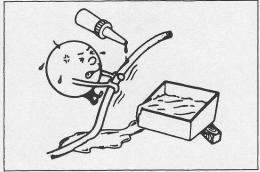
2. Oil should be applied to the moving components of parts.

3. Specified oil or grease should be applied at the prescribed locations (such as oil seals) before reassembly.

GI-6



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9MUGIX-005

ADJUSTMENTS

Use suitable gauges and/or testers when making adjustments.

RUBBER PARTS AND TUBING

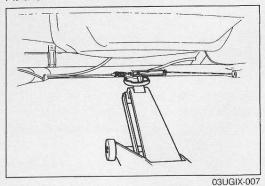
Prevent gasoline or oil from getting on rubber parts or tubing.

GI JACK AND SAFETY STAND POSITIONS/VEHICLE LIFT (2-SUPPORT TYPE) POSITIONS

JACK AND SAFETY STAND POSITIONS

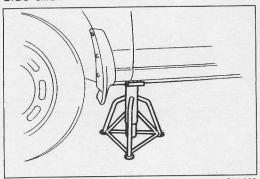
FRONT END Jack position:

At the front crossmember



Safety stand positions:

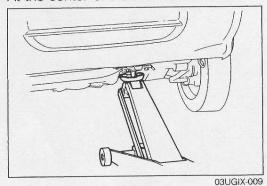
Side sills



01AGIX-003

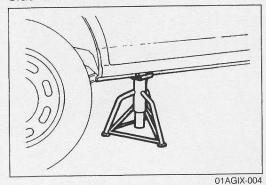
REAR END Jack position:

At the center of the rear crossmember



Safety stand positions:

Side sills

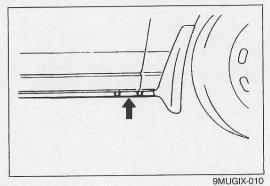


VEHICLE LIFT (2-SUPPORT TYPE) POSITIONS

FRONT END

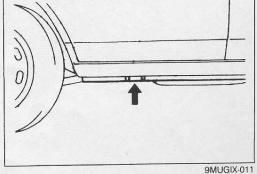
Frame

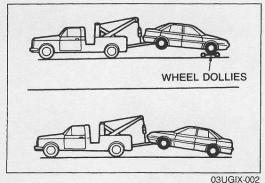
Side sills

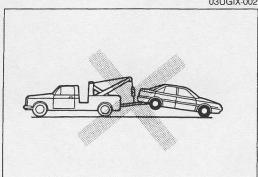


REAR END Frame

Side sills







TOWING

Proper towing equipment is necessary to prevent damage to GI the vehicle.

Laws and regulations applicable to vehicles in tow must always be observed.

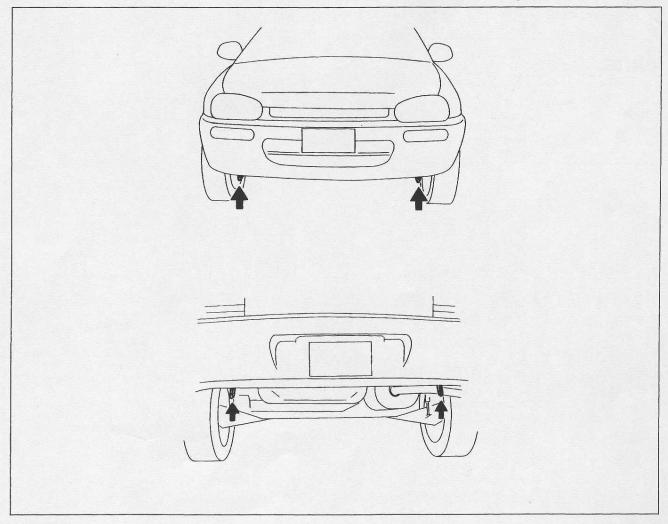
As a general rule, towed vehicles should be pulled with the driving wheels off the ground. If excessive damage or other conditions prevent towing the vehicle with the driving wheels off the ground, use wheel dollies.

With either automatic or manual transaxle:

- 1. Set the ignition switch in the ACC position;
- 2. Place the selector lever or shift lever in N (Neutral);
- 3. Release the parking brake.

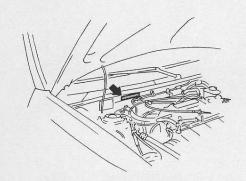
Caution

- Do not tow the vehicle backward with driving wheels on the ground. This may cause internal damage to the transaxles.
- Do not use the hook loops under the front and rear of the vehicle for towing purposes. These hook loops are designed ONLY for transport tie-down. If tie-down hook loops are used for towing, the front/rear bumper will be damaged.

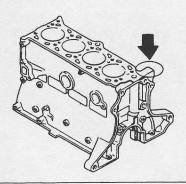


IDENTIFICATION NUMBER LOCATIONS

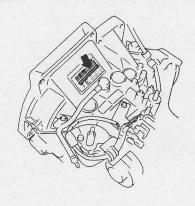
VEHICLE IDENTIFICATION NUMBER (VIN)



ENGINE MODEL AND NUMBER



AUTOMATIC TRANSAXLE MODEL AND NUMBER



9MUGIX-015

UNITS

N·m (m-kg or cm-kg, ft-lb or in-lb)	
rpm	. Revolutions per minute
À	Ampere(s)
V	Volt(s)
Ω	. Ohm(s) (resistance)
kPa (kg/cm², psi)	. Pressure
	(usually positive)
mmHg (inHg)	Pressure
3 ()	(usually negative)
W	. Watt
liters (US qt, Imp qt).	
mm (in)	

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ABBREVIATIONS

ABDC	After bottom dead center
A/C	Air conditioner
ACC	
ATX	
ATDC	After top dead center
ATF	Automatic transmission fluid
BAC	Bypass air control
BBDC	
BTDC	Before top dead center
CPU	Central processing unit

EC-AT...... Electronically-controlled automatic transmission ECU Engine control unit EGI Electronic gasoline injection Electrical load E/L EX Exhaust IC Integrated circuit IGN. Ignition Intake INT Intermittent ISC Idle speed LH . Left hand Idle speed control Motor M..... MIL Malfunction indicator lamp MTX...... Manual transaxle OD Overdrive OFF...... Switch off ON.... Switch on PCV...... Positive crankcase ventilation Pressure regulator PRC...... control P/S..... Power steering P/W Power window RH..... Right hand SST..... Special service tool ST Start SW Switch TDC...... Top dead center

03UGIX-004

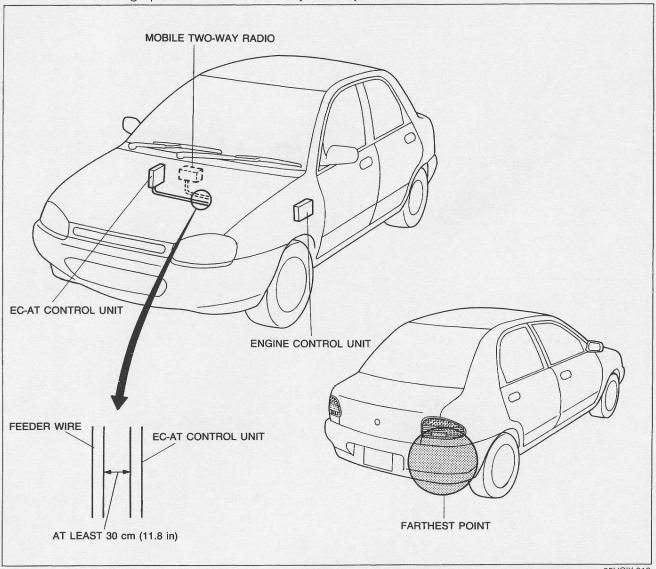
CAUTION

INSTALLATION OF MOBILE TWO-WAY RADIO SYSTEM

If a mobile two-way radio system is installed improperly or if a high-powered type is used, the EGI system and other systems may be affected.

When the vehicle is to be equipped with a mobile two-way radio, observe the following precautions:

- 1. Install the antenna at the farthest point from control units.
- 2. Install the antenna feeder as far as possible from the control unit harnesses (at least 30 cm [11.8 in]).
- 3. Ensure that the antenna and feeder are properly adjusted.
- 4. Do not install a high-powered mobile two-way radio system.

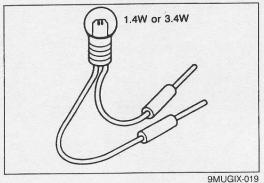


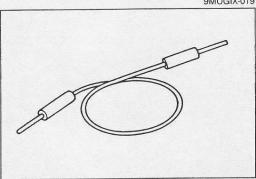
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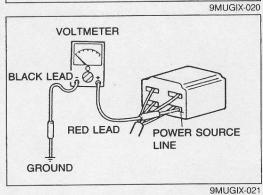
25 03UGIX-005

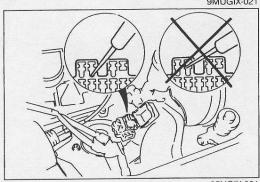
REMOVAL OF IGNITION KEY ON AUTOMATIC TRANSAXLE MODEL

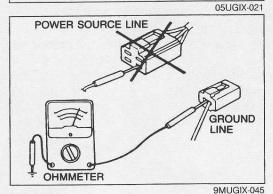
The selector lever must be in P (PARK) to turn the ignition key to the OFF position. If the switch seems to be off but the key cannot be removed, the switch may still be in the ACC position, or the selector lever may not be in P (PARK). Shift the selector lever to P (PARK), and turn the ignition key to the LOCK position. The key should now be free for removal.











GI-12

ELECTRICAL TROUBLESHOOTING TOOLS Test Light

The test light, as shown in the figure, uses a 12V bulb. The two lead wires should be connected to probes. The test light is used for simple voltage checks and for checking for short circuits.

Caution

 When checking the control unit, never use a bulb over 3.4W.

Jumper Wire

The jumper wire is used for testing by shorting across switch terminals and ground connections.

Caution

 Do not connect a jumper wire from the power source line to a body ground; this may cause burning or other damage to harnesses or electronic components.

Voltmeter

The DC voltmeter is used to measure of circuit voltage. A voltmeter with a range of 15V or more is used by connecting the positive (+) probe (red lead wire) to the point where voltage is to be measured and the negative (–) probe (black lead wire) to a body ground.

Diagnosis Connector

Insert the probe into the service hole when connecting a jumper wire to the diagnosis connector.

Caution

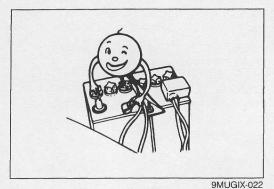
Do not insert the jumper wire probe into the diagnosis connector terminal, which may damage the terminal.

Ohmmeter

The ohmmeter is used to measure the resistance between two points in a circuit and also to check for continuity and diagnosis of short circuits.

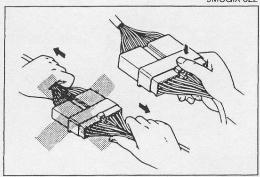
Caution

Do not attempt to connect the ohmmeter to any circuit to which voltage is applied; this may burn or otherwise damage the ohmmeter.



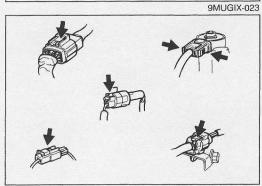
CAUTION WITH ELECTRICAL PARTS Battery Cable

Before disconnecting connectors or replacing electrical parts, disconnect the negative battery cable.

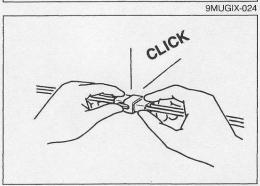


Connectors Removal of connector

Never pull on the wiring harness when disconnecting connectors.

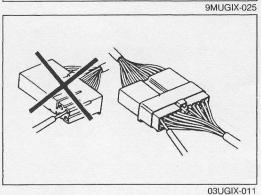


Connectors can be removed by pressing or pulling the lock lever as shown.



Locking of connector

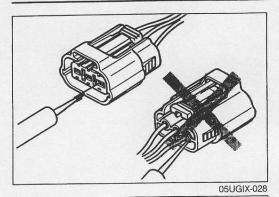
When locking connectors, make sure to listen for a click that will indicate they are securely locked.



Inspection

1. When a tester is used to check for continuity or to measure voltage, insert the tester probe from the wire harness side.

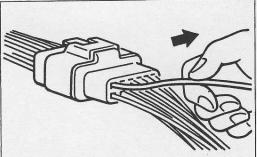
CAUTION



2. Check the terminals of waterproof connectors from the connector side, as they cannot be accessed from the wire harness side.

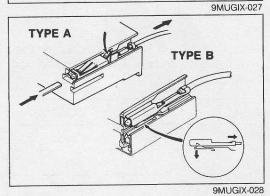
Caution

- Use fine wire to prevent damage to the terminal.
- Do not damage the terminal when inserting the tester lead.



Terminals Inspection

Pull lightly on individual wires to check that they are secured in the terminal.



Replacement of terminals

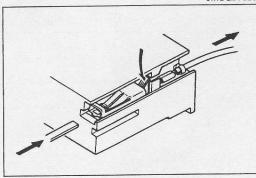
Use the appropriate tools to remove the terminal as shown. When installing the terminal, be sure to insert it until it locks securely.

<Female>

Insert a thin piece of metal from the terminal side of the connector, and then, with the terminal locking tab pressed down, pull the terminal out from the connector.

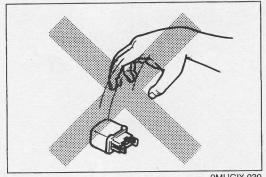
<Male>

Same as the female type.

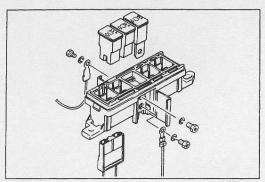


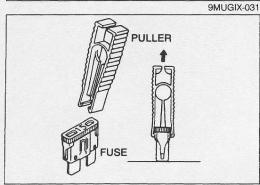
Sensors, Switches, and Relays

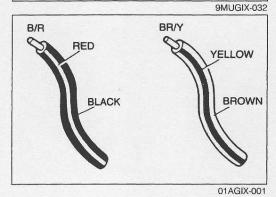
Handle sensors, switches, and relays carefully. Do not drop them or strike them against other parts.



9MUGIX-030







Fuse Replacement

1. When replacing a fuse, be sure to replace it with one of specified capacity.

If a fuse again fails after it has been replaced, the circuit probably has a short circuit and the wiring should be checked.

- 2. Be sure the negative battery terminal is disconnected before replacing a main fuse (80A).
- 3. When replacing a pullout fuse, use the fuse puller supplied in the fuse box cover.

Wiring Harness Wiring color codes

Two-color wires are indicated by a two-color code symbol. The first code indicates the base color of the wire and the second the color of the stripe.

CODE	COLOR	CODE	COLOR
В	Black	0	Orange
BR	Brown	Р	Pink
G	Green	R	Red
GY	Gray	V	Violet
L	Blue	W	White
LB	Light Blue	Υ	Yellow
LG	Light Green		-

PRE-DELIVERY INSPECTION AND SCHEDULED MAINTENANCE SERVICES

PRE-DELIVERY INSPECTION	A-	2
PRE-DELIVERY INSPECTION TABLE	A-	2
SCHEDULED MAINTENANCE SERVICES	A-	3
01	EOAX-0	001

PRE-DELIVERY INSPECTION TABLE

EXTERIOR	
INSPECT and ADJUST, if necessary, the following items to specification: Glass, exterior bright metal and paint for damage Wheel lug nuts Tire pressures All weatherstrips for damage or detachment Operation of bonnet release and lock Operation of trunk lid and fuel lid opener (if equipped) Door operation and alignment Headlight aiming INSTALL the following parts Wheel caps or rings (if equipped)	 ☐ Headlight cleaner (if equipped) ☐ Horn, wipers and washer ☐ Antenna (if equipped) ☐ Cigarette lighter and clock (if equipped) ☐ Heater and defroster at various mode selections ☐ Canvas top (if equipped) CHECK the following items: ☐ Presence of spare fuse ☐ Upholstery and interior finish CHECK and ADJUST, if necessary, the following items: ☐ Operation and fit of windows ☐ Pedal height and free play of brake and clutch pedal ☐ Parking brake
☐ Outside mirror(s)☐ Front flap (if equipped)	UNDER BONNET-ENGINE RUNNING AT OPERATING TEMPERATURE
UNDER BONNET-ENGINE OFF INSPECT and ADJUST, if necessary, the following items to	CHECK the following items: ☐ Operation of idle-up system for air conditioner or power steering (if equipped)
specification. Fuel, coolant and hydraulic lines, fittings, connections and components for leaks Engine oil level Brake master cylinder fluid levels Clutch master cylinder fluid levels (if equipped) Windshield washer reservoir fluid level	☐ Automatic transaxle fluid level ☐ Initial ignition timing ☐ Idle speed ☐ Operation of throttle sensor ☐ Operation of dashpot ON HOIST
 □ Radiator coolant level and specific gravity □ Tightness of water hose clamps □ Tightness of battery terminals, electrolyte level and specific gravity □ Manual transaxle oil level □ Drive belt(s) tension □ Accelerator cable and linkage for free movement □ Headlight cleaner and fluid level (if equipped) 	CHECK the following items. Underside fuel, coolant and hydraulic lines, fittings, connections and components for leaks Tires for cuts or bruises Steering linkage, suspension, exhaust system and all underside hardware for looseness or damage
INTERIOR INSTALL the following parts ☐ Rubber stopper for inside rear view mirror (if equipped) ☐ Fuse for accessories CHECK the operation of the following items ☐ Seat controls (sliding and reclining) and head rest ☐ Seat belts	CHECK the following items: Brake operation Clutch operation Steering control Operation of meters and gauges Squeaks, rattles or unusual noises Engine general performance Emergency locking retractors
☐ Ignition switch and steering lock ☐ Power window (if equipped) ☐ Door locks including child proof door locks ☐ Inhibitor switch (ATX only) ☐ All lights including warning and indicator lights	REMOVE the seat and floor mat protective covers CHECK for the necessary owner information materials, tools and spare tire in vehicle

01A0AX-001

☐ Ignition key reminder buzzer (if equipped)

SCHEDULED MAINTENANCE SERVICES

Maintenance interval		, n	A STATE OF THE STATE OF	SEATTLE PARTIES				_	ver co		-		1 00	
	Months	_	6	12	18	24	30	36	42	48	54	60	66	72
Maintenance item	×1000 km	1.5	7.5	15	22.5	30	37.5	45	52.5	60	67.5	75	82.5	90
ENGINE														
Engine valve clearance				T		1		1		1		-		- 1
Ex. manifold bolts and nuts		T				T	- Table			Т				T
Engine timing belt*2		<u> </u>			Re	eplace	e every	105.	000 kil	omete	ers			
Drive belts*4		A				1		1	T	1		1		1
Engine oil*1		R	R	R	R	R	R	R	R	R	R	R	R	R
Oil filter*1		R		R		R		R		R		R		R
COOLING SYSTEM														
Cooling system		Ti		1		1		1		1		1		1
Engine coolant (With reservoir)		·				R				R				R
							-						1	
FUEL SYSTEM														
Idle speed	Anna Parista	Α		A		A		A		A		A		A
Air cleaner element*3	Material Control					R				R				R
Fuel filter						R				R				R
Fuel lines and hoses	Th MEDE						L							- 1
GNITION SYSTEM														
Initial ignition timing		Α		1		1		1		- 1		-1		- 1
Spark plugs				1		1 -		1		1		-1		1
Evaporative system				-1		-				-		1		- !
EXHAUST EMISSION CON	TROL SYS	TEM	dana				N.B.				, ,		, ,	
Dashpot				1				1		1				1
Throttle sensor				1		1		1				1		1
ELECTRICAL SYSTEM														
Battery electrolyte level and spec	ific gravity	1		1		1		1		-		-1		- 1
CHASSIS AND BODY														
					-	-		1		1		1		-1
Clutch pedal				1						1		1		
	ons	1		1				1		1			1	- 1
Brake lines, hoses and connection	ons	1	ı	l I		I R		1		R	1	1		I R
Brake lines, hoses and connection Brake fluid*5	ons	-	I	 		R	1			R	1	1		R I
Brake lines, hoses and connection Brake fluid*5 Parking brake	ons	-	I		1		1		1		1			-
Brake lines, hoses and connection Brake fluid*5 Parking brake Drum brakes	ons	-	I		1	1			1	1	1	1		- 1
Brake lines, hoses and connection Brake fluid*5 Parking brake Drum brakes Disc brakes		Í	I			1				1	1	1		1
Brake lines, hoses and connection Brake fluid*5 Parking brake Drum brakes Disc brakes Power steering fluid and lines (If	equipped)	İ	I		1	1			1	1 1 1	1	1		1
Brake lines, hoses and connection Brake fluid*5 Parking brake Drum brakes Disc brakes Power steering fluid and lines (If Steering operation and gear house	equipped) sing	ı	I		1	1					1	1		1
Brake lines, hoses and connection Brake fluid*5 Parking brake Drum brakes Disc brakes Power steering fluid and lines (If Steering operation and gear house Steering linkages rack guide and	equipped) sing	İ	I								1	1		1
Brake lines, hoses and connection Brake fluid*5 Parking brake Drum brakes Disc brakes Power steering fluid and lines (If Steering operation and gear hous Steering linkages rack guide and Manual transaxle oil	equipped) sing		I	1	1							1 1 1		1 1 1 1 1
Brake lines, hoses and connection Brake fluid*5 Parking brake Drum brakes Disc brakes Power steering fluid and lines (If Steering operation and gear hous Steering linkages rack guide and Manual transaxle oil Automatic transaxle fluid level	equipped) sing	ı	I I		1						1	1	1	1 1 1 1
Brake lines, hoses and connection Brake fluid*5 Parking brake Drum brakes Disc brakes Power steering fluid and lines (If Steering operation and gear hous Steering linkages rack guide and Manual transaxle oil Automatic transaxle fluid level Front suspension ball joints	equipped) sing		1	1	-		-		1		1	1 1 1	1	1 1 1 1 1 1
Brake lines, hoses and connection Brake fluid*5 Parking brake Drum brakes Disc brakes Power steering fluid and lines (If Steering operation and gear hous Steering linkages rack guide and Manual transaxle oil Automatic transaxle fluid level Front suspension ball joints Front wheel bearing greases	equipped) sing		I I	1	-		-	1 1 1 1 R	1		1	1 1 1 1	1	1 1 1 1 1 1 1 R
Brake lines, hoses and connection Brake fluid*5 Parking brake Drum brakes Disc brakes Power steering fluid and lines (If Steering operation and gear house Steering linkages rack guide and Manual transaxle oil Automatic transaxle fluid level Front suspension ball joints Front wheel bearing greases Drive shaft dust boots	equipped) sing		I I		-		-		1		1	1 1 1 1 R 1	1	1 1 1 1 1 1 1 1 1 1 1
Brake fluid*5 Parking brake Drum brakes Disc brakes Power steering fluid and lines (If Steering operation and gear hous Steering linkages rack guide and Manual transaxle oil Automatic transaxle fluid level Front suspension ball joints Front wheel bearing greases	equipped) sing		I I	1	-		-	1 1 1 1 R	1			1 1 1 1	T T	1 1 1 1 1 1 1 R

SCHEDULED MAINTENANCE SERVICES

Chart symbols:

1: Inspect: Visual examination of functional measurement of system's operation (performance)

A: Adjust

R: Replace or change

T: Tighten L: Lubricate

Note:

 As the result of visual examination or functional measurement of a system's operation (performance), correct, clean or replace as required.

Remarks:

 After 90,000 km or 72 months, continue to follow the described scheduled maintenance items and intervals periodically.

As for * marked items in this maintenance chart, please pay attention to the following points.

*1: If the vehicle is operated under the following conditions, it is suggested that the engine oil and oil filter be changed more often than at usual recommended intervals.

a) Driving in dusty conditions.

b) Extended periods of idling or low speed operation.

c) Driving for a prolonged period in cold temperature or driving only short distance regularly.

*2: Replacement of the timing belt is required at every 105,000 km. Failure to replace timing belt may result in damage to the engine.

*3: If the vehicle is operated in very dusty or sandy areas, inspect and, if necessary, replace more often than at usual recommended intervals.

*4: Adjust or inspect alternator and water pump drive belt, and power steering and air conditioner drive belt, if equipped.

*5: Replace every two years.

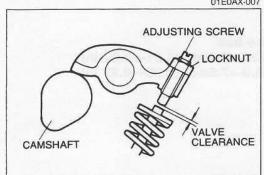
If there has been continuous hard driving, mountain driving, or if the brakes are used extensively or the vehicle is operated in extremely humid climates, the brake fluid should be changed annually.

Emission Control and Related Systems:

The ignition and fuel systems are vitally important to the proper operation of the emission control and related systems, as well as for efficient engine operations.

It is strongly recommended that all servicing related to these systems be done by your authorized Mazda Dealer. 01A0AX-003

01E0AX-007



ADJUSTMENT OF ENGINE VALVE CLEARANCE

Note

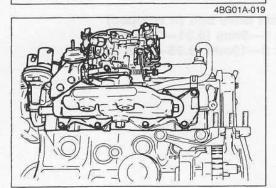
- When valve clearance inspection and cylinderhead bolts retightening service are at the same interval, tighten the cylinder head bolts first.
- 1. Warm up the engine to normal operating temperature.
- 2. With the piston of the No.1 cylinder at TDC of compression, adjust the valve clearances illustrated.

Valve clearance (at valve)
Intake : 0.30mm (0.012 in)
Exhaust: 0.30mm (0.012 in)

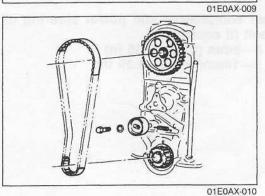
Turn the crankshaft one full turn so that the piston of the No.4 cylinder is at TDC of compression, and adjust the clearances of the remaining valves.



Tightening torque: 19—25 N·m (1.9—2.6 m-kg, 14—19 ft-lb)



01E0AX-008



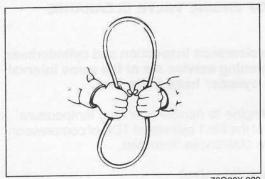
TIGHTENING EXHAUST MANIFOLD NUTS

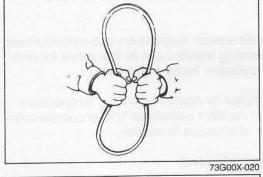
Tightening torque: 16—23 N·m (1.6—2.3 m-kg, 12—17 ft-lb)

REPLACEMENT TIMING BELT

Refer to Section B of the Workshop Manual for the replacement procedure of the timing belt.

SCHEDULED MAINTENANCE SERVICES



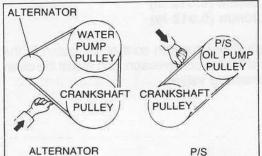


INSPECTION AND ADJUSTMENT OF DRIVE BELTS (Alternator and water pump drive belt, power steering pump and air conditioner compressor drive belt)

1. Check the belt for cracks or any other damage.

2. Adjust or replace, if necessary.

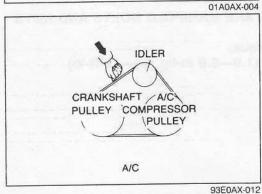
3. Check the drive belt tension with thumb pressure of about 98 N (10 kg, 22 lb) at each arrow points.



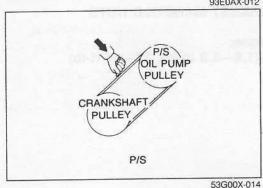
Belt deflection

Alternator drive belt

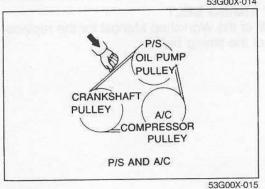
New belt: 5.5-7.0mm (0.21-0.27 in) Used belt: 6.0-7.5mm (0.23-0.29 in)



Air conditioner drive belt (if eqipped) New belt: 8-9mm (0.31-0.35 in) Used belt: 9-10mm (0.35-0.39 in)



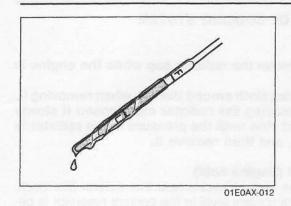
Power steering oil pump drive belt (if equipped) New belt: 8-9mm (0.31-0.35 in) Used belt: 9-10mm (0.35-0.39 in)



Air conditioner compressor and power steering oil pump drive belt (if equipped) New belt: 8-9mm (0.31-0.35 in)

Used belt: 9-10mm (0.35-0.39 in)





REPLACEMENT OF ENGINE OIL

- 1. Warm up the engine.
- 2. Drain the oil by removing the drain plug and oil filler cap.

Warning

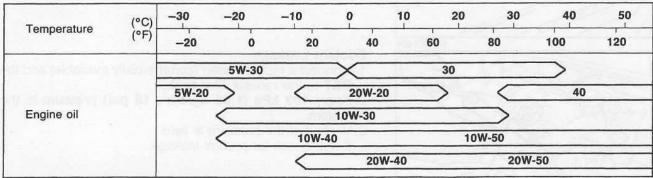
- Wait a while for the engine is too hot.
 And be careful to drain.
- 3. Reinstall the drain plug securely.

Tightening torque: 29—41 N·m (3.0—4.2 m-kg, 22—30 ft-lb)

- 4. Refill the engine with the specified oil to the "F" level marked on the level gauge.
- 5. Refit the oil filler cap securely.

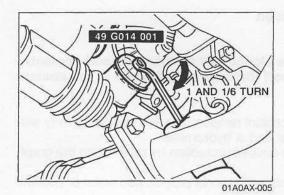
Oil pan capacity: 3.0 liters (3.2 US qt, 2.6 lmp qt)

Recommended SAE viscosity numbers



Typical specification: API service SD, SE or SF

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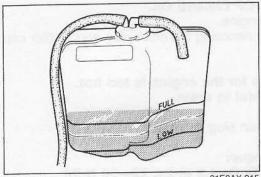


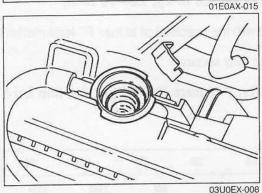
REPLACEMENT OF ENGINE OIL FILTER

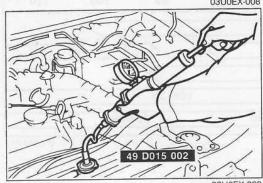
- 1. Remove the oil filter with the SST a suitable wrench.
- 2. Use a clean rag to wipe off the mounting surface on the engine.
- 3. Apply a small amount of clean engine oil to the rubber seal of the new filter.
- 4. Install the oil filter and tighten it by hand until the rubber seal contacts the base.
- 5. Tighten the filter 1 and 1/6 turns with a filter wrench.
- 6. Start the engine and check for leaks.
- 7. Check the oil level and add oil if necessary.

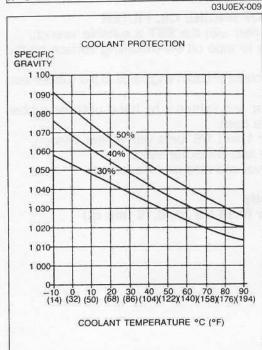
Oil filter capacity

B3: 0.17 liter (0.18 US qt, 0.15 lmp qt)









INSPECTION OF COOLING SYSTEM

Warning

- Never remove the radiator cap while the engine is hot.
- · Wrap a thick cloth around the cap when removing it.
- When removing the radiator cap, loosen it slowly to the first stop until the pressure in the radiator is released, and then remove it.

Coolant Level (Engine cold)

- 1. Verify that the coolant level is near the radiator filler neck.
- 2. Verify that the coolant level in the coolant reservior is between the FULL and LOW marks.
- 3. Add coolant if necessary.

Coolant Quality

- Verify that there is no buildup of rust or scale around the radiator cap or radiator filler neck.
- Verify that coolant is free of oil. Replace the coolant if necessary.

Coolant Leakage

- Connect a radiator tester (commercially available) and the SST to the radiator filler neck.
- Apply 103 kPa (1.05 kg/cm², 15 psi) pressure to the system.
- Verify that the pressure is held.
 If not, check for coolant leakage.

Coolant Protection

Caution

- · Do not use alcohol- or methanol-based coolant.
- Use only soft (demineralized) water in the coolant mixture.
- Measure the coolant temperature and specific gravity with a thermometer and a hydrometer.
- 2. Determine the coolant protection by referring to the graph shown.
 - If the coolant protection is not proper, add water or coolant.

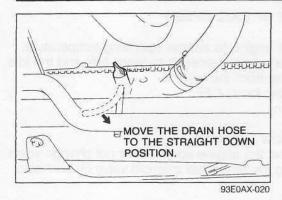
Antifreeze solution mixture percentage

Volume p	percentage	Gravity at
Water	Coolant	20°C (68°F)
65	35	1.054
.55	45	1.066
45	55	1.078
	Water 65 55	65 35 55 45

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05U0EX-009





REPLACEMENT OF ENGINE COOLANT

Warning

- Never open the radiator cap while the engine is hot.
- · Wrap a thick cloth around the cap when loosening.
- Use caution when draining hot coolant.

Caution

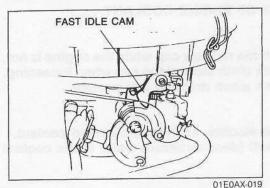
- · Do not use alcohol- or methanol-based coolant.
- Use only soft (demineralized) water in the coolant mixture.
- 1. Remove the radiator cap and loosen the drain plug.
- 2. Drain the coolant into a suitable container.
- 3. Flush the cooling system with water until all traces of color are gone; then let the system drain completely.
- 4. Install the drain plug.
- 5. Fill with the proper amount and mixture of ethylene glycol based coolant by referring to the table above.

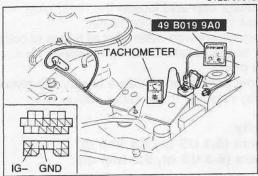
Coolant capacity

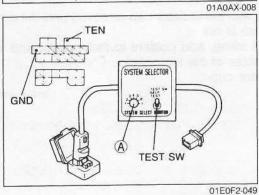
MTX: 5.0 liters (5.3 US qt, 4.4 Imp qt) ATX: 6.0 liters (6.3 US qt, 5.3 Imp qt)

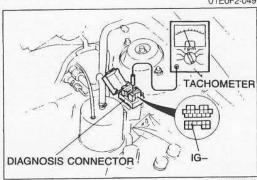
- 6. Run the engine with the radiator cap removed until the upper radiator hose is hot.
- 7. With the engine idling, add coolant to the radiator until it reaches the bottom of the filler neck.
- 8. Install the radiator cap.

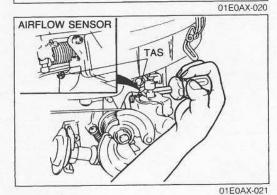
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A-10

ADJUSTMENT OF IDLE SPEED Preparation

- 1. Warm up the engine to normal operating temperature.
- 2. Verify that the wax rod extends outward fully and the idle cam separates from the roller.
- 3. Turn all electric loads OFF.
 - Blower Fan
 - Headlight
 - Rear Window Defroster
- 4. Make sure that the engine speed does not change when disconnecting the air bypass solenoid valve (A) connector.

Note

- If the engine speed decreases, the engine is still under the warm-up condition.
- 5. If the electric cooling fan is operating, wait till the fan stops.
- 6. Verify that the engine is running at idle in good condition.
- 7. Connect the SST to the diagnosis connector.
- 8. Connect a tachometer to the diagnosis connector **IG** terminal as shown.
- 9. Set switch (A) to position 1.
- 10. Set TEST SW to SELF-TEST.

Note

 If the SST is not used, jump across the TEN terminal and the GND terminal of the diagnosis connector.

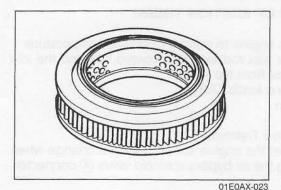
Idle Speed

1. Check the idle speed with a tachometer.

Idle speed: MTX (Neutral) 750 + 50 rpm ATX (P range) 1,100 + 50 rpm

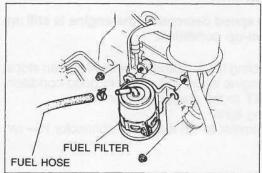
2. If not within the specification, adjust the idle by turning the throttle adjusting screw (TAS).

SCHEDULED MAINTENANCE SERVICES



REPLACEMENT OF AIR CLEANER ELEMENT

Visually check the air cleaner element for excessive dirt, damage or oil, replace if necessary.



REPLACEMENT OF FUEL FILTER

Warning

- Keep sparks and open flames away from the fuel area.
- After replacing the fuel filter, check that the filter joints are not leaking.

To replace the fuel filter, proceed as follows:

- 1. Disconnect the fuel hoses.
- 2. Remove the fuel filter with the bracket.
- 3. Install a new filter in the reverse order of removal.



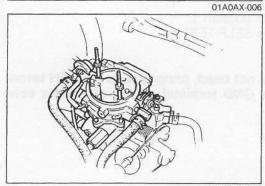
 When installing the fillter make sure the hoses are pushed on as far as possible. Secure the hoses with clips.



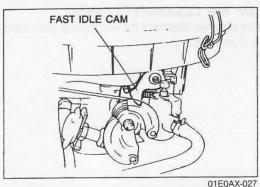
Check the fuel line fittings, connections and components for leaks.

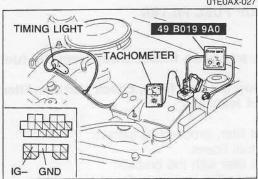
There should be no wetness or stained areas that might indicate leaks.

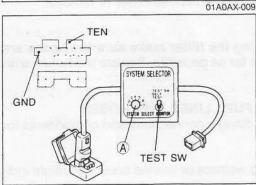
Replace any defective hoses or clips.

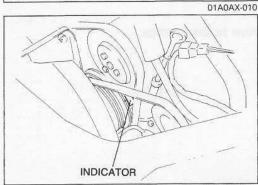


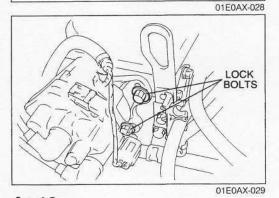
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ADJUSTMENT OF IGNITION TIMING Preparation

- 1. Warm up the engine to normal operating temperature.
- 2. Verify that the wax rod extends outward fully and the idle cam separates from the roller.
- 3. Turn all electric loads OFF.
 - Blower Fan
 - Headlight
 - Rear Window Defroster
- Make sure that the engine speed does not change when disconnecting the air bypass solenoid valve (A) connector.

Note

- If the engine speed decreases, the engine is still under the warm-up condition.
- 5. If the electric cooling fan is operating, wait till the fan stops.
- 6. Verify that the engine is running at idle in good condition.
- 7. Connect the SST to the diagnosis connector.
- 8. Connect a timing light.
- Connect a tachometer to the diagnosis connector IG- terminal as shown.
- 10. Set switch (A) to position 1.
- 11. Set TEST SW to SELF-TEST.

Note

 If the SST is not used, jump across the TEN terminal and the GND terminal of the diagnosis connector.

Ignition Timing Inspection / Adjustment

1. Check that the idle speed is within the specification.

Idle speed: MTX (Neutral) 750 $^{+50}_{-0}$ rpm ATX (P range) 1,100 $^{+50}_{-0}$ rpm

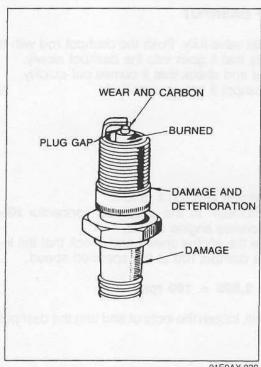
2. Check the ignition timing with a timing light.

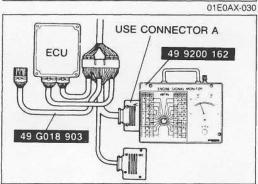
Ignition timing: BTDC 16 ± 1°

- If the ignition timing is not within the specification, loosen the distributor lock bolts and turn the distributor to make the adjustment.
- 4. Tighten the distributor lock bolts to the specified torque.

Tightening torque: 16—23 N·m (1.6—2.3 m-kg, 12—16 ft-lb)

5. Put a seal on the distributor lock bolt.







INSPECTION OF SPARK PLUGS

- 1. Check the plugs for burned or eroded electrodes, fouling or cracked porcelain.
- 2. Measure the electrode gap. If necessary, adjust the gap to specifications or replace the spark plugs.

Plug gap: 1.0—1.1mm (0.039—0.043 in) (0.75—0.85mm [0.029—0.033 in])

-B1 Carburetor

ENGINE	B1	B3
NGK	BPR5ES, BPR6ES	BKR5E-11, BKR6E-11
NIPPONDENSO	W16EXR-U, W20EXR-U	K16PR-U11, K20PR-U11

Caution

- When installing a new plug or reinstalling old plugs, use a small amount of anti-seize compound or molybdenum-based thread lubricant on the first few threads.
- Do not pull the spark plug cables to remove them, pull on the spark plug boots.

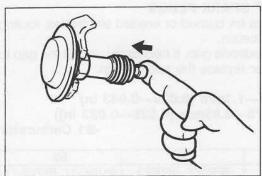
INSPECTION OF THROTTLE SENSOR

- 1. Warm up the engine to normal operating temperature.
- 2. Verify that the wax rod expands outward fully and the cam separates from the roller.
- 3. Stop the engine and turn the ignition switch ON.
- 4. Connect the SSTs (Engine Signal Monitor and Adapter Harness) to the ECU as shown.
- 5. Set the SST (Engine Signal Monitor) to terminal 2M.
- 6. Rotate the throttle link by hand and verify that the voltage is within the specification.

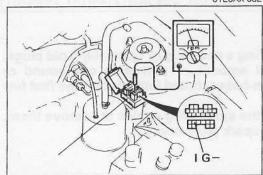
Specification

COLI Terminal	Throttle val	ve condition
ECU Terminal	Fully closed	Fully open
2M	0.41—0 62V	4.14—4.46V

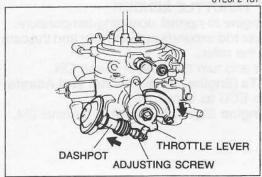
7. If not as specified, adjust the throttle sensor.







01E0F2-137



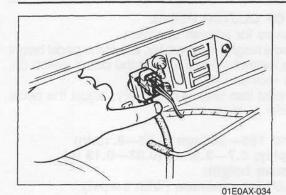
INSPECTION OF DASHPOT Inspection

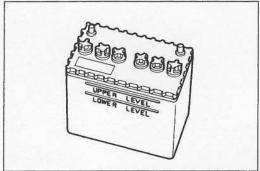
- Open the throttle valve fully. Push the dashpot rod with a finger and verify that it goes into the dashpot slowly.
- 2. Release the rod and check that it comes out quickly.
- 3. Replace the dashpot if not as specified.
- 4. Warm up the engine and run it at idle.
- 5. Connect a tachometer to the diagnosis connector **IG**—terminal and increase engine speed.
- Slowly decrease the engine speed and check that the lever touches the dashpot rod at the specified speed.

Specification: 2,500 ± 100 rpm

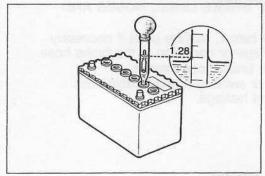
7. If not as specified, loosen the locknut and turn the dashpot to adjust.







4BG00X-069



93E0AX-029

INSPECTION OF EVAPORATIVE SYSTEM

- 1 Warm up the engine to normal operating temperature and run it at idle.
- Disconnect the vacuum hose from the solenoid valve as shown in the figure, and verify that no vacuum is felt at the solenoid valve.
- 3. If not as specified, check the solenoid valve.

INSPECTION OF BATTERY

Check the electrolyte level.

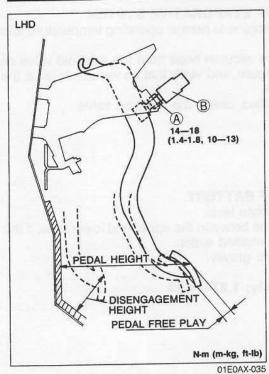
The level should be between the upper and lower lines. If the level is low, add distilled water. Check the specific gravity.

Specific gravity: 1.27-1.29

INSPECTION OF ALL ELECTRICAL SYSTEM

Check the all electrical systems.

If the mulfunction is found, refer to Section T or wiring diagrams for repair.





1. Check the pedal for smooth operation.

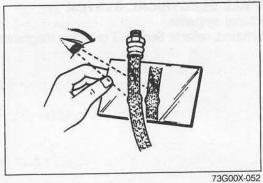
2. Check the pedal height. If necessary, adjust the pedal height by loosening locknut (A) and turning the clutch switch (B), retighten the locknut (A).

3. Check the pedal free play. If necessary, adjust the pedal free play. Refer to H-4.

Pedal height: 196—207mm (7.72—8.15 in) Pedal free play: 0.7—3.3mm (0.03—0.13 in)

Disengagement height:

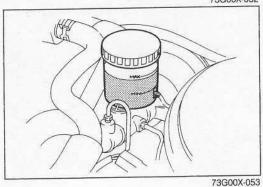
41mm (1.61 in) minimum (With carpet)



INSPECTION OF BRAKE LINES, HOSES AND CONNECTIONS

Check the points below, replace parts if necessary.

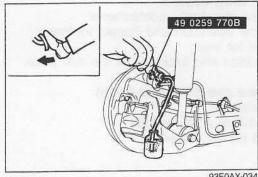
- 1. Cracking, damage or corrosion of the brake hose.
- 2. Damage to the brake hose threads.
- 3. Scars, cracks or swelling of the flexible hose.
- 4. All lines for fluid leakage.



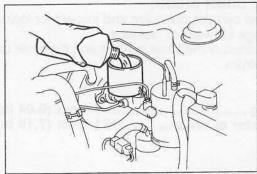
INSPECTION OF BRAKE FLUID

Check fluid level in reservoir. The level should be between the Max, and Min. lines on the reservoir.

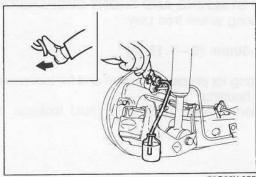
If the fluid level is extremely low, check the brake system for leaks.



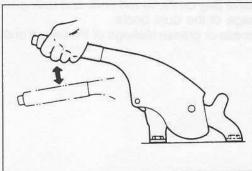




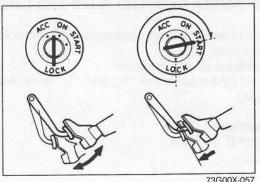
63U11X-023



73G00X-055



01E0AX-037



REPLACEMENT OF BRAKE FLUID AIR BLEEDING

- 1. Remove the brake fluid from the reservoir by using a suction pump.
- 2. Fill the reservoir with new brake fluid.

Fluid specification: FMVSS 116: DOT-3 **SAE: J1703**

- 3. Attach a vinyl tube to the bleeder screw and place the other end of the vinyl tube in a container.
- 4. Pump out the old brake fluid by loosening each bleeder screw (one by one) and pumping the brake pedal.
- 5. Bleed air as described below.

Caution

- · The fluid in the reservoir must be maintained at the 2/4 level or higher during air bleeding.
- · Be careful not to spill brake fluid onto painted surfaces.
- 1. Jack up the vehicle and support it with safety stands.
- 2. Remove the bleeder cap and attach a vinyl hose to the bleeder plug.
- 3. Place the other end of the vinyl tube in a container.
- 4. Slowly pump the brake pedal several times.
- 5. While the brake pedal is pressed, loosen the bleeder screw to let fluid and air escape.
- 6. Repeat steps 4 and 5 until there are no air bubbles in the
- 7. Check for correct brake operation.
- 8. Check to be sure that there is no fluid leakage. Be sure to clean away any spilled fluid with rags.
- 9. After bleeding the air, add brake fluid to the reservoir up to the specified level.

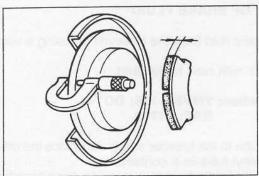
INSPECTION OF PARKING BRAKE

- 1. Pull the brake lever with 98 N (10 kg, 22 lb) of force and measure the lever stroke.
- 2. If necessary, adjust the lever stroke by turning the adjusting nut.

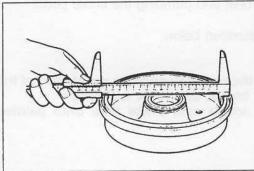
Stroke: 6-8 notches

INSPECTION OF POWER BRAKE UNIT AND HOSES

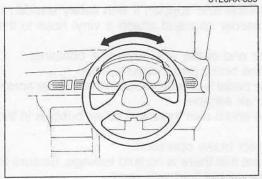
- 1. Check the vacuum hose, connectors and check-valve for cracks, chafing, deterioration etc.
- 2. With the engine stopped, depress the pedal a few times.
- 3. With the pedal depressed, start the engine.
- 4. If, immediately after the engine starts, the pedal moves down slightly, the unit is good.



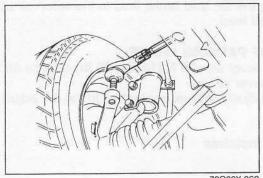
01E0AX-038



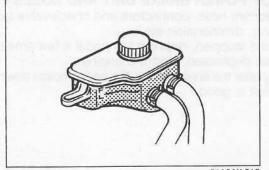
01E0AX-039



01E0AX-040



73G00X-062



01A0AX-012

INSPECTION OF DISC BRAKE

Check the following disc brake components.

- 1. Check the caliper operation and inspect for leaks.
- 2. Check the pads for wear.
- 3. Check the condition and thickness of the disc plate.

Minimum: Brake pad 2.0mm (0.08 in)
Disc plate thickness
16.0mm (0.63 in) ATX models
10mm (0.39 in) MTX models

INSPECTION OF DRUM BRAKE

- 1. Check the wheel cylinder operation and inspect for leaks.
- 2. Check the linings for wear or damage.
- Check the condition of the inner surface and the inner diameter of the drum.

Limit:

INSPECTION OF STEERING AND FRONT SUSPENSION

1. Check the steering wheel free play.

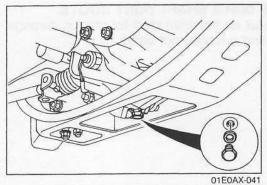
Free play: 0-30mm (0-1.18 in)

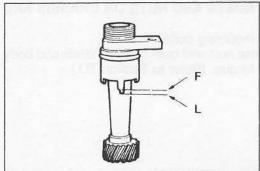
- 2. Check the steering for proper operation and for looseness of the steering housing.
- 3. Check the steering gear housing for fluid leakage or seepage.
- 4. Check for excessive play on the tie rod ends and rack guide.
- 5. Check for damage of the dust boots.
- 6. Check for looseness or grease leakage of the tie rod ends.

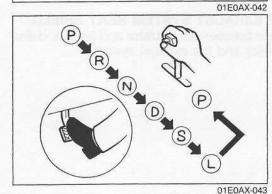
INSPECTION OF POWER STEERING FLUID AND LINES (if equipped)

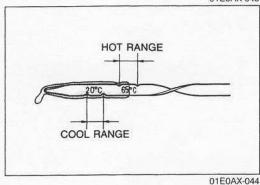
- 1. Check the fluid hoses, lines and connections for cracks, chafing, deterioration, etc.
- Check the fluid level on the reservoir.
 The level should be between the "F" and "L" level. Add fluid if necessary.

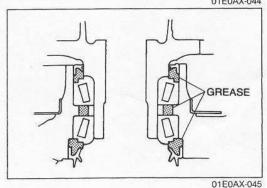
Fluid specification: ATF Dexron®II or M-III











REPLACEMENT OF MANUAL TRANSAXLE OIL

- 1. Visually check the manual transaxle for oil leakage.
 If leakage is found, check for the cause, and repair.
- 2. Remove the speedometer cable and driven gear.
- 3. Remove the drain plug and drain the oil.
- 4. Reinstall the drain plug securely.

Tightening torque: 24—35 N·m (2.4—3.6 m-kg, 17—26 ft-lb)

5. Fill with the specified oil from the speedometer driven gear hole to the F mark on the speedometer driven gear.

Specified oil

Grade: API service GL-4

Viscosity: All-season Dexron®II or M2C33F Above -18°C (0°F) SAE 75W-80

Capacity:

2.5 liters (2.64 US qt, 2.2 lmp qt)

INSPECTION OF AUTOMATIC TRANSAXLE FLUID LEVEL

Caution

- · Place the vehicle on a flat, level surface.
- 1. Apply the parking brake and position wheel chocks securely to prevent the vehicle from rolling.
- 2. Warm-up the engine until the ATF reaches 60—70°C (140—158°F).
- While depressing the brake pedal, shift the selector lever to each range (P-L) and leave it a few seconds in each range.
- 4. Shift back to P.

Note

- Only use the COOL (20°C) range as a rough reference.
- 5. Ensure that the ATF level is in the HOT (65°C) range. Add ATF to specification, if necessary.

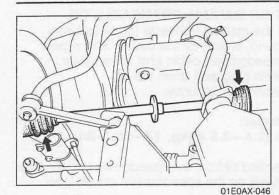
ATF type: Dexron® II or M-III

Capacity: 6.3 liters (6.7 US qt, 5.5 Imp qt)

REPLACEMENT OF FRONT WHEEL BEARING GREASESCompletely fill the shaded area shown in the figure with lithium grease.

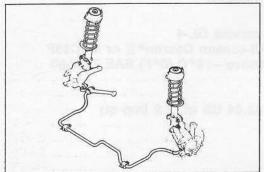
Note

 Refer to page M–8 for disassembly / assembly procedure.



INSPECTION OF DRIVE SHAFT DUST BOOTS

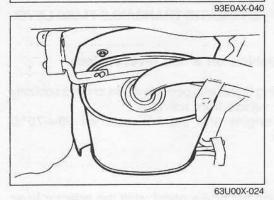
Check the dust boot on the drive shaft for cracks, damage, grease leakage, and a loose boot band.



TIGHTENING OF BOLTS AND NUTS ON CHASSIS AND BODY

1. Tighten all seat mounting bolts.

2. Retighten any loose nuts and bolts on the chassis and body to the specified torque. (Refer to Section TD.)



INSPECTION OF EXHAUST SYSTEM HEAT SHIELD

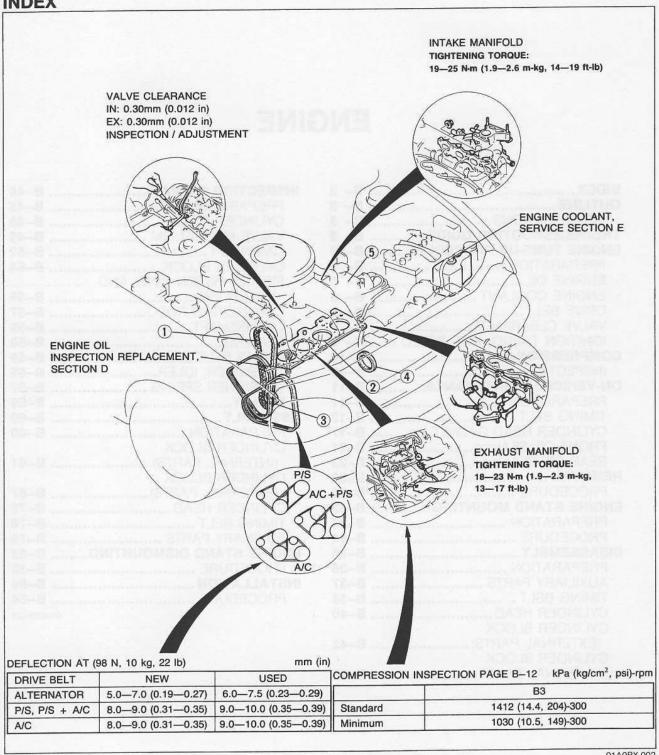
Check the clearance between the insulator and body and also between the insulator and the exhaust system.

ENGINE

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01A0BX-002

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Replacement page B-23	Installation page B-84

OUTLINE

SPECIFICATIONS

Item		Engine	В3	
Туре			Gasoline, 4-cycle	
Cylinder arrange	ement and number	the heat set	In-line, 4-cylinders	
Combustion cha	mber		Pentroof	
Valve system			OHC, belt-driven 16 valves	
Displacement		cc (cu in)	1323 (80.7)	
Bore and stroke		mm (in)	71.0 × 83.6 (2.80 × 3.29)	
Compression rat	tio		9.4	
Compression pre	essure k	Pa (kg/cm², psi)-rpm	1373 (14.4, 199)-300	
	INI	Open BTDC	5°	
V-1 - 8	IN	Close ABDC	40°	
Valve timing	EV	Open BBDC	40°	
	EX	Close ATDC	5°	
\ / . I	and a second second	IN	0.30 (0.012)	
Valve clearance mm (in)		EX	0.30 (0.012)	
Idle speed rpm		MTX	750 ⁺⁵⁰	
		ATX	1100 - 0	
Ignition timing	aceton I	BTDC	16 ± 1°	
Firing order	TEXAST OF TAXABLE		1-3-4-2	

01A0BX-003

TROUBLESHOOTING GUIDE

Problem	Possible Cause	Remedy	Page
Difficult starting	Malfunction of engine-related components Burned valve Worn piston, piston ring, or cylinder Failed cylinder head gasket	Replace Replace or repair Replace	B-49 B-54,56 B-17
	Malfunction of fuel system	Refer to Section F	
	Malfunction of ignition system	Refer to Section G	
Poor idling	Malfunction of engine-related components Poor valve-to-valve seat contact Failed cylinder head gasket	Replace or repair Replace	B-49 B-17
	Malfunction of fuel system	Refer to Section F	
	Malfunction of ignition system	Refer to Section G	
Excessive oil consumption	Oil working up Worn piston ring groove or sticking piston ring Worn piston or cylinder	Replace Replace or repair	B-56 B-54,56
	Oil working down Worn valve seal Worn valve stem or guide	Replace Replace	B-61,72 B-50
	Oil leakage	Refer to Section D	

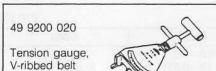
TROUBLESHOOTING GUIDE

Problem	Possible Cause	Remedy	Page
Insufficient power	Insufficient compression Compression leakage from valve seat Seized valve stem Weak or broken valve spring Failed cylinder head gasket Cracked or distorted cylinder head Sticking, damaged, or worn piston ring Cracked or worn piston	Repair Replace Replace Replace Replace Replace Replace Replace Replace	B-51 B-49 B-52 B-17 B-48 B-56 B-56
	Malfunction of fuel system	Refer to Section F	
	Malfunction of ignition system	Refer to Section G	
	Others Slipping clutch Dragging brakes Wrong size tires	Refer to Section H Refer to Section P Refer to Section Q	
Abnormal combustion	Malfunction of engine-related components Sticking or burned valve Weak or broken valve spring Carbon accumulation in combustion chamber	Replace Replace Eliminate carbon	B-49 B-52
	Malfunction of fuel system	Refer to Section F	
	Malfunction of ignition system	Refer to Section G	
Engine noise	Crankshaft- or bearing-related parts Excessive main bearing oil clearance Main bearing seized or heat-damaged Excessive crankshaft end play Excessive connecting rod bearing oil clearance Connecting rod bearing seized or heat-damaged	Replace or repair Replace Replace or repair Replace or repair Replace	B-64 B-58 B-65 B-65 B-58
	Piston-related parts Worn cylinder Worn piston or piston pin Seized piston Damaged piston ring Bent connecting rod	Replace or repair Replace Replace Replace Replace	B-55 B-56 B-56 B-56 B-57
	Valves or timing-related parts Broken valve spring Excessive valve guide clearance	Replace Replace	B-52 B-49
	Malfunction of cooling system	Refer to Section E	
	Malfunction of fuel system	Refer to Section F	
	Others Malfunction of water pump bearing Improper drive belt tension Malfunction of alternator bearing Exhaust gas leakage	Refer to Section E Adjust Refer to Section G Refer to Section F	B- 6

01A0BX-004

ENGINE TUNE-UP PROCEDURE

PREPARATION SST

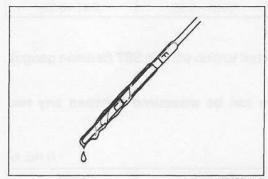


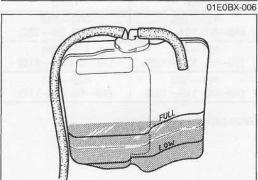
For inspection of drive belt tension

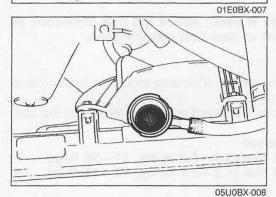
49 B019 9A0 System selector

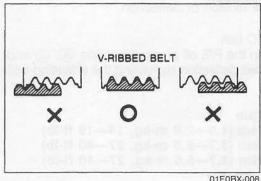
For inspection of ignition timing and idle speed

01A0BX-005









ENGINE OIL Inspection

- 1. Be sure the vehicle is on level ground.
- 2. Warm up the engine to normal operating temperature and stop it.
- 3. Wait for five minutes.
- 4. Remove the oil dipstick and check the oil level and condition.
- 5. Add or replace oil if necessary.

Note

 The distance between the L and F marks on the dipstick represents 0.8 liter (0.85 US qt, 0.70 Imp qt).

ENGINE COOLANT Inspection Coolant level (engine cold)

Warning

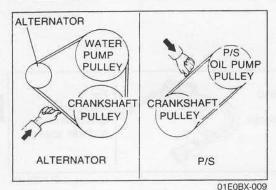
- Never remove the radiator cap while the engine is hot.
- · Wrap a thick cloth around the cap when removing it.
- 1. Verify that the coolant level is near the radiator filler neck.
- 2. Check that the coolant level in the coolant reservoir is between the FULL and LOW marks.
- 3. Add coolant if necessary.

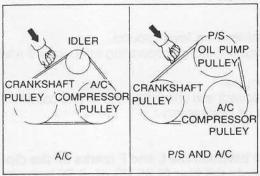
Coolant quality

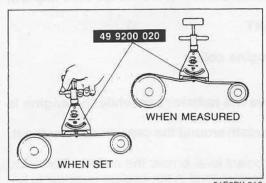
- Verify that there is no buildup of rust or scale around the radiator cap or radiator filler neck.
- 2. Verify that the coolant is free of oil.
- 3. Replace the coolant if necessary.

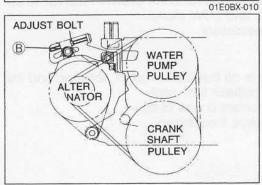
DRIVE BELT Inspection

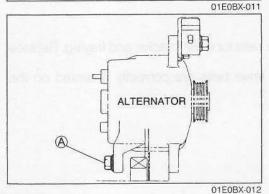
- Check the drive belts for wear, cracks, and fraying. Replace if necessary.
- 2. Verify that the drive belts are correctly mounted on the pulleys.











B-6

Check the drive belt deflection by applying moderate pressure (98 N, 10 kg, 22 lb) midway between the pulleys, as shown. Adjust if necessary.

Deflection

mm (in)

Drive belt	New	Used
Alternator	5 0—7.0 (0 19—0.27)	6.0—7.5 (0.23—0.29)
P/S, P/S + A/C	8 0—9.0 (0.31—0 35)	9.0—10 0 (0.35—0.39)
A/C	8 0—9.0 (0.31—0.35)	9.0—10.0 (0.35—0.39)

4. Check the drive belt tension with the SST (tension gauge).

Note

 Belt tension can be measured between any two pulleys.

Tension

N (kg, lb)

Drive belt	New	Used
Alternator	451—785 (46—80, 101—176)	392—588 (40—60, 88—132)
P/S, P/S + A/C	491—589 (50—60, 110—132)	422—491 (43—50, 95—110)
A/C	491—589 (50—60, 110—132)	422—491 (43—50, 95—110)

5. Install the air intake pipe.

Adjustment

Caution

 If a new belt is used, adjust the belt deflection at the midpoint of new belt specification.

Alternator belt

- 1. If necessary, loosen the alternator mounting bolts (A) and adjusting bolt (B).
- 2. Lever the alternator outward and apply tension to the belt.

Tightening torque

A: 37—51 N·m (3.8—5.3 m-kg, 27—38 ft-lb) B: 18—25 N·m (1.9—2.6 m-kg, 13—18 ft-lb)

3. Recheck the belt tension or deflection.

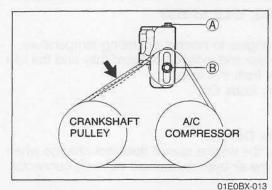
P/S belt, P/S + A/C belt

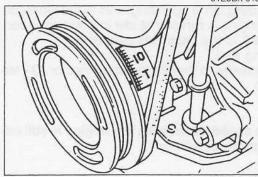
If necessary, loosen the P/S oil pump mounting (A), (B) and (C) and adjust the belt deflection by turning the adjusting bolt (D).

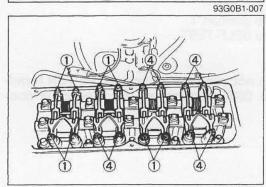
Tightening torque

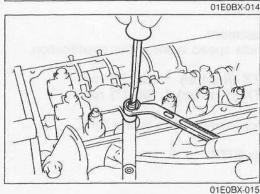
(A): 19—25 N·m (1.9—2.6 m-kg, 14—19 ft-lb) (B): 36—54 N·m (3.7—5.5 m-kg, 27—40 ft-lb)

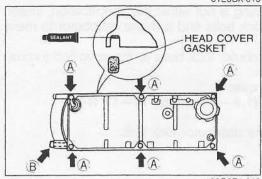
©: 36-54 N·m (3.7-5.5 m-kg, 27-40 ft-lb)











93G0B1-010

A/C belt

If necessary, loosen the locknut (A) and adjust the belt deflection by turning the adjusting bolt (B).

Tightening torque:

37-51 N·m (3.8-5.3 m-kg, 27-38 ft-lb)

VALVE CLEARANCE

Inspection / Adjustment

- 1. Warm up the engine to normal operating temperature.
- 2. Remove the air cleaner.
- 3. Remove the accelerator cable.
- 4. Remove the cylinder head cover.
- 5. Turn the crankshaft and align the timing mark so that the piston of the No.1 or No.4 cylinder is at TDC of compression.
- 6. Measure the valve clearances ① with the No.1 cylinder at TDC of compression, and those of ④ with the No.4 cylinder at TDC of compression.

Valve clearance (valve side)

IN: 0.30mm (0.012 in) EX: 0.30mm (0.012 in)

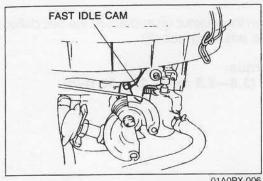
- 7. If it is not within specification, adjust and recheck the valve clearance.
- 8. Turn the crankshaft one full turn and measure the remaining valve clearances. Adjust if necessary.
- 9. Install the cylinder head cover.

Tightening torque

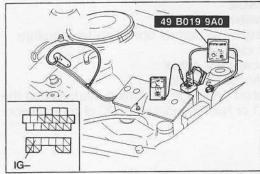
Bolt A: 4.9—9.8 N·m (50—90 cm-kg, 43—78 in-lb) Bolt B: 7.8—11 N·m (80—110 cm-kg, 69—95 in-lb)

Caution

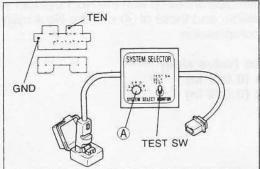
- If the head cover gasket is reused, apply sealant in the groove as shown.
- 10. Install the accelerator cable.
- 11. Install the air cleaner.
- 12. Start the engine and check for excessive tappet noise.



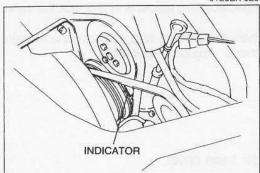
01A0BX-006



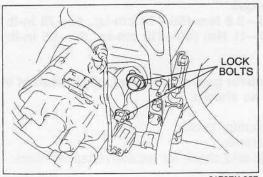
01E0BX-024



01E0BX-025



01E0BX-026



01E0BX-027

IGNITION TIMING, IDLE SPEED Preparation

- 1. Warm up the engine to normal operating temperature.
- 2. Verify that the wax rod extends outward fully and the idle cam separates from the roller.
- 3. Turn all electric loads OFF.
 - Blower Fan
 - Headlight
 - Rear Window Defroster
- 4. Make sure that the engine speed does not change when disconnecting the air bypass solenoid valve (A) connector.
- 5. If the electric cooling fan is operating, wait till the fan stops.
- 6. Verify that the engine is running at idle in good condition.
- 7. Connect the **SST** to the diagnosis connector.
- 8. Connect a timing light.
- 9. Connect a tachometer to the diagnosis connector IG- terminal as shown.

Note

- If the engine speed decreases, the engine is still under the warm-up condition.
- 10. Set switch (A) to position 1.
- 11. Set TEST SW to SELF-TEST.

 If the SST is not used, jump across the TEN terminal and the GND terminal of the diagnosis connector.

Ignition Timing Inspection / Adjustment

1. Check that the idle speed is within the specification.

750 ±50 rpm Idle speed: MTX (Neutral) ATX (P range) 1,100 ±50 rpm

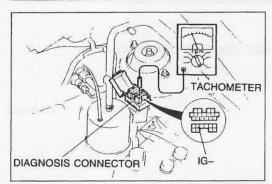
2. Check the ignition timing with a timing light.

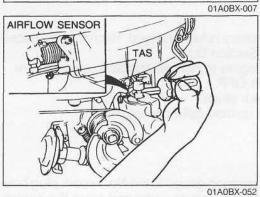
Ignition timing: BTDC 16 ± 1°

- 3. If the ignition timing is not within the specification, loosen the distributor lock bolts and turn the distributor to make the adjustment.
- 4. Tighten the distributor lock bolts to the specified torque.

Tightening torque: 19-25 Nm (1.9-2.6 m-kg, 14-19 ft-lb)

5. Put a seal on the distributor lock bolt.





Idle Speed

Perform "Preparation". (Refer to page B–8.)
 Check the idle speed with a tachometer.

Idle speed: MTX (Neutral) 750 $^{+50}_{-0}$ rpm ATX (P range) 1,100 $^{+50}_{-0}$ rpm

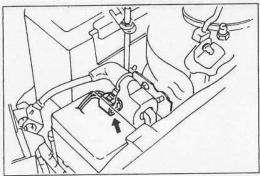
3. If not within specification, adjust the idle by turning the throttle adjusting screw.

COMPRESSION

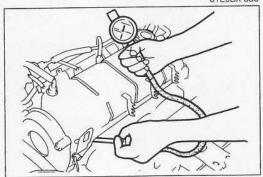
If the engine exhibits low power, poor fuel economy, or poor idle, check the following:

- 1. Ignition system (Refer to Section G.)
- 2. Compression
- 3. Fuel system (Refer to Section F.)

01A0BX-008



01E0BX-030



01A0BX-009

INSPECTION

- Verify that the battery is fully charged. Recharge it if necessary. (Refer to Section G.)
- 2. Warm up the engine to normal operating temperature.
- 3. Turn the engine OFF.
- 4. Remove all spark plugs.
- 5. Disconnect the ignition coil connector.
- 6. Connect a compression gauge to the No.1 spark plug hole.
- 7. Fully depress the accelerator pedal and crank the engine.
- 8. Record the maximum gauge reading.
- 9. Check each cylinder.

Compression

kPa (kg/cm², psi)-rpm

	B3
Standard	1412 (14.4, 204)-300
Minimum	1030 (10.5, 149)-300
Max. difference between cylinders	196 (2.0, 26)

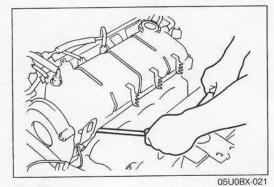
- If the compression in one or more cylinders is low, pour a small amount of engine oil into the cylinder and recheck the compression.
 - If the compression increases, the piston, piston rings, or cylinder wall may be worn.
 - (2) If the compression stays low, the valve may be stuck or seating improperly.
 - (3) If the compression in adjacent cylinders stays low, the cylinder head gasket may be defective or the cylinder head distorted.
- 11. Connect the ignition coil connector.

05U0BX-020

- 12. Apply antiseize compound or molybdenum-based lubricant to the spark plug threads.
- 13. Install the spark plugs.

Tightening torque:

15-23 N·m (1.5-2.3 m-kg, 11-17 ft-lb)



B-10

ON-VEHICLE MAINTENANCE

PREPARATION SST

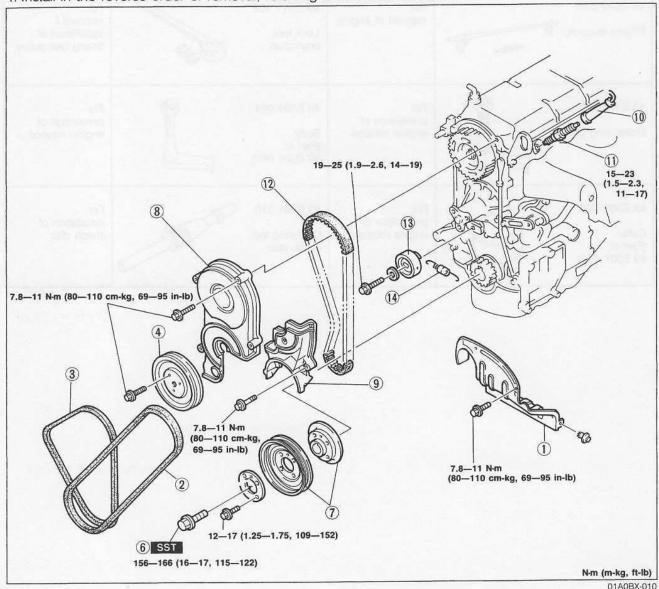
49 G017 5A0 Engine support	For support of engine	49 D011 102 Lock tool, crankshaft	For removal / installation of timing belt pulley
49 E301 060 Brake, ring gear	For prevention of engine rotation	49 E301 061 Body (Part of 49 E301 060)	For prevention of engine rotation
49 E301 062 Collar (Part of 49 E301 060)	For prevention of engine rotation	49 SE01 310 Centering tool, clutch disc	For installation of clutch disc

01E0BX-032

TIMING BELT

Removal / Installation

- 1. Disconnect the negative battery cable.
- 2. Lift up the vehicle.
- 3. Remove in the order shown in the figure, referring to Removal Note.
- 4. Install in the reverse order of removal, referring to Installation Note.



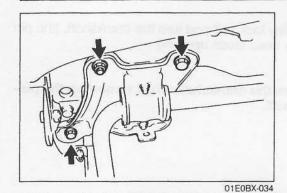
Installation Note...... page B–15 7. Crankshaft pulley and pulley boss

8. Timing belt cover, upper

9. Timing belt cover, lower

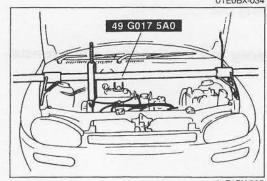
10. High-tension leads

11. Spark plugs

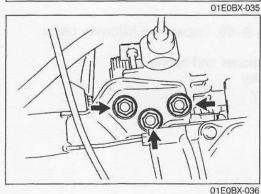


Removal note Plate

1. Remove the right stabilizer mounting bolts.

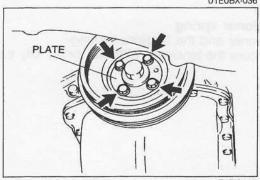


2. Suspend the engine with the SST.

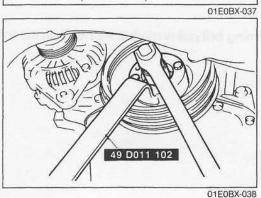


3. Remove the engine mount No.3 mounting bolts and turn over the engine mount No.3.

4. Lower the engine approximately 50mm (1.97 in) gradually.



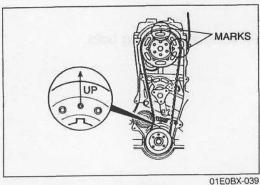
5. Remove the plate mounting bolts, and then the plate.



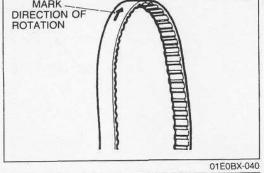
Pulley lock bolt

Hold the pulley boss with the SST.
 Using the SST, loosen the pulley lock bolt.

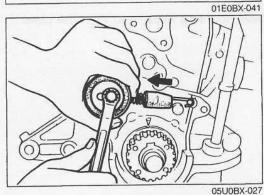
3. Remove the pulley lock bolt and pulley.

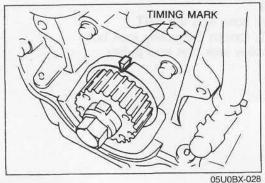


MARK DIRECTION OF ROTATION



DAMAGE, WEAR PEELING CRACK





B-14

Timing belt

1. Install the pulley lock bolt and turn the crankshaft. (the pin on the pulley boss faces up-right)

Caution

 Do not turn the crankshaft while removing the pulley lock bolt.

2. Remove the timing belt.

· Mark the timing belt rotation for proper reinstallation.

Inspection

Referring to page B-69, inspect the following parts:

1. Timing belt

2. Timing belt tensioner and spring

3. Timing belt pulley

4. Camshaft pulley

Installation note

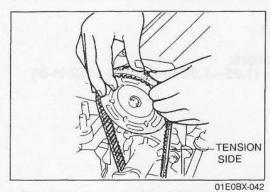
Tensioner, tensioner spring

1. Install the tensioner and the tensioner spring.

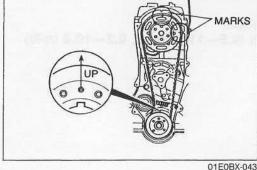
2. Temporarily secure the tensioner with the spring fully extended.

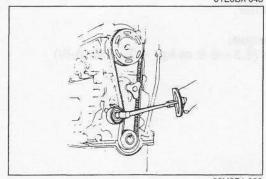
Timing belt

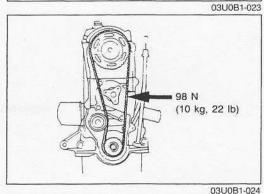
1. Verify that the timing belt pulley mark is aligned with the timing mark.

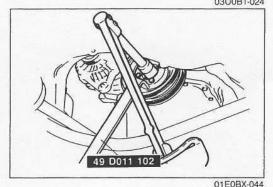


MARKS









2. Install the timing belt so that there is no looseness at the tension side.

Caution

Do not turn the crankshaft counterclockwise.

- 3. Install the pulley boss and pulley lock bolt.
- 4. Turn the crankshaft two turns clockwise, and face the pin on the pulley boss up-right.
- 5. Verify that the camshaft pulley marks are aligned with the cylinder head cover marks. If not aligned, remove the timing belt and repeat from tensioner installation.
- 6. Loosen the tensioner lock bolt to apply tension to the timing belt.

Caution

- Be sure not to apply tension other than that of the tensioner spring.
- 7. Tighten the tensioner lock bolt.

Tightening torque: 19-25 N·m (1.9-2.6 m-kg, 14-19 ft-lb)

- 8. Turn the crankshaft 2 turns clockwise and verify that the marks are correctly aligned.
- 9. Check the timing belt deflection by applying moderate pressure (98 N, 10 kg, 22 lb) midway between the crankshaft pulley and the camshaft pulley. If the timing belt deflection is not correct, temporarily secure tensioner lock bolt so the spring is fully extended and

Deflection:

11.0-13.0mm (0.43-0.51 in) at 98 N (10 kg, 22 lb)

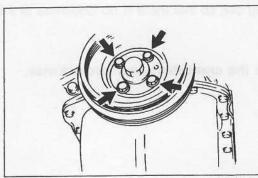
repeat steps 4-8 above or replace the tensioner spring.

10. Remove the pulley lock bolt and pulley boss using the SST.

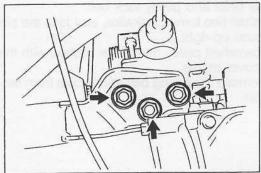
Pulley lock bolt

Install the crankshaft pulley and tighten the pulley lock bolt using the SST.

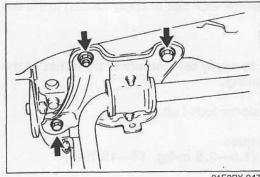
Tightening torque: 157-167 N·m (16-17 m-kg, 116-123 ft-lb)



01E0BX-045



01E0BX-046



01E0BX-047

Steps After Installation

- 1. Lower the vehicle.
- 2. Connect the negative battery cable.
- 3. Start the engine and check as follows:
 - Ignition timing (Refer to page B-8.)

Plate

1. Install the plate.

Tightening torque: 12-17 Nm (1.25-1.75 m-kg, 109-152 in-lb)

2. Lift the engine and install the engine mount No.3.

Tightening torque: 93-117 N·m (9.5-11.9 m-kg, 8.2-10.3 in-lb)

3. Install the stabilizer.

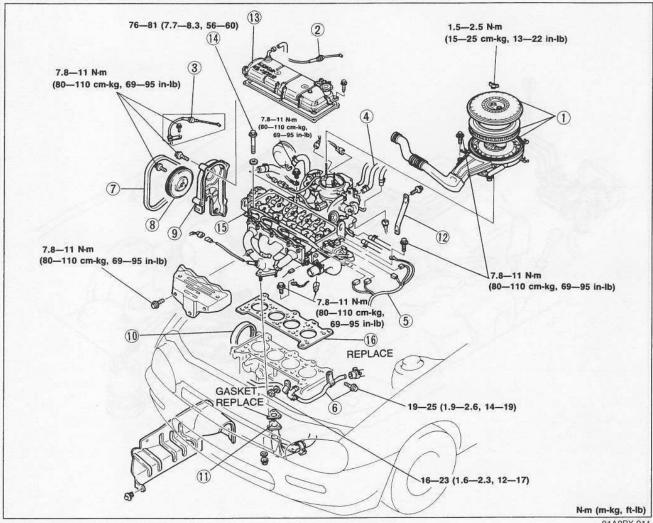
Tightening torque: 54-67 N·m (5.5-6.9 m-kg, 4.7-5.9 in-lb)

01E0BX-048

CYLINDER HEAD GASKET Replacement

Caution

- Position the hose clamp in the original location on the hose, and squeeze the clamp lightly with large pliers to ensure a good fit.
- 1. Disconnect the negative battery cable.
- 2. Drain the engine coolant into a container.
- 3. Remove in the order shown in the figure, referring to Removal Note.
- 4. Install in the reverse order of removal, referring to Installation Note.



Installation Note...... page B–20

3. Throttle cable 4. Hoses

Removal / Installation Note...... page B-18

5. Harnesses
Removal / Installation Note....... page B–19

6. Water bypass pipe nuts and bolts

7. Alternator drive belt

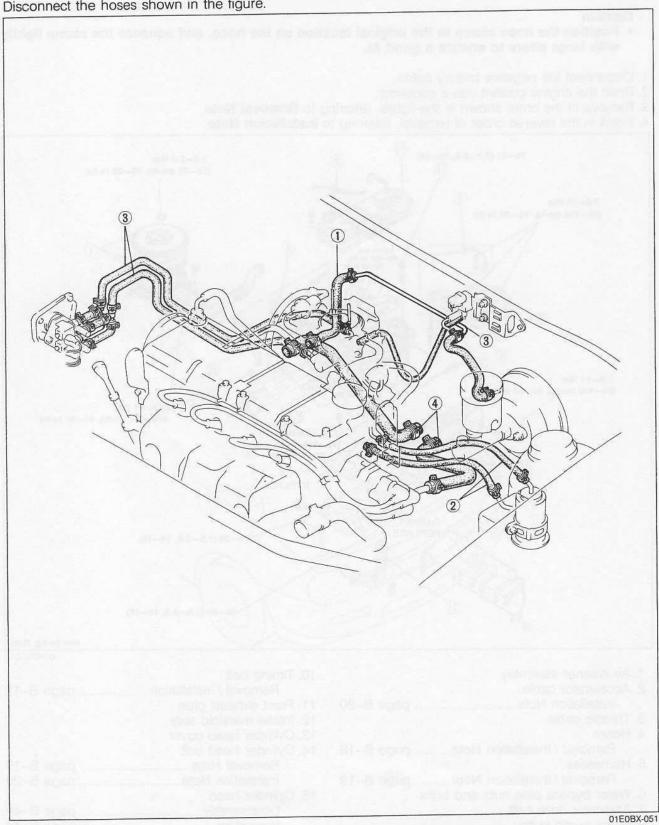
8. Water pump pulley

9. Timing belt cover, upper

10. Timing belt		
Removal / Installation	page	B-12
11. Front exhaust pipe		
12. Intake manifold stay		
13. Cylinder head cover		
14. Cylinder head bolt		
Removal Note	page	B-19
Installation Note		
15. Cylinder head		
Disassembly	page	B-40
Inspection	page	B-48
Assembly	page	B-72
16. Cylinder head gasket		
The Court of Marin Court of the		

Removal / Installation note Hoses

Disconnect the hoses shown in the figure.

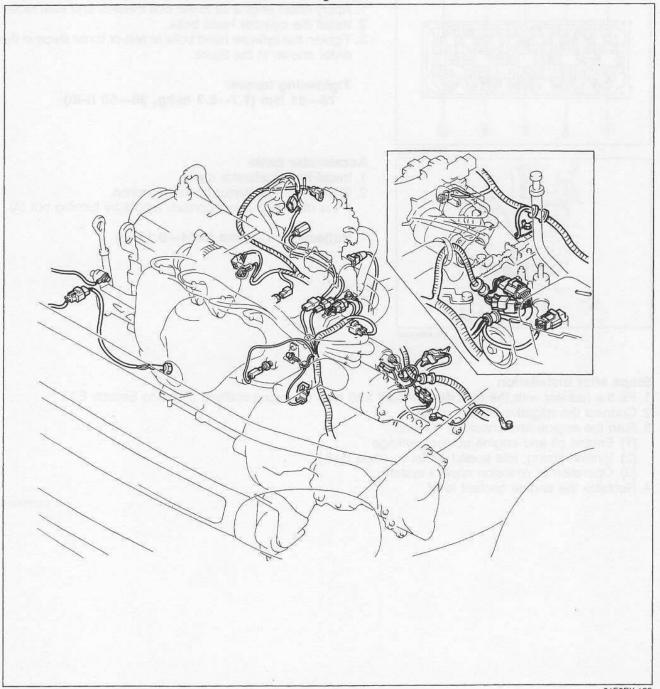


- 1. Brake vacuum hose
- 2. Fuel hose

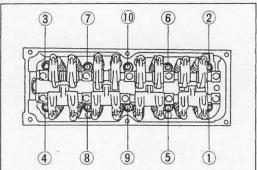
- 3. Vacuum hose (solenoid valve)
- 4. Heater hose

Harnesses

Disconnect the harness connectors shown in the figure.



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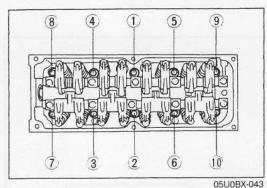


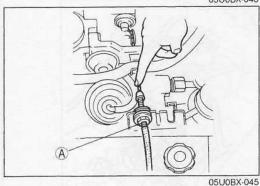
05U0BX-042

- Cylinder head bolt

 1. Loosen the cylinder head bolts in two or three steps in the order shown in the figure.

 2. Remove the cylinder head bolts.





Installation note Cylinder head bolt

- 1. Apply clean engine oil to the bolt threads and seat faces.
- 2. Install the cylinder head bolts.
- 3. Tighten the cylinder head bolts in two or three steps in the order shown in the figure.

Tightening torque: 76—81 N·m (7.7—8.3 m-kg, 56—60 ft-lb)

Accelerator cable

- 1. Install the accelerator cable.
- 2. Check the accelerator cable deflection.

 If the deflection is not correct, adjust by turning nut (A).

Deflection: 1-3mm (0.04-0.12 in)

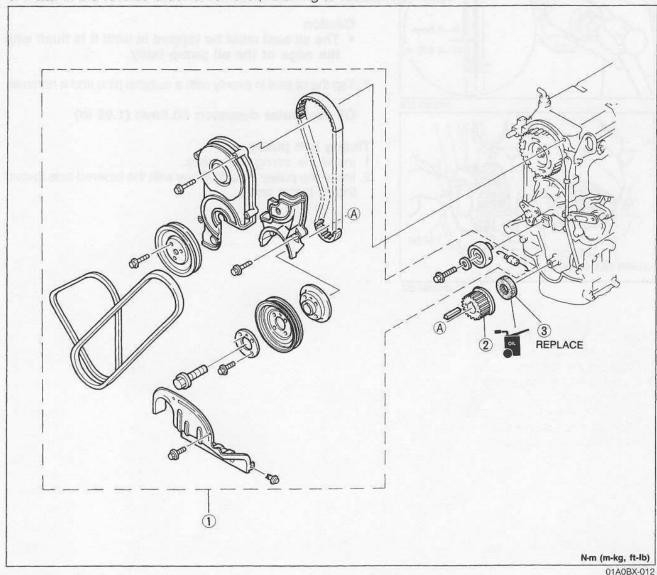
Steps after installation

- 1. Fill the radiator with the specified amount and type of engine coolant. (Refer to Section E.)
- 2. Connect the negative battery cable.
- 3. Start the engine and check as follows:
 - (1) Engine oil and engine coolant leakage
 - (2) Ignition timing, idle speed (Refer to page B-8.)
 - (3) Operation of emission control system
- 4. Recheck the engine coolant level.

01E0BX-053

FRONT OIL SEAL Replacement

- Disconnect the negative battery cable.
 Remove in the order shown in the figure, referring to Removal Note.
- 3. Install in the reverse order of removal, referring to Installation Note.



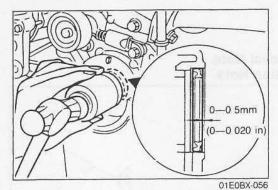
1. Timing belt	
Removal / Installation	page B-12
2. Timing belt pulley	
Installation Note	page B-22

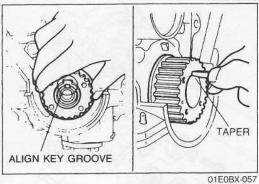




Removal note Oil seal

- 1. Cut the oil seal lip with a razor knife.
- 2. Remove the oil seal with a screwdriver protected with a rag.





Installation note Oil seal

- 1. Apply a small amount of clean engine oil to the lip of a new oil seal.
- 2. Push the oil seal slightly in by hand.

Caution

- The oil seal must be tapped in until it is flush with the edge of the oil pump body.
- 3. Tap the oil seal in evenly with a suitable pipe and a hammer.

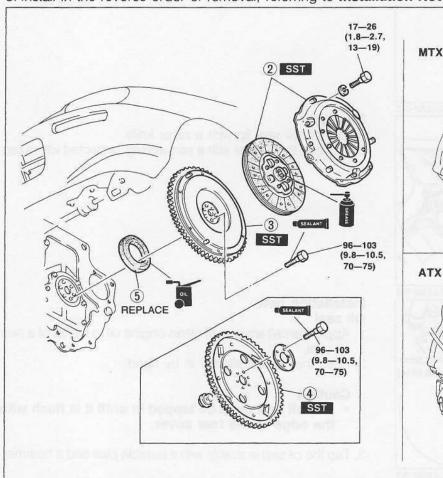
Oil seal outer diameter: 50.5mm (1.98 in)

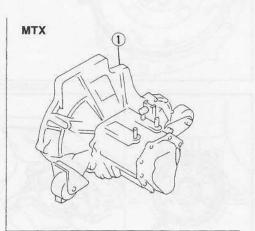
Timing belt pulley

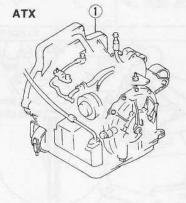
- 1. Install the timing belt pulley.
- 2. Install the pulley Woodruff key with the tapered side toward the oil pump body.

REAR OIL SEAL Replacement

- 1. Disconnect the negative battery cable.
- 2. Remove in the order shown in the figure, referring to Removal Note.
- 3. Install in the reverse order of removal, referring to **Installation Note**.



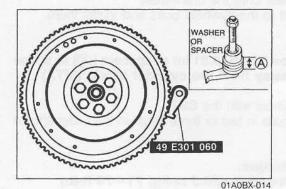




N-m (m-kg, ft-lb) 01A0BX-013

. Section J
Section K
Section H

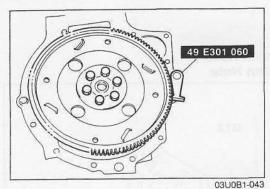
Removal Note below Installation Note page B–24 4. Drive plate (ATX) Removal Note page B–24 Installation Note page B–25 5. Oil seal Removal Note page B–24 Installation Note page B–24 Installation Note page B–24	3. Flywheel (MTX)		
4. Drive plate (ATX) Removal Note	Removal Note		below
Removal Note	Installation Note	page	B-24
Installation Note	4. Drive plate (ATX)		
5. Oil seal Removal Note page B-24	Removal Note	page	B-24
Removal Note page B-24	Installation Note	page	B-25
	5. Oil seal	, ,	
Installation Note page B-24	Removal Note	page	B-24
	Installation Note	page	B-24

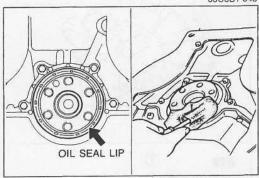


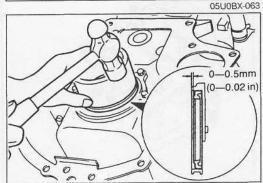
Removal note Flywheel (MTX)

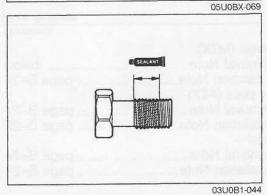
Caution

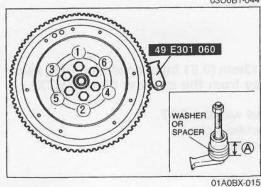
- Add approx 13mm (0.51 in) of spacers (A) to space the SST away from the cylinder block. (MTX)
- 1. Hold the flywheel with the SST.
- 2. Remove the flywheel bolts.
- 3. Remove the flywheel.











B-24

Drive plate (ATX)

- 1. Hold the drive plate with the SST.
- 2. Remove the drive plate lock bolts.
- 3. Remove the backing plate, drive plate, and adapter.

Oil seal

- 1. Cut the oil seal lip with a razor knife.
- 2. Remove the oil seal with a screwdriver protected with a rag.

Installation note

Oil seal

- Apply a small amount of clean engine oil to the lip of a new oil seal.
- 2. Push the oil seal slightly in by hand.

Caution

- The oil seal must be tapped in until it is flush with the edge of the rear cover.
- 3. Tap the oil seal in evenly with a suitable pipe and a hammer.

Oil seal outer diameter: 100mm (3.94 in)

Flywheel (MTX)

1. Remove the sealant from the flywheel bolt holes in the crankshaft and from the flywheel bolts.

Caution

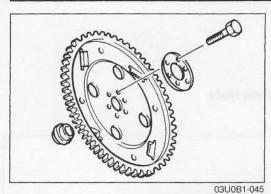
- If all the previous sealant cannot be removed from a bolt, replace the bolt.
- · Do not apply sealant if a new bolt is used.
- 2. Set the flywheel onto the crankshaft.
- 3. Apply sealant to the flywheel bolts and install them.

Caution

- Add approx 13mm (0.51 in) of spacers (A) to space the SST away from the cylinder block. (MTX)
- 4. Hold the flywheel with the SST.
- 5. Tighten the bolts in two or three steps in the order shown in the figure.

Tightening torque:

96-103 Nm (9.8-10.5 m-kg, 71-76 ft-lb)



49 E301 060 10 0 4 30 0 0 2 5 03U0B1-046 Drive plate (ATX)

1. Remove the sealant from the drive plate bolt holes in the crankshaft and from the drive plate bolts.

Caution

- If all the previous sealant cannot be removed from a bolt, replace the bolt.
- · Do not apply new sealant if a new bolt is used.
- 2. Install the adapter, drive plate, and backing plate onto the crankshaft.
- 3. Apply sealant to the drive plate bolts and install them.
- 4. Hold the drive plate with the SST.
- 5. Tighten the bolts in two or three steps in the order shown in the figure.

Tightening torque: 96—103 N·m (9.8—10.5 m-kg, 71—76 ft-lb)

Steps After Installation

- 1. Connect the negative battery cable.
- 2. Start the engine and perform engine adjustments as necessary.

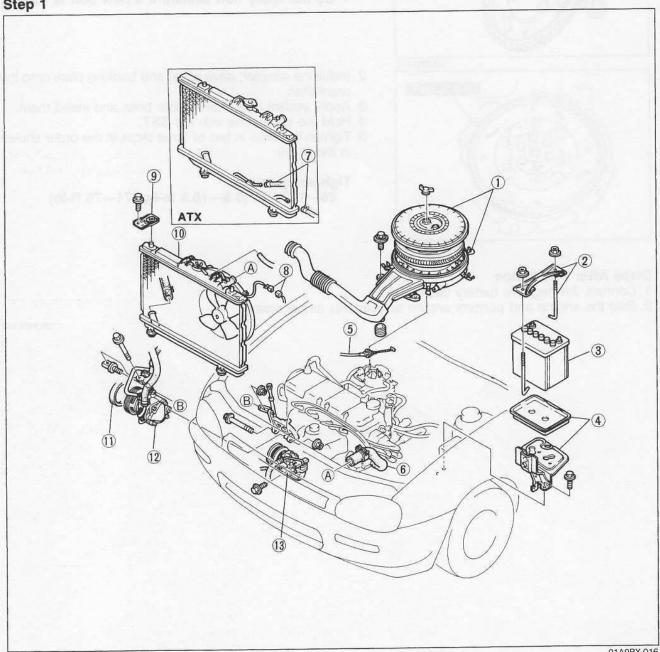
05U0BX-072

REMOVAL

PROCEDURE

- Disconnect the negative battery cable.
 Drain the engine coolant and transaxle oil.
- 3. Remove in the order shown in the figure, referring to Removal Note.

Step 1



01A0BX-016

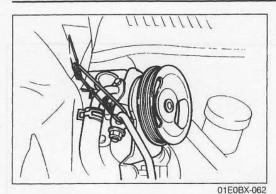
- 1. Air cleaner assembly
- 2. Battery clamp
- 3. Battery
- 4. Battery carrier
- 5. Accelerator cable
- 6. Radiator hose
- 7. Oil cooler hose (ATX)
- 8. Cooling fan connector

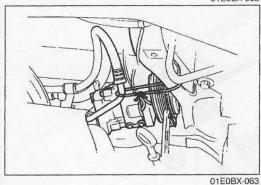
- 9. Radiator bracket
- 10. Radiator and cooling fan assembly
- 11. Drive belt
- 12. P/S oil pump and bracket (if equipped)

Removal Note..... page B-27

13. A/C compressor (if equipped)
Removal Note...... page B–27

REMOVAL





Removal note P/S oil pump (if equipped)

Caution

- · Do not damage the hoses.
- 1. Remove the P/S oil pump with the hoses still connected.
- 2. Position the pump away from the engine and affix it with wire.

A/C compressor (if equipped)

Caution

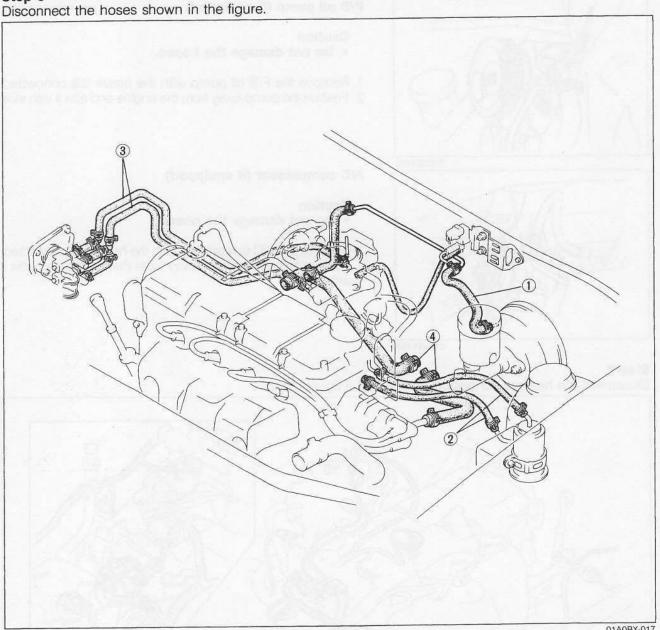
- · Do not damage the hoses.
- 1. Remove the A/C compressor with the hoses still connected.
- 2. Position the compressor away from the engine and affix it with wire.

Step 2
Disconnect the harness connectors shown in the figure.



01E0BX-163

Step 3



01A0BX-017

- 1. Brake vacuum hose
- 2. Fuel hose

Removal Note below

- 3. Vacuum hose (solenoid valve)
- 4. Heater hose

Removal note Fuel hose

Warning

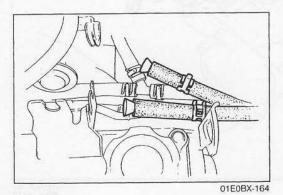
 Keep sparks and open flame away from the fuel area.

Caution

- Cover the hose with a rag because fuel will spray out when disconnecting.

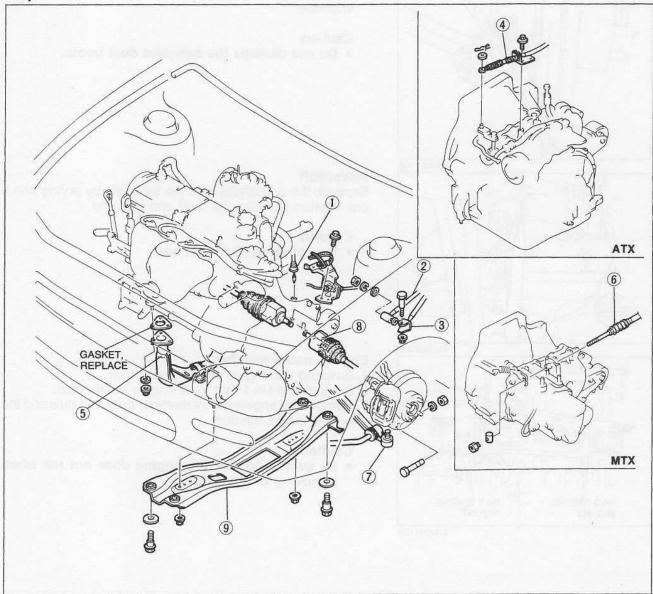
 • Plug the disconnected hoses to avoid fuel leakage.

Disconnect the fuel hoses.



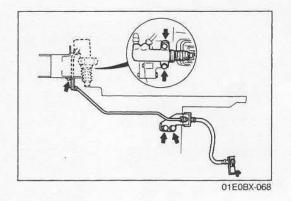
B-28

Step 4



01A0BX-018

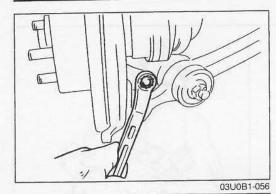
- Speedometer cable
 Shift control rod (MTX)
 Extension bar (MTX)
 Shift control cable (ATX)
 Front exhaust pipe
 Clutch cable
- 6. Clutch cable



7. Lower arm	
Removal Note	page B-29
8. Driveshaft	
Removal Note	page B-30
9. Engine mount member	
Removal Note	page B-30

Removal note Lower arm

1. Remove the bolts and nuts at the left and right lower arm ball joints.



2. Pull the lower arm downward to separate them from the knuckles.

Caution

Do not damage the ball-joint dust boots.

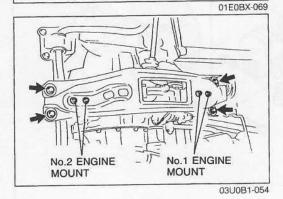


Driveshaft

Separate the driveshafts from the transaxle by prying with a bar inserted between the shaft and the case.

Caution

Do not damage the oil seal.



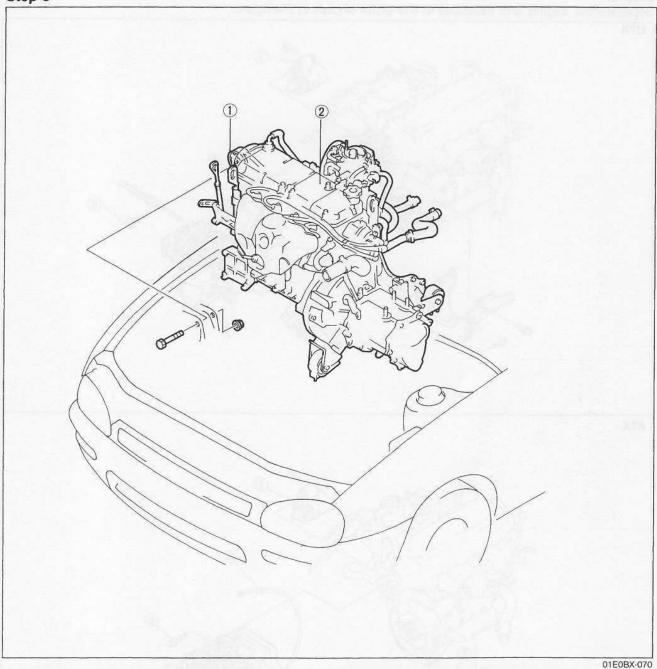
Engine mount member

- 1. Suspend the engine with a chain block.
- 2. Remove the No.1 and No.2 engine mount nuts.
- 3. Remove the engine mount member bolts and nuts and the engine mount member.

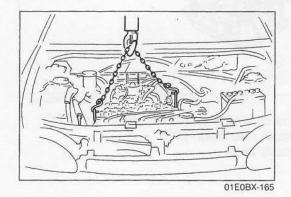
Caution

 Be careful so that the engine does not fall when removing the member.

Step 5



1. No.3 engine mount



2. Engine and transaxle assembly Removal note...... below

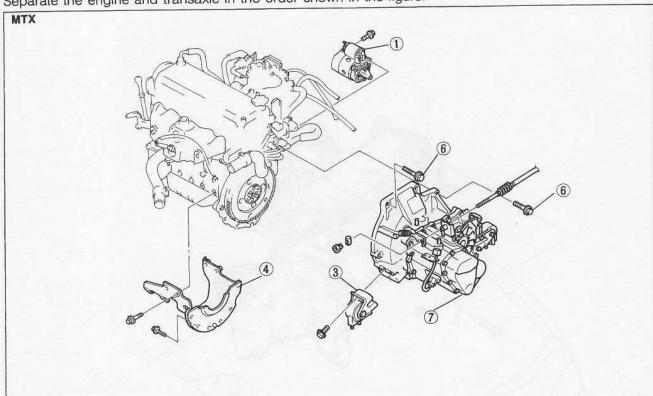
Removal note Engine and transaxle assembly

Caution

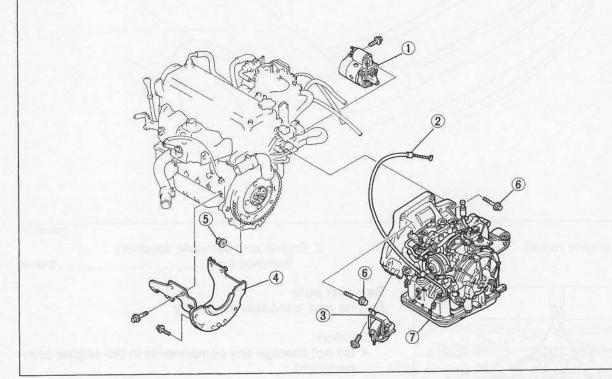
· Do not damage any components in the engine compartment.

Lift the engine and transaxle assembly out as a unit.

Step 6 Separate the engine and transaxle in the order shown in the figure.



ATX



01E0BX-071

- 1. Starter and bracket 2. Throttle cable (ATX)

- 3. No.1 engine mount 4. Integrated stiffener

- 5. Torque converter and drive plate nuts (ATX)6. Transaxle installation bolts
- 7. Transaxle assy.

ENGINE STAND MOUNTING

PREPARATION SST

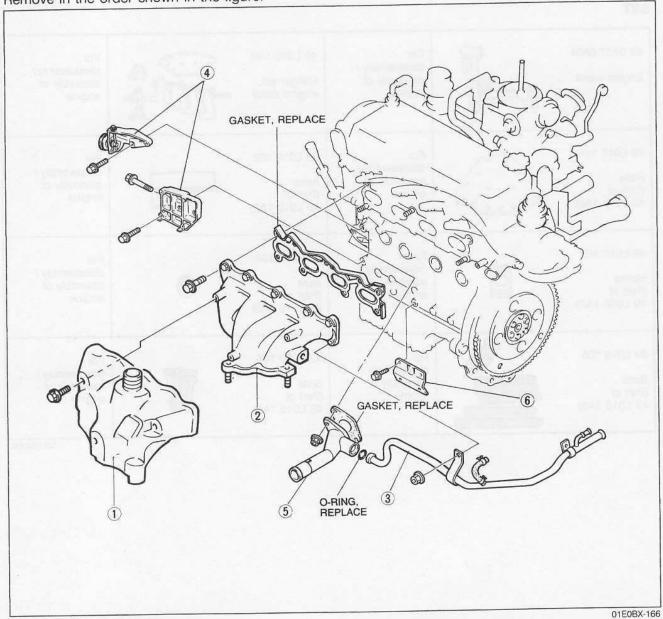
49 0107 680A Engine stand	For disassembly / assembly of engine	49 L010 1A0 Hanger set, engine stand	For disassembly / assembly of engine
49 L010 101 Plate (Part of 49 L010 1A0)	For disassembly / assembly of engine	49 L010 102 Arms (Part of 49 L010 1A0)	For disassembly / assembly of engine
49 L010 103 Hooks (Part of 49 L010 1A0)	For disassembly / assembly of engine	49 L010 104 Nuts (Part of 49 L010 1A0)	For disassembly / assembly of engine
49 L010 105 Bolts (Part of 49 L010 1A0)	For disassembly / assembly of engine	49 L010 106 Bolts (Part of 49 L010 1A0)	For disassembly / assembly of engine

05U0BX-082

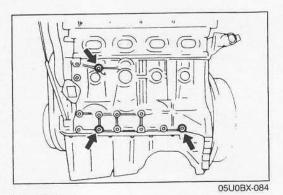
PROCEDURE

Step 1

Remove in the order shown in the figure.



- 1. Exhaust manifold insulator
- 2. Exhaust manifold
- 3. Water bypass pipe



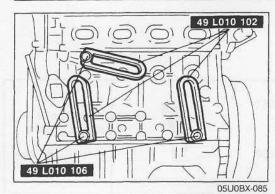
B-34

- 4. A/C compressor bracket and idler
- 5. Water inlet pipe
- 6. Exhaust pipe bracket

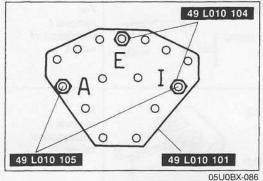
Step 2

Caution

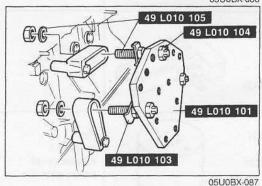
 When installing the SST (engine hanger), use the holes shown in the figure.



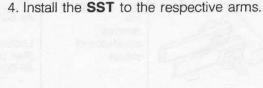
 Install the SST (arms) to the holes as shown in the figure, and loosely tighten the SST (bolts).



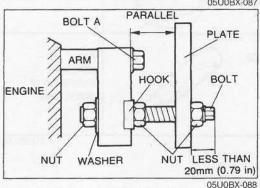
Assemble the SST (bolts and plate) in the specified position.



3. Assemble the SST (nuts, hooks, and bolts).



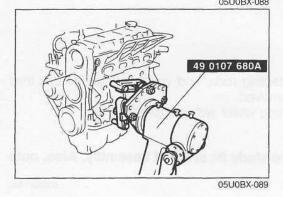
Note



Adjust the SST (bolts) so that less than 20mm (0.79 in) of thread is exposed.
Make the SST (plate and arms) parallel by adjust-

ing the SST (bolts and nuts).

5. Tighten the SST (bolts and nuts) to affix the SST firmly.



6. Mount the engine on the SST (engine stand).

DISASSEMBLY

PREPARATION SST

49 E301 060 Brake, ring gear	For prevention of engine rotation	49 E301 061 Body (Part of 49 E301 060)	For prevention of engine rotation
49 E301 062 Collar (Part of 49 E301 060)	For prevention of engine rotation	49 0636 100B Arm, valve spring lifter	For removal / installation of valves
49 B012 0A2 Pivot, valve spring lifter	For removal / installation of valves	49 B012 012 Body (Part of 49 B012 0A2)	For removal / installation of valves
49 B012 013 Foot (Part of 49 B012 0A2)	For removal / installation of valves	49 B012 014 Locknut (Part of 49 B012 0A2)	For removal / installation of valves
49 S120 170 Remover, valve seal	For removal of valve seals	49 D011 001 Support block body	For removal / installation of piston pins
49 H011 001B Support block head	For removal / installation of piston pins	49 D011 003 Piston pin installer	For removal / installation of piston pins
49 8134 045 Piston pin guide	For removal / installation of piston pins	WARE TOUR PROPERTY OF THE PROP	01E0B

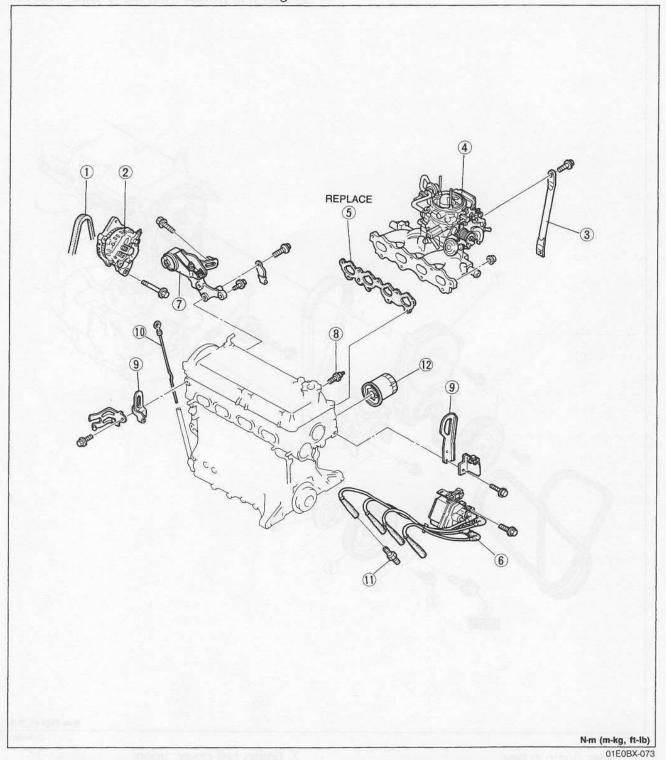
- 1. Code all identical parts (such as piston, piston rings, connecting rods, and valve springs) so that they can be reinstalled in the cylinder from which they were removed.
- 2. Clean the parts with a steam cleaner. Blow off any remaining water with compressed air.

Note

 During disassembly of any part or system, be sure to study its order of assembly. Also, note any deformation, wear, or damage. 93G0B1-040

AUXILIARY PARTS

- 1. Drain the engine oil.
- 2. Disassemble in the order shown in the figure.

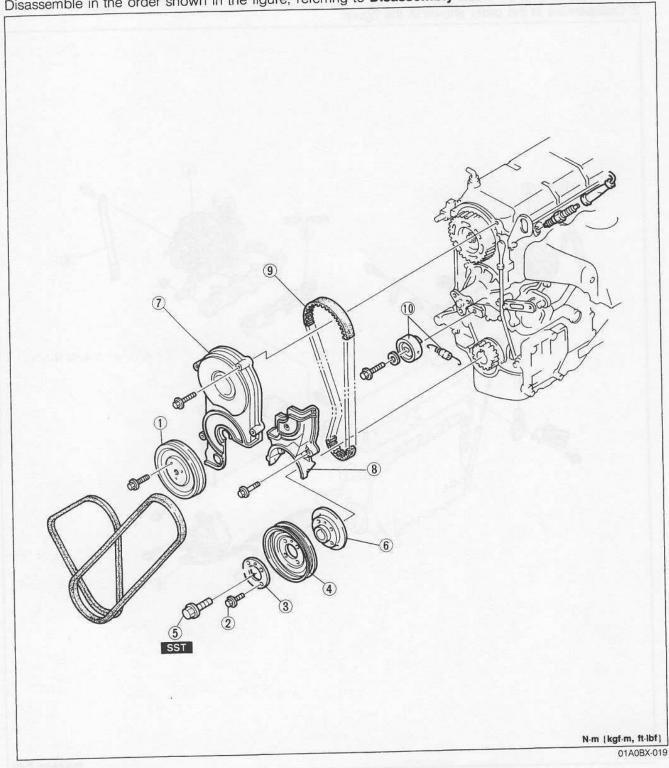


- 1. Alternator drive belt
- 2. Alternator
- 3. Intake manifold stay4. Intake manifold assembly
- 5. Intake manifold gasket6. Distributor and high-tension lead

- 7. No.3 engine mount bracket
- 8. Oil pressure switch
- 9. Engine hanger
- 10. Oil dipstick
- 11. Spark plug
- 12. Oil filter

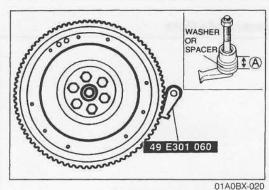
TIMING BELT

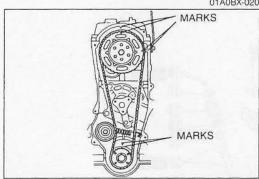
Disassemble in the order shown in the figure, referring to **Disassembly Note**.

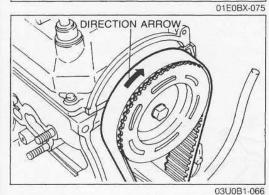


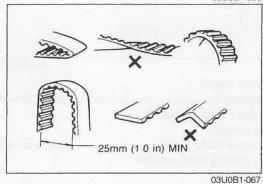
Water pump pulley Crankshaft pulley bolt	
3. Plate	
4. Crankshaft pulley	
5. Pulley lock bolt	D 47
Disassembly Note pa	ge B-47
6. Pulley boss	

7. Timing belt cover, upper		
8. Timing belt cover, lower		
9. Timing belt Disassembly Note Inspection	page page	B-39 B-59
10. Tensioner, tensioner spring	page	B-59









Disassembly Note Pulley lock bolt

Caution

- Add approx 13mm (0.51 in) of spacers (A) to space the SST away from the cylinder block. (MTX)
- 1. Hold the flywheel (MTX) or drive plate (ATX) with the SST.
- 2. Remove the pulley lock bolt.

Timing belt

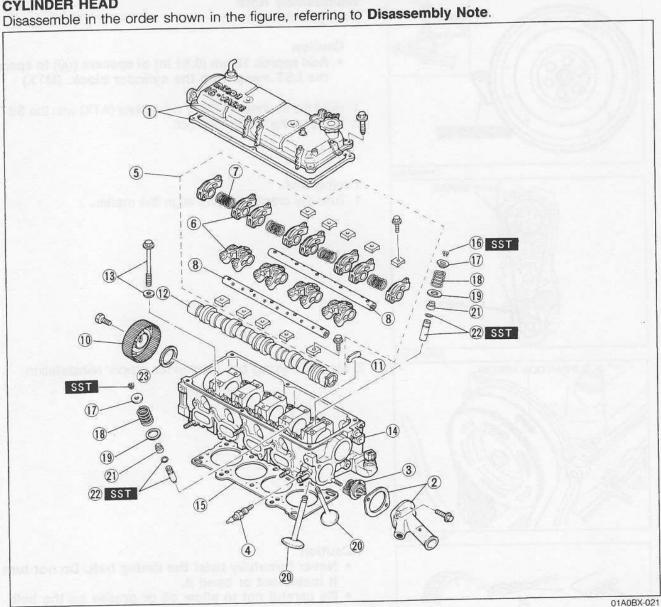
1. Turn the crankshaft and align the marks.

2. Mark the timing belt rotation for proper reinstallation.

Caution

- Never forcefully twist the timing belt. Do not turn it inside out or bend it.
- · Be careful not to allow oil or grease on the belt.

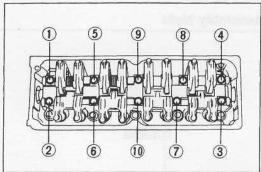
CYLINDER HEAD



 Cylinder head cover and gasket Thermostat cover and gasket 		
3. Thermostat		
4. Thermosensor		
5. Rocker arm and shaft assembly		
Disassembly note	page	B-41
6. Rocker arm		
7. Rocker arm spring		
8. Rocker shaft		
9. Camshaft pulley		
Disassembly Note	page	B-41
Inspection	page	B-59
10. Thrust plate		
11. Camshaft		
Inspection	page	B-52
12. Cylinder head bolts		
Disassembly Note	page	B-41
	3/1	

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13. Cylinder head Inspection	page	B-48
14. Cylinder head gasket		
15. Valve keeper Disassembly Note	page	B-41
16. Valve spring seat, upper		
17. Valve spring Inspection	. page	B-52
18. Valve spring seat, lower		
19. Valve		D 40
Inspection	. page	B-49
20. Valve seal Disassembly Note Inspect for wear and damage	. page	B-41
21. Valve guide		
Inspection	. page	B-49
Replacement	. page	B-50
22. Oil seal		

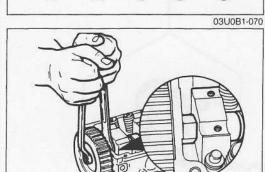
Disassembly Note



Rocker arm and rocker shaft assembly

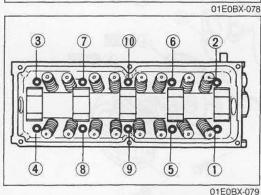
1. Remove the rocker arm and rocker shaft assembly.

2. Code all rocker arms and springs so that they can be reinstalled in the same places from which they were removed.



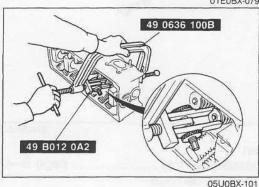
Camshaft pulley

- 1. Hold the camshaft using a suitable wrench on the cast hexagon.
- 2. Remove the camshaft pulley bolt.
- 3. Remove the camshaft pulley.



Cylinder head bolts

- 1. Loosen the cylinder head bolts in two or three steps in the order shown in the figure.
- 2. Remove the cylinder head bolts.



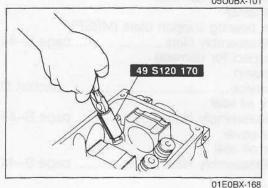
Valve keeper

- 1. Set the SST against the upper valve spring seat as shown in the figure.
- 2. Remove the valve keepers.

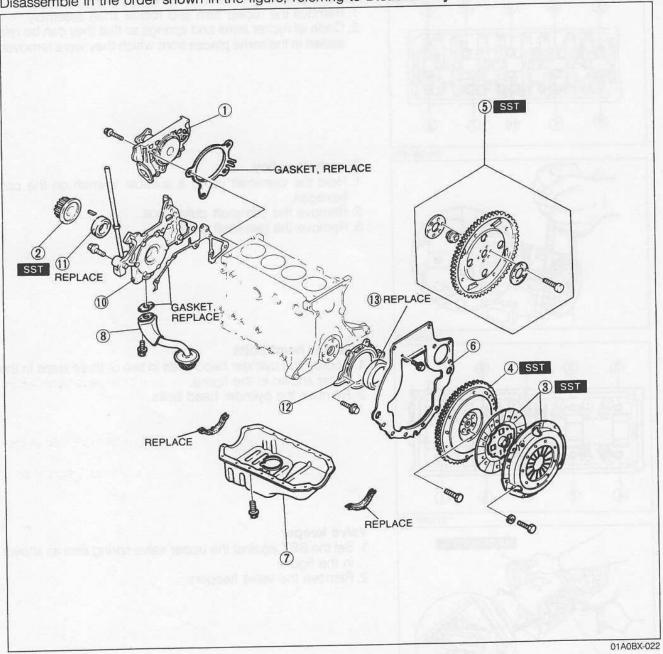


Valve seal

Remove the valve seal with the SST.

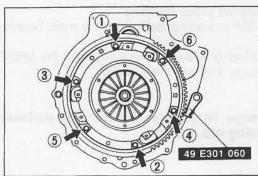


CYLINDER BLOCK (EXTERNAL PARTS)
Disassemble in the order shown in the figure, referring to Disassembly Note.

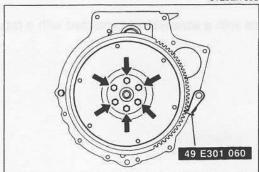


1. Water pump Service Section E
2. Timing belt pulley Inspection
3. Clutch cover, clutch disc (MTX) Service Section H
4. Flywheel (MTX) Disassembly Note page B-43 Inspect for wear and damage
5. Backing plate, drive plate, and adapter (ATX) Disassembly Note page B-43
6. End plate

7. Oil pan Disassembly Note page B-43 Inspect for damage
8. Oil strainer
9. Main bearing support plate (MBSP) Disassembly Note page B-44 Inspect for damage
10. Oil pump
Service Section D
11 Front oil seal
Disassembly Note page B-44
12. Rear cover
13. Rear oil seal
Disassembly Note page B-44







01E0BX-084

Disassembly Note Flywheel

Caution

- Add approx 13mm (0.51 in) of spacers (A) to space the SST away from the cylinder block. (MTX)
- 1. Hold the flywheel with the SST.
- 2. Loosen the clutch cover bolts in two or three steps in the order shown in the figure.
- 3. Remove the clutch cover.
- 4. Remove the flywheel bolts.
- 5. Remove the flywheel.
- 6. Remove the SST.

Backing plate, drive plate, and adapter (ATX)

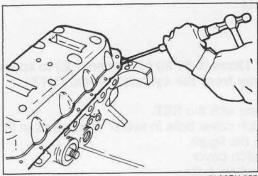
- 1. Hold the drive plate with the SST.
- 2. Remove the drive plate bolts.
- 3. Remove the backing plate, drive plate, and adapter.
- 4. Remove the SST.

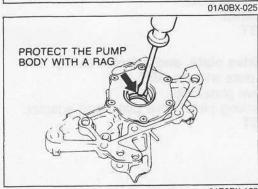
Oil pan

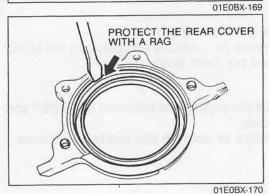
- 1. Remove the oil pan mounting bolts.
- 2. Insert a screwdriver or a suitable tool between the MBSP and oil pan, and pry them apart.

Caution

- Do not insert the prying tool between the MBSP and cylinder block.
- Do not damage or scratch the contact surfaces.







Main bearing support plate (MBSP)

- Remove the MBSP mounting bolts from the main bearing cap.
- 2. Insert a screwdriver or a suitable tool between the MBSP and cylinder block, and pry them apart.

Caution

 Do not damage or scratch the contact surfaces when removing old sealant.

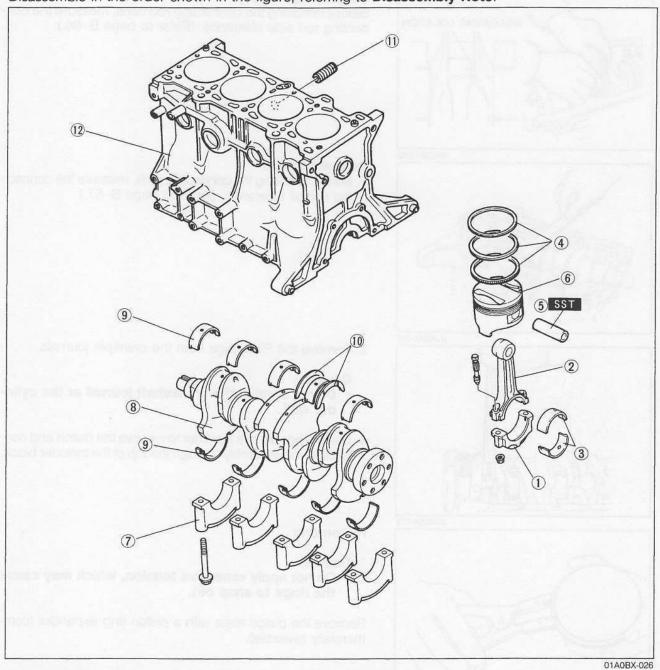
Front oil seal

Remove the oil seal with a screwdriver protected with a rag.

Rear oil seal

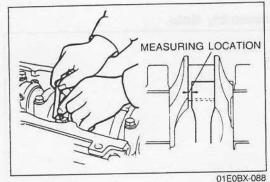
Remove the oil seal with a screwdriver protected with a rag.

CYLINDER BLOCK (INTERNAL PARTS)
Disassemble in the order shown in the figure, referring to **Disassembly Note**.



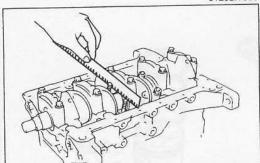
Connecting rod cap		
Disassembly Note	page	B-46
2. Connecting rod		
Disassembly Note	page	B-46
Inspection		
3. Connecting rod bearing		
Inspection	page	B-58
4. Piston ring		
Disassembly Note	page	B-46
Inspection		
5. Piston pin		
Disassembly Note	page	B-46
Inspection		

6. Piston		
Inspection	page	B-56
7. Main bearing cap		
Disassembly Note	page	B-47
8. Crankshaft		
Disassembly Note	page	B-47
Inspection		
9. Main bearing		
Inspection	page	B-58
10. Thrust bearing		
11. Oil filter joint		
12. Cylinder block		
Inspection	page	B-54



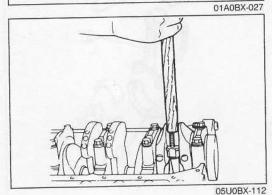
Disassembly Note Connecting rod cap

Before removing the connecting rod caps, measure the connecting rod side clearance. (Refer to page B-66.)



Connecting rod

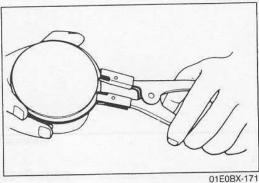
1. Before removing the connecting rods, measure the connecting rod oil clearance. (Refer to page B-57.)



2. Remove the Plastigage from the crankpin journals.

Caution

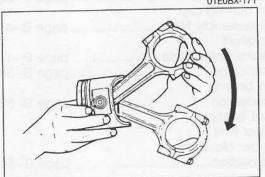
- Do not scratch the crankshaft journal or the cylinder wall.
- 3. Use the handle of a hammer to remove the piston and connecting rod assembly through the top of the cylinder block.



Piston ring

 Do not apply excessive tension, which may cause the rings to snap out.

Remove the piston rings with a piston ring expander (commercially available).



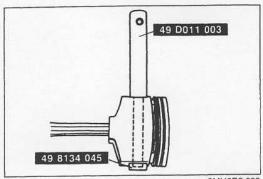
Piston pin

03U0B1-085

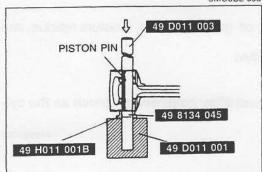
Caution

- Mark the connecting rod direction for proper reassembly.
- 1. Before disassembling the piston and connecting rod, check the oscillation torque as shown. If the large end does not drop by its own weight, replace the piston or the piston pin.

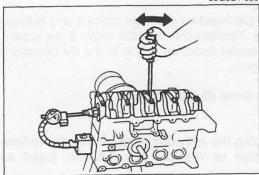
B - 46



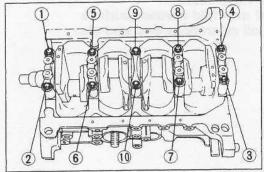
9MU0B2-098



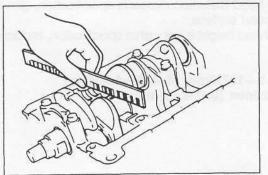
93G0B1-050



01A0BX-028



05U0BX-116



01E0BX-172

2. Assemble the SST as shown.

- 3. Mount the piston and connecting rod in the SST as shown.
- Press out the piston pin.
 While removing the piston pin, check the pressure. If it is lower than 4905 N (500 kg, 1100 lb), replace the piston pin or connecting rod.

Main bearing cap

1. Before removing the main bearing caps, measure the crankshaft end play. (Refer to page B-65.)

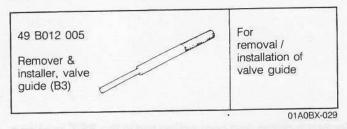
- 2. Loosen the main bearing cap bolts in two or three steps in the order shown in the figure.
- 3. Remove the main bearing caps.

Crankshaft

Before removing the crankshaft, measure the main bearing oil clearances. (Refer to page B-74.)

INSPECTION / REPAIR

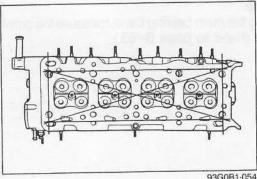
PREPARATION SST



- 1. Clean all parts, being sure to remove all gasket fragments, dirt, oil, grease, carbon, moisture residue, and other foreign materials.
- 2. Inspection and repairs must be performed in the order specified.

 Do not damage the joints or friction surfaces of aluminum alloy components (such as the cylinder head or pistons).

01E0BX-093



CYLINDER HEAD

- 1. Inspect the cylinder head for damage, cracks, and leakage of water and oil. Replace the cylinder head if necessary.
- 2. Measure the cylinder head distortion in the six directions shown in the figure.

Distortion: 0.15mm (0.006 in) max.

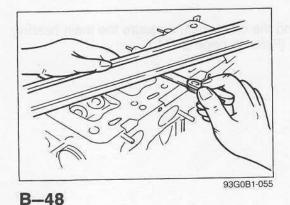
Caution

 Before grinding the cylinder head, check the following and repair or replace the cylinder head as necessary.

Sinking of valve seats

Damage of manifold contact surface

Camshaft oil clearances and end play

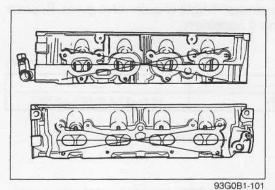


3. If the cylinder head distortion exceeds specification, grind the cylinder head surface.

If the cylinder head height is not within specification, replace it.

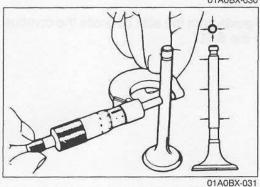
Height: 107.4—107.6mm (4.228—4.236 in)

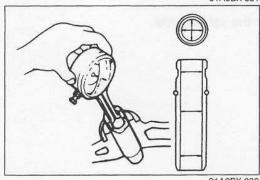
Grinding: 0.20mm (0.008 in) max.

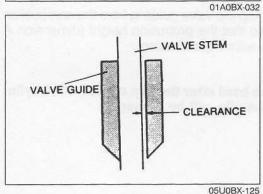


MARGIN THICKNESS ANGLE 45°

01A0BX-030







4. Measure the manifold contact surface distortion in the six directions shown in the figure.

Distortion: 0.15mm (0.006 in) max.

5. If distortion exceeds specification, grind the surface or replace the cylinder head.

VALVE MECHANISM Valve and Valve Guide

- Inspect each valve for the following. Replace or resurface the valve if necessary.
 - (1) Damaged or bent stem
 - (2) Rough or damaged face
 - (3) Damaged or unevenly worn stem tip
- Measure the valve head margin thickness of each valve. Replace the valve if necessary.

Margin thickness min.

mm (in)

	B3	
IN	1.1 (0.043)	
EX	1.2 (0.047)	

3. Measure the length of each valve.

Length

mm (in)

	The state of the s	B3
TKT	Standard	108.24 (4.261)
IN	Minimum	107.74 (4.241)
EX	Standard	109.34 (4.304)
	Minimum	108.84 (4.285)

4. Measure the stem diameter of each valve at the points shown.

Diameter

mm (in)

	B3
IN	5.970—5.985 (0.2350—0.2356)
EX	5.965—5.980 (0.2348—0.2354)

5. Measure the inner diameter of each valve guide at the points shown.

Inner diameter

mm (in)

	B3
IN, EX	6.01-6.03 (0.2366-0.2374)

Calculate the valve stem to guide clearance. Subtract the outer diameter of the valve stem from the inner diameter of the corresponding valve guide.

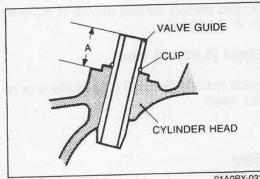
Clearance

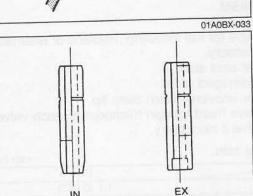
IN: 0.025-0.060mm (0.0010-0.0024 in)

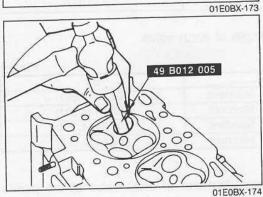
EX: 0.030-0.065mm (0.0012-0.0026 in)

Maximum: 0.20mm (0.008 in)

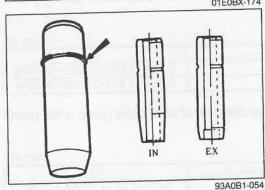
If the clearance exceeds specification, replace the valve and/or valve guide.

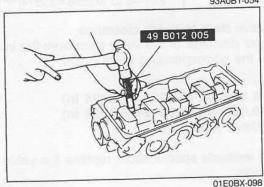






IN





8. Measure the protrusion height of each valve guide. Replace the valve guide if necessary.

Height

mm (in)

	B3
IN, EX	16.8—17.4 (0.661—0.685)

Replacement of valve guide

 As the shapes of the intake and exhaust valve guides are different, install correctly.

Removal

Remove the valve guide from the side opposite the combustion chamber with the SST.

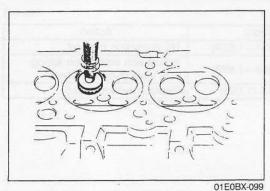
Installation

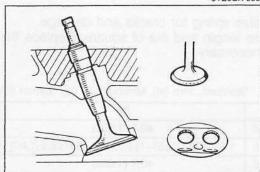
1. Fit the clip onto the valve guide.

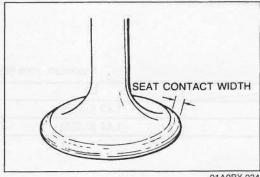
2. Using the SST, tap the valve guide in from the combustion chamber side so that the protrusion height (dimension A in the figure) is within specification.

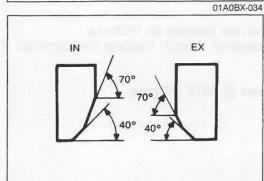
Caution

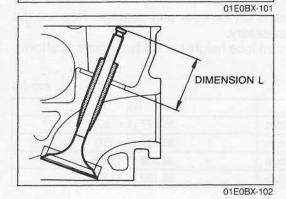
 Do not strike hard after the clip contacts the cylinder head, the clip will be damaged.











Valve Seat

- 1. Inspect the contact surface of each valve seat and valve face for the following:
 - (1) Roughness
 - (2) Damage
- 2. If necessary, resurface the valve seat with a **45°** valve seat cutter and/or resurface the valve face.
- 3. Apply a thin coat of Prussian blue to the valve face.
- 4. Inspect the valve seating by pressing the valve against the seat.
 - (1) If blue does not appear 360° around the valve face, replace the valve.
 - (2) If blue does not appear 360° around the valve seat, resurface the seat.
- 5. Measure the seat contact width.

Width

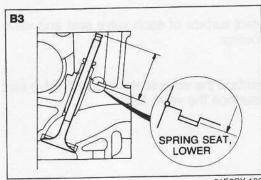
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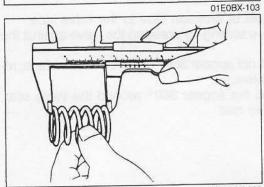
mm (in)

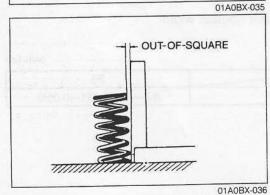
ugarondo -	B3
IN, EX	0.8—1.4 (0.031—0.055)

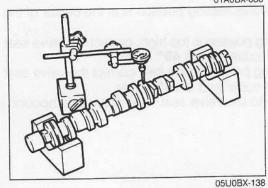
- 6. Verify that the valve seating position is at the center of the valve face.
 - (1) If the seating position is too high, correct the valve seat with a **70°** cutter and a **45°** cutter.
 - (2) If the seating position is too low, correct the valve seat with a **40°** cutter and a **45°** cutter.
- 7. Seat the valve to the valve seat with lapping compound.
- Inspect the sinking of the valve seat.
 Measure the protruding length (dimension L) of the valve stem.

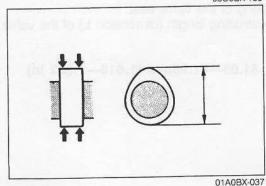
Dimension L: 41.05-41.95mm (1.616-1.652 in)











mm (in)

Measurement	Action
41.5-42.0 (1.634-1.654)	No correction needed
42.0—43.0 (1.654—1.693)	Adjust with washer on spring seat area of cylinder head
More than 43.0 (1.693)	Replace cylinder head

Valve Spring

- 1. Inspect each valve spring for cracks and damage.
- 2. Measure the free length and out of square. Replace the valve spring if necessary.

Free length

Standard...mm (in), Minimum...N (kg, lb)/mm (in)

		B3
200	Standard	40.7 (1.602)
IN	Minimum	133.2—150.7 (13.58—15.37, 29.88—33.81)/36.0 (1.417)
Name of the last	Standard	40.7 (1.602)
EX	Minimum	133.2—150.7 (13.58—15.37, 29.88—33.81)/36.0 (1.417)

Out-of-square

Maximum ..mm (in)

	B3
IN	1.42 (0.055)
EX	1.42 (0.055)

CAMSHAFT

- 1. Set the front and rear journals on V-blocks.
- 2. Measure the camshaft runout. Replace the camshaft if necessary.

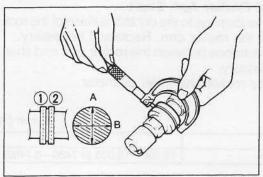
Runout: 0.03mm (0.0012 in) max.

- 3. Inspect the camshaft for wear and damage. Replace the camshaft if necessary.
- 4. Measure the cam lobe heights at the two points as shown.

Height

mm (in)

		B3
	Standard	36.527 (1.4380)
IN	Minimum	36.327 (1.4301)
	Standard	36.333 (1.4304)
EX	Minimum	36.133 (1.4225)



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5. Measure the journal diameters X and Y directions at the two points (1) and (2) shown.

Diameter

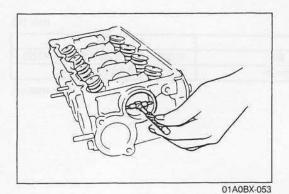
mm (in)

Carlo Sign	B3
No.1 & No.5	43.440-43.460 (1.7102-17.110)
No.2 & No.4	43.425—43.450 (1.7096—1.7106)
No.3	43.410—43.435 (1.7091—1.7100)

Out of round: 0.05mm (0.002 in) max.

- 6. Measure the oil clearances between the camshaft and cylinder head.
 - (1) Remove all foreign material and oil from the journals and the camshaft bore.
 - (2) Measure the camshaft bore diameter.

03U0B1-105



Diameter

mm (in)

	B3
No.1 & No.5	43.500-43.525 (1.7126-1.7135)
No.2, No.3, No.4	43.500—43.525 (1.7126—1.7135)

(3) Subtract the journal diameter from the bore diameter.

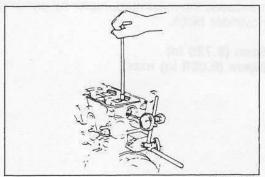
Oil clearance

mm (in)

No.1 & No.5	0.040-0.085 (0.0016-0.0033)
No.2 & No.4	0.050—0.100 (0.0019—0.0039)
No.3	0.065—0.115 (0.0025—0.0045)
Maximum	0.15 (0.006)

(4) If the clearance exceeds the maximum, replace the camshaft or cylinder head.

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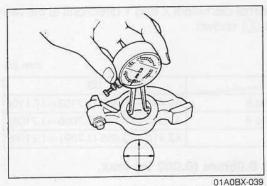


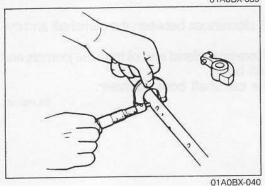
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7. Measure the camshaft end play. If it exceeds the maximum, replace the thrust plate or camshaft.

End play: 0.060-0.200mm (0.0023-0.0078 in)

Maximum: 0.2mm (0.007 in)





Rocker Arm and Rocker Arm Shaft

- 1. Check for wear or damage to the contact surface of the rocker arm shaft or the rocker arm. Replace if necessary.
- 2. Check the oil clearance between the rocker arm and shaft. Replace if necessary.
 - (1) Measure the rocker arm inner diameter.

Diameter

mm (in)

	B3
IN, EX	19.000—19.033 (0.7480—0.7493)

(2) Measure the rocker arm shaft diameter.

Diameter

mm (in)

	B3
IN, EX	18.959—18.980 (0.7464—0.7472)

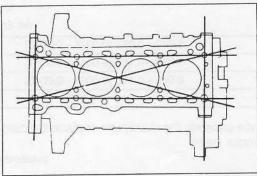
(3) Subtract the shaft diameter from the rocker arm diameter.

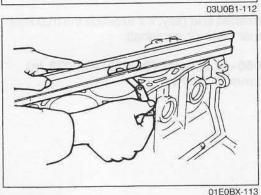
Oil clearance

mm (in)

	B3
IN, EX	0.020-0.074 (0.0008-0.0029)
Maximum	0.10 (0.004)

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CYLINDER BLOCK

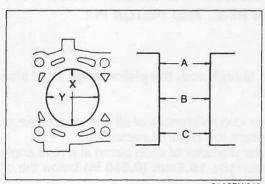
- 1. Check the cylinder block for the following and repair or replace the cylinder block as necessary.
 - (1) Leakage damage.
 - (2) Cracks.
 - (3) Scoring of wall.
- 2. Measure the distortion of the top surface of the cylinder block in the six directions shown in figure.

Distortion: 0.15mm (0.006 in) max.

3. If the distortion exceeds the maximum, repair by grinding or replace the cylinder block.

Height: 221.5mm (8.720 in) Grinding: 0.20mm (0.008 in) max.





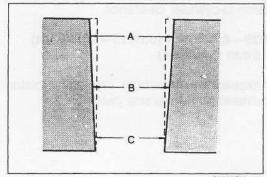
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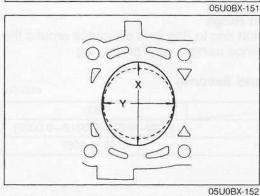
4. Measure the cylinder bores in X and Y directions at three levels (A, B, and C) in each cylinder as shown.

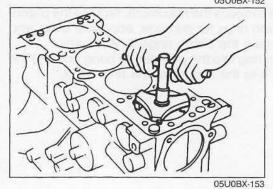
Cylinder bore

mm (in)

1272 642	B3
Standard	71.006—71.013 (2.7955—2.7958)
0.25 (0.010) oversize	71.256—71.263 (2.8053—2.8056)
0.50 (0.020) oversize	71.506—71.513 (2.8152—2.8155)
0.75 (0.030) oversize	71.756—71.763 (2.8250—2.8253)
1.00 (0.04) oversize	72.006—72.013 (2.8349—2.8352)







Caution

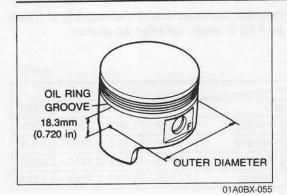
- The boring size should be based on the size of an oversize piston and be the same for all cylinders.
- (1) If the cylinder bore exceeds the maximum, rebore the cylinder to oversize.
- (2) If the difference between measurements A and C exceeds the maximum taper, rebore the cylinder to oversize.

Taper: 0.019mm (0.0007 in) max.

(3) If the difference between measurements X and Y exceeds the maximum out-of-round, rebore the cylinder to oversize.

Out-of-round: 0.019mm (0.0007 in) max.

5. If the upper part of a cylinder wall shows uneven wear, remove the ridge with a ridge reamer.



PISTON, PISTON RING, AND PISTON PIN Piston

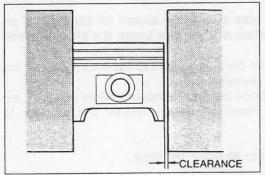
Caution

- If the piston is replaced, the piston rings must also be replaced.
- 1. Inspect the outer circumferences of all pistons for seizure or scoring. Replace the piston if necessary.
- 2. Measure the outer diameter of each piston at a right angle (90°) to the piston pin, 16.5mm (0.650 in) below the oil ring land lower edge.

Piston diameter

mm (in)

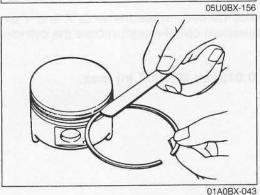
Standard	70.961—70.967 (2.7937—2.7939)
0.25 (0.010) oversize	71.211—71.217 (2.8036—2.8028)
0.50 (0.020) oversize	71.461—71.467 (2.8134—2.8137)
0.75 (0.030) oversize	71.711—71.717 (2.8233—2.8235)
1.00 (0.04) oversize	71.961-71.967 (2.8331-2.8333)



3. Measure the piston-to-cylinder clearance.

Clearance: 0.039-0.052mm (0.0015-0.0020 in) Maximum: 0.15mm (0.006 in)

4. If the clearance exceeds the maximum, replace the piston or rebore the cylinders to fit oversize pistons.



Piston and Piston Rings

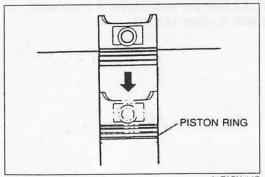
1. Measure the piston ring to ring land clearance around the entire circumference using a new piston ring.

Clearance (Top and Second)

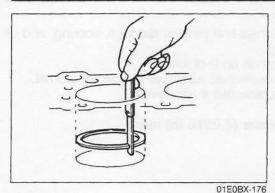
mm (in)

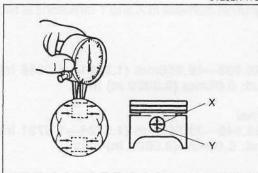
	B3	
Standard	0.030-0.070 (0.0012-0.0028)	
Maximum	0.15 (0.006)	

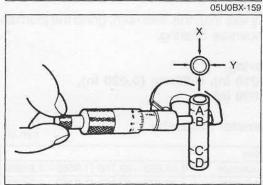
- 2. If the clearance exceeds the maximum, replace the piston.
- 3. Inspect the piston rings for damage, abnormal wear, and breakage. Replace the piston rings if necessary.
- 4. Insert the piston ring into the cylinder by hand and use the piston to push it to the bottom of the ring travel.

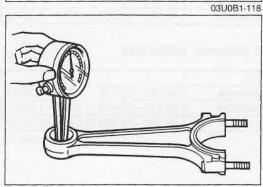


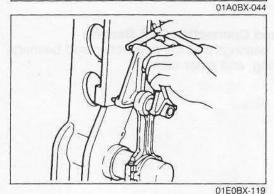
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5. Measure each piston ring end gap with a feeler gauge. Replace the piston ring if necessary.

End gap

Top: 0.15—0.30mm (0.006—0.012 in) Second: 0.30—0.45mm (0.011—0.017 in) Oil rail: 0.20—0.70mm (0.008—0.028 in)

Maximum: 1.0mm (0.039 in)

Piston and Piston Pin

Measure each piston pin hole diameter in X and Y directions at four points.

Diameter: 19.988-20.000mm (0.7869-0.7874 in)

2. Measure each piston pin diameter in X and Y directions at four points.

Diameter: 19.974-19.980mm (0.7864-0.7866 in)

3. Calculate the piston pin-to-piston clearance.

Clearance: 0.008-0.026mm (0.0003-0.0010 in)

4. If the clearance exceeds specification, replace the piston and/or piston pin.

CONNECTING ROD

1. Measure each connecting rod bushing inner diameter.

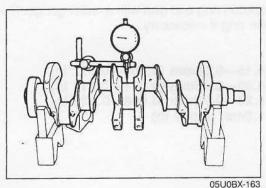
Diameter: 19.943—19.961mm (0.7852—0.7859 in)

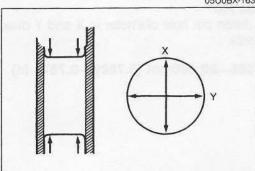
2. Calculate the clearance between the connecting rod bushing and piston pin.

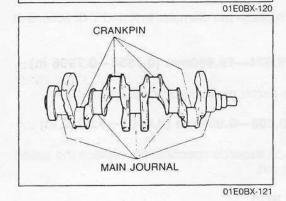
Interference: 0.013—0.037mm (0.0005—0.0015 in)

3. Measure each connecting rod for bending. Repair or replace the connecting rod if necessary.

Bending: 0.075mm (0.0030 in) max./50mm (1.97 in)







CRANKSHAFT

- Check the journals and pins for damage, scoring, and oil hole clogging.
- 2. Set the crankshaft on V-blocks.
- 3. Measure the crankshaft runout at the center journal. Replace the crankshaft if necessary.

Runout: 0.04mm (0.0016 in) max.

Measure each journal diameter in X and Y directions at two points.

Main journal

Diameter: 49.938—49.956mm (1.9661—1.9668 in) Out-of-round: 0.05mm (0.0020 in) max.

Crankpin journal

Diameter: 39.940—39.956mm (1.5724—1.5731 in) Out-of-round: 0.05mm (0.0020 in) max.

5. If the diameter is less than the minimum, grind the journals to match an undersize bearing.

Undersize bearing:

0.25mm (0.010 in), 0.50mm (0.020 in), 0.75mm (0.030 in)

Main journal diameter undersize

mm (in)

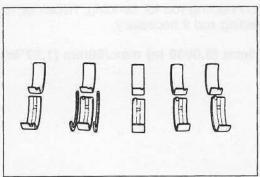
Bearing size	
0.25 (0.010) undersize	49.688—49.706 (1.9562—1.9569)
0.50 (0.020) undersize	49.438—49.456 (1.9463—1.9470)
0.75 (0.030) undersize	49.188—49.206 (1.9365—1.9372)

Crankpin journal diameter undersize

mm (in)

Bearing size	
0.25 (0.010) undersize	39.690—39.706 (1.5626—1.5632)
0.50 (0.020) undersize	39.440-39.456 (1.5528-1.5534)
0.75 (0.030) undersize	39.190—39.206 (1.5429—1.5435)

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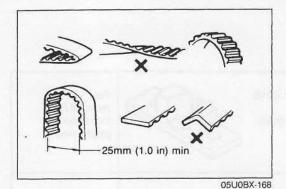
01E0BX-177

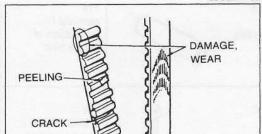
BEARING

Main Bearing and Connecting Rod Bearing

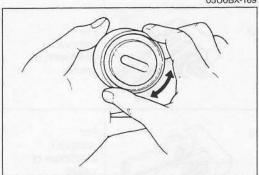
Check the main bearings and the connecting rod bearings for peeling, scoring, and other damage.

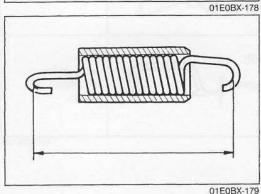
B-58

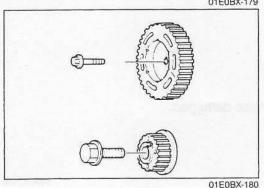




05U0BX-169







TIMING BELT

Caution

- Never forcefully twist, turn inside out, or bend the timing belt.
- · Do not allow oil or grease on the belt.
- 1. Replace the timing belt if there is any oil or grease on it.
- 2. Check the timing belt for damage, wear, peeling, cracks, and hardening. Replace the timing belt if necessary.

TENSIONER, IDLER

Caution

 Do not clean the tensioner or idler with cleaning fluids. If necessary, use a soft rag to wipe them clean, and avoid scratching them.

Check the tensioner and idler for smooth rotation and abnormal noise. Replace the tensioner or idler if necessary.

TENSIONER SPRING

Measure the free length of the tensioner spring. Replace the tensioner spring if necessary.

Free length: 64.0mm (2.520 in)

PULLEY

Timing Belt Pulley, Camshaft Pulley

Caution

 Do not clean the pulleys with cleaning fluids. If necessary, use a soft rag to wipe them clean, and avoid scratching them.

Inspect the pulley teeth for wear, deformation, and other damage. Replace the pulley if necessary.

ASSEMBLY

PREPARATION SST

For removal / installation of piston pins	49 H011 001B Support block head	For removal / installation of piston pins
For removal / installation of piston pins	49 8134 044 Piston pin guide	For removal / installation of piston pins
For prevention of engine rotation	49 E301 061 Body (Part of 49 E301 060)	For prevention of engine rotation
For prevention of engine rotation	49 B012 0A2 Pivot, valve spring lifter	For removal / installation of valves
For removal / installation of valves	49 B012 013 Foot (Part of 49 B012 0A2)	For removal / installation of valves
For removal / installation of valves	49 0636 100B Arm, valve spring lifter	For removal / installation of valves
For		01E0BX-12
installation of clutch disc	1309	
	removal / installation of piston pins For removal / installation of piston pins For prevention of engine rotation For prevention of engine rotation For removal / installation of valves For removal / installation of valves	removal / installation of piston pins For removal / installation of piston pins For prevention of engine rotation For removal / installation of valves For installation of valves For installation of valves

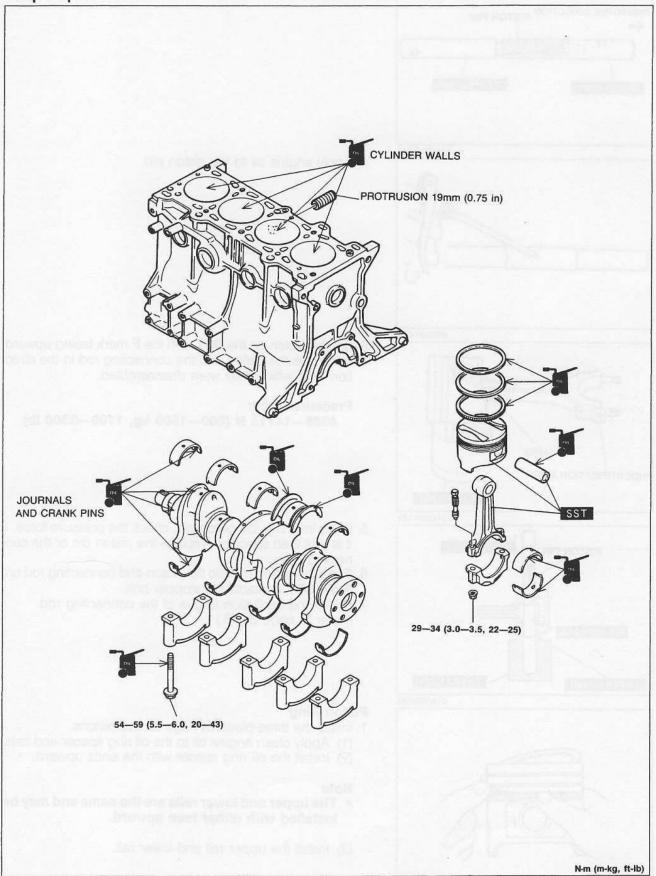
Clean all parts before reinstallation.
 Apply new engine oil to all sliding and rotating parts.
 Replace plain bearings if they are peeling, burned, or otherwise damaged.
 Tighten all bolts and nuts to the specified torques.

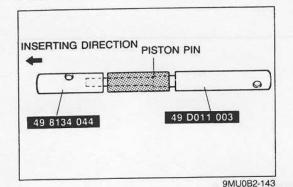
Caution

· Do not reuse gaskets or oil seals.

93G0B1-082

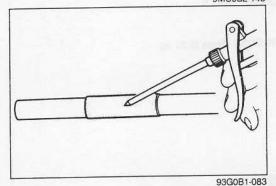
CYLINDER BLOCK (INTERNAL PARTS) Torque Specifications



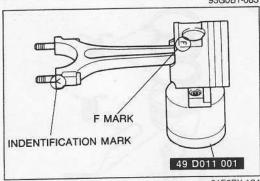


Connecting Rod

1. Assemble the SST as shown.



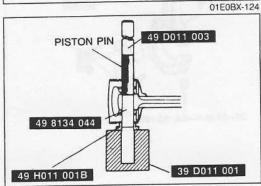
2. Apply engine oil to the piston pin.



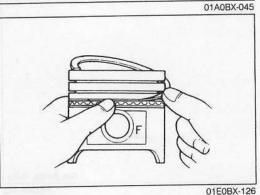
3. Set the piston on the SST with the F mark facing upward.

 Assemble the piston and the connecting rod in the direction from which they were disassembled.

Pressure force: 4905—14715 N (500—1500 kg, 1100—3300 lb)



- While inserting the piston pin, check the pressure force. If it is less than specified, replace the piston pin or the connecting rod.
- Press the piston pin into the piston and connecting rod until the SST contacts the stopper bolt.
- Check the oscillation torque of the connecting rod. (Refer to page B-46.)



Piston Ring

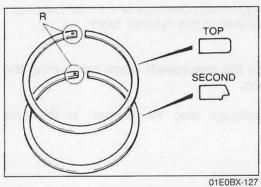
1. Install the three-piece oil rings on the pistons.

- (1) Apply clean engine oil to the oil ring spacer and rails.
- (2) Install the oil ring spacer with the ends upward.

Note

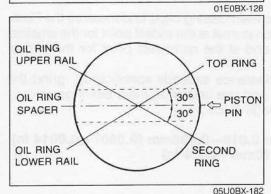
- The upper and lower rails are the same and may be installed with either face upward.
- (3) Install the upper rail and lower rail.

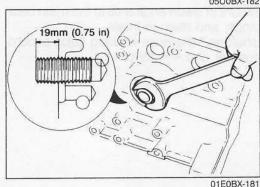
B

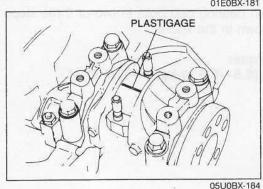


SPACER TANG
UPPER RAIL

OIL RING
SPACER ENDS
LOWER RAIL







Verify that both rails are expanded by the spacer tangs as shown in the figure by making certain the rails turn smoothly in both directions.

Caution

- The rings must be installed with the R marks upward.
- The second ring must be installed with the scraper face downward.
- 3. Apply clean engine oil to the top and second piston rings.
- 4. Install the second ring to the piston; then install the top ring. Use a piston ring expander (commercially available).

5. Position the end gaps of the rings as shown in the figure.

Oil Filter Joint

Install the oil filter joint so that it protrudes as specified.

Protrusion: 19mm (0.75 in)

Crankshaft

 Before installing the crankshaft, inspect the main bearing oil clearances as follows.

Oil clearance inspection

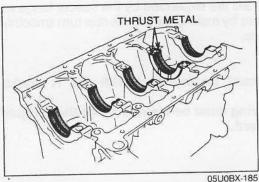
(1) Remove all foreign material and oil from the journals and bearings.

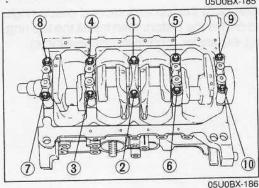
Caution

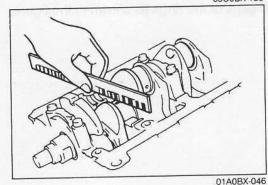
- Install the grooved upper main bearings in the cylinder block.
- Install the thrust bearings with the oil groove facing the crankshaft.

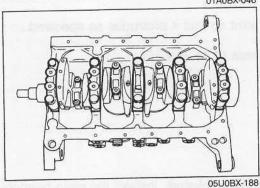
B-63

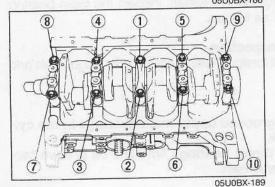
ASSEMBLY











B-64

- (2) Install the upper main bearings and thrust bearings.
- (3) Set the crankshaft in the cylinder block.

Caution

- Do not rotate the crankshaft when measuring the oil clearances.
- (4) Position Plastigage atop the journals in the axial direction.
- (5) Install the lower main bearings and the main bearing caps according to the cap number and ← mark.
- (6) Tighten the main bearing cap bolts in two or three steps in the order shown in the figure.

Tightening torque: 54—59 N·m (5.5—6.0 m-kg, 40—43 ft-lb)

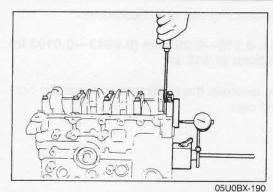
- (7) Remove the main bearing caps, and measure the Plastigage at each journal at the widest point for the smallest clearance and at the narrowest point for the largest clearance.
- (8) If the oil clearance exceeds specification, grind the crankshaft and use undersize main bearings. (Refer to page B-58.)

Oil clearance: 0.018—0.036mm (0.0007—0.0014 in) Maximum: 0.10mm (0.004 in)

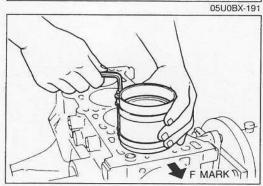
- Apply a liberal amount of clean engine oil to the main bearings, thrust bearings, and main journals.
- 3. Install the crankshaft and the main bearing caps according to the cap number and ← mark.

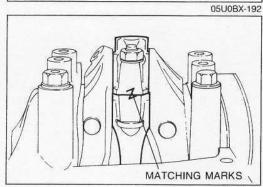
 Tighten the main bearing cap bolts in two or three steps in the order shown in the figure.

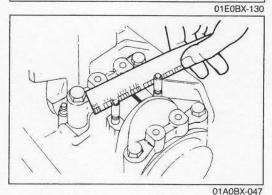
Tightening torque: 54—59 N·m (5.5—6.0 m-kg, 40—43 ft-lb)



WIDTH







5. Measure the crankshaft end play.

End play: 0.080—0.282mm (0.0031—0.0111 in) Maximum: 0.30mm (0.012 in)

If the end play exceeds the maximum, grind the crankshaft and install an oversize thrust bearing or replace the crankshaft and thrust bearing.

Thrust bearing width Standard:

2.500-2.550mm (0.0984-0.1004 in)

0.25mm (0.010 in) oversize:

2.625-2.675mm (0.1033-0.1053 in)

0.50mm (0.020 in) oversize:

2.750-2.800mm (0.1083-0.1102 in)

0.75mm (0.030 in) oversize:

2.875-2.925mm (0.1132-0.1152 in)

Piston and Connecting Rod Assembly

Caution

 Protect the connecting rod bolts with rubber sleeves to prevent damage to the crankpin journals.

Connecting Rod Cap

1. Measure the connecting rod bearing oil clearances using the same procedure as for the main bearing oil clearance.

Caution

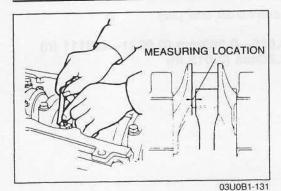
 Align the matching marks on the cap and the connecting rod when installing the connecting rod cap.

Tightening torque:

29-34 N·m (3.0-3.5 m-kg, 22-25 ft-lb)

Oil clearance: 0.028—0.068mm (0.0011—0.0027 in) Maximum: 0.10mm (0.004 in)

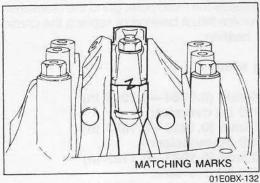
2. If the oil clearance exceeds the maximum, grind the crankshaft and use undersize bearings. (Refer to page B–58.)



3. Measure the connecting rod side clearances.

Side clearance: 0.110—0.262mm (0.0043—0.0103 in) Maximum: 0.30mm (0.012 in)

4. If the clearance exceeds the maximum, replace the connecting rod and cap.



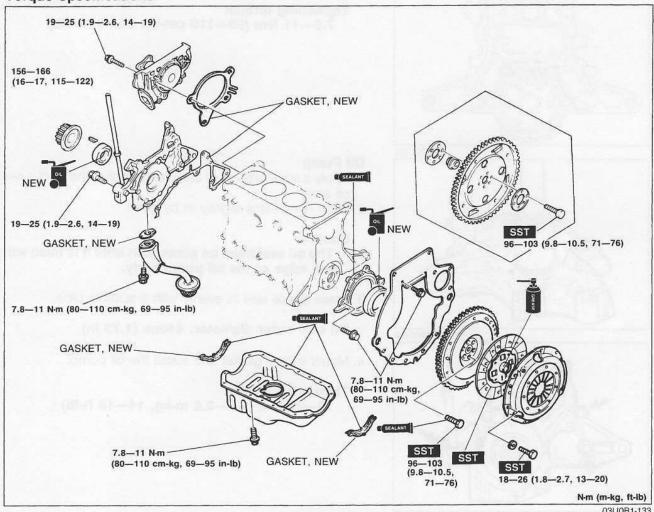
Apply a liberal amount of clean engine oil to the crankpin journals and connecting rod bearings.

6. Install the connecting rod caps with the matching marks aligned.

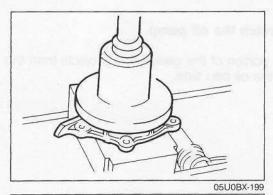
7. Tighten the connecting rod cap nuts in two or three steps.

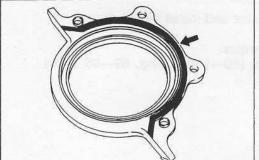
Tightening torque: 29—34 N·m (3.0—3.5 m-kg, 22—25 ft-lb)

CYLINDER BLOCK (EXTERNAL PARTS) **Torque Specifications**









05U0BX-200

Rear Cover

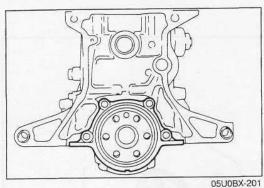
- 1. Apply a small amount of clean engine oil to the lip of a new
- 2. Push the oil seal slightly in by hand.

Caution

- The oil seal must be pressed in until it is flush with the edge of the rear cover.
- 3. Press the oil seal in evenly with a suitable pipe.

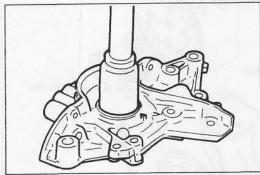
Oil seal outer diameter: 100mm (3.94 in)

4. Apply silicone sealant to the shaded area shown in the figure.



5. Install the rear cover.

Tightening torque: 7.8—11 N·m (80—110 cm-kg, 69—95 in-lb)



Oil Pump

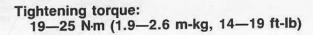
- 1. Apply a small amount of clean engine oil to the lip of a new oil seal.
- 2. Push the oil seal slightly in by hand.

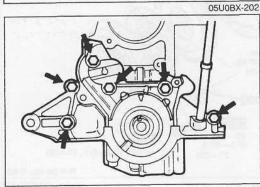


- The oil seal must be pressed in until it is flush with the edge of the oil pump body.
- 3. Press the oil seal in evenly with a suitable pipe.

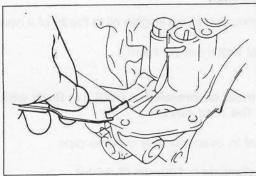
Oil seal outer diameter: 44mm (1.73 in)

4. Mount a new gasket and install the oil pump.



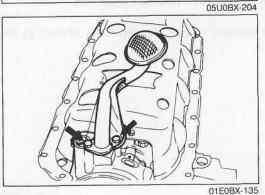


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Caution

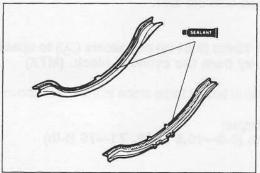
- . Do not scratch the oil pump.
- 5. Cut away the portion of the gasket that projects from the body toward the oil pan side.



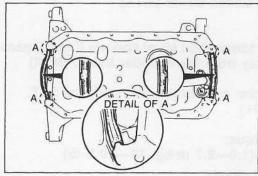
Oil Strainer

Mount a new gasket and install the oil strainer.

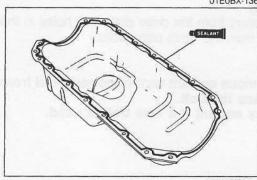
Tightening torque: 7.8—11 N·m (80—110 cm-kg, 69—95 in-lb)



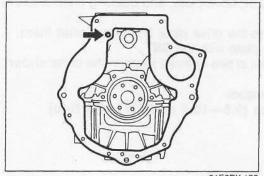
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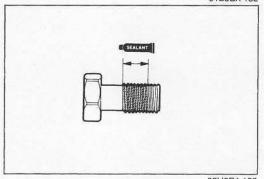
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05U0BX-210



01E0BX-182



03U0B1-138

Oil Pan

- 1. Remove all foreign material from the contact surfaces.
- 2. Apply silicone sealant to the shaded areas shown in the figure.

Install new gaskets onto the oil pump body and the rear cover with the projections in the notches as shown in the figure.

- 4. Apply a continuous bead of silicone sealant to the oil pan along the inside of the bolt holes and overlap the ends.
- 5. Install the oil pan.

Tightening torque:

7.8-11 N·m (80-110 cm-kg, 69-95 in-lb)

End Plate

Install the end plate.

Tightening torque:

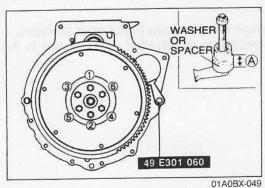
7.8—11 N·m (80—110 cm-kg, 69—95 in-lb)

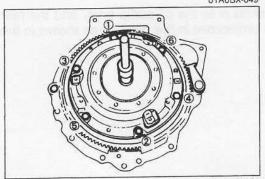
Flywheel (MTX)

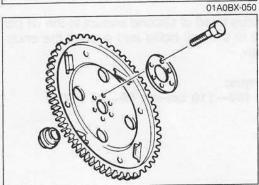
1. Remove the sealant from the flywheel bolt holes in the crankshaft and from the flywheel bolts.

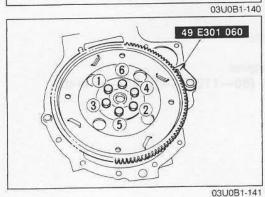
Caution

- If all the previous sealant cannot be removed from a bolt, replace the bolt.
- Do not apply sealant if a new bolt is used.
- 2. Set the flywheel onto the crankshaft.
- 3. Apply sealant to the flywheel bolts and install them.









4. Hold the flywheel with the SST.

Caution

- Add approx 13mm (0.51 in) of spacers (A) to space the SST away from the cylinder block. (MTX)
- 5. Tighten the bolts in two or three steps in the order shown.

Tightening torque: 96—103 N·m (9.8—10.5 m-kg, 71—76 ft-lb)

Clutch Disc and Clutch Cover (MTX)

Caution

 Add approx 13mm (0.51 in) of spacers (A) to space the SST away from the cylinder block. (MTX)

Install the clutch disc and clutch cover using the **SST**. (Refer to Section H.)

Tightening torque: 18—26 N·m (1.8—2.7 m-kg, 13—20 ft-lb)

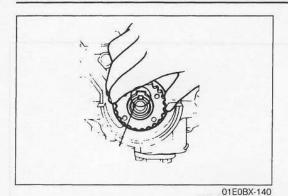
Drive Plate (ATX)

1. Remove the sealant from the drive plate bolt holes in the crankshaft and from the drive plate bolts.

Caution

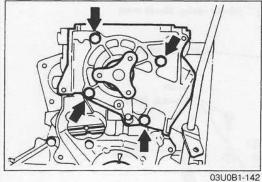
- If all the previous sealant cannot be removed from a bolt, replace the bolt.
- · Do not apply sealant if a new bolt is used.
- 2. Install the adapter, drive plate, and backing plate onto the crankshaft.
- 3. Apply sealant to the drive plate bolts and install them.
- 4. Hold the drive plate with the SST.
- 5. Tighten the bolts in two or three steps in the order shown.

Tightening torque: 96—103 N·m (9.8—10.5 m-kg, 71—76 ft-lb)



Timing Belt Pulley

 Install the timing belt pulley.
 Install the pulley Woodruff key with the tapered side toward the oil pump body.



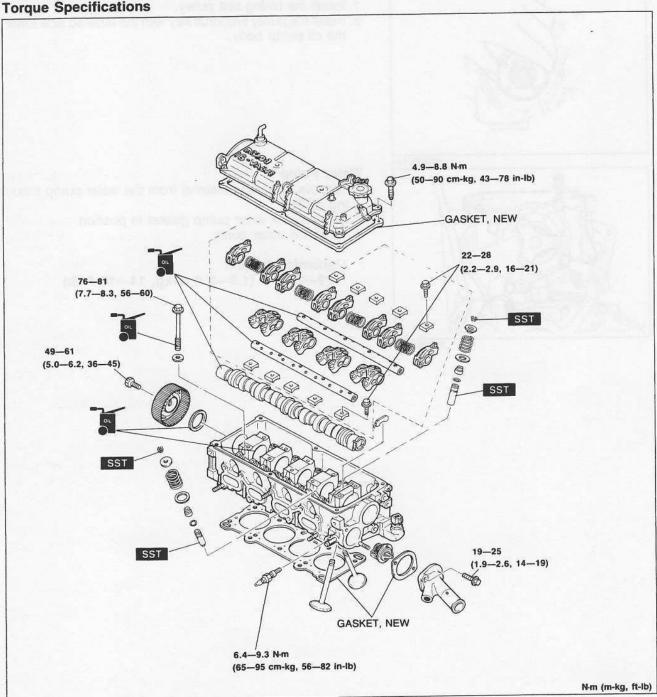
Water Pump

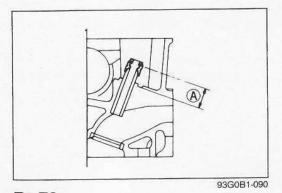
- 1. Remove all foreign material from the water pump mounting surface.
- 2. Place a new water pump gasket in position.
- 3. Install the water pump.

Tightening torque:

19-25 N·m (1.9-2.6 m-kg, 14-19 ft-lb)

CYLINDER HEAD **Torque Specifications**



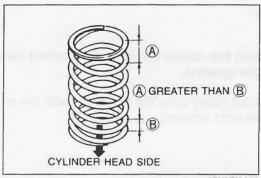


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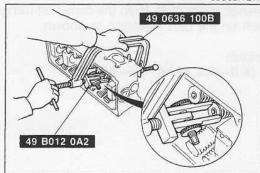
Valve Seal

- Install the new valve seal onto the valve guide by hand.
 After installation, adjust the protrusion (A) to specification.

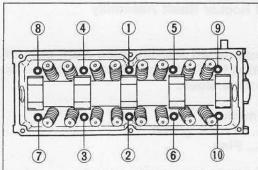
Protrusion: 18.1—18.7mm (0.713—0.736 in)



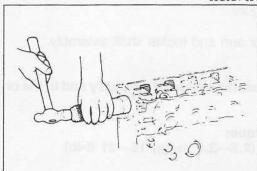




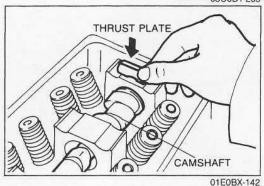
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03U0B1-205



Valve and Valve Spring

- Install the lower spring seat.
- 2. Install the valve.

Caution

- Install the spring with the closer pitch toward the cylinder head.
- 3. Install the valve spring and the upper spring seat.
- 4. Compress the valve spring with the **SST**, and install the valve keepers.
- 5. Remove the SST.
- Tap the end of the valve stem lightly two or three times with a plastic hammer to verify that the keepers are fully seated.

Cylinder Head Gasket

- Remove all foreign material from the top of the cylinder block.
- 2. Place the new cylinder head gasket in position.

Cylinder Head

- 1. Install the cylinder head.
- 2. Apply clean engine oil to the bolt threads and seat faces.
- 3. Tighten the cylinder head bolts in two or three steps in the order shown.

Tightening torque:

76—81 N·m (7.7—8.3 m-kg, 56—60 ft-lb)

Camshaft Oil Seal

- Apply a thin coat of engine oil to the camshaft oil seal and cylinder head.
- 2. Tap the camshaft oil seal into the cylinder head with a suitable pipe.

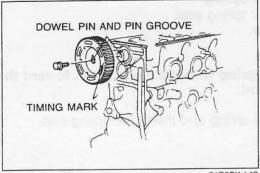
Caution

 The oil seal must be tapped in until it is flush with the cylinder head.

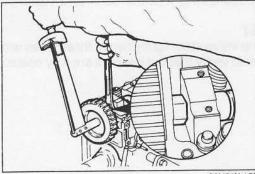
Oil seal outer diameter: 40mm (1.57 in)

Camshaft

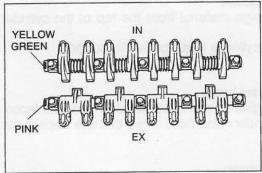
- 1. Apply engine oil to the journals and bearing.
- 2. Insert and mount the camshaft into position with the thrust plate.



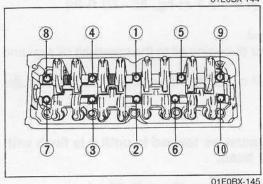
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63U01X-122



01E0BX-144



Camshaft Pulley

Note

- Be certain that the dowel pin of the camshaft also faces straight upward.
- 1. Install the camshaft pulley onto the dowel pin with the pin groove facing straight upward.
- 2. Tighten the camshaft pulley bolt. Hold the camshaft using a suitable wrench on the cast hexagon as shown.

Tightening torque: 49—61 N·m (5.0—6.2 m-kg, 36—45 ft-lb)

Rocker Arm and Rocker Shaft Assembly

Caution

- · Face the rocker shaft identification mark upward.
- The installation bolt holes are different for the exhaust and intake sides.

Identification mark

IN Yellow green

EX..... Pink

- 1. Assemble the rocker arm and rocker shaft assembly as shown in the figure.
- 2. Install the rocker arm and rocker shaft assembly.

Caution

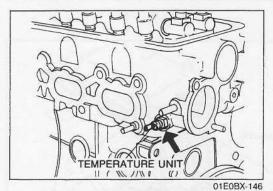
The bolts must be tightened gradually and in the order shown.

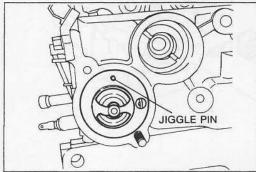
Tightening torque:

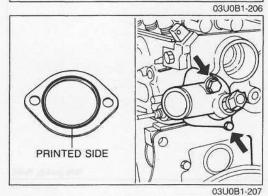
22-28 N·m (2.2-2.9 m-kg, 16-21 ft-lb)

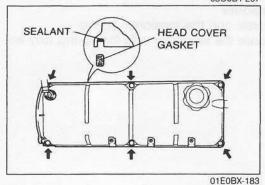
Valve Clearance Adjustment

Refer to page B-7.









Temperature gauge unit

Install the temperature gauge unit into the cylinder head with seal tape on the threads.

Tightening torque:

6.4-9.3 N·m (65-95 cm-kg, 56-82 in-lb)

Thermostat and Thermostat Cover

- 1. Remove all foreign material from the thermostat cover mounting surface.
- 2. Install the thermostat with the jiggle pin facing upward.
- 3. Install a new gasket and the thermostat cover.

Tightening torque:

19-25 N·m (1.9-2.6 m-kg, 14-19 ft-lb)

Caution

 The printed side of the gasket must face the thermostat.

Cylinder Head Cover

Install the cylinder head cover.

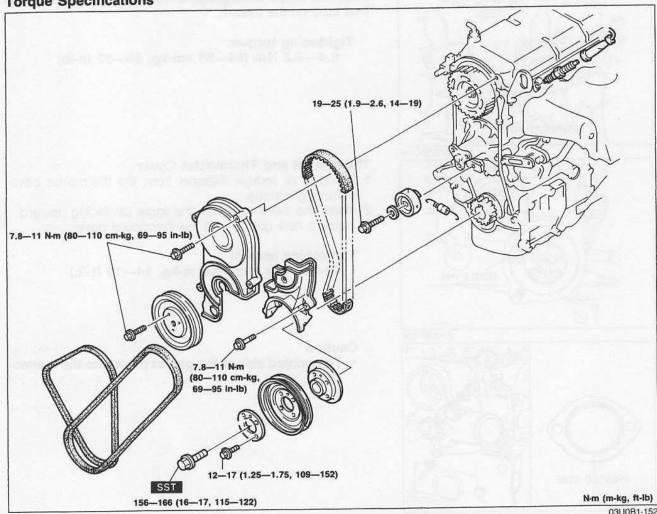
Tightening torque:

4.9-8.8 N·m (50-90 cm-kg, 43-78 in-lb)

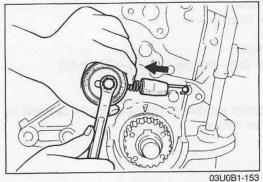
Caution

 If the head cover gasket is reused, apply sealant in the groove as shown.

TIMING BELT **Torque Specifications**



03U0B1-152



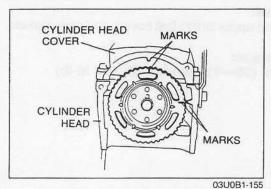
TIMING MARK 03U0B1-154

Timing Belt Tensioner

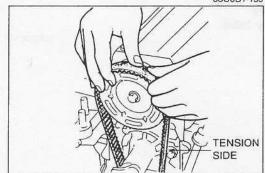
- 1. Install the tensioner and the tensioner spring.
- 2. Temporarily secure the tensioner with the spring fully extended.

Timing Belt

1. Verify that the timing belt pulley mark is aligned with the timing mark.



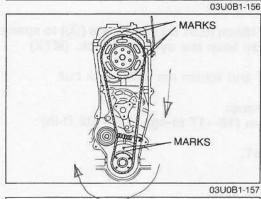
2. Verify that the camshaft pulley marks are aligned with the cylinder head cover marks.



3. Install the timing belt so that there is no looseness at the tension side.

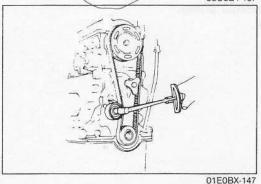
Caution

Do not turn the crankshaft counterclockwise



4. Turn the crankshaft two turns clockwise, and align the timing belt pulley mark with the timing mark.

5. Verify that the camshaft pulley marks are aligned with the cylinder head cover mark. If not aligned, remove the timing belt and repeat from tensioner installation.

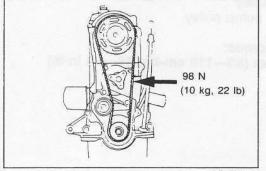


6. Loosen the tensioner bolt to apply tension to the timing belt.

- Be sure not to apply tension other than that of the tensioner spring.
- 7. Tighten the tensioner bolt.

Tightening torque: 19-25 N·m (1.9-2.6 m-kg, 14-19 ft-lb)

- 8. Turn the crankshaft two turns clockwise and verify that the timing marks are correctly aligned.
- 9. Measure the timing belt deflection by applying moderate pressure (98 N, 10 kg, 22 lb) midway between the crankshaft pulley and the camshaft pulley. If the timing belt deflection is not correct, temporarily secure the tensioner bolt so the spring is fully extended and repeat steps 4-8 above or replace the tensioner spring.

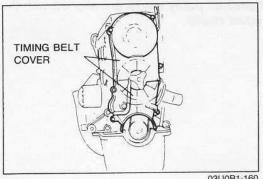


01E0BX-148

Deflection:

11.0—13.0mm (0.43—0.51 in) at 98 N (10 kg, 22 lb)

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03U0B1-160

Timing Belt Cover

Install the lower and upper timing belt covers and new gaskets.

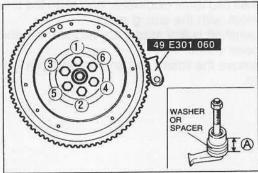
Tightening torque:

7.8-11 N·m (80-110 cm-kg, 69-95 in-lb)

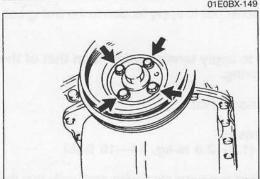
Crankshaft Pulley

1. Install the pulley boss.

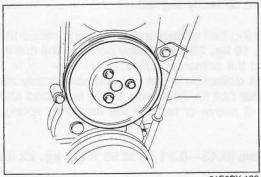
01E0BX-184



01E0BX-149



01E0BX-185



01E0BX-186

Caution

- Add approx 13mm (0.51 in) of spacers (A) to space the SST away from the cylinder block. (MTX)
- 2. Mount the SST and tighten the pulley lock bolt.

Tightening torque: 156-166 Nm (16-17 m-kg, 115-122 ft-lb)

- 3. Remove the SST.
- 4. Install the crankshaft pulley.
- 5. Install the plate.

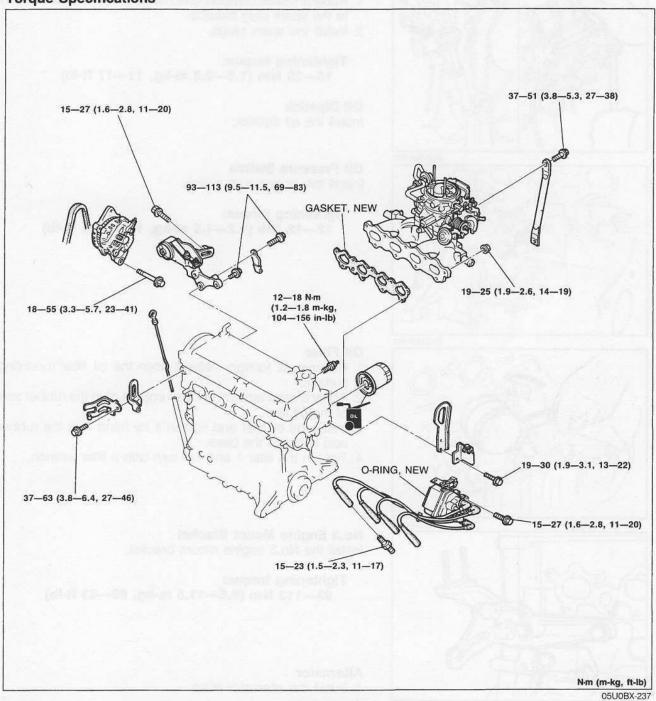
Water Pump Pulley

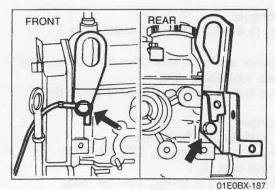
Install the water pump pulley.

Tightening torque:

7.8—11 N·m (80—110 cm-kg, 69—95 in-lb)

AUXILIARY PARTS Torque Specifications



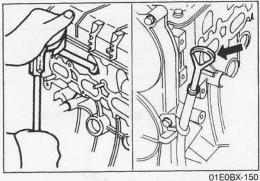


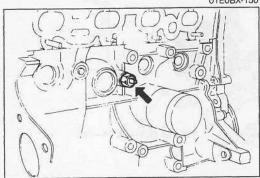
Engine Hanger

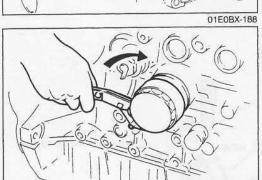
Install the front and rear engine hangers.

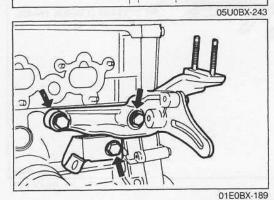
Tightening torque

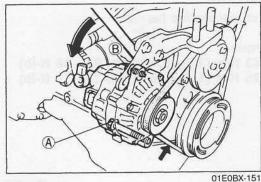
Front: 37—63 N·m (3.8—6.4 m-kg, 27—46 ft-lb) Rear : 19—25 N·m (1.9—2.6 m-kg, 14—19 ft-lb)











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Spark Plug

 Apply antiseize compound or molybdenum-based lubricant to the spark plug threads.

2. Install the spark plugs.

Tightening torque: 15—23 N·m (1.5—2.3 m-kg, 11—17 ft-lb)

Oil Dipstick

Install the oil dipstick.

Oil Pressure Switch

Install the oil pressure switch.

Tightening torque: 12—18 N·m (1.2—1.8 m-kg, 104—156 in-lb)

Oil Filter

Remove all foreign material from the oil filter mounting surface.

2. Apply a small amount of clean engine oil to the rubber seal of the oil filter.

3. Install the oil filter and tighten it by hand until the rubber seal contacts the base.

4. Tighten the filter 1 and 1/6 turn with a filter wrench.

No.3 Engine Mount Bracket

Install the No.3 engine mount bracket.

Tightening torque: 93—113 N·m (9.5—11.5 m-kg, 69—83 ft-lb)

Alternator

1. Install the alternator strap.

Tightening torque:

37-52 N·m (3.8-5.3 m-kg, 27-38 ft-lb)

Install the alternator and alternator drive belt. Loosely tighten the alternator installation bolt.

3. Adjust the drive belt deflection. (Refer to page B-5.)

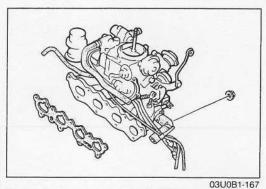
Tightening torque

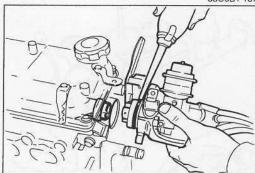
Alternator installation bolt (A):

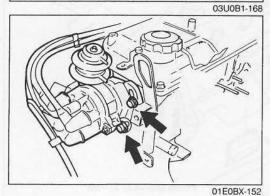
37-52 N·m (3.8-5.3 m-kg, 27-38 ft-lb)

Belt-adjusting bolt (B):

19-25 N·m (1.9-2.6 m-kg, 14-19 ft-lb)







Intake Manifold Assembly

- Remove all foreign material from the intake manifold contact surface.
- 2. Install a new gasket and the intake manifold assembly.

Tightening torque: 19—25 N⋅m (1.9—2.6 m-kg, 14—19 ft-lb)

Distributor and High-tension Lead

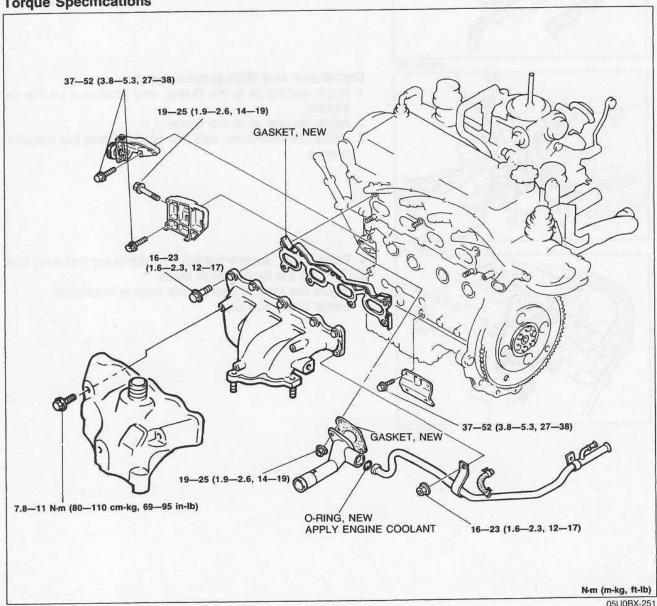
- 1. Apply engine oil to the O-ring, and position it on the distributor.
- 2. Apply engine oil to the blade.
- 3. Install the distributor with the blade fit into the camshaft groove.
- 4. Temporarily, loosely tighten the distributor installing bolt.
- 5. Connect the high-tension leads.
- 6. Adjust the ignition timing after engine installation. (Refer to Section G.)

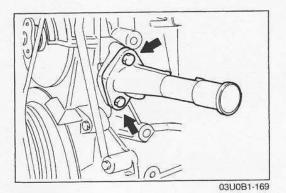
ENGINE STAND DISMOUNTING

PROCEDURE

- 1. Remove the engine from the SST (engine stand).
- 2. Remove the SST (engine hanger) from the engine.
- 3. Install the parts shown in the figure.

Torque Specifications





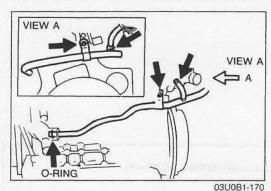
B-82

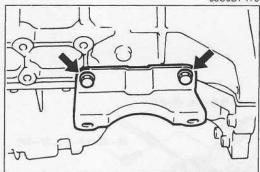
Water Inlet Pipe

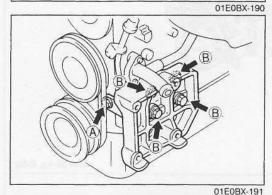
- 1. Remove all foreign material from the water inlet pipe mounting surface.
- 2. Install a new gasket and the water inlet pipe.

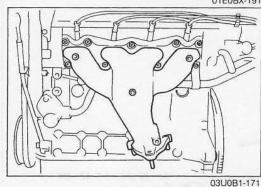
Tightening torque:

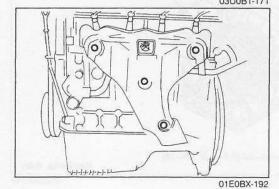
19—25 N·m (1.9—2.6 m-kg, 14—19 ft-lb)











- 3. Apply a small amount of engine coolant to the new O-ring.
- 4. Install the water bypass pipe.

Exhaust Pipe Bracket

Install the exhaust pipe bracket.

Tightening torque:

37-52 N·m (3.8-5.3 m-kg, 27-38 ft-lb)

A/C Compressor Bracket

Install the A/C compressor bracket.

Tightening torque

A: 19—25 N·m (1.9—2.6 m-kg, 14—19 ft-lb) B: 37—52 N·m (3.8—5.3 m-kg, 27—38 ft-lb)

Exhaust Manifold

- 1. Remove all foreign material from the exhaust manifold contact surface.
- 2. Install a new gasket and the exhaust manifold.

Tightening torque:

16-23 N·m (1.6-2.3 m-kg, 12-17 ft-lb)

Exhaust Manifold Insulator

Install the exhaust manifold insulator.

Tightening torque:

7.8-11 N·m (80-110 cm-kg, 69-95 in-lb)

INSTALLATION

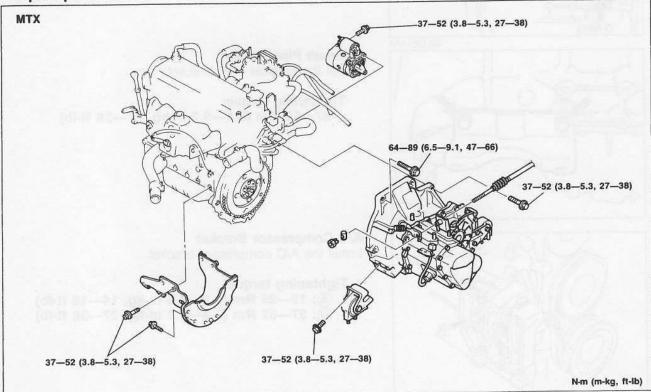
PROCEDURE

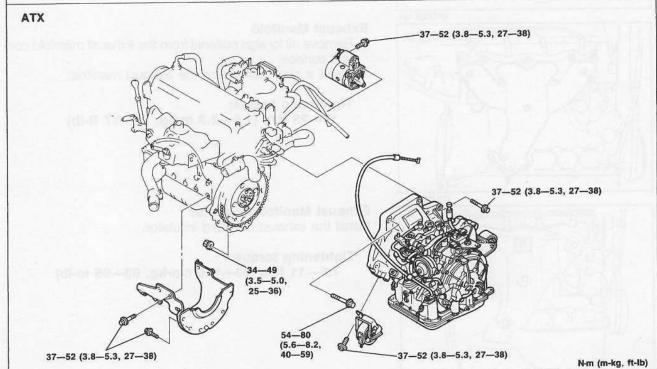
Tighten all bolts and nuts to the specified torques.

Step 1

Join the engine and transmission.

Torque Specifications



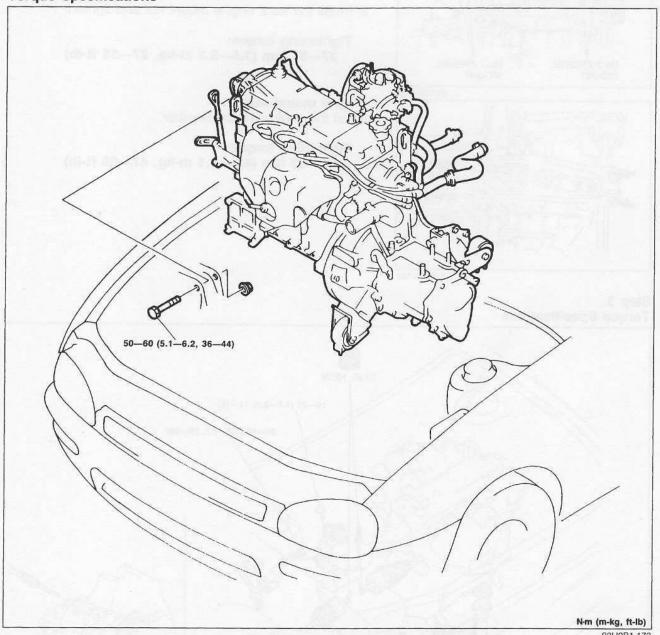


Step 2

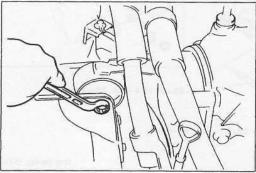
Warning

· Be sure the vehicle is securely supported on safety stands.

Torque Specifications





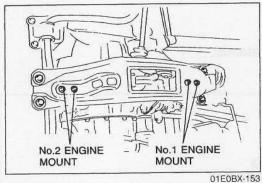


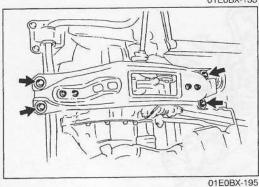
01E0BX-194

Engine and transaxle assembly

1. Suspend the engine and transaxle assembly.

- · Do not damage any components in the engine compartment.
- 2. Align the No.3 engine mount bolts with the engine mount mounting holes.





Engine mount

1. Install the No.1 engine mount nut and tighten.

Tightening torque: 37—51 N·m (3.8—5.3 m-kg, 27—38 ft-lb)

2. Install the No.2 engine mount nut and tighten.

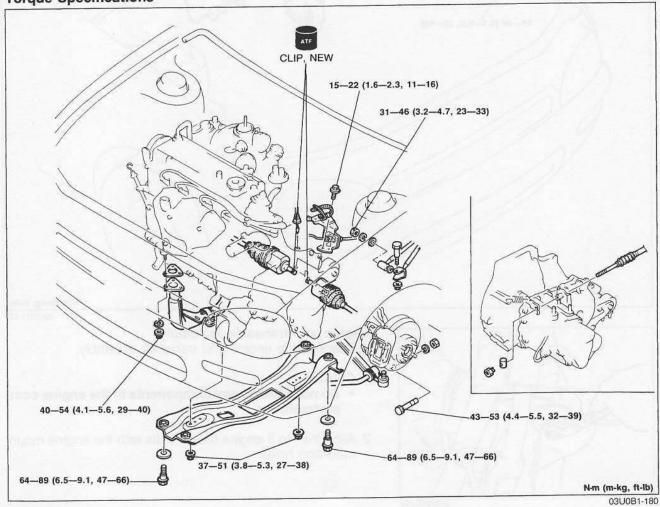
Tightening torque: 37—51 N·m (3.8—5.3 m-kg, 27—38 ft-lb)

Engine mount member

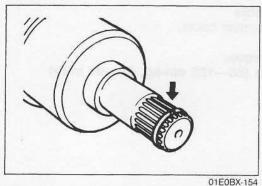
Install the engine mount member.

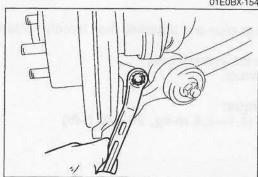
Tightening torque: 64—89 N·m (6.5—9.1 m-kg, 47—66 ft-lb)

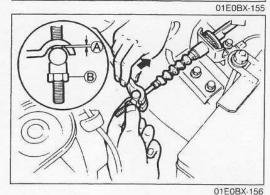
Step 3 Torque Specifications

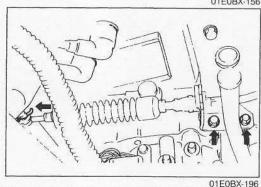


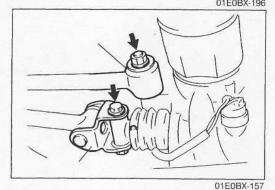
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Driveshaft

1. Apply grease to the end of the driveshaft.

Caution

- When installing the driveshaft, be careful not to damage the oil seal.
- After installation, pull the front hub outward to confirm that the driveshaft is securely held by the clip.
- 2. Fit a new clip and install the driveshaft.
- 3. Install the lower arm ball-joint to the knuckle, and tighten the clinch bolt.

Tightening torque: 43—53 N·m (4.4—5.5 m-kg, 32—39 ft-lb)

Clutch cable

Install the clutch cable and check diffrection. (Refer to Section H.)

Shift control cable (ATX)

Install the shift control cable to the transaxle.

Tightening torque: 6.9—11 N·m (70—110 cm-kg, 61—95 in-lb)

Shift control rod (MTX)

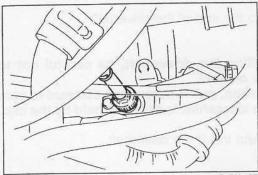
Install the shift control rod to the transaxle.

Tightening torque: 16—22 N·m (1.6—2.3 m-kg, 12—16 in-lb)

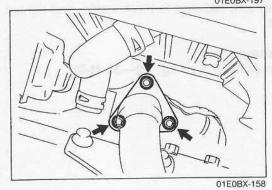
Extension bar (MTX)

Install the extension bar to the transaxle.

Tightening torque: 31—46 N·m (3.2—4.7 m-kg, 23—34 in-lb)



01E0BX-197



Speedometer cable

Install the speedometer cable.

Tightening torque:

7.8-12 N·m (80-120 cm-kg, 69-96 in-lb)

Exhaust pipe

- 1. Install the exhaust pipe and a gasket; then loosely tighten the locknuts.
- 2. Loosely tighten the bracket bolts.
- 3. Tighten the locknuts.

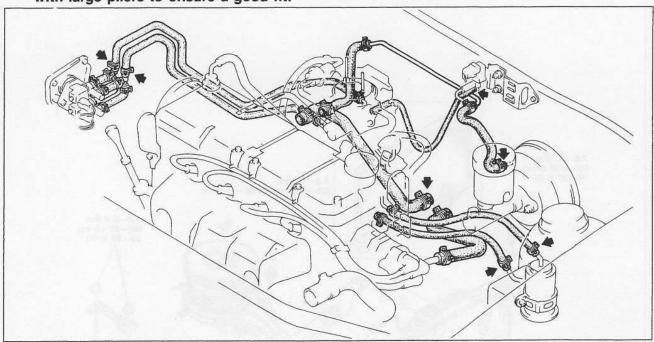
Tightening torque:

40-54 N·m (4.1-5.6 m-kg, 29-40 ft-lb)

Step 4 Connect the hoses shown in the figure.

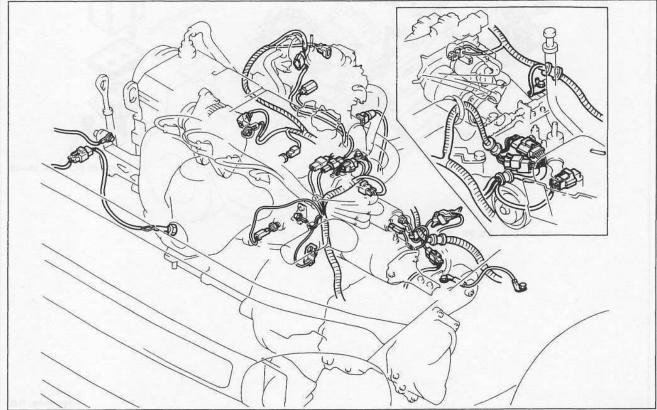
Caution

Position the hose clamp in the original location on the hose, and squeeze the clamp lightly with large pliers to ensure a good fit.



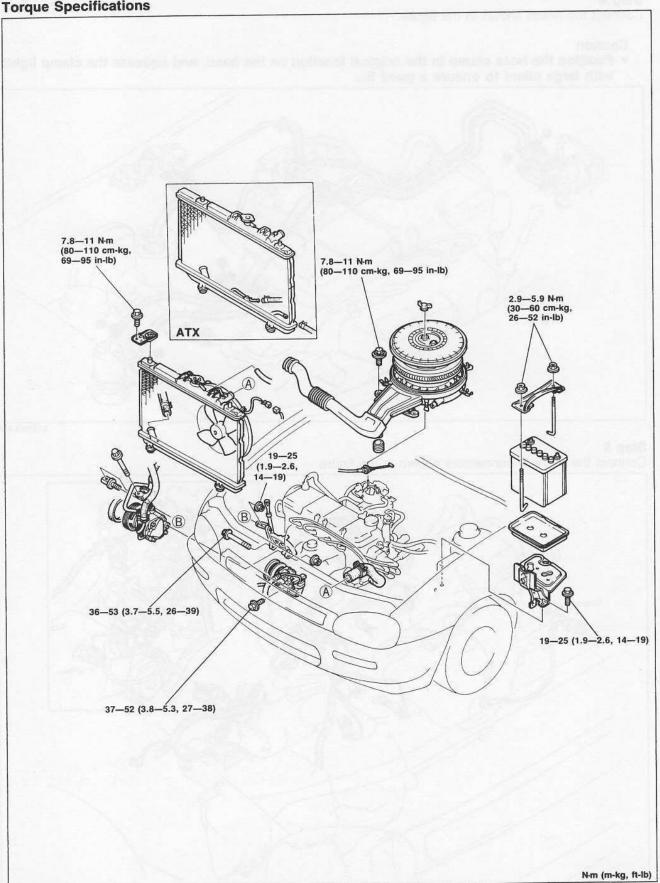
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Step 5 Connect the harness connectors shown in the figure.



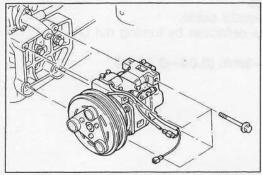
01E0BX-199 B-89

Step 6 Torque Specifications



A/C compressor (if equipped) Install the A/C compressor.

Tightening torque:

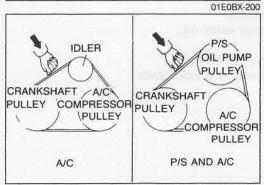


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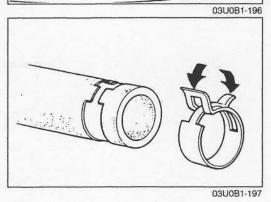
P/S oil pump and bracket
Install the P/S oil pump and bracket.

Tightening torque: 37—52 N·m (3.8—5.3 m-kg, 27—38 ft-lb)

37-52 N·m (3.8-5.3 m-kg, 27-38 ft-lb)



01E0BX-159



Drive belt

- 1. Install the P/S and/or A/C drive belt.
- 2. Adjust the drive belt deflections. (Refer to page B-5.)

Radiator and cooling fan assembly

1. Install the radiator and cooling fan assembly.

Tightening torque: 7.8—11 N·m (80—110 cm-kg, 69—95 in-lb)

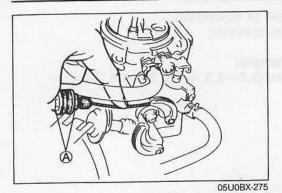
2. Tighten the A/C pipe bracket to the radiator.

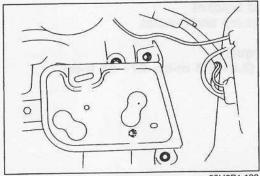
Tightening torque: 6.4—9.3 N·m (65—95 cm-kg, 56—82 in-lb)

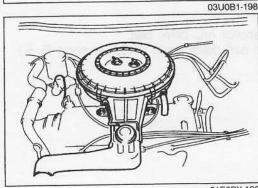
3. Connect the upper and lower radiator hoses.

Caution

- Position the hose clamp in the original location on the hose, and squeeze the clamp lightly with large pliers to ensure a good fit.
- Connect the coolant reservoir hose.
- 5. Connect the cooling fan connector.
- 6. Connect the oil cooler hose. (ATX)







01E0BX-160

Accelerator cable

1. Install the accelerator cable.

2. Adjust the cable deflection by turning nut (A).

Deflection: 1-3mm (0.04-0.12 in)

Battery duct, battery carrier, and battery

1. Install the battery duct.

2. Install the battery carrier.

Tightening torque: 19—25 N·m (1.9—2.6 m-kg, 14—19 ft-lb)

3. Install the battery and the battery bracket.

Tightening torque: 2.9—5.9 N·m (30—60 cm-kg, 26—52 in-lb)

Air cleaner assembly

Install the air cleaner assembly.

Undercover and side cover

Install the undercover and side cover.

Steps After Installation

1. If the engine oil was drained, fill with the specified amount and type of engine oil. (Refer to Section D.)

2. Fill the radiator with the specified amount and type of engine coolant. (Refer to Section E.)

3. If the transaxle oil was drained, fill with the specified amount and type of transaxle oil. (Refer to Sections J, K.)

4. Connect the negative battery cable.

5. Start the engine and check the following

(1) Engine oil, transaxle oil, and engine coolant leakage

(2) Ignition timing, idle speed (Refer to page B-8.)

(3) Operation of emission control system

6. Perform a road test.

7. Recheck the engine oil and engine coolant levels.

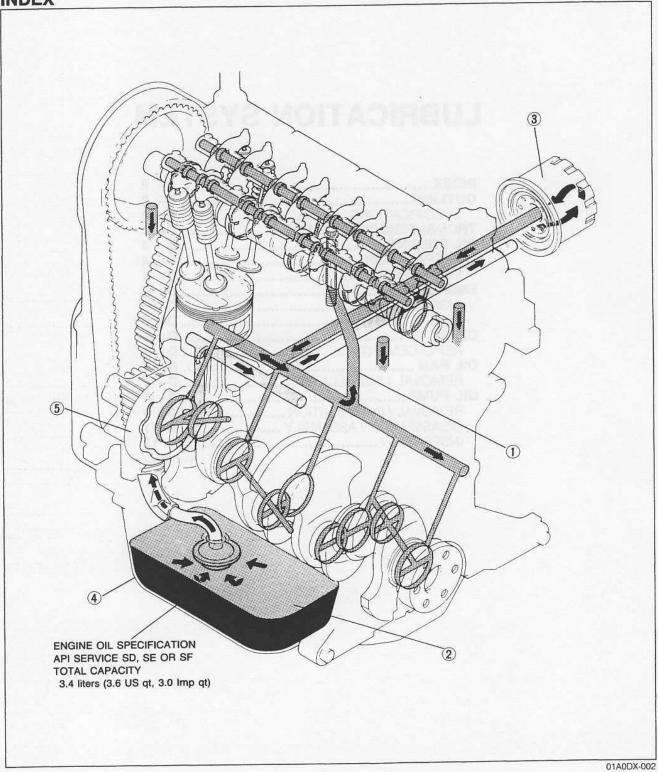
01E0BX-161

LUBRICATION SYSTEM

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page	D-	6
	page page	page D- page D- page D- page D-

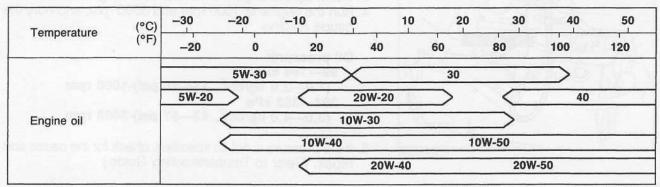
4. Oil pan	2000	D	7
Removal / Installation	page	D-	1
5. Oil pump		_	_
Removal / Installation	page	D-	S
Disassembly / Assembly	page	D-1	1

OUTLINE

SPECIFICATIONS

Item		Engine model	B3	
Lubrication s	ystem	1 -00-90	Force-fed	
0:1	Туре		Trochoid gear	
Oil pump	Regulated pressure ki	Pa (kg/cm², psi)	343—441 (3.5—4.5, 50—64)	
O:1 514	Туре		Full-flow, paper element	
Oil filter	Relief pressure differential kl	Pa (kg/cm², psi)	98 (1.0, 14)	
Oil warning p	pressure kl	Pa (kg/cm², psi)	4.9—44 (0.05—0.45, 0.7—6.4)	
	Total (dry engine) liters	(US qt, Imp qt)	3.4 (3.6, 3.0)	
Oil capacity	Oil pan liters	(US qt, Imp qt)	3.0 (3.2, 2.6)	
	Oil filter liters	(US qt, Imp qt)	0.17 (0.18, 0.15)	
Engine oil (A	PI service)		SD, SE, or SF	
			01A0DX	-003

Recommended SAE Viscosity



Anticipated ambient temperature range before succeeding oil change, °C (°F).

01E0DX-005

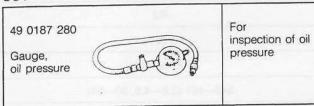
TROUBLESHOOTING GUIDE

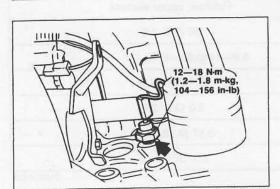
Problem	Possible Cause	Remedy	Page
Engine hard starting	Improper engine oil Insufficient engine oil	Replace Add oil	D- 5 D- 5
Excessive oil consumption	Oil working up or down Oil leakage	Refer to Section B Repair	
Oil pressure drop	Insufficient oil Oil leakage Worn and/or damaged oil pump gear Worn plunger (inside oil pump) or weak spring Clogged oil strainer Excessive main bearing or connecting rod bearing clearance	Add oil Repair Replace Replace Clean Refer to Section B	D- 4 -
Warning lamp illuminates while engine is running	Oil pressure drop Malfunction of oil pressure switch Malfunction of electrical system	As described above Refer to Section T Refer to Section T	-

01A0DX-004

OIL PRESSURE

PREPARATION SST

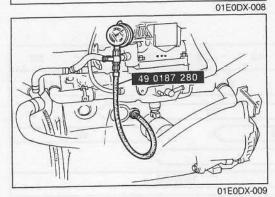




01E0DX-007

INSPECTION

1. Remove the oil pressure switch.



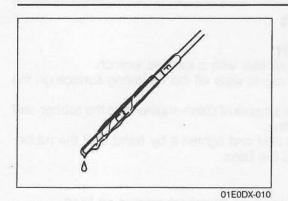
2. Screw the SST into the oil pressure switch hole.

3. Warm up the engine to normal operating temperature.

4. Run the engine at 1000 rpm and 3000 rpm, and note the gauge reading.

Oil pressure: 99—196 kPa (1.0—2.0 kg/cm², 15—28 psi)-1000 rpm 294—392 kPa (3.0—4.0 kg/cm², 43—57 psi)-3000 rpm

5. If the pressure is not as specified, check for the cause and repair. (Refer to Troubleshooting Guide.)



ENGINE OIL

INSPECTION

- 1. Be sure the vehicle is on level ground.
- 2. Warm up the engine to normal operating temperature and stop it.
- 3. Wait for five minutes.
- 4. Remove the oil dipstick and check the oil level and condition.
- 5. Add or replace oil as necessary.

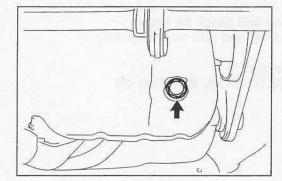
Note

 The distance between the L and F marks on the dipstick represents 0.8 liter (0.85 US qt, 0.70 Imp qt).

REPLACEMENT

Warning

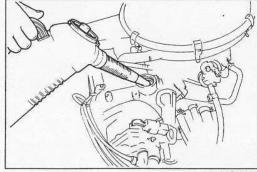
- · Be careful when draining; the oil is hot.
- 1. Warm up the engine to normal operating temperature and stop it.
- 2. Remove the oil filler cap and the oil pan drain plug.
- 3. Drain the oil into a suitable container.
- 4. Install a new gasket and the drain plug.



Tightening torque:

29-41 N·m (3.0-4.2 m-kg, 22-30 ft-lb)

05U0DX-011



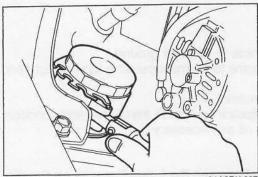
- 01A0DX-005
- O1AODX-006

- 5. Refill the engine with the specified type and amount of engine oil. (Refer to page D-3.)
- 6. Refit the oil filler cap.

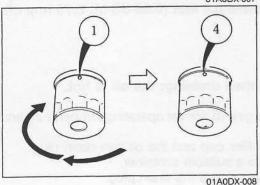
- 7. Run the engine and check for leaks.
- 8. Check the oil level and add oil if necessary.

Oil pan capacity:

3.0 liters (3.2 US qt, 2.6 Imp qt)



01A0DX-007



OIL FILTER

REPLACEMENT

- 1. Remove the oil filter with a suitable wrench.
- 2. Use a clean rag to wipe off the mounting surface on the engine.
- 3. Apply a small amount of clean engine oil to the rubber seal of the new filter.
- 4. Install the oil filter and tighten it by hand until the rubber seal contacts the base.
- Hand tightening type (Numbers printed on filter)
 Tighten the filter 3/4 of a turn by hand after it contacts the
 cylinder block.
 If tightening by hand is difficult, use a suitable wrench.

Example:

 When the oil filter contacts the cylinder block at "1", turn it 3/4 of a turn further to "4."

Filter wrench tightening type (No numbers printed on filter) Tighten the filter 1 and 1/6 turns with a suitable wrench after it contacts the cylinder block.

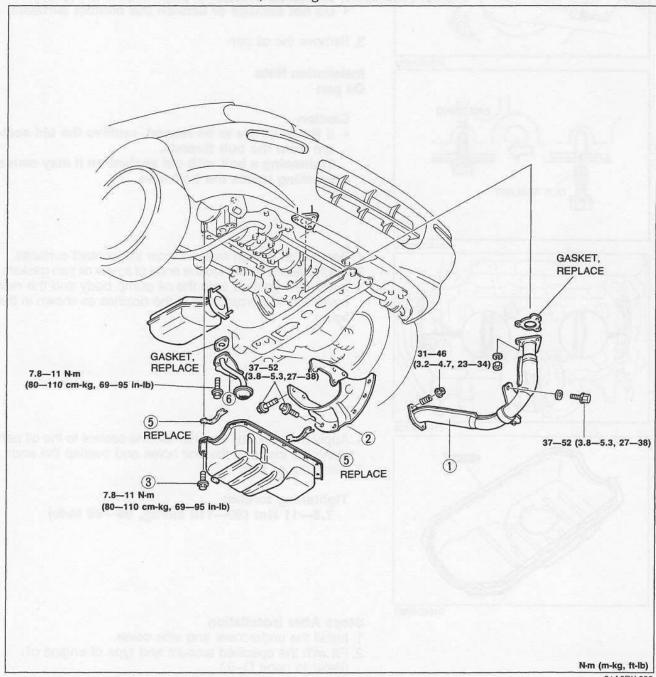
- 6. Start the engine and check for leaks.
- 7. Check the oil level and add oil if necessary.

Oil filter capacity: 0.17 liter (0.18 US qt, 0.15 Imp qt)

OIL PAN

REMOVAL / INSTALLATION

- 1. Disconnect the negative battery cable.
- 2. Drain the engine oil.
- 3. Remove the undercover and side cover.
- 4. Remove in the order shown in the figure, referring to Removal Note.
- 5. Install in the reverse order of removal, referring to Installation Note.

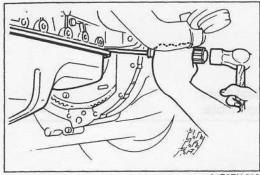


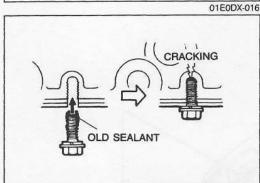
01A0DX-009

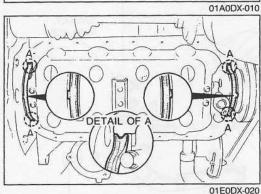
- Front exhaust pipe and bracket
- 2. Integrated stiffener
- 3. Oil pan bolts
- 4. Oil pan

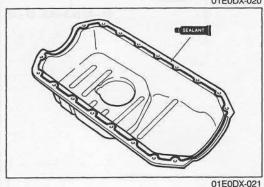
Removal Note page D- 8 Installation Note...... page D- 8

- Gaskets
- 6. Oil strainer









Removal Note

- 1. Remove the oil pan mounting bolts.
- Insert a screwdriver or a suitable tool between the MBSP and oil pan to pry them apart.

Caution

- Do not insert the prying tool between the MBSP and cylinder block.
- Do not damage or scratch the contact surfaces.
- 3. Remove the oil pan.

Installation Note Oil pan

Caution

- If the bolts are to be reused, remove the old sealant from the bolt threads.
 Tightening a bolt with old sealant on it may cause cracking inside the bolt hole.
- 1. Remove all foreign material from the contact surfaces.
- 2. Apply silicone sealant to the ends of a new oil pan gaskets.
- Install new gaskets onto the oil pump body and the rear cover with the projections in the notches as shown in the figure.

- 4. Apply a continuous bead of silicone sealant to the oil pan along the inside of the bolt holes and overlap the ends.
- Install the oil pan.

Tightening torque: 7.8—11 N·m (80—110 cm-kg, 69—95 in-lb)

Steps After Installation

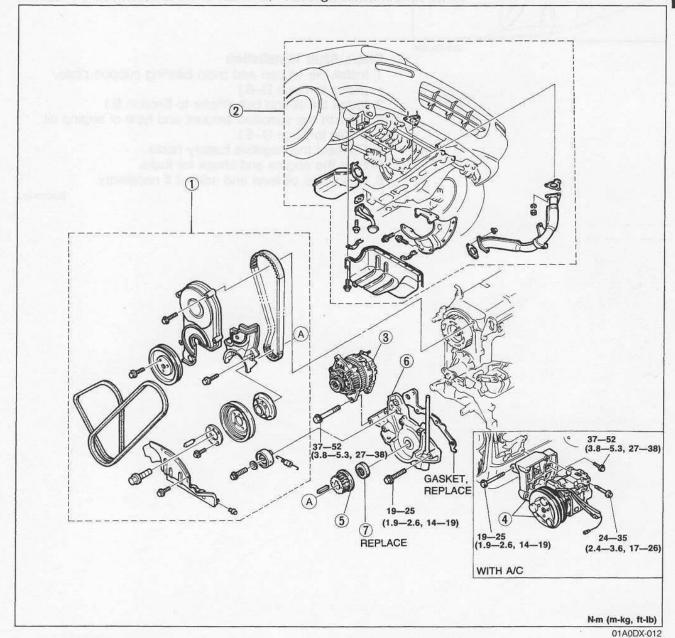
- 1. Install the undercover and side cover.
- 2. Fill with the specified amount and type of engine oil. (Refer to page D-5.)
- 3. Connect the negative battery cable.
- 4. Start the engine and check for leaks.
- 5. Check the oil level and add oil if necessary.

01A0DX-011

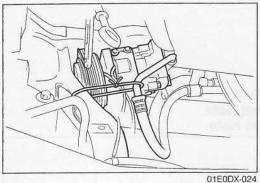
OIL PUMP

REMOVAL / INSTALLATION

- 1. Disconnect the negative battery cable.
- 2. Drain the engine oil.
- 3. Remove the timing belt. (Refer to Section B.)
- 4. Remove the oil pan and integrated stiffener. (Refer to page D-7.)
- 5. Remove in the order shown in the figure, referring to Removal Note.
- 6. Install in the reverse order of removal, referring to Installation Note.



1. Timing belt assembly	
Service	Section B
2. Oil pan	
Removal Note	page D- 8
Installation Note	page D- 8
3. Alternator	
4. A/C compressor (with A/C)	
Removal Note	page D-10



Removal Note A/C compressor (with A/C)

Caution

- Do not damage the hoses.
- 1. Remove the A/C compressor with the hoses still connected.
- 2. Position the compressor away from the engine and affix it with wire.

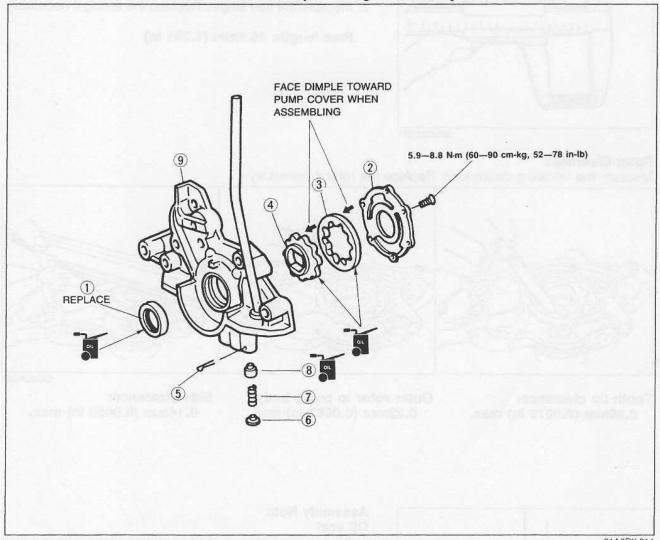
Steps After Installation

- 1. Install the oil pan and main bearing support plate. (Refer to page D-8.)
- 2. Install the timing belt. (Refer to Section B.)
- 3. Fill with the specified amount and type of engine oil. (Refer to page D-5.)
- 4. Connect the negative battery cable.
- 5. Start the engine and check for leaks.
- 6. Check the oil level and add oil if necessary.

01A0DX-013

DISASSEMBLY / ASSEMBLY

- 1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
- 2. Assemble in the reverse order of disassembly, referring to Assembly Note.



01A0DX-014

1. Oil seal	
Disassembly Note	. below
Assembly Notepage	
2. Pump cover	
Inspect for distortion and damage	
3 Outer rotor	

- Outer rotor
- 4. Inner rotor
- 5. Roll pin

- 6. Spring seat
- 7. Pressure spring

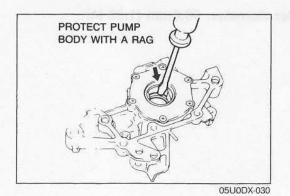
Inspection...... page D-12

8. Control plunger

Inspect for wear and damage

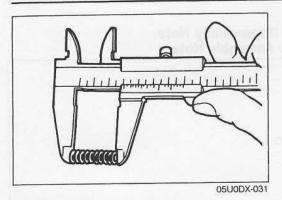
9. Pump body

Inspect for distortion and damage



Disassembly Note

Remove the oil seal with a screwdriver protected with a rag.



INSPECTION Pressure Spring

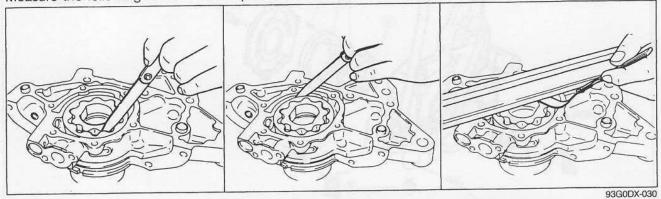
1. Inspect the spring for weakness or breakage.

2. Measure the free length. Replace the spring if necessary.

Free length: 45.5mm (1.791 in)

Rotor Clearance

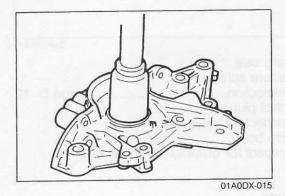
Measure the following clearances. Replace the rotor if necessary.



Tooth tip clearance: 0.20mm (0.0079 in) max.

Outer rotor to pump body: 0.22mm (0.0087 in) max.

Side clearance: 0.14mm (0.0055 in) max.



Assembly Note Oil seal

- 1. Apply a small amount of clean engine oil to the lip of a new oil seal.
- 2. Push the oil seal slightly in by hand.

Caution

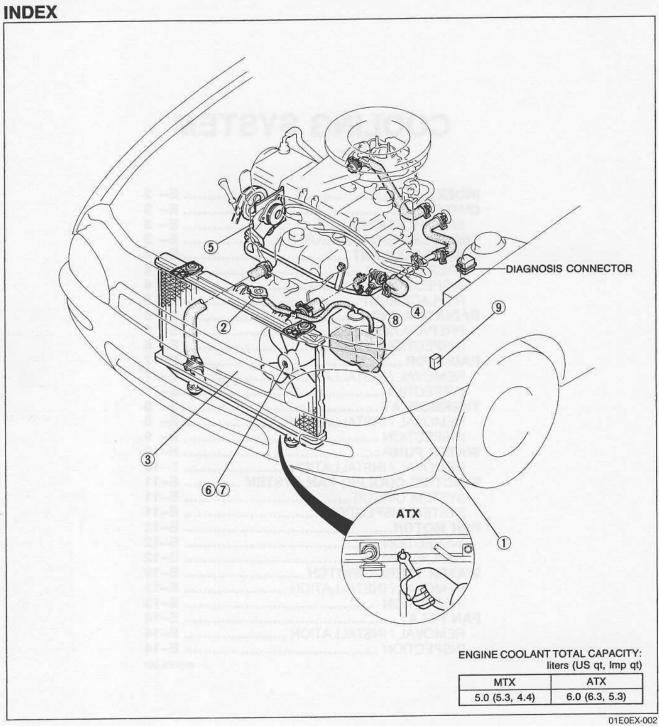
- The oil seal must be pressed in until it is flush with the edge of the oil pump body.
- 3. Press the oil seal in evenly with a suitable pipe.

Oil seal outer diameter: 50.5mm (1.98 in)

COOLING SYSTEM

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SYSTEM CIRCUIT	E-1	1
SYSTEM INSPECTION	E-1	1
FAN MOTOR	E-1	2
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Removal / Installation	page	E-13
9. Fan relay		
Removal / Installation	page	E-14

OUTLINE

SPECIFICATIONS

Item	Engine model	В3
Cooling system	n paleus	Water-cooled, forced circulation
Coolant capaci	ity liters (US qt, Imp qt)	MTX: 5.0 (5.3, 4.4) ATX: 6.0 (6.3, 5.3)
Motor pure	Туре	Centrifugal, belt-driven
Water pump	Water seal	Unified mechanical seal
	Туре	Wax
Thermostat	Opening temperature °C (°F)	86.5—89.5 (187—193)
	Full-open temperature °C (°F)	100 (212)
	Full-open lift mm (in)	8.5 (0.335) or more
Radiator	Туре	Corrugated fin
naulator	Cap valve opening pressure kPa (kg/cm², psi)	74—103 (0.75—1.05, 11—15)
	Motor current A	6.6 ± 1
Cooling fan	Number of blade	4
	Outer diameter of blade mm (in)	300 (11.9)

01A0EX-001

TROUBLESHOOTING GUIDE

Problem	Possible Cause	Remedy	Page
Overheating	Coolant level insufficient Coolant leakage Radiator fins clogged Radiator cap malfunction Cooling fan malfunction Thermostat malfunction Water passage clogged Water pump malfunction	Add Repair Clean Replace Replace Replace Clean Replace Clean Replace	E- 4
Corrosion	Impurities in coolant	Replace	E- 5

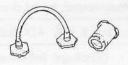
01E0EX-004

ENGINE COOLANT

PREPARATION SST

49 D015 0A0

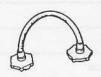
Adapter set, radiator tester



For inspection of cooling system pressure

49 D015 002

Adapter A (Part of 49 D015 0A0)



For inspection of cooling system pressure

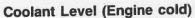
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INSPECTION

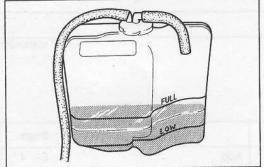
Warning

- Never remove the radiator cap while the engine is
 hot.
- Wrap a thick cloth around the cap when removing it.
- When removing the radiator cap, loosen it slowly to the first stop until the pressure in the radiator is released, and then remove it.

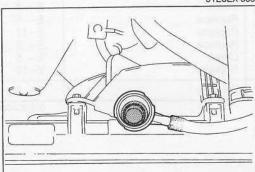
03U0EX-006



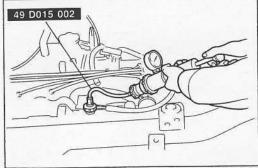
- 1. Verify that the coolant level is near the radiator filler neck.
- 2. Verify that the coolant level in the coolant reservior is between the FULL and LOW marks.
- 3. Add coolant if necessary



01E0EX-005



03U0EX-008



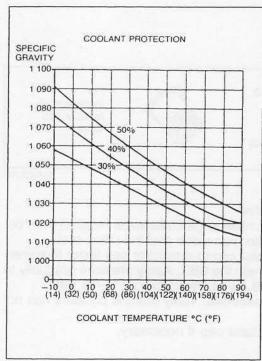
01E0EX-006

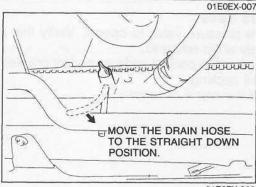
Coolant Quality

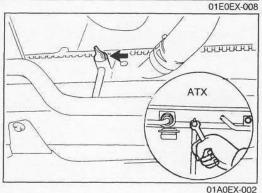
- Verify that there is no buildup of rust or scale around the radiator cap or radiator filler neck.
- Verify that coolant is free of oil. Replace the coolant if necessary.

Coolant Leakage

- Connect a radiator tester (commercially available) and the SST to the radiator filler neck.
- 2. Apply 103 kPa (1.05 kg/cm², 15 psi) pressure to the
- 3. Verify that the pressure is held.
- 4. If not as specified, check for coolant leakage.







Coolant Protection

Caution

- Do not use alcohol- or methanol-based coolant.
- Use only soft (demineralized) water in the coolant mixture.
- 1. Measure the coolant temperature and specific gravity with a thermometer and a hydrometer.
- Determine the coolant protection by referring to the graph shown.
- 3. If the coolant protection is not proper, add water or coolant.

Antifreeze solution mixture percentage

	Volume percentage		Gravity at	
Coolant protection	Water	Coolant	20°C (68°F)	
Above -16°C (3°F)	65	35	1054	
Above -26°C (-15°F)	55	45	1066	
Above -40°C (-40°F)	45	55	1078	

05U0EX-010

REPLACEMENT

Warning

- Never open the radiator cap while the engine is hot.
- · Wrap a thick cloth around the cap when loosening.
- When removing the radiator cap, loosen it slowly to the first stop until the pressure in the radiator is released, and then remove it.
- Use caution when draining hot coolant.

Caution

- · Do not use alcohol- or methanol-based coolant.
- Use only soft (demineralized) water in the coolant mixture.
- Before loosening the radiator drain plug, verify that the radiator drain hose faces straight down.
- Remove the radiator cap and loosen the drain plug by hand (MTX) or by a wrench (ATX).
- 2. Drain the coolant into a suitable container.
- 3. Flush the cooling system with water until all traces of color are gone; then let the system drain completely.
- Install the drain plug.
- 5. Fill with the proper amount and mixture of ethylene glycol based coolant by referring to the table above.

Coolant capacity

liters (US qt, Imp qt)

E	33
MTX	ATX
5.0 (5.3, 4.4)	6.0 (6.3, 5.3)

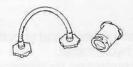
- 6. Run the engine with the radiator cap removed until the upper radiator hose is hot.
- 7. With the engine idling, add coolant to the radiator until it reaches the bottom of the filler neck.
- 8. Install the radiator cap.

RADIATOR CAP

PREPARATION SST

49 D015 0A0

Adapter set, radiator tester



For inspection of radiator cap valve

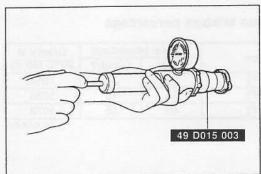
49 D015 003

Adapter B (Part of 49 D015 0A0)

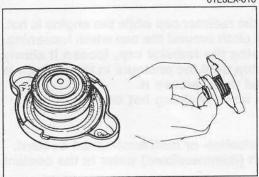


For inspection of radiator cap valve

01A0EX-006



01E0EX-010



05U0EX-013

INSPECTION Radiator Cap Valve

- 1. Remove foreign material (such as water residue) from between the radiator cap valve and the valve seat.
- Attach the radiator cap to a radiator cap tester (commercially available) with the SST. Apply pressure gradually to 74—103 kPa (0.75—1.05 kg/cm², 11—15 psi).
- Wait about 10 seconds. Verify that the pressure has not decreased.
- 4. Replace the radiator cap if necessary.

Negative Pressure Valve

- 1. Pull the negative pressure valve to open it. Verify that it closes completely when released.
- 2. Check for damage on the contact surfaces and for cracked or deformed seal packing.
- 3. Replace the radiator cap if necessary.

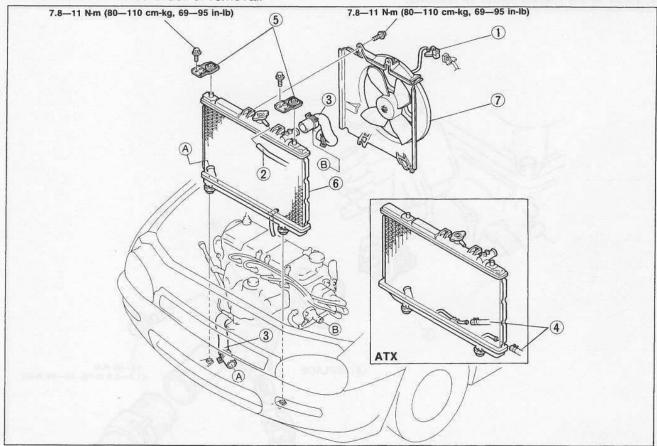
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RADIATOR

REMOVAL / INSTALLATION

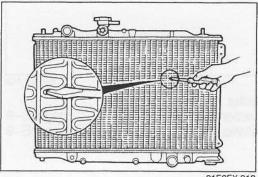
Caution

- · Before loosening the radiator drain plug, verify that the radiator drain hose faces straight down.
- Position the hose clamp in the original location on the hose, and squeeze the clamp lightly with large pliers to ensure a good fit.
- 1. Disconnect the negative battery cable.
- 2. Drain the engine coolant.
- 3. Remove in the order shown in the figure.
- 4. Install in the reverse order of removal.



01E0EX-011

- 1. Cooling fan connector
- 2. Coolant reservoir hose
- 3. Radiator hose
- 4. Oil cooler hose (ATX)



01E0EX-012

- 5. Radiator bracket
- 6. Radiator

Inspection page E-7

7. Cooling fan and radiator cowling assembly

INSPECTION

Check for the following and repair or replace as necessary.

- 1. Cracks, damage, and water leakage.
- 2. Bent fins (repair with a screwdriver).
- 3. Distorted or bent radiator inlet.

Steps After Installation

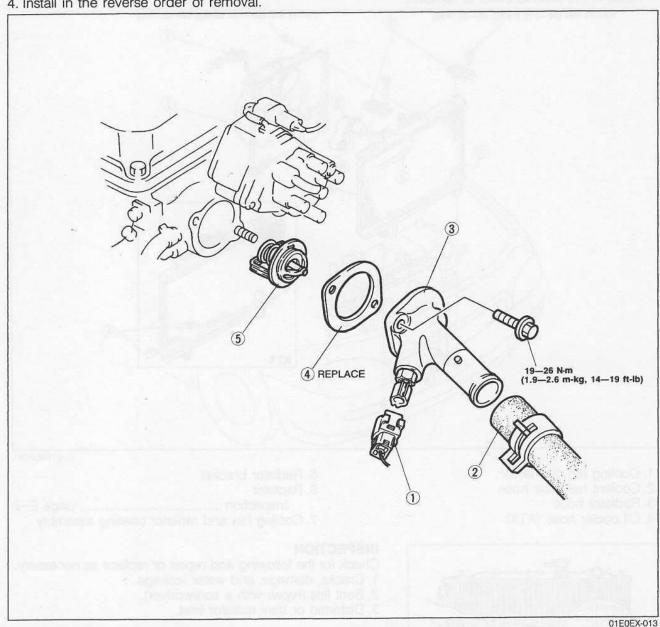
- 1. Fill the radiator with the specified amount and type of engine coolant. (Refer to page E-4.)
- 2. Connect the negative battery cable.
- 3. Start the engine and check for leaks.

THERMOSTAT

REMOVAL / INSTALLATION

Caution

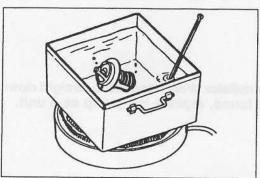
- Before loosening the radiator drain plug, verify that the radiator drain hose faces straight down.
- Position the hose clamp in the original location on the hose, and squeeze the clamp lightly with large pliers to ensure a good fit.
- 1. Disconnect the negative battery cable.
- 2. Drain the engine coolant.
- 3. Remove in the order shown in the figure.
- 4. Install in the reverse order of removal.

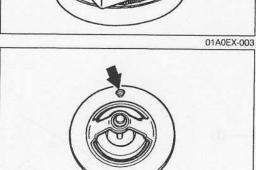


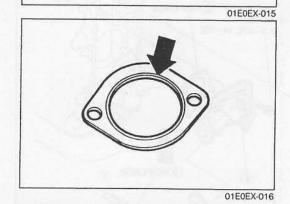
- 1. Water thermoswitch connector
- 2. Upper radiator hose
- 3. Thermostat cover
- 4. Thermostat gasket Installation Note...... page E-9

5.	Therm	osta

Inspection page E-9
Installation Note page E-9







INSPECTION

- 1. Visually check that the thermostat valve is airtight.
- 2. Place the thermostat and a thermometer in water.
- 3. Heat the water and check the following:

B3				
Opening temperature	°C (°F)	86.5—89.5 (187—193)		
Full-open temperature	°C (°F)	100 (212)		
Full-open lift	mm (in)	8.5 (0.335) or more		

Installation Note Thermostat

Install the thermostat into the cylinder head with the jiggle pin at the top.

Thermostat gasket

Install a new gasket with the sealing ring facing the cylinder head.

Steps After Installation

- 1. Fill the radiator with the specified amount and type of engine coolant. (Refer to page E-5.)
- 2. Connect the negative battery cable.
- 3. Start the engine and check for leaks.

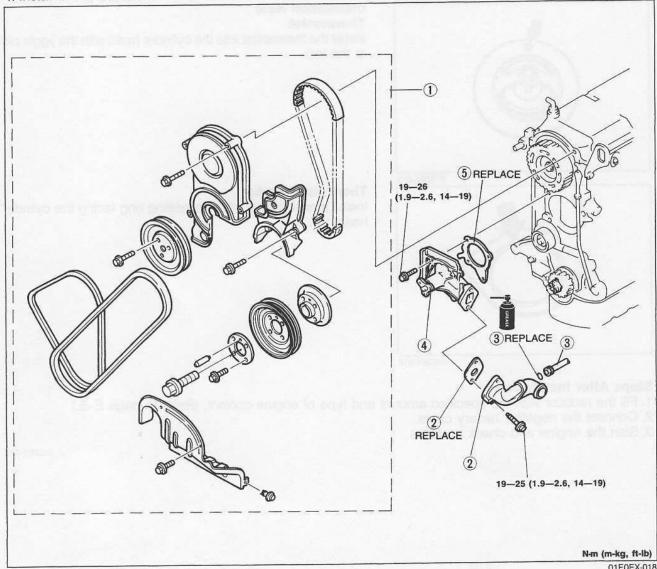
01E0EX-017

WATER PUMP

REMOVAL / INSTALLATION

Caution

- Before loosening the radiator drain plug, verify that the radiator drain hose faces straight down.
- Do not disassemble the water pump. If a problem is found, replace the pump as a unit.
- 1. Disconnect the negative battery cable.
- 2. Drain the engine coolant.
- 3. Remove in the order shown in the figure.
- 4. Install in the reverse order of removal.



01E0EX-018

1. Timing belt

Service Section B

- 2. Water inlet pipe and gasket
- 3. Water bypass pipe and O-ring

- 4. Water pump assembly Inspect for cracks, damaged mounting surface, bearing condition, and leakage
- 5. Water pump gasket

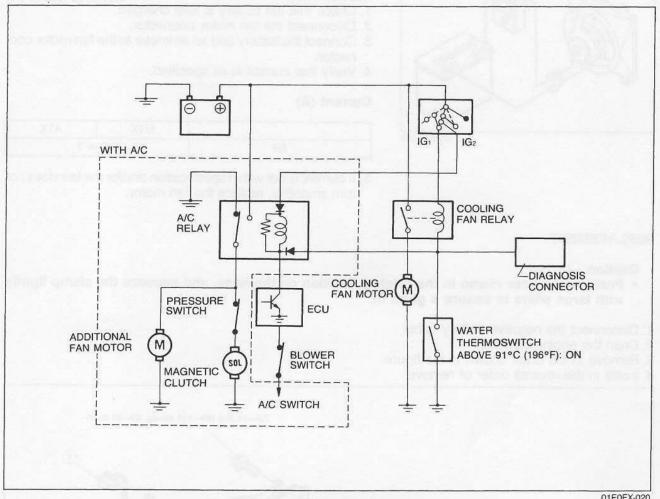
Steps After Installation

- 1. Fill the radiator with the specified amount and type of engine coolant. (Refer to page E-5.)
- 2. Connect the negative battery cable. 3. Start the engine and check for leaks.

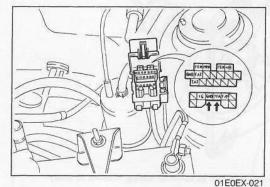
01E0EX-019

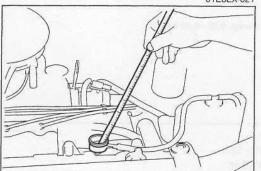
ELECTRIC COOLING FAN SYSTEM

SYSTEM CIRCUIT









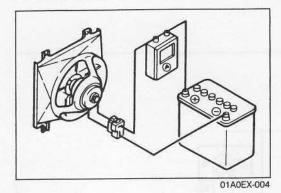
01A0EX-007

SYSTEM INSPECTION

- 1. Jump across the fan test (TFA) terminal and the ground (GND) terminal of the diagnosis connector.
- 2. Turn the ignition switch ON and verify that the fan operates. If the fan does not operate, inspect the cooling fan system components and wiring harness.
- 3. Remove the radiator cap and place a thermometer in the radiator filler neck.
- 4. Start the engine.
- 5. Verify that the fan operates when the coolant temperature is as specified.

Operation temperature: above 91°C (196°F)

If the fan does not operate, check the water thermoswitch. (Refer to page E-13.)



FAN MOTOR

INSPECTION

- 1. Check that the battery is fully charged.
- 2. Disconnect the fan motor connector.
- 3. Connect the battery and an ammeter to the fan motor con-
- 4. Verify that current is as specified.

Current (A)

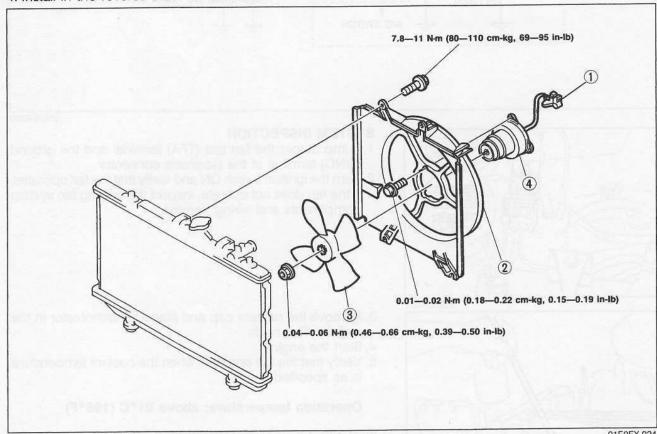
	MTX	ATX
B3	6.6	± 1

5. If current is not within specification and/or the fan does not turn smoothly, replace the fan motor.

REPLACEMENT

Caution

- Position the hose clamp in the original location on the hose, and squeeze the clamp lightly with large pliers to ensure a good fit.
- 1. Disconnect the negative battery cable.
- 2. Drain the engine coolant.
- 3. Remove in the order shown in the figure.
- 4. Install in the reverse order of removal.



01E0EX-024

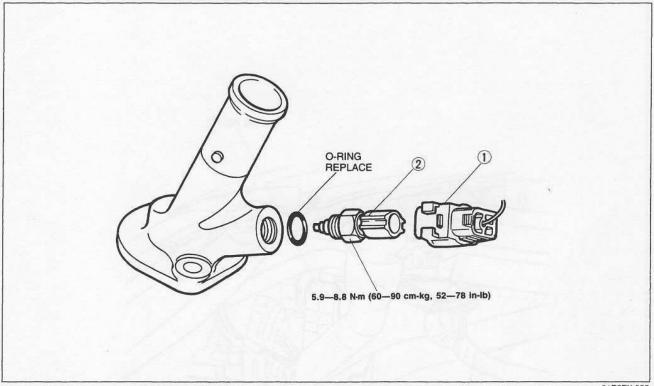
- 1. Cooling fan connector
- 2. Radiator cowling

- 3. Cooling fan
- 4. Fan motor

WATER THERMOSWITCH

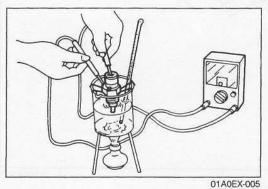
REMOVAL / INSTALLATION

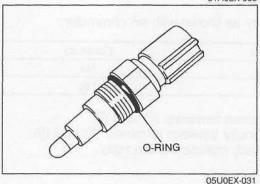
- 1. Disconnect the negative battery cable.
- 2. Remove in the order shown in the figure
- 3. Install in the reverse order of removal, referring to Installation Note.



01E0EX-025

1. Water thermoswitch connector





2. Water thermoswitch

Inspection	page	E-13
Installation Note	page	E-13

INSPECTION

- 1. Place the switch and a thermometer in water.
- 2. Heat the water gradually and check continuity of the switch with an ohmmeter.

Coolant temperature	°C (°F)	Continuity
More than 91 (196)		Yes
Less than 84 (183)		No

3. If not as specified, replace the water thermoswitch.

Installation Note Water thermoswitch

1. Apply a small amount of engine coolant to the new O-ring.

- · Do not use an impact wrench for installation.
- 2. Install the water thermoswitch.

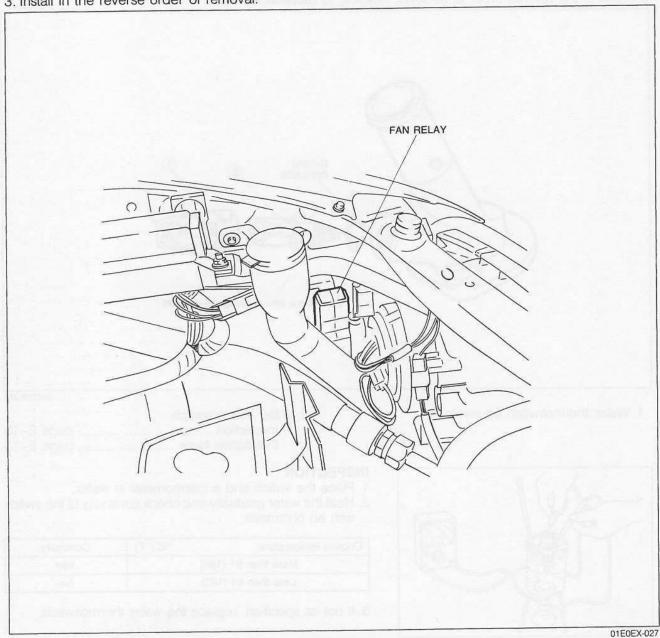
Tightening torque: 5.9-8.8 N·m (60-90 cm-kg, 52-78 in-lb)

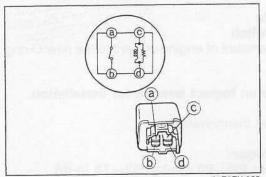
E - 13

FAN RELAY

REMOVAL / INSTALLATION

- 1. Disconnect the negative battery cable.
- 2. Remove the fan relay.
- 3. Install in the reverse order of removal.





01E0EX-028

INSPECTION

1. Check continuity as shown with an ohmmeter.

Terminal	Continuity	
(a)—(b)	No	
©-@	Yes	

Apply 12V between terminals © and ③.
 Check for continuity between terminals ⓐ and ⓑ.
 If not as specified, replace the fan relay.

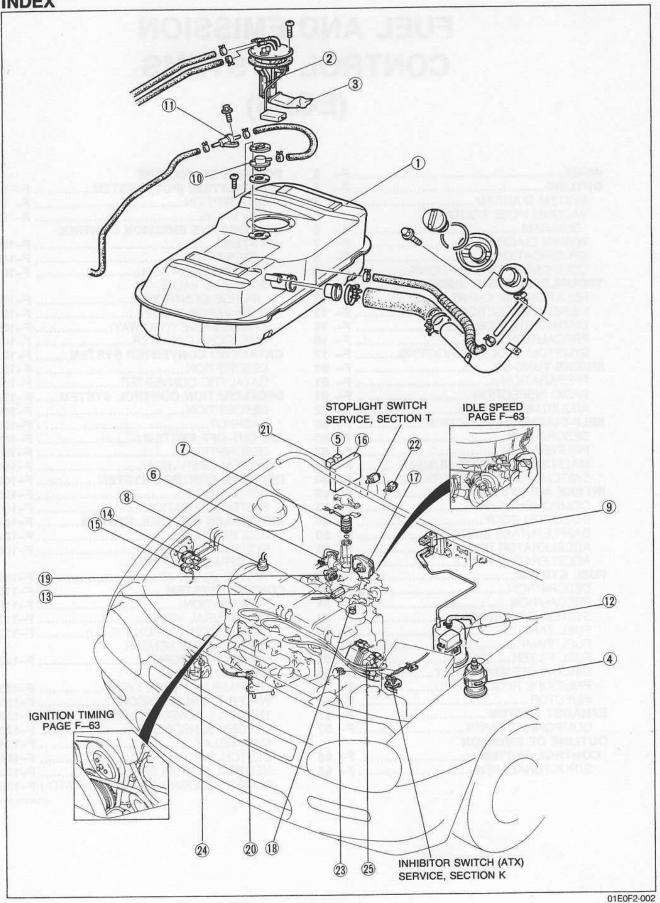
FUEL AND EMISSION CONTROL SYSTEMS (EGI-S)

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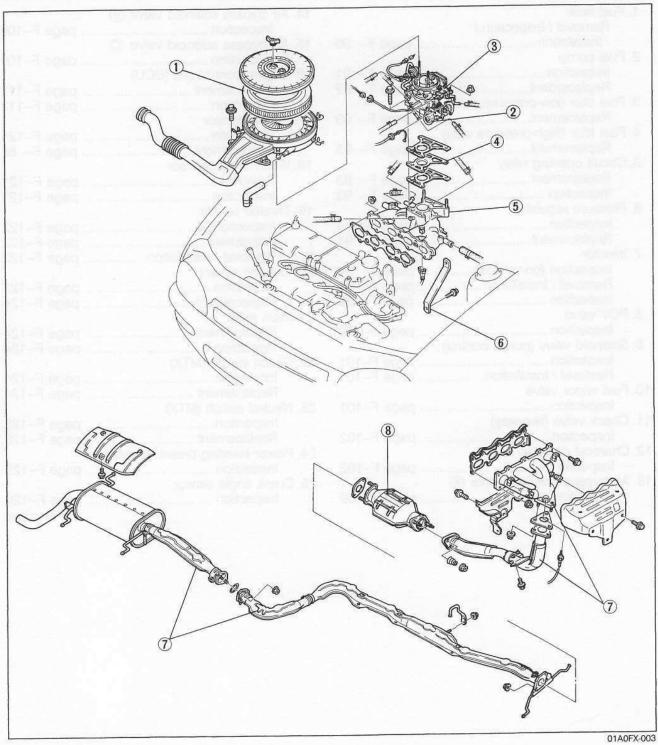
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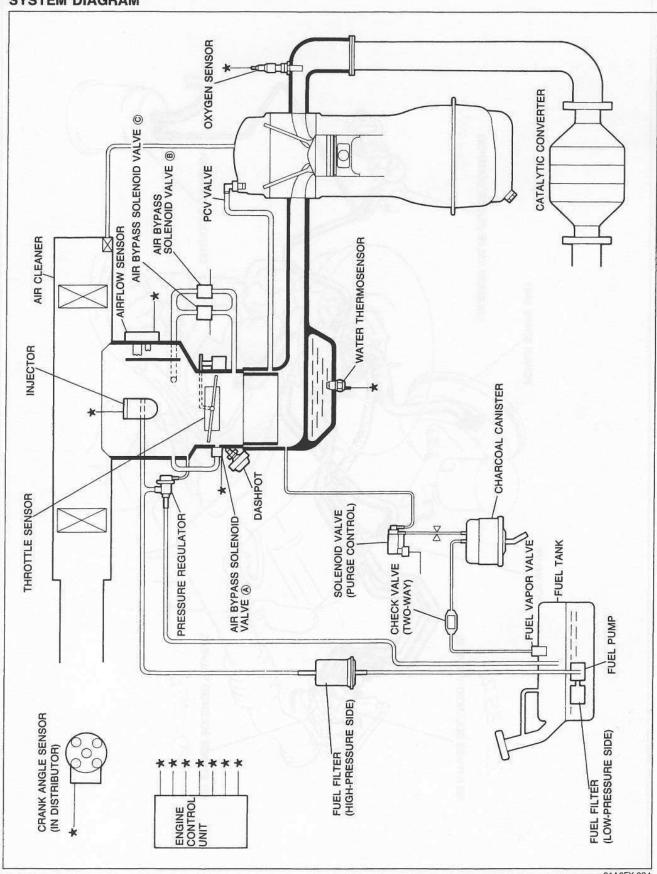
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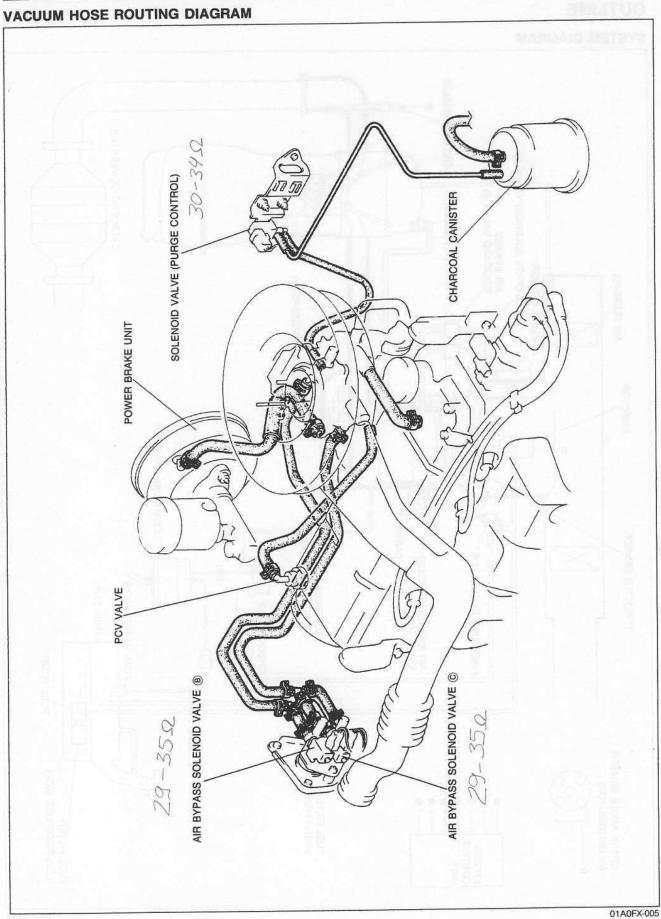
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OUTLINE

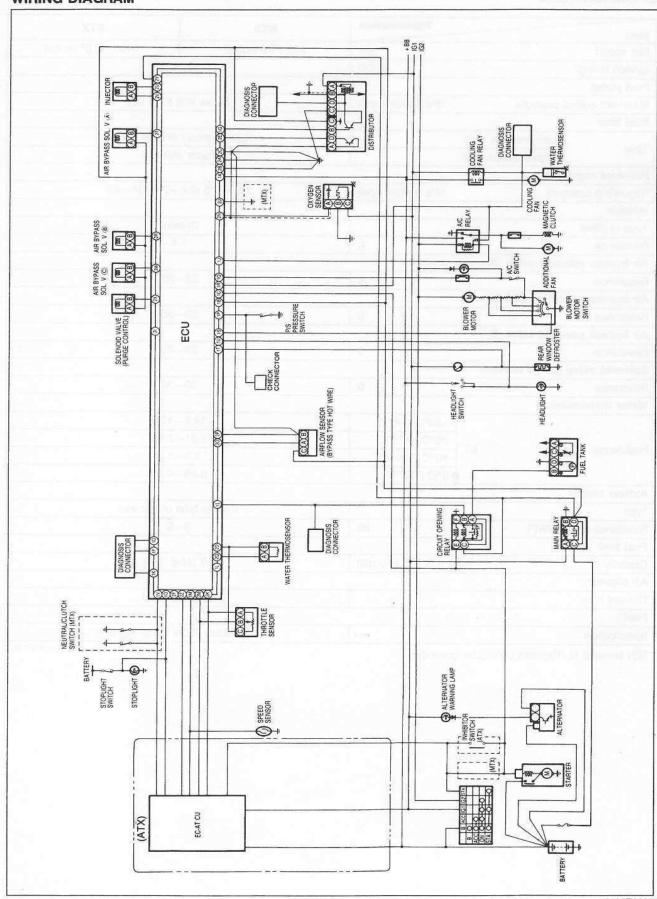
SYSTEM DIAGRAM



F



WIRING DIAGRAM



SPECIFICATIONS

Item		Transmission	MTX	ATX		
Idle speed		rpm	750 ± 50 (Neutral)	1,100 ⁺⁵⁰ ₋₀ (P range)		
Ignition timing	*	BTDC	*16	± 1°		
Fuel pump						
Maximum out	put pressure	kPa (kg/cm², psi)	Below 63	38 (6.5, 92)		
Fuel filter	Per Processing					
	Low-pressure side		Nylon elemen	nt (in fuel pump)		
Type High-pressure side			Paper element			
Pressure reg	ulator					
Regulating pr		kPa (kg/cm², psi)	235—275 (2.	4—2.8, 34—40)		
Injector	1887 118					
Type of drive			Cu	irrent		
Resistance		Ω		1.4		
ALWARD TO STATE OF THE STATE OF	olenoid valve (A)					
Resistance		Ω	22	2—28		
Air bypass s	olenoid valve ®					
Resistance Ω			29—35			
Air bypass s	olenoid valve ©					
Resistance		Ω	29	9—35		
Solenoid val	ve (purge control)					
Resistance		Ω	30)—34		
Water therm	osensor					
DOMESTIC VALUE OF SHORE		-20°C (-4°F)	14.6	5—17.8		
		20°C (68°F)	The state of the s	—2.69		
Resistance	kΩ	40°C (104°F)	1.0)—1.3		
		0°C (176°F)	0,29	9—0.35		
Airflow sens	sor					
Туре				pe of hot-wire		
Resistance (H	HWN-HWP)	kΩ	3	3—5		
Fuel tank				N. N. M.		
Capacity	lite	rs (US gal, Imp gal)	40 (1	0.6, 8.8)		
Air cleaner						
Element type			Oil pe	ermeated		
Fuel						
Specification			Unleaded (RC	ON 90 or higher)		

^{*}TEN terminal of diagnosis connector grounded.

COMPONENT DESCRIPTIONS

Component	Function	Remark
Air bypass solenoid valve (a) INJECTION BODY	Supplies bypass air into intake manifold by opening bypass air passage at either following condition: a) Engine cranking b) Electric load c) P/S pressure switch ON d) A/C switch ON e) Range change (N→D) f) Deceleration control	Electrical load a) Cooling fan b) Blower motor switch c) Headlight switch d) Rear window defroster switch
Air bypass solenoid valve ®	Supplies bypass air into intake manifold by opening bypass air passage at either following condition: a) Engine cranking b) P/S pressure switch ON c) Deceleration control	
Air bypass solenoid valve ©	Supplies bypass air into intake manifold by opening bypas air passage with A/C switch ON	
Air cleaner	Filters air entering injection body	Oil permeated
Airflow senser	Detects amount of intake air; sends signal to ECU	Uses Vref (5V) as power source
Baffle	Directs fuel/air mixture into intake manifold	
Catalytic converter	Reduce HC, CO and NOx by chemical reaction	Monolith type
Charcoal canister	Stores fuel tank fumes while engine stopped	
Check valve (two-way)	Controls pressure in fuel tank	Two-way type
Circuit opening relay	Voltage for fuel pump while engine running	
Clutch switch (MTX)	Detects clutch condition; sends signal to ECU	Switch OFF when clutch pedal released
Crank angle sensor Ne-signal	Detects crank angle at 180° intervals; sends signal to ECU	
Diagnosis connector	Concentrated service connector Terminals: 1. EGI self-diagnostic terminal 2. EC-AT self-diagnostic terminal 3. Initial set terminal 4. Fuel pump check terminal 5. Cooling fan check terminal 6. Engine rpm output terminal	21-pin (located near left strut tower)
Dashpot	Prevents after burn when throttle valve closes suddenly	Atmospheric type
Engine control unit (ECU)	Controls operation of the following. a) Fuel injection control system b) Electronic spark advance (ESA) control system c) A/C cut-off system d) Deceleration control system e) Fuel pump control system f) Evaporative emission control system g) Fail-safe control system h) Secondary air injection system	
Fuel filter	Filters particles from fuel	
Fuel pump	Provides fuel to injector	Operates while engine running Installed in fuel tank
Fuel vapor valve	Supply only evaporative emission into charcoal canister to prevent charcoal canister from fuel leak.	

Component	Function	Remark
Ignition switch (START position)	Engine cranking signal sent to ECU	
Inhibitor switch (ATX)	Detects in-gear condition; sends signal to ECU	Switch ON in N or P ranges
Injection body	a) Injects fuel into intake manifold b) Adjusts intake air amount by throttle valve c) Idle-up by air bypass solenoid valve (a) d) Detects amount of intakes air by airflow sensor	Consists of throttle valve, dashpot, throttle sensor, fast idle cam, airflow sensor, injector, pressure regulator, and air bypass solenoid valve
Injector	Injects fuel in relation to engine needs	Controlled by signals from ECU High-ohmic injector Installed on injection body
Main relay (FUEL INJ relay)	Supplies electric current to injector, ECU, etc.	Mark Statement C. F. D. C.
Neutral switch (MTX)	Detects in-gear condition; sends signal to ECU	Switch ON in neutral
Oxygen sensor	Detects oxygen concentration; sends signal to ECU	Zirconia ceramic and platinum coating
PCV valve	Controls blowby gas introduced into engine	IN I SECTION TO SECTION IN THE SECTI
P/S pressure switch	Detects P/S operation; sends signal to ECU	P/S: ON when steering wheel turned
Pressure regulator	Adjusts fuel pressure supplied to injector	Super Signer source [
Speed sensor	Detects speed; sends signal to ECU	Installed on instrument cluster
Stoplight switch	Detects braking operation (deceleration); sends signal to ECU	HALF BALLIEU EITE EIN HARVESS ROMMAN
Solenoid valve (purge control)	Controls evaporative fumes from canister to intake manifold	
Throttle sensor	Detects throttle valve opening angle; sends signal to ECU	Installed on injection body
Water thermosensor	Detects coolant temperature; sends signal to ECU	Installed on intake manifold

01A0FX-008

TROUBLESHOOTING GUIDE

RELATIONSHIP CHART

OUTPUT DEVICE	10	INJECTOR		ONTROL)	ONTROL)		/E &	/E ®	/E ©		11-03 1-11-0 1-11-0 1-11-0 1-00-0 1-0
INPUT DEVICE	FUEL INJECTION AMOUNT	FUEL INJECTION TIMING	CIRCUIT OPENING RELAY (FUEL PUMP CONTROL)	SOLENOID VALVE (PURGE CONTROL)	IGNITER (IGNITION TIMING CONTROL)	A/C RELAY (A/C CUT-OFF)	AIR BYPASS SOLENOID VALVE	AIR BYPASS SOLENOID VALVE	AIR BYPASS SOLENOID VALVE	SELF-DIAGNOSIS CHECKER (MALFUNCTION CODE)	SELF-DIAGNOSIS CHECKER (MONITOR LAMP)
EC-AT CONTROL UNIT				n. u	0						
DIAGNOSIS CONNECTOR (TEN TERMINAL)					0					0	0
IGNITION SWITCH (START POSITION)	0		0		0	0	0	0			
E/L SIGNAL*	0	n.lva	neni		0	III	0	(CA)	1130		0
P/S PRESSURE SWITCH	0				0		0	0			0
A/C SWITCH	0					0			0	teen	barri.
INHIBITOR SWITCH (ATX)	0			0			0	0			0
NEUTRAL AND CLUTCH SWITCHES (MTX)	0			0			0	0			0
STOPLIGHT SWITCH		parties.	Sen			L N	páti	0	n as	Linjir	0
SPEED SENSOR	0	o la									
THROTTLE SENSOR	0			0	0	0	0	0	0	0	
AIRFLOW SENSOR	0			0	0		0	0		0	
OXYGEN SENSOR	0			0		١,				0	
WATER THERMOSENSOR	0			0	0		0	0		0	0
CRANK ANGLE SENSOR (Ne-SIGNAL)	0	0	0	0	0	0	0	0	0	0	

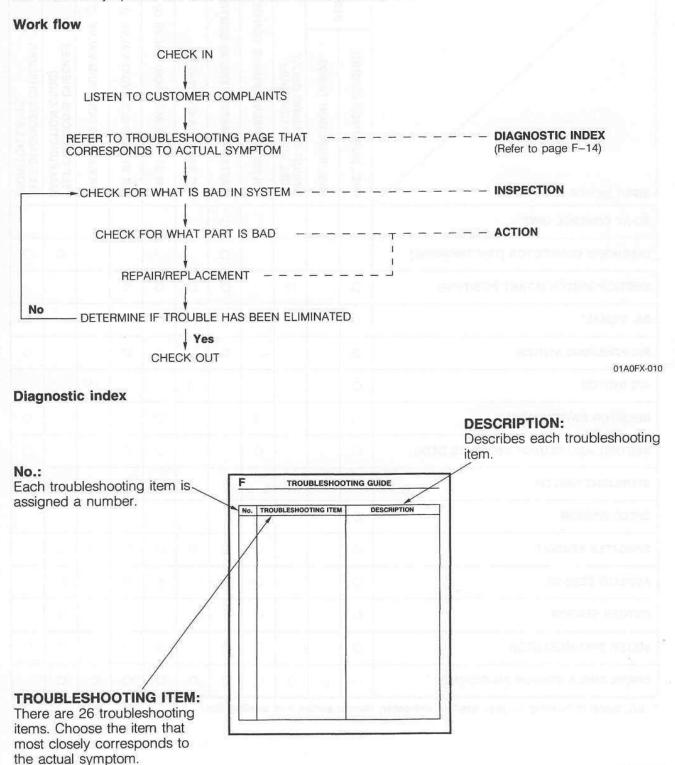
^{*} E/L signal is headlights, rear window defroster, blower switch and cooling fan.

01A0FX-009

USING THIS SECTION

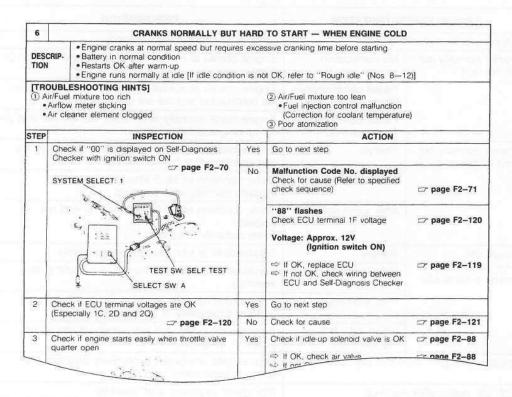
Introduction

Most of the fuel and emission control system is electrically controlled, often making it difficult to diagnose problems in the system, especially intermittent problems. Before undertaking actual checks, take a few minutes to talk with a customer who approaches with a drivability complaint. The customer is often a good source of information on such problems, especially intermittent ones. Through talks with the customer, one can find out what the symptoms are and under what conditions they occur.



01E0F2-014

Troubleshooting chart



05U0FX-015

DESCRIPTION:

Further describes the symptom. Confirm that the chart addresses the actual symptom before beginning troubleshooting.

TROUBLESHOOTING HINTS:

This describes the possible point of malfunction.

STEP:

This shows the order of troubleshooting. Proceed with troubleshooting as indicated.

INSPECTION:

This describes an inspection to quickly determine the malfunction of parts. If a detailed procedure is necessary to perform the INSPECTION, refer to the page shown by the "" mark.

ACTION:

This recommends the appropriate action to take as a result (Yes/No) of the INSPECTION. How to perform the action is described on the reference page shown by the "" mark.

05U0FX-016

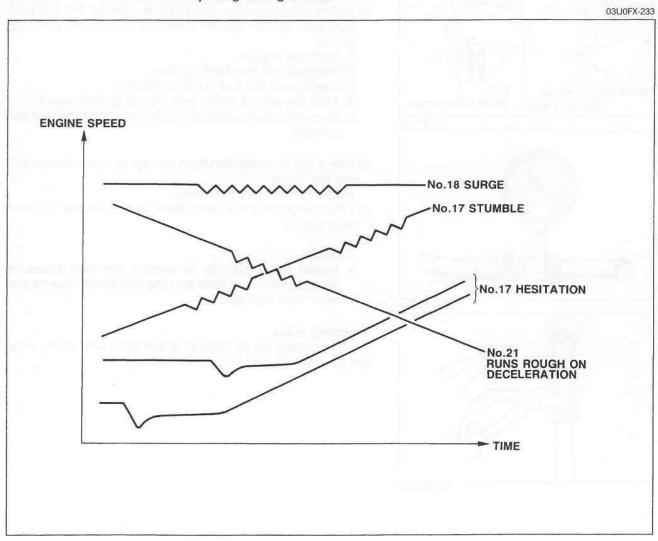
TROUBLESHOOTING GUIDE

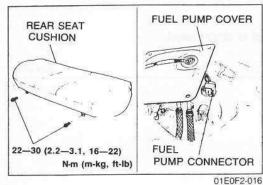
DIAGNOSTIC INDEX

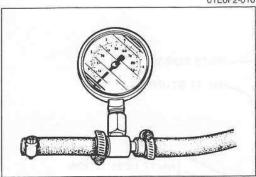
No.	TROUBLESH	OOTING ITEM	DESCRIPTION	PAGE
1	Will not crank or cran	ks slowly	Refer to Engine Electrical System	G-4
2	will not start firing Partial combustion— Engine cranks at normal speed but shows only par-		F-17	
3		Partial combustion— When engine cold	Engine cranks at normal speed but shows only partial combustion and will not continue to run	F-19
4		Partial combustion— After warm-up	Engine starts normally when cold, but will not start after running and hot soaked	F-21
5	Cranks normally but hard to start	Always	Engine cranks at normal speed but requires excessive cranking time before starting	F-23
6	27-75 page 97	When engine cold	Same condition as No.5 when engine cold Restarts normally after warm-up	F-25
7	Street laws of	After warm-up	Same condition as No.5 after running and hot soaked Starts normally when cold	F-27
8	Rough idle	Always	Engine stalls or vibrates excessively at idle	F-29
9	(Low idle speed)/ Engine stalls at idle	Before warm-up	Engine stalls or vibrates excessively at idle during warm-up	F-31
10		After warm-up	Engine runs normally at idle during warm-up but vibrates excessively or stalls after warm-up	F-33
11	20-25 may 5	When A/C, P/S, or E/L ON	Engine stalls or vibrates excessively at idle when A/C, P/S, or E/L ON	F-35
12	Rough idle/Engine sta	ills just after starting	Engine stalls or vibrates excessively only just after starting (acceleration from idle)	F-36
13	High idle speed after	warm-up	Idle speed excessive after warm-up	F-38
14	Idle moves up and do	own/Idle hunting	Engine speeds up and down periodically at idle	F-39
15	Engine stalls on dece	leration	Engine unexpectedly stops running while decelerating or after deceleration	F-41
16	Engine stalls suddenly	y (Intermittent)	Engine intermittently stops running	F-42
17	Hesitates/Stumbles or	acceleration	Flat spot occurs just after accelerator depressed or mild jerking occurs during acceleration	F-43
18	Surges while cruising		Unexpected change in engine speed which is usually repetitive	F-45
19	Lack of power	Les granochistosof	Performance poor under load when throttle valve wide open Maximum speed reduced	F-47
20	Poor acceleration		Performance poor while accelerating	F-50
21	Runs rough on decel	eration/Backfire	Engine runs rough while decelerating and abnormal combustion occurs in exhaust system	F-53
22	Knocking	Egin NE Dines	Abnormal combustion accompanied by audible "pinging" noise	F-55
23	Fuel odor	in the same	Gasoline odor in cabin	F-57
24	Exhaust sulfur smell		Exhaust gas smells like rotten eggs	F-58
25	High oil consumption		Oil consumption excessive	F-58
26	Poor fuel economy		Fuel economy unsatisfactory	F-59

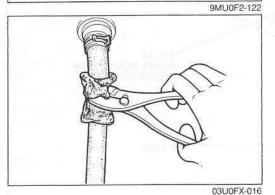
01A0FX-011

Description of Drivability
STUMBLE: Mild jerking during acceleration.
HESITATION: Flat spot occurring just after the accelerator pedal is depressed.
SURGE: Continuous soft jerking during cruise.









PRECAUTION

Fuel Pressure Release and Servicing Fuel System

Fuel in the fuel system remains under high pressure even when the engine is not running.

- a) Before disconnecting any fuel line, release the fuel pressure from the fuel system to reduce the possibility of injury or fire.
 - 1. Start the engine.
 - 2. Remove the rear seat cushion.
 - 3. Disconnect the fuel pump connector.
 - 4. After the engine stalls, turn off the ignition switch.
 - Reconnect fuel pump connector and install the rear seat cushion.
- b) Use a rag as protection from fuel spray when disconnecting the hoses.
 - Plug the hoses after removal.
- c) When inspecting the fuel system, use a suitable fuel pressure gauge.

Caution

 Install hose clamps to secure the fuel pressure gauge to the fuel filter and the fuel main hose to prevent fuel leakage.

Pinching Hose

When pinching an air hose or a fuel hose with pliers, wrap the hose with a rag to prevent damage.

SYMPTOM TROUBLESHOOTING

2		CRANKS NORMALLY BUT WILL NOT START (NO COMBUSTION)						
DESC	CRIP-	Engine cranks at normal speed but shows Battery in normal condition Throttle valve not held fully open while cran Fuel in tank	CO10 200.0	7.00 V0 00 00 00 00 00 00 00 00 00 00 00 0				
Beca ① N ② N	ause of spate ESHOOTING HINTS] of no combustion, possibly no fuel is injected to rk n control malfunction n system component malfunction injection component injection component injection component injection component injection	engin	e or no ignition at all cylinders ③ Low fuel line pressure ④ Low engine compression ⑤ ECU power supply circuit open ⑥ ECU ground circuit open					
TEP		INSPECTION		ACTION				
1		rong blue spark visible at disconnected high- ion lead?	Yes	Go to next step				
			No	Perform Step 2 ⇒ If OK, check ignition system (Refer to troubleshooting ''Misfire'') ⇒ If not OK, refer to specified check sequence for displayed code No.	□ page G-17 □ page F-70			
2		00'' displayed on Self-Diagnosis Checker ignition switch ON?	Yes	Go to next step				
	SYS	TEM SELECT: 1	No	Malfunction Code No. displayed Check for cause (Refer to specified check sequence for displayed code No.)	□ page F–70			
		SELECT SW: A TEST SW: SELF TEST		"88" flashes Check ECU terminal 1F voltage Voltage: Approx. 12V (Ignition switch ON)	□ page F-114 □ page F-112			
3		ove air cleaner cover; is fuel injected from tor while cranking engine? 1.5-2.0 N·m (15-20 cm-kg, 13-17 in-lb)	Yes	Check following points	page G-19 page F-63 page B-10 page F-118 page F-89 page F-97			
	ĺ		No	Check for injector operating sound while cranking engine ⇒ If OK, go to next step ⇒ If not OK, go to Step 6				

TEP	INSPECTION		ACTION
4	Connect diagnosis connector terminals F/P and GND with jumper wire; is fuel pump operating sound evident with ignition switch ON? page F-92 JUMPER WIRE	Yes	Check if fuel is injected while cranking engine in this condition If injected, check circuit opening relay If not injected, check injector for clogging and if fuel is in tank
	DIAGNOSIS CONNECTOR GND F/P	No	Go to next step
5	Is there continuity between fuel pump connector (a) and (b)?	Yes	Check circuit opening relay
		No	Replace fuel pump
6	Is there approx. 12V momentarily at ECU 2V terminal while cranking engine? (Engine signal monitor green and red lamps flash) USE CONNECTOR A	Yes	Try to replace injector (Injector stuck)
	49 9200 162 49 G018 903	No	Check injector for continuity □ If OK, check wiring related to ECU terminals 2Y, 2V, 2U, and 2A □ If not OK, replace injector

01A0FX-012

DESC	a Hattery in normal condition	only pa	artial combustion and will not continue to	run
① A ② A	DUBLESHOOTING HINTS] ir/Fuel mixture too rich Water thermosensor malfunction ir/Fuel mixture too lean Fuel injection control malfunction (Correction for coolant temperature) Low fuel line pressure Air leakage of intake air system		③ Low engine compression	
TEP	INSPECTION		ACTION	
1	Is "00" displayed on Self-Diagnosis Checker	Yes	Go to next step	
	with ignition switch ON? SYSTEM SELECT: 1 page F-67	No	Malfunction Code No. displayed Check for cause (Refer to specified check sequence)	☑ page F–70
			"88" flashes Check ECU terminal 1F voltage Voltage: Approx. 12V (Ignition switch ON)	⇔ page F–114
	SELECT SW: A TEST SW: SELF TEST		 ⇒ If OK, replace ECU ⇒ If not OK, check wiring between ECU and Self-Diagnosis Checker 	☐ page F–112
2	Is strong blue spark visible at each disconnected high-tension lead?	Yes	Go to next step	
		No	Check distributor cap and rotor	page G-23
3	Connect diagnosis connector terminals F/P and GND with jumper wire; is there correct fuel line	Yes	Go to next step	
	Fuel line pressure: 235—275 kPa (2.4—2.8 kg/cm², 34—40 psi) PRESSURE GAUGE	No	Low pressure Check fuel line pressure while pinching fuel return hose ⇒ If fuel line pressure quickly increases, check pressure regulator If fuel line pressure gradually increases, check for clogging between fuel pump and pressure regulator If not clogged, check fuel pump maximum pressure	□ page F–91
	JUMPER WIRE DIAGNOSIS CONNECTOR		High pressure Is fuel return hose clogged or restricted? ⇒ If OK, replace pressure regulator ⇒ If not OK, repair or replace	☑ page F–94

STEP	INSPECTION	ACTION		
4	Are ECU terminal voltages OK? (Especially 1C, 1K, 2O and 2Q)	Yes	Go to next step	
	⇔ page F–112	No	Check for cause	page F-114 F-116
5	Is there air leakage of intake air system components?	Yes	Repair or replace	mark copy
		No	Go to next step	
6	Does engine starts when water thermosensor is disconnected?	Yes	Check water thermosensor	page F-121
		No	Go to next step	Carl 188 III
7	Are spark plugs OK?	Yes	Go to next step	The section of
31	PLUG GAP 1.0—1.1mm WEAR AND CARBON BUILDUP BURNS			
	(0.039—0.043 in) DAMAGE AND DETERIORATION DAMAGE	No	Clean, or replace	□ page G-19
8	Is engine compression correct?	Yes	Try known good ECU and check if condition improves	
	Engine compression: More than 1,030 kPa (10.5 kg/cm², 149 psi)-300 rpm	No	Check engine condition Worn piston, piston rings or cylinder wall Defective cylinder head gasket Distorted cylinder head Improper valve seating Valve sticking in guide	□ page B-10

4		CRANKS NORMALLY BUT WILL NOT START (PARTIAL COMBUSTION) — AFTER WARM-UP				
DESCRIP- TION		partial	combustion but will not continue to run after running and			
① A	DUBLESHOOTING HINTS] ir/Fuel mixture too rich Insufficient fuel injection control (Correction for coolant temperature) Injector fuel leakage		Vapor lock Fuel pressure not held in fuel line after engine stopped High RVP (winter) fuel used in warm weather			
TEP	INSPECTION		ACTION			
1	Warm-up engine to normal operating temperature and stop it Connect diagnosis connector terminals F/P and GND with jumper wire for 3 minutes with ignition switch ON, then does engine start? JUMPER WIRE	Yes	Change fuel to another brand			
al v	DIAGNOSIS CONNECTOR GND F/P	No	Go to next step			
2	Connect diagnosis connector terminals F/P and GND with jumper wire; is fuel line pressure cor-	Yes	Go to next step			
70 - 10 - 10 - 10 - 10 - 10 - 10 - 10 -	rect with ignition switch ON? page F–89 Fuel line pressure: 235–275 kPa (2.4–2.8 kg/cm², 34–40 psi) PRESSURE GAUGE FUEL FILTER	No	Low pressure Check fuel line pressure while pinching fuel return hose ⇒ If fuel line pressure quickly increases, check pressure regulator If fuel line pressure gradually increases, check fuel line and filter for clogging If not clogged, check fuel pump maximum pressure □ page F-91			
	JUMPER WIRE DIAGNOSIS CONNECTOR		High pressure Is fuel return hose clogged or restricted? ⇒ If OK, replace pressure regulator ⇒ If not OK, repair or replace			
3	In same condition as Step 2, is fuel line pressure held after ignition switch is turned OFF? page F-88	Yes	Go to Step 5			
	Fuel line pressure: More than 147 kPa (1.5 kg/cm², 21 psi) for 5 min.	No	Go to next step			
4	Plug outlet of pressure regulator; is fuel line pressure held after ignition switch is turned OFF?	Yes	Replace pressure regulator			
	Fuel line pressure: More than 147 kPa (1.5 kg/cm², 21 psi) for 5 min.	No	Check fuel pump hold pressure page F–88 If OK, check injector for fuel leakage page F–96 page F–96 page F–96 page F–92			

STEP	INSPECTION		ACTION	
5	Disconnect water thermosensor connector; does engine start?	Yes	Check water thermosensor ⇒ If OK, check connections of water thermosensor and ECU 2Q terminal ⇒ If not OK, replace water thermosensor	□ page F-121 □ page F-121
Disc		No	Go to next step	
6	Is "00" displayed on Self-Diagnosis Checker with ignition switch ON? page F-67 SYSTEM SELECT: 1	Yes	Go to next step	
		No	Malfunction Code No. displayed Check for cause (Refer to specified check sequence)	⇔ page F–70
			"88" flashes Check ECU terminal 1F voltage Voltage: Approx. 12V (Ignition switch ON)	c page F-114
	SELECT SW: A TEST SW: SELF TEST		 ⇒ If OK, replace ECU ⇒ If not OK, check wiring between ECU and Self-Diagnosis Checker 	r page F–112
7	Are ECU terminal voltages OK? (Especially 1C, 2O and 2Q) page F-112	Yes	Go to next step	
		No	Check for cause	page F-115 F-117 F-119
8	Try known good ECU and check if condition improve?	Yes	Replace ECU	page F-112
		No	Change fuel to another brand	

5	CRANKS NORMALLY	CRANKS NORMALLY BUT HARD TO START — ALWAYS				
DESC						
① A	DUBLESHOOTING HINTS] ir/Fuel mixture too lean Fuel injection control malfunction (Correction for coolant temperature) Low fuel line pressure Air leakage	5 130	Air/Fuel mixture too rich Fuel injection control malfunction (Correction for coolant temperature) Carbon deposit in hot-wire passage Poor ignition spark			
TEP	INSPECTION		ACTION			
1	Is "00" displayed on Self-Diagnosis Checker with ignition switch ON?	Yes	Go to next step			
	SYSTEM SELECT: 1	No	Malfunction Code No. displayed Check for cause (Refer to specified check sequence)	☑ page F–70		
			"88" flashes Check ECU terminal 1F voltage Voltage: Approx. 12V	☞ page F–114		
	SELECT SW: A TEST SW: SELF TEST		(Ignition switch ON) ⇒ If OK, replace ECU ⇒ If not OK, check wiring between ECU and Self-Diagnosis Checker	☑ page F–112		
2	Is there air leakage of intake air system components?	Yes	Repair or replace			
		No	Go to next step			
3	Is air cleaner element clean?	Yes	Go to next step			
		No	Replace air cleaner element			
4	Does engine start easily when throttle valve quarter open?	Yes	Check throttle valve for carbon deposit and then go to Step 6			
		No	Go to next step			
5	Is fuel line pressure correct at idle? page F-94	Yes	Go to next step	-eret jinii		
	Fuel line pressure: 235—275 kPa (2.4—2.8 kg/cm², 34—40 psi) PRESSURE GAUGE	No	Low pressure Check fuel line pressure while pinching fuel return hose □ If fuel line pressure quickly increases, check pressure regulator □ If fuel line pressure gradually increases, check for clogging between fuel pump and pressure regulator If not clogged, check fuel pump maximum pressure	ເສງ page F–91		

TEP	INSPECTION		ACTION	
6	Is air bypass solenoid valve (A) OK? page F-108	Yes	Go to next step	
	AIR BYPASS SOLENOID VALVE®	No	Replace solenoid valve	
7	Are ECU terminal voltages OK? (Especially 1C, 1K and 2Q)	Yes	Go to next step	
	page F-109	No	Check for cause	page F-115 F-117 F-119
8	Connect diagnosis connector terminals F/P and GND with jumper wire; does engine start normally? JUMPER WIRE	Yes	Check circuit opening relay ⇒ If relay OK, repair or replace wire harness ⇒ If relay not OK, replace relay	☑ page F–93
	DIAGNOSIS CONNECTOR GND F/P	No	Go to next step	
9	Connect System Selector to diagnosis connector and set Test Switch to "SELF TEST"; is there correct ignition timing at idle after warm-up? page F-63 Ignition timing: BTDC 16 ± 1°	Yes	Go to next step	
	TEN GND INDICATOR TEST SW	No	Adjust ignition timing	page F-63
10	Is engine compression correct?	Yes	Go to next step	eng netti bilati
	Engine compression (Minimum): 1,030 kPa (10.5 kg/cm², 149 psi)-300 rpm	No	Check engine condition Worn piston, piston rings or cylinder wall Defective cylinder head gasket Distorted cylinder head Improper valve seating Valve sticking in guide	☑ page B-10

6	CRANKS NORMALLY BUT	HARD	TO START — WHEN ENGINE COLD				
DESC TION	Battery in normal condition Restarts OK after warm-up						
① A	DUBLESHOOTING HINTS] ir/Fuel mixture too rich Fuel injection control malfunction (Correction for coolant temperature) Thermowax malfunction		Air/Fuel mixture too lean				
TEP	INSPECTION		ACTION				
1	Is "00" displayed on Self-Diagnosis Checker	Yes	Go to next step				
	with ignition switch ON? page F-67 SYSTEM SELECT: 1	No	Malfunction Code No. displayed Check for cause (Refer to specified check sequence) page F-70				
		1 84	"88" flashes Check ECU terminal 1F voltage page F-114 Voltage: Approx. 12V (Ignition switch ON)				
	SELECT SW: A TEST SW: SELF TEST		 ⇒ If OK, replace ECU ⇒ If not OK, check wiring between ECU and Self-Diagnosis Checker 				
2	Are ECU terminal voltages OK? (Especially 1C, 2D, and 2Q)	Yes	Go to next step				
	□ page F–112	No	Check for cause page F-115 F-117 F-119				
3	Does engine start easily when throttle valve quarter open?	Yes	Check thermowax				
		No	Go to next step				
4	Is there air leakage of intake air system components?	Yes	Repair or replace				
		No	Go to next step				
5	Is air cleaner element clean?	Yes	Go to next step				
		No	Replace air cleaner element				
6	Are spark plugs OK? page G-19 WEAR AND CARBON BUILDUP PLUG GAP 1.0-1.1mm	Yes	Go to next step				
	(0.039—0.043 in) DAMAGE AND DETERIORATION DAMAGE	No	Clean or replace				

STEP	INSPECTION		ACTION	
7	Is fuel line pressure correct at idle? page F-94	Yes	Go to next step	estel .
	Fuel line pressure: 235—275 kPa (2.4—2.8 kg/cm², 34—40 psi) PRESSURE GAUGE	No	Low pressure Check fuel line pressure while pinching fuel return hose in fuel line pressure quickly increases, check pressure regulator If fuel line pressure gradually increases, check fuel line for clogging between fuel pump and pressure regulator If not clogged, check fuel pump maximum pressure	☞ page F–91
7	FUEL FILTER	S BR	High pressure Is fuel return hose clogged or restricted ⇒ If OK, replace pressure regulator ⇒ If not OK, repair or replace hose	page F-94
8	Try known good ECU; does condition improve?	Yes	Replace ECU	page F-112
	All short more	No	Change fuel to another brand	

7	CRANKS NORMALLY BU	T HAR	D TO START — AFTER WARM-UP			
DESC	RIP- soaked	res excessive cranking time before starting after running and hot				
① Ai • I	DUBLESHOOTING HINTS] ir/Fuel mixture too rich Fuel injection control malfunction injector fuel leakage		Vapor lock Fuel pressure not held in fuel line a High RVP (winter) fuel used in warm	fter engine stopped		
STEP	INSPECTION		ACTION			
1	Is "00" displayed on Self-Diagnosis Checker with ignition switch ON?	Yes	Go to next step			
	SYSTEM SELECT: 1 page F-67	No	Malfunction Code No. displayed Check for cause (Refer to specified check sequence)	⇔ page F–70		
30			"88" flashes Check ECU terminal 1F voltage Voltage: Approx. 12V (Ignition switch ON)	☐ page F-114		
	SELECT SW: A TEST SW: SELF TEST		⇔ If OK, replace ECU ⇔ If not OK, check wiring between ECU and Self-Diagnosis Checker	☑ page F–112		
2	Are ECU terminal voltages OK? (Especially 1C, 2Q, and 2T)	Yes	Go to next step			
	c page F–112	No	Check for cause	page F-115 F-117 F-119		
3	Run engine at idle; is fuel line pressure is held after ignition switch turned OFF?	Yes	Go to next step			
	Fuel line pressure: More than 147 kPa (1.5 kg/cm², 21 psi) for 5 min.	No	Plug outlet of pressure regulator and check if fuel line pressure is held after ignition switch turned OFF			
	PRESSURE GAUGE		⇒ If OK, replace pressure regulator ⇒ If not OK, check fuel pump hold pressure	□ page F–94 □ page F–88		
	THESSURE GAUGE		If fuel pump is OK, check injector for fuel leakage	page F-96		
	FUEL FILTER					

TEP	INSPECTION		ACTION	
4	Warm-up engine to normal operating temperature and stop it Connect diagnosis connector terminals F/P and GND with jumper wire for 3 minutes with ignition switch ON; does if engine starts easily?	Yes	Change fuel to another brand	
	JUMPER WIRE DIAGNOSIS CONNECTOR GND F/P	No	Go to next step	
5	Try known good ECU; does condition improves?	Yes	Replace ECU	□ page F-112
	DID Assessment of the last	No	Change fuel to another brand	

8		ROUGH IDLE/ENGINE STALLS AT IDLE — ALWAYS					
DESC	CRIP-	Engine starts normally but stalls or vibrates	excess	sively at idle in every condition			
① A	ir/Fuel Air lea Fuel in Low fo	ESHOOTING HINTS] I mixture too lean akage njection control malfunction uel line pressure ake air amount		 ③ Incorrect idle speed • Idle speed misadjustment ④ One or more spark plugs not firing ⑤ Low engine compression ⑥ Carbon deposit in injection body 	Ann property		
TEP		INSPECTION		ACTION			
1	Is "C with	00" displayed on Self-Diagnosis Checker ignition switch ON?	Yes	Go to next step			
	SYS	TEM SELECT: 1 Page F-67	No	Malfunction Code No. displayed Check for cause (Refer to specified check sequence)	c page F–70		
	1/3/			"88" flashes Check ECU terminal 1F voltage Voltage: Approx. 12V (Ignition switch ON)	□ page F-114		
		SELECT SW: A TEST SW: SELF TEST		 ⇒ If OK, replace ECU ⇒ If not OK, check wiring between ECU and Self-Diagnosis Checker 	page F-112		
2	Are I	ECU terminal voltages OK? ecially 1K, 2M, 2O and 2Q)	Yes	Go to next step			
		□ page F–112	No	Check for cause	□ page F-115 F-117 F-119		
3		onnect each high-tension lead at idle; does ne speed decrease equally at each cylinder?	Yes	Go to Step 5			
			No	Go to next step			
4		rong blue spark visible at disconnected high- on lead?	Yes	Go to next step	-		
			No	Check high-tension lead	□ page G–23		
T .				 ⇒ If OK, check distributor cap and rotor ⇒ If not OK, replace high-tension lead 	page G-23		
5		wear and carbon buildup PLUG GAP 1.0—1.1mm BURNS	Yes	Check for correct engine compression ⇒ If OK, replace injector ⇒ If not OK, check for cause	□ page B-10 □ page F-96 □ page B-10		
	(0	DAMAGE AND DETERIORATION DAMAGE	No	Clean or replace	□ page G-19		

TEP	INSPECTION		ACTION	
6	Connect System Selector to diagnosis connector and set Test Switch to "SELF TEST"; is correct ignition timing correct at idle after warm-up? page F-62 Ignition timing: BTDC 16 ± 1°	Yes	Go to next step	
	TEN GND NDICATOR A TEST SW	No	Adjust ignition timing	□ page F-62
7	Is fuel line pressure correct at idle? page F-94	Yes	Go to next step	
A1	Fuel line pressure: 235—275 kPa (2.4—2.8 kg/cm², 34—40 psi) (Vacuum hose to pressure regulator disconnected) PRESSURE GAUGE FUEL FILTER	No	Low pressure Check fuel line pressure while pinching fuel return hose If fuel line pressure quickly increases, check pressure regulator If fuel line pressure gradually increases, check for clogging between fuel pump and pressure regulator If not clogged, check fuel pump maximum pressure	page F–91
8	Is there air leakage at intake air system components?	Yes	Repair or replace	
	Roll Car Co.	No	Go to next step	
9	Is engine compression correct?	Yes	Try known good ECU and does condition improve?	
	Engine compression (Minimum): 1,030 kPa (10.5 kg/cm², 149 psi)-300 rpm	No	Check for cause	☐ page B-10

9	ROUGH IDLE/ENGINE STALLS AT IDLE — BEFORE WARM-UP					
DESC	• Engine speed low or engine stalls or vibrat	tes exce	essively at idle during warm-up	A COLUMNIA DE		
① L	OUBLESHOOTING HINTS] ow intake air amount Carbon deposit in injection body Air cleaner element clogged Thermowax unit stuck		Low fuel injection control Fuel injection control malfunction (Correction for coolant temperature) Poor atomization Low RVP (summer) fuel used in column.			
TEP	INSPECTION		ACTION			
1	Is "00" displayed on Self-Diagnosis Checker with ignition switch ON?	Yes	Go to next step			
	SYSTEM SELECT: 1	No	Malfunction Code No. displayed Check for cause (Refer to specified check sequence)	⇔ page F–70		
			"88" flashes Check ECU terminal 1F voltage Voltage: Approx. 12V (Ignition switch ON)	c page F–114		
	SELECT SW: A TEST SW: SELF TEST		⇒ If OK, replace ECU ⇒ If not OK, check wiring between ECU and Self-Diagnosis Checker	r page F–112		
2	Is there air leakage of intake air system components?	Yes	Repair or replace			
		No	Go to next step			
3	Is air cleaner element clean?	Yes	Go to next step			
	e u s	No	Replace air cleaner element	Shift militipl		
4	Are ECU terminal voltages OK? (Especially 1K, 2M, 2O, 2T and 2Q)	Yes	Go to next step	o raidh		
	⇔ page F–112	No	Check for cause	page F-115 F-117 F-119		
5	Is air bypass solenoid valve (A) OK? page F-109	Yes	Go to next step			
LF						
100	AIR BYPASS SOLENOID VALVE(B) INJECTION BODY	No	Replace solenoid valve	☐ page F–109		
	1-50/4D		900			

TEP	INSPECTION		ACTION	
6	Is water thermosensor resistance correct? page F-121	Yes	Go to next step	
			A Section of Contract of Contr	
		No	Replace water thermosensor	ເສື page F–121
7	Connect System Selector to diagnosis connector	Yes	Go to next step	
	and set Test Switch to "SELF TEST" when engine is cold		The Cartin	
	Does engine speed decrease as engine warms up? TEN page F-85			
	GND SYSTEM SELECTOR	No	Replace injection body	□ page F–84
	A TEST SW			
8	Connect System Selector to diagnosis connector and set Test Switch to "SELF TEST"	Yes	Go to next step	
	Is ignition timing correct at idle after warm-up? page F-62	1 3	e I shed.	
	Ignition timing: BTDC 16 ± 1°			
	TEN	No	Adjust ignition timing	☐ page F–62
	GND SOTH WHITE			
	INDICATOR A TEST SW		and of agent	
9	Try known good ECU; does condition improves?	Yes	Replace ECU	☐ page F-112
		No	Change fuel to another brand	

10		ROUGH IDLE/ENGINE STALLS AT IDLE — AFTER WARM-UP				
DES	CRIP-	• Engine runs normally at idle during warm-u	up but	engine stalls or vibrates excessively after	warm-up	
① Ic ② A	dle spe ir/Fuel Air lea Low fu	ESHOOTING HINTS] sed control system malfunction mixture too lean kage sel line pressure alve stuck (open)		Air/Fuel mixture too rich Fuel injection control malfunction (Correction for coolant temperature Poor ignition Low engine compression)	
STEP		INSPECTION	-	ACTION		
1		0" displayed on Self-Diagnosis Checker ignition switch ON?	Yes	Go to next step		
. 18	SYST	□ page F–67 TEM SELECT: 1	No	Malfunction Code No. displayed Check for cause (Refer to specified check sequence)	□ page F–70	
	1			"88" flashes Check ECU terminal 1F voltage	□ page F-114	
	(3000		Voltage: Approx. 12V (Ignition switch ON)		
	74	SELECT SW: A TEST SW: SELF TEST	E	⇒ If OK, replace ECU ⇒ If not OK, check wiring between ECU and Self-Diagnosis Checker	□ page F-112	
2	Are E	ECU terminal voltages OK? ecially 1K, 2M, 2O and 2Q)	Yes	Go to next step	Non-arti	
		⇔ page F–112	No	Check for cause	□ page F-115 F-117 F-119	
3		onnect high-tension lead at idle; does enspeed decrease equally at all cylinders?	Yes	Go to next step		
		Traffic Man	No	Go to Step 10	ergy stage	
4	Is the	ere air leakage of intake air system com- nts?	Yes	Repair or replace		
			No	Go to next step		
5	Is air	cleaner element clean?	Yes	Go to next step		
		Avenue sa suré som still à	No	Replace air cleaner element		
6	does	throttle adjusting screw counterclockwise; idle condition improve? OW SENSOR TAS	Yes	Adjust idle speed	r page F–62	
	12		No	Return throttle adjusting screw to its original position, and go to next step		

TEP	INSPECTION		ACTION	
7	Is fuel line pressure correct at idle?	Yes	Go to next step	
	Fuel line pressure: 235—275 kPa (2.4—2.8 kg/cm², 34—40 psi) PRESSURE GAUGE FUEL FILTER	No	Low pressure Check fuel line pressure while pinching fuel return hose ⇒ If fuel line pressure quickly increases, check pressure regulator If fuel line pressure gradually increases, check for clogging between fuel pump and pressure regulator If not clogged, check fuel pump maximum pressure	□ page F–91
8	Connect System Selector to diagnosis connector and set Test Switch to "SELF TEST" Is ignition timing correct at idle after warm-up? page F-62	Yes	Go to next step	
	Ignition timing: BTDC 16 ± 1°	No	Adjust ignition system	□ page F-62
9	Disconnect water thermosensor connector Does engine condition improve?	Yes	Replace water thermosensor	PINTER!
		No	Try known good ECU and check if condition improves	
10	Is engine compression correct? page B-10	Yes	Go to next step	
	Engine compression (Minimum): 1,030 kPa (10.5 kg/cm ² , 149 psi)-300 rpm	No	Check engine	□ page B-10
11	Is strong blue spark visible at each disconnected high-tension lead?	Yes	Go to next step	e uneq in e
		No	Check high-tension lead ⇒ If OK, check distributor cap and rotor ⇒ If not OK, replace high-tension lead	☑ page G–23 ☑ page G–23
12	Are spark plugs OK? page G-19 WEAR AND CARBON BUILDUP PLUG GAP 1.0—1.1mm	Yes	Try known good ECU and check if condition improves	
	(0.039—0.043 in) DAMAGE AND DETERIORATION DAMAGE	No	Repair or replace	

11		ROUGH IDLE/ENGINE STA	ALLS A	T IDLE — WHEN A/C, P/S, E/L ON	
DESC	CRIP-	 Engine stalls or vibrates excessively at idle A/C, P/S, headlights, blower fan and electri Idle condition is normal when A/C, P/S and 	c coolir	ng fan operate normally	
		ESHOOTING HINTS] eed control system malfunction			
TEP		INSPECTION		ACTION	
1	ls "C	00" displayed on Self-Diagnosis Checker	Yes	Go to next step	
		ignition switch ON?		(ASTREE)	[1]
14	sys	TEM SELECT: 1	No	Malfunction Code No. displayed Check for cause (Refer to specified check sequence)	c page F–70
	1	SELECT SW: A TEST SW: SELF TEST		"88" flashes Check ECU terminal 1F voltage Voltage: Approx. 12V (Ignition switch ON) ⇒ If OK, replace ECU ⇒ If not OK, check wiring between ECU and Self-Diagnosis Checker	□ page F-114 □ page F-112
2	Using	g Self-Diagnosis Checker Monitor Lamp; are hes OK with ignition switch ON?	Yes	Go to next step	
		□ page F-80	No	Lamp not ON or OFF with speci- fied switch Check for cause (Refer to specified check sequence)	☑ page F–81 F–82
	MONI	MOINTOR SELECT SE		Lamp always ON Check wiring between ECU terminal 1D and Self-Diagnosis Checker	
3	ls air	bypass solenoid valve OK?	Yes	Adjust idle-up engine speed	☐ page F-64
	• A/6 • E/L • P/S	CSolenoid valve © page F-109 page F-109 page F-109 page F-109 page F-109 page F-109 page F-109			
	VALVE	AIR BYPASS SOL. V. ©	No	Replace solenoid valve	

2				LLS JUST AFTER STARTING	idla)
ION	RIP-	 Engine starts normally but vibrates excessively Idle conditions are normal in other conditions 	ely or s	stalls just after starting (acceleration from	idle)
1) Aii • A • F	r/Fuel Air lea Fuel ir	ESHOOTING HINTS] mixture too lean kage njection control malfunction uel line pressure		② Throttle sensor malfunction	
EP	-OVV 10	INSPECTION	-	ACTION	
1	le "C	0'' displayed on Self-Diagnosis Checker	Yes	Go to next step	
	with	ignition switch ON? page F-67 TEM SELECT: 1	No	Malfunction Code No. displayed Check for cause (Refer to specified check sequence)	c page F-70
	140	SELECT SW: A TEST SW: SELF TEST		"88" flashes Check ECU terminal 1F voltage Voltage: Approx. 12V (Ignition switch ON) ⇒ If OK, replace ECU ⇒ If not OK, check wiring between ECU and Self-Diagnosis Checker	☑ page F–114 ☑ page F–112
2		ere air leakage of intake air system com-	Yes	Repair or replace	
	pone	ents?	No	Go to next step	
3	Is fu	el line pressure correct at idle? page F-94	Yes	Go to next step	
		line pressure: 5—275 kPa (2.4—2.8 kg/cm², 34—40 psi)	No	Low pressure Check for fuel line pressure while pinching fuel return hose	
	PRE	SSURE GAUGE		 ⇒ If fuel line pressure quickly increases, check pressure regulator ⇒ If fuel line pressure gradually increases, check for clogging between fuel pump and pressure regulator If not clogged, check fuel pump maximum pressure 	
		FUEL FILTER		High pressure Is fuel line clogged? ⇒ If OK, replace pressure regulator ⇒ If not OK, replace	☑ page F–94
4	and	nect System Selector to diagnosis connector set Test Switch to "SELF TEST" nition timing correct at idle after warm-up? page F-63	Yes	In same condition as Step 3 in- spection Check for correct idle speed	□ page F-63
П	Igni	tion timing: BTDC 16 ± 1°		Idle speed: 750 +50 rpm (MTX) 1,100 +50 rpm (ATX) ⇒ If OK, go to next step ⇒ If not OK, adjust idle speed	□ page F–63
	7	GND GOVERNER OF THE PARTY OF TH	No	Adjust	J.P.

TEP	INSPECTION		ACTION	
5	Are ECU terminal voltages OK? (Especially 1B, 2M, 2O, and 2Q)	Yes	Go to next step	
	Note When checking voltages, tap, move, and wiggle harness and connector to recreate problem	No	Check for cause	
6	Are spark plugs OK? WEAR AND CARBON BUILDUP PLUG GAP 1.0—1.1mm (0.039—0.043 in) DAMAGE AND DETERIORATION DAMAGE	Yes	Go to next step	
		No	Repair or replace	
7 Is engine compression correct? page B–10	Yes	Try known good ECU and check if condition improves	1874	
	Engine compression (Minimum): 1,030 kPa (10.5 kg/cm ² , 149 psi)—300 rpm	No	Check engine	□ page B-10

13		HIGH IDLE	SPEED	AFTER WARM-UP	
DESC	RIP-	•Idle speed excessive after warm-up		Direction of	
Exce 1) Th 2) Id	ssive rottle le spe Therm	ESHOOTING HINTS] intake air supplied to engine valve not fully closed eed control malfunction lowax malfunction pass solenoid valve ON at idle		 A/C, P/S or E/L signal sent to ECU 	Company Company Company Company
TEP		INSPECTION		ACTION	
1		rottle valve fully closed when accelerator ased?	Yes	Go to Step 3	
			No	Is throttle linkage correctly installed and operates freely? ⇒ If OK, go to Step 2 ⇒ If not OK, clean, adjust or replace linkage	
2	Does fast idle cam release throttle lever? FAST IDLE CAM THROTTLE	Yes	Adjust idle speed by turning throttle adjust screw	c page F−63	
	LEVE		No	Replace injection body	
3	ls "(00" displayed on Self-Diagnosis Checker ignition switch ON?	Yes	Go to next step	
	Acceptance	□ page F–67 STEM SELECT: 1	No	Malfunction Code No. displayed Check for cause (Refer to specified check sequence)	□ page F-70
	-	TEST SW: SELF TEST		"88" flashes Check ECU terminal 1F voltage Voltage: Approx. 12V (Ignition switch ON)	c page F–114
				 ⇒ If OK, replace ECU ⇒ If not OK, check wiring between ECU and Self-Diagnosis Checker 	□ page F-112
4	Are 2T t	ECU 1P, 1R, 1S, 1T, 1U, 2M, 2Q, 2R, and terminal voltages OK?	Yes	Adjust idle speed by turning throttle adjust screw	□ page F-63
			No	Check for cause	page F-115 F-117 F-119

14		IDLE MOVES U	IP AND	DOWN/IDLE HUNTING	
DESC TION	CRIP-	• Engine speeds up and down periodically a	t idle	Hall Value same	
① A ② TI ③ F	ir leak hrottle	sensor misadjusted ection amount inconstant			
TEP		INSPECTION		ACTION	
1	Is the	ere air leakage at intake air system?	Yes	Repair or replace leakage point	
		-	No	Go to next step	
2	Is Po	CV valve OK? □ page F–99	Yes	Go to next step	
Tr.	-	A. Tradit	No	Replace PCV valve	
3	Is air	r cleaner element clean?	Yes	Go to next step	
			No	Replace element	a muscont
4	Disc	onnect high-tension lead at idle; does enspeed decrease equally at each cylinder?	Yes	Go to next step	
			No	Go to Step 9	
5	Is "C with	00" displayed on Self-Diagnosis Checker ignition switch ON?	Yes	Go to next step	
	SYST	SYSTEM SELECT: 1	No	Malfunction Code No. displayed Check for cause (Refer to specified check sequence)	□ page F-70
	4	SELECT SW: A TEST SW: SELF TEST		"88" flashes Check ECU terminal 1F voltage Voltage: Approx. 12V (Ignition switch ON)	page F-114
6	and	nect System Selector to diagnosis connector set Test Switch to "SELF TEST" e normal?	Yes	ECU and Self-Diagnosis Checker Try known good ECU	
	GNE	SYSTEM SELECTOR STEST SW	No	Go to next step	

TEP	INSPECTION		ACTION	
7	Connect System Selector to diagnosis connector and set Test Switch to "SELF TEST" Is ignition timing correct at idle after warm-up? page F-62 Ignition timing: BTDC 16 ± 1°	Yes	Check for injector leakage	
	GND GND TEST SW	No	Adjust ignition timing	c page F–62
8	Are ECU terminal voltages OK? (Especially 2M)	Yes	Go to next step	
	page F-118	No	Check for cause	page F-119
9	Is strong blue spark visible at each disconnected high-tension lead?	Yes	Go to next step	
		No	Check high-tension lead ⇒ If OK, check distributor cap and rotor ⇒ If not OK, replace high-tension lead	per Or = 1
10	Are spark plugs OK? WEAR AND CARBON BUILDUP page G-19 PLUG GAP 1.0—1.1mm (0.039—0.043 in) DAMAGE AND	Yes	Check for correct engine compression Compression (Minimum): 1,030 kPa (10.5 kg/cm², 149 psi)-300 rpm ⇒ If OK, go to next step ⇒ If not OK, check for cause	□ page B-10 □ page B-10
	DETERIORATION	No	Clean or replace	
11	Try known good ECU and check if condition			

15			ON DECELERATION	
TION		e decelera	ating or after deceleration	
Eng orce	ROUBLESHOOTING HINTS] gine speed drops too much when releasing accele be Dashpot misadjusted Fuel cut control malfunction	rator or po	oor connector connection disconnected to 3 Idle speed misadjustment	by deceleration
TEP	INSPECTION		ACTION	
1	Is idle condition normal?	Yes	Go to next step	
		No	Adjust or perform troubleshooting Nos. 8—11 "ROUGH IDLE"	
2	Is dashpot correctly adjusted? page F-104	Yes	Go to next step	
	Dashpot set speed: 2,500 ± 100 rpm	No	Adjust dashpot	
3	Is "00" displayed on Self-Diagnosis Checker with ignition switch ON?	Yes	Go to next step	
	SYSTEM SELECT: 1 page F-67	No	Malfunction Code No. displayed Check for cause (Refer to specified check sequence)	☑ page F-70
			"88" flashes Check ECU terminal 1F voltage Voltage: Approx. 12V (Ignition switch ON)	page F-114
	SELECT SW: A TEST SW: SELF TES	Τ	⇒ If not OK, check wiring between ECU and Self-Diagnosis Checker	
4	AIR BYPASS INJECTION BODY VALVE AIR BYPASS	Yes	Go to next step	
	VALVE (A) AIR BYPASS SOLENOID VALVE	No	Replace	Marillon (
5	Are ECU terminal voltages OK? (Especially 1B, 2M, 2Q and 2V)	Yes	Go to next step	
	⇔ page F–112	No	Check for cause	□ page F-115 F-117 F-119
6	Is there poor connection at either of following? Ignition coil Igniter Distributor	Yes	Repair or replace	E) 10
	High-tension lead Injector Circuit opening relay ECU	No	Try known good ECU Does condition improves?	

16	ENGINE STALL	ENGINE STALLS SUDDENLY (INTERMITTENT)				
DESC	Engine intermittently stops running Before stalling, engine condition OK					
n In	DUBLESHOOTING HINTS] termittently no spark or no fuel injection caused by Poor connection in wiring harness	vehicle	vibration, acceleration, or deceleration			
TEP	INSPECTION		ACTION			
1	Is "00" displayed on Self-Diagnosis Checker with ignition switch ON?	Yes	Go to next step			
	page F−67 SYSTEM SELECT: 1	No	Malfunction Code No. displayed Check for cause (Refer to specified check sequence) Note • When checking wiring harness and tap, move, and wiggle suspect serves to recreate problem	page F-70 d connectors, nsor and/or har-		
	SELECT SW: A TEST SW: SELF TEST		"88" flashes	page F-114		
2	Is there poor connection at either of following? Ignition coil Igniter Distributor	Yes	Repair or replace			
51	High-tension lead Injector Circuit opening relay ECU	No	Go to next step			
3	Are ECU terminal voltages OK? (Especially 1B, 1G, 1I, 2A, 2B, 2C, 2E and 2V) page F-112	Yes	Go to Troubleshooting No.2 "CRANKS NORMALLY BUT WILL NOT START (NO COMBUSTION)"	□ page F–17		
•	Note • When checking voltages, tap, move, and wiggle harness and connector to recreate problem	No	Check for cause	☐ page F-115 F-117 F-119		

17		HESITATES/STUMBLES ON ACCELERATION				
DESC		fter accelerator depr	essed o	r mild jerking occurs during acceleration		
① A	OUBLESHOOTING HINTS] ir/Fuel mixture becomes lean w Fuel injection control malfunction Air leakage Fuel line pressure decreases Spark advance control malfunction	on (Correction for acc	elerator celeratin	g condition)	from energy	
STEP				ACTION		
1	Is "00" displayed on Self-Dia with ignition switch ON?	gnosis Checker	Yes	Go to next step		
	SYSTEM SELECT: 1	☐ page F-67	No	Malfunction Code No. displayed Check for cause (Refer to specified check sequence)	☑ page F–70	
				"88" flashes Check ECU terminal 1F voltage	□ page F–114	
	5 · 1 · 1			Voltage: Approx. 12V (Ignition switch ON)		
		T SW: SELF TEST		 ⇒ If OK, replace ECU ⇒ If not OK, check wiring between ECU and Self-Diagnosis Checker 	□ page F-112	
2	Is there air leakage at intake a ponents?	air system com-	Yes	Repair or replace		
			No	Go to next step		
3	Is air cleaner element clean?	☐ page F-62	Yes	Go to next step		
			No	Replace air cleaner element		
4	Are ECU terminal 1K, 2M, 2C OK?	and 2Q voltages	Yes	Go to next step		
		page F-112	No	Check for cause	page F-115 F-117 F-119	
5	Is throttle linkage correctly ins throttle valve open freely?	talled and does	Yes	Go to next step		
			No	Clean or replace as required any binding or damaged linkage and ad- just cable deflection at injection body	☑ page F–86	
6	Is fuel line pressure correct at	idle?	Yes	Does fuel line pressure decrease when accelerating quickly?		
	Fuel line pressure: 235—275 kPa (2.4—2.8 kg	/cm², 34—40 psi)		 ⇒ If decreases, check fuel line and filter for clogging ⇒ If no decrease, go to next step 		
	PRESSURE GAUGE		No	Low pressure Check fuel line pressure while pinching fuel return hose in fuel line pressure quickly increases, check pressure regulator if fuel line pressure gradually increases, check for clogging between fuel pump and pressure regulator	9	
		FUEL FILTER		If not clogged, check fuel pump maximum pressure	☐ page F–91	

STEP	INSPECTION		ACTION
7	Connect System Selector to diagnosis connector and set Test Switch to "SELF TEST" Is ignition timing correct at idle after warm-up? page F-62 Ignition timing: BTDC 16 ± 1°	Yes	Does ignition timing advance when accelerating? ⇒ If advances, go to next step ⇒ If not advance, replace ECU □ page F-112
	TEN GND INDICATOR A TEST SW	No	Adjust
8	Are air duct and air hoses correctly installed?	Yes	Go to next step
		No	Repair
9	Is exhaust system restricted? page F-97	Yes	Repair or replace
		No	Go to next step
10	Try known good ECU and check if condition improves		

18		SURGES WHILE CRUISING					
DES	CRIP-	• Unexpected change in engine speed which	h is usu	ally repetitive			
① A ② N	kir/Fuel Misfire	ESHOOTING HINTS] mixture too lean nnection in wiring harness		** * * * DE14 gree	mel authlings		
TEP		INSPECTION		ACTION			
1		0" displayed on Self-Diagnosis Checker ignition switch ON?	Yes	Go to next step	1/9/11		
	SYST	Page F-67	No	Malfunction Code No. displayed Check for cause (Refer to specified check sequence)	□ page F-70		
	1			"88" flashes Check ECU terminal 1F voltage Voltage: Approx. 12V	□ page F–114		
	4			(Ignition switch ON)			
	-7 5-5	SELECT SW: A TEST SW: SELF TEST		 ⇒ If OK, replace ECU ⇒ If not OK, check wiring between ECU and Self-Diagnosis Checker 	☐ page F-112		
2	Is thr	ottle sensor OK?	Yes	Go to next step			
		Religious An Americal Front Inc. (1975)	No	Adjust	Nagarani		
3	3 Disconnect oxyg dition improves?	onnect oxygen sensor connector; does con- improves?	Yes	Check oxygen sensor	☐ page F-123		
		OXYGEN SENSOR CONNECTOR	No	Go to next step			
4	Are E	CU terminal voltages OK?	Yes	Go to next step	o Milana I ti		
			No	Check for cause	□ page F-115 F-117 F-119		
5		ottle linkage correctly installed and does tle valve open operates freely?	Yes	Go to next step	Party 1		
			No	Correct, clean, or replace as required any binding or damaged linkage, and adjust cable deflection at injection body	c page F–86		
6	Is the	re air leakage of intake air system com- nts?	Yes	Repair or replace	#		
	035		No	Go to next step			
7	Is air	cleaner element clean?	Yes	Go to next step			
			No	Replace air cleaner element			

STEP	INSPECTION		ACTION	
8	Connect System Selector to diagnosis connector and set Test Switch to "SELF TEST" Is ignition timing correct at idle after warm-up? page F-62 Ignition timing: BTDC 16 ± 1°	Yes	Does ignition timing advance when accelerating? ⇒ If advances, go to next step ⇒ If not advance, replace ECU	c page F–112
20	TEN GND A TEST SW	No	Adjust	
9	Is fuel line pressure correct at idle? page F-94 Fuel line pressure: 235-275 kPa (2.4-2.8 kg/cm², 34-40 psi)	Yes	Does fuel line pressure decrease when accelerating quickly? If decreases, check for fuel pump maximum pressure If OK, check fuel line and filter for clogging If no decrease, go to next step	
	PRESSURE GAUGE FUEL FILTER	No	Low pressure Check fuel line pressure by pinching fuel return hose ⇒ If fuel line pressure quickly increases, check pressure regulator if fuel line pressure gradually increases, check for clogging between fuel pump and pressure regulator if not clogged, check fuel pump maximum pressure	⇔ page F–91
	TOEL FILTER		High pressure Check if fuel return line is clogged ⇒ If OK, replace pressure regulator ⇒ If not OK, replace	
10	Check for poor connection of following parts	Yes	Repair or replace	
	High-tension lead Injector Circuit opening relay ECU	No	Go to next step	
11	Try known good ECU and check if condition improves			01A0FX-

19		LACK OF POWER				
DESC	CRIP-	Performance poor under load when throttle Reduced maximum speed Idle condition normal	e valve	wide open	Total Control	
① F	actors Clutch ATX sl Brake Low til Incorre Overlo ow inta Throttle	eshooting hints] other than engine malfunction is slipping lipping dragging re pressure ect tire size baded ake air amount e valve not open fully ed intake air system		Air/Fuel mixture too lean Fuel line pressure decreases Fuel injection malfunction Poor ignition Low engine compression Alcohol blended fuel used		
TEP		INSPECTION		ACTION		
1	 Clu AT. 	ck factors other than engine utch slipping	Yes	Go to next step		
		ake dragging	No	Repair		
2		ottle valve fully opened when accelerator essed fully?	Yes	Go to next step		
			No	Is accelerator cable correctly installed ⇒ If OK, check throttle valve ⇒ If not OK, install accelerator cable correctly	page F-86	
3	Is "00 with i	0" displayed on Self-Diagnosis Checker gnition switch ON?	Yes	Go to next step	=	
	SYST	Page F-67	No	Malfunction Code No. displayed Check for cause (Refer to specified check sequence) "88" flashes	r page F–70	
		SELECT SW: A TEST SW: SELF TEST		Check ECU terminal 1F voltage Voltage: Approx. 12V (Ignition switch ON)	□ page F-114 □ page F-112	
4	and s Is ign	ect System Selector to diagnosis connector set Test Switch to "SELF TEST" ition timing correct at idle after warm-up? page F-62	Yes	Check if ignition timing advances when accelerating ⇒ If advances, go to next step ⇒ If not advance, check ECU termi-		
	Igniti	on timing: BTDC 16 ± 1° TEN		nal voltages	page F-112	
	IND	GND A TEST SW	No	Adjust		
5		CU terminal voltages OK? cially 1K, 2M, 2K, and 2S)	Yes	Go to next step		
		□ page F-112	No	Check for cause		

STEP	INSPECTION		ACTION
6	Is there air leakage of intake air system com- ponents?	Yes	Repair or replace
,		No	Go to next step
7	Is air cleaner element clean? page F-62	Yes	Go to next step
		No	Replace air cleaner element
8	Is fuel line pressure correct at idle? page F-94 Fuel line pressure: 235—275 kPa (2.4—2.8 kg/cm², 34—40 psi)	Yes	Does fuel line pressure decrease when accelerating quickly if decreases, check fuel pump maximum pressure If OK, check fuel line and filter for clogging If not decrease, go to next step
	PRESSURE GAUGE FUEL FILTER	No	Low pressure Check fuel line pressure while pinching fuel return hose ⇒ If fuel line pressure quickly increases, check pressure regulator ⇒ If fuel line pressure gradually increases, check for clogging between fuel pump and pressure regulator If not clogged, check fuel pump maximum pressure This pressure The pressure pinch pinc
	FOEL FILTER		Check if fuel return line is clogged ⇒ If OK, replace pressure regulator ⇒ page F–95 ⇒ If not OK, replace
9	Remove air cleaner; is there any carbon deposit or dirt in injection body?	Yes	Clean
		No	Go to next step
10	Are spark plugs OK?	Yes	Go to next step
	PLUG GAP 1.0—1.1mm		
	(0.039—0.043 in) DAMAGE AND DETERIORATION DAMAGE	No	Clean or replace
			to a distribution

STEP	INSPECTION		ACTION	
11	Is resistance of ignition coil OK? page G-20 Resistance (at 20°C [68°F]): Primary coil winding 0.68-0.84Ω Secondary coil winding 9.6-14.4 kΩ PRIMARY COIL	Yes	Go to next step	
	SECONDARY COIL	No	Replace	
12	Is engine compression correct?	Yes	Go to next step	
	Engine compression: 1,030 kPa (10.5 kg/cm², 149 psi)-300 rpm	No	Check engine condition Worn piston, piston rings or cylinder wall Defective cylinder head gasket Distorted cylinder head Improper valve seating Valve sticking in guide	□ page B-10
13	Change fuel; does condition improves?	Yes	Change fuel to another brand	

20			ELERATION	
DESC	Performance poor while accelerating Idle condition normal		0.5 460	
T Fa • (• / • E • I • (2 Lo	DUBLESHOOTING HINTS] Inctors other than engine malfunction Clutch slipping ATX slipping Brake dragging Low tire pressure Incorrect tire size Diver-loaded Diver-l		 ③ Air/Fuel mixture too lean • Fuel line pressure decreases • Fuel injection malfunction ④ Poor ignition ⑤ Low engine compression ⑥ Alcohol blended fuel used 	encounter of a
TEP	INSPECTION		ACTION	
1	Check factors other than engine • Clutch slipping	Yes	Go to next step	had.
	 Low tire pressure Incorrect tire size ATX slipping page Q-2 page Q-2 page K-10 	No	Repair	
2	Does throttle valve fully open when depressing	Yes	Go to next step	
accelerator fully?	accelerator rolly?	No	Check if accelerator cable is correctly installed	⊏ page F–86
en	A series to the series of the		 ⇒ If OK, check throttle valve ⇒ If not OK, install accelerator cable correctly 	☐ page F-86
3	Is "00" displayed on Self-Diagnosis Checker with ignition switch ON?	Yes	Go to next step	-11-12-1
	SYSTEM SELECT: 1	No	Malfunction Code No. displayed Check for cause (Refer to specified check sequence)	r page F–70
			"88" flashes Check ECU terminal 1F voltage Voltage: Approx. 12V (Ignition switch ON)	☑ page F–114
	SELECT SW: A TEST SW: SELF TEST		 ⇒ If OK, replace ECU ⇒ If not OK, check wiring between ECU and Self-Diagnosis Checker 	page F-112
4	Connect System Selector to diagnosis connector and set Test Switch to "SELF TEST" Is ignition timing correct at idle after warm-up? page F-62	Yes	Does ignition timing advance when accelerating? ⇒ If advances, go to next step ⇒ If not advance, check ECU termi-	nor- E 444
	Ignition timing: BTDC 16 ± 1° TEN	No	nal voltages Adjust	☑ page F–112
	INDICATOR A TEST SW	353 NAT 193 V	, 14,400	
5	Are ECU terminal voltages OK? (Especially 2M)	Yes	Go to next step	
	ote it is is	No	Check for cause	page F-115 F-117 F-119

		ACTION
Is there air leakage at intake air system components?	Yes	Repair or replace
	No	Go to next step
Is there any carbon deposit or dirt in injection body?	Yes	Clean
	No	Go to next step
Is fuel line pressure correct at idle? page F-94	Yes	Check if fuel line pressure decreases when accelerating quickly
Fuel line pressure: 235—275 kPa (2.4—2.8 kg/cm², 34—40 psi)		 If decrease, check fuel pump maximum pressure If OK, check fuel line and filter for clogging If not decrease, go to next step
PRESSURE GAUGE FUEL FILTER	No	Low pressure Check for fuel line pressure while pinching fuel return hose if fuel line pressure quickly increases, check pressure regulator if fuel line pressure gradually increases, check for clogging between fuel pump and pressure regulator if not clogged, check fuel pump maximum pressure page F−91
		High pressure Check if fuel line is clogged ⇒ If OK, replace pressure regulator ⇒ page F–95 ⇒ If not OK, replace
Are spark plugs OK?	Yes	Go to next step
WEAR AND CARBON BUILDUP PLUG GAP 1.0—1.1mm BURNS		e i
(0.039—0.043 in) DAMAGE AND DETERIORATION DAMAGE	No	Clean or replace
	Is there any carbon deposit or dirt in injection body? Is fuel line pressure correct at idle? page F–94 Fuel line pressure: 235—275 kPa (2.4—2.8 kg/cm², 34—40 psi) PRESSURE GAUGE Page G–19 WEAR AND CARBON BUILDUP PLUG GAP 1.0—1.1mm (0.039—0.043 in) DAMAGE AND DETERIORATION	Is there any carbon deposit or dirt in injection body? No No No Is fuel line pressure correct at idle? page F-94 Fuel line pressure: 235—275 kPa (2.4—2.8 kg/cm², 34—40 psi) PRESSURE GAUGE No No WEAR AND CARBON BUILDUP PLUG GAP 1.0—1.1mm (0.039—0.043 in) DAMAGE AND DETERIORATION No No

TROUBLESHOOTING GUIDE

STEP	INSPECTION		ACTION	
10	Change fuel and check if acceleration improves	Yes	Change fuel to another brand	
		No	Go to next step	
11	Check for correct engine compression page B-10	Yes	Try known good ECU and check if engine condition improves	
	Engine compression (Minimum): 1,030 kPa (10.5 kg/cm ² , 149 psi)-300 rpm	No	Check engine condition Worn piston, piston rings or cylinder wall Defective cylinder head gasket Distorted cylinder head Improper valve seating Valve sticking in guide	page B-10

21	- Represent	RUNS ROUGH	ON DE	CELERATION/BACKFIRE			
DES			abnorm	normal combustion occurs in exhaust system			
① A	OUBLESHOOTING HINTS] Air/Fuel mixture too rich Air cleaner element clogged Fuel injection control malfunc Injector fuel leakage Throttle sensor malfunction Dashpot malfunction	ition (Fuel cut control)			an topically		
STEP	INSPE	CTION		ACTION			
1	Is "00" displayed on Self-D with ignition switch ON?	iagnosis Checker	Yes	Go to next step			
	SYSTEM SELECT: 1		No	Malfunction Code No. displayed Check for cause (Refer to specified check sequence)	□ page F-70		
				"88" flashes Check ECU terminal 1F voltage Voltage: Approx. 12V (Ignition switch ON)	☑ page F–114		
Y.	SELECT SW: A	TEST SW: SELF TEST		⇒ If OK, replace ECU ⇒ If not OK, check wiring between ECU and Self-Diagnosis Checker	☑ page F–112		
2	Is there air leakage at intake ponents?	e air system com-	Yes	Repair or replace	/		
			No	Go to next step			
3	Is air cleaner element clean	page F-62	Yes	Go to next step			
i			No	Replace air cleaner element			
4	Are ECU terminal voltages ((Especially 2M and 2Q)	OK?	Yes	Go to next step			
		⊏ page F–112	No	Check for cause	page F-115 F-117 F-119		
5	Is there 0V at ECU 2V termi on deceleration? (Engine signal monitor green		Yes	Go to next step			
			No	Try known good ECU and check if condition improves			
6	Is throttle sensor OK?		Yes	Go to next step			
		8. NG	No	Adjust	page F-122		

TEP	INSPECTION		ACTION
7	Is dashpot correctly adjusted? page F-104 Dashpot set speed: Approx. 2,500 ± 100 rpm	Yes	Check if throttle valve is contaminated ⇒ If contaminated, clean throttle body ⇒ If not contaminated, replace throt-
	Арргол. 2,300 1 100 грн	Ne	tle body
	THROTTLE LEVER ADJUSTING SCREW	No	Adjust
8	Is there injector fuel leakage? page F–96 Fuel leakage: Below 1 drop/5 min.	Yes	Replace injector
51		No	Go to next step
9	Try known good ECU and check if condition improves		

22			KNC	OCKING	
DESC	CRIP-	Abnormal combustion accompanied by aud	dible "p	oinging" noise	
① Ir ② C	ncorrec	ESHOOTING HINTS] It ignition timing (Too advanced) deposits in cylinder ating		Air/Fuel mixture too lean Fuel injection amount not correct Fuel line pressure decreases while	accelerating
TEP		INSPECTION		ACTION	
1	and Is igr	nect System Selector to diagnosis connector set Test Switch to "SELF TEST" nition timing correct at idle after warm-up? page F-62 cion timing: BTDC 16 ± 1°	Yes	Go to next step	AS CALLMAN
		TEN	No	Adjust	Ä
	INI	GND GND A TEST SW		V-3	
2		0" displayed on Self-Diagnosis Checker ignition switch ON?	Yes	Go to next step	de maril et la
	SYST	EM SELECT: 1	No	Malfunction Code No. displayed Check for cause (Refer to specified check sequence)	□ page F-70
				"88" flashes Check ECU terminal 1F voltage Voltage: Approx. 12V (Ignition switch ON)	☑ page F–114
		SELECT SW: A TEST SW: SELF TEST		 ⇒ If OK, replace ECU ⇒ If not OK, check wiring between ECU and Self-Diagnosis Checker 	☐ page F—112
3	Is the	ere air leakage of intake air system com- nts?	Yes	Repair or replace	
			No	Go to next step	
4	Is en	gine compression correct? page B-10	Yes	Go to next step	
	Engii 1,0	ne compression (Minimum): 030 kPa (10.5 kg/cm², 149 psi)-300 rpm	No	High compression Check engine condition Carbon deposits	☐ page B-10

STEP	INSPECTION	19-060	ACTION	
5	Is fuel line pressure correct at idle? page F-94	Yes	Does if fuel line pressure decrease when accelerating quickly?	
	Fuel line pressure: 235—275 kPa (2.4—2.8 kg/cm², 34—40 psi)		 ⇒ If decreases, check for clogging between fuel pump and pressure regulator ⇒ If not decrease, go to next step 	
	PRESSURE GAUGE FUEL FILTER	No	Low pressure Check fuel line pressure while pinching fuel return hose ⇒ If fuel line pressure quickly increases, check pressure regulator If fuel line pressure gradually increases, check for clogging between fuel pump and pressure regulator If not clogged, check fuel pump maximum pressure	☑ page F–91
6	Is cooling system OK?	Yes	Go to next step	
		No	Repair or replace Thermostat Electric cooling fan Radiator	page E-8 page E-11 page E-7
7	Try known good ECU and check if condition improves	Yes	Replace ECU	page F-112
		No	Change fuel to another brand or use higher octane fuel	

23			FUEL	ODOR	
DESC	Streeting .	Gasoline odor in cabin			
1) Po	oor co	ESHOOTING HINTS] onnection or damaged at fuel system or evaporal canister overflow due to evaporative emission	orative e	emission control system rol system malfunction	
TEP		INSPECTION		ACTION	
1		ere fuel leakage or damage of fuel system evaporative emission control system?	Yes	Repair or replace	
			No	Go to next step	
2	Is ''0 with	0" displayed on Self-Diagnosis Checker ignition switch ON? page F-67	Yes	Go to next step	
	SYST	EM SELECT: 1	No	Malfunction Code No. displayed Check for cause (Refer to specified check sequence)	c page F−70
	1			"88" flashes Check ECU terminal 1F voltage	page F-114
	1		T	Voltage: Approx. 12V (Ignition switch ON)	
		SELECT SW: A TEST SW: SELF TEST		⇒ If OK, replace ECU ⇒ If not OK, check wiring between ECU and Self-Diagnosis Checker	□ page F–112
3	with (cuum felt at solenoid valve (purge control) engine running and throttle valve opened? tral switch connector disconnected)	Yes	Go to Step 5	
	1		No	Check for solenoid valve operating	
				sound ⇒ If OK, check vacuum hoses for clogging ⇒ If not OK, go to next step	
1	contro	v 12V and ground to solenoid valve (purge oil) cuum felt at solenoid valve at idle?	Yes	Check ECU terminal voltages	⇔ page F–112
		BATTERY	No	Replace solenoid valve	
		nown good ECU and check if condition			*

24	EXHAUST SI	ULFER SMELL
DESCRI	Exhaust gas smells abnormally	legal is the superior of the legal
[TROU High st	BLESHOOTING HINTS] Ifer content fuel used	jet kiej per senten in net g pomp om klen tell kolessenten ett i met met se
STEP	INSPECTION	ACTION
1 (hange fuel to another brand	

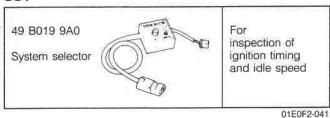
25	HIGH	H OIL C	ONSUMPTION
DESC			
1) P(CV system malfunction ngine malfunction (Oil working up, working down, o	or leakag	ge)
TEP	INSPECTION		ACTION
1	Are there PCV hose, ventilation hose or their attaching nipples separated, damaged, clogged,	Yes	Repair or replace
	or restricted?	No	Go to next step
2	Is there air pressure or oil at ventilation hose?	Yes	Go to next step
		No	Check for correct engine compression
3	Is vacuum felt at PCV valve at idle? page F-99	Yes	Check engine condition Worn piston ring groove Stuck piston rings Worn piston or cylinder
	PCV VALVE	No	Replace PCV valve

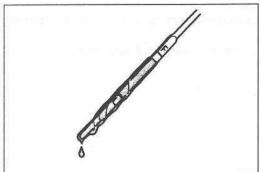
26		POO	R FUE	L ECONOMY	
DESC	CRIP-	• Fuel economy unsatisfactory		1814 H at feet	
While warr front	e fuel m-up p ted wit operato ow enc Poor i Low in Electro Clutch	ESHOOTING HINTS] consumption is drastically increased by city draggeriods, etc., as opposed to "trip" mileage, and his "poor mileage" conditions. However, since for depressing accelerator more than usual due gine power gnition intake air amount onic spark advance control system malfunction as slipping/ATX slipping list component restricted	attempthe operator	ot should be made to determine these fa	ctors when con-
TEP		INSPECTION		ACTION	
1	• Lo	ck factors other than engine w tire pressure page Q-2 precommended tire size page Q-2	Yes	Go to next step	
J.	• Bra	utch slipping	No	Repair	
2	Are a	air hoses connected correctly? page F-83	Yes	Go to next step	
		THE RESERVE OF THE PARTY OF THE	No	Repair	
3		00" displayed on Self-Diagnosis Checker ignition switch ON?	Yes	Go to next step	
10	SYST	Page F-67	No	Malfunction Code No. displayed Check for cause (Refer to specified check sequence)	□ page F–70
		SELECT SW: A TEST SW: SELF TEST		"88" flashes Check ECU terminal 1F voltage Voltage: Approx. 12V (Ignition switch ON)	page F-114
4	Is the	ere air leakage at intake air system com- ents?	Yes		
		i i	No		
5	Is air	cleaner element clean? page F-62	Yes	Go to next step	
			No	Replace air cleaner element	
6		ECU terminal voltages OK? ecially 2M, 2N, 2R and 2T)	Yes	Go to next step	
		c page F–112	No	Check for cause	

TEP	INSPECTION		ACTION
7	Connect System Selector to diagnosis connector and set Test Switch to "SELF TEST" Is ignition timing correct at idle after warm-up? page F-62	Yes	Go to next step
6	Ignition timing: BTDC 16 ± 1°		
	INDICATOR A TEST SW	No	Adjust
8	Is fuel line pressure correct at idle? page F-94	Yes	Go to next step
	Fuel line pressure: 235—275 kPa (2.4—2.8 kg/cm², 34—40 psi)		
	PRESSURE GAUGE		
		No	High pressure Check if vacuum hose to pressure regulator is damaged or poorly con- nected
	FUEL FILTER		 ⇒ If OK, replace pressure regulator ⇒ If not OK, repair or replace hose
9	Run engine at idle and then stop engine Is fuel line pressure hold? page F-88	Yes	Go to next step
	Fuel line pressure: More than 147 kPa (1.5 kg/cm ² , 21 psi) for 5 min.		
	PRESSURE GAUGE		THE REPORT OF THE PARTY OF THE
		No	Check injectors for fuel leakage
	FUEL FILTER		
	Change fuel to another brand		

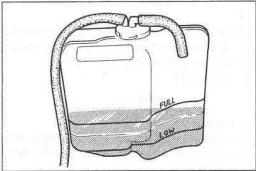
ENGINE TUNE-UP

PREPARATION SST





01E0F2-042



01E0F2-043

BASIC INSPECTION Engine Oil

- 1. Be sure the vehicle is on level ground.
- 2. Warm up the engine to normal operating temperature and stop it.
- 3. Wait for five minutes.
- 4. Remove the oil dipstick and check the oil level and condition.
- 5. Add or replace oil if necessary.

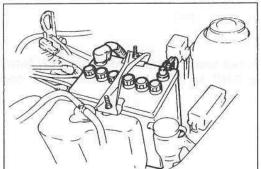
Note

 The distance between the L and F marks on the dipstick represents 0.8 liter (0.85 US qt, 0.70 lmp qt).

Engine Coolant Coolant level (engine cold)

Warning

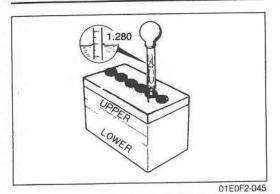
- Never remove the radiator cap while the engine is hot.
- · Wrap a thick cloth around the cap when removing it.
- 1. Pull out the sub tank cap.
- 2. Verify that the coolant level is near the radiator filler neck.
- 3. Verify that the coolant level in the coolant reservoir is between the FULL and LOW marks.
- 4. Add coolant if necessary.

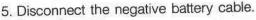


01E0F2-044

Battery

- Check the tightness of the terminals to ensure good electrical connections.
- 2. Check for corroded or frayed battery cables.
- 3. Wash the top of the battery with water to prevent arc over.
- 4. Verify that the electrolyte level is between the upper and lower marks. Add distilled water if necessary.

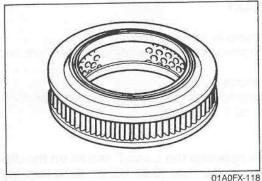




6. Open the cap.

7. Measure the specific gravity of each cell with a hydrometer.

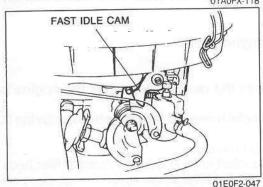
Specification: 1.27-1.29 (at 20°C [68°F])



Air Cleaner Element

1. Check the air cleaner element for excessive dirt, damage,

2. Replace the air cleaner element if necessary.



TACHOMETER

49 B019 9A0

ADJUSTMENT Preparation

1. Warm up the engine to normal operating temperature.

2. Verify that the wax rod has extended outward fully and that the fast idle cam has separated from the roller.

3. Turn all electrical loads OFF.

Blower fan

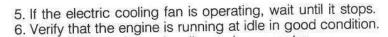
Headlight

Rear window defroster

4. Make sure that the engine speed does not change when disconnecting the air bypass solenoid valve (A) connector.



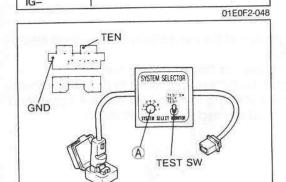
· If the engine speed decreases, the engine is still under the warm-up condition.



7. Connect the SST to the diagnosis connector.

8. Connect a timing light.

9. Connect a tachometer to the diagnosis connector IGterminal.



10. Set switch (A) to position 1.

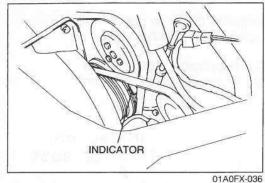
11. Set TEST SW to SELF-TEST.

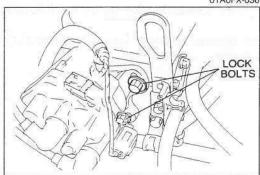
01E0F2-049

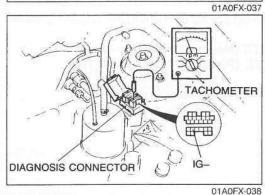
 If the SST is not used, jump across the TEN terminal and the GND terminal of the diagnosis connector.

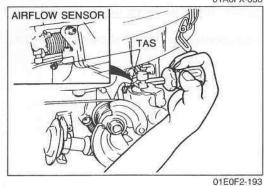
F-62

TIMING LIGHT









Ignition Timing Inspection / Adjustment

1. Perform "Preparation". (Refer to page F-62.)

2. Verify that the idle speed is within the specification.

Idle speed: MTX (Neutral) 750 $^{+50}_{-0}$ rpm ATX (P range) 1,100 $^{+50}_{-0}$ rpm

3. Check the ignition timing with a timing light.

Ignition timing: BTDC 16 ± 1°

 If the ignition timing is not within specification, loosen the distributor lock bolts and turn the distributor to make the adjustment.

5. Tighten the distributor lock bolts to the specified torque.

Tightening torque: 16—23 N·m (1.6—2.3 m-kg, 12—16 ft-lb)

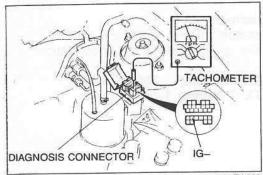
Idle Speed

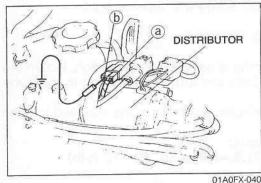
1. Perform "Preparation". (Refer to page F-62.)

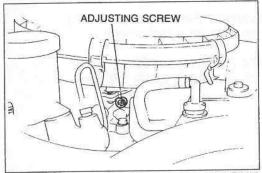
2. Check the idle speed with a tachometer.

Idle speed: MTX (Neutral) 750 $^{+50}_{-0}$ rpm ATX (P range) 1,100 $^{+50}_{-0}$ rpm

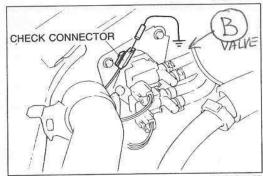
If not within specification, adjust the idle by tuning the throttle adjusting screw.



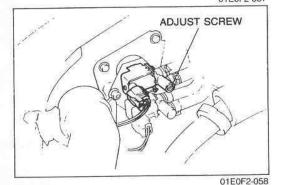




01E0F2-056



01E0F2-057



F-64

Idle-up Speed

1. Perform "Preparation". (Refer to page F-62.)

2. Check the idle speed with a tachometer.

Idle speed: MTX (Neutral) 750 ±50 rpm ATX (P range) 1,100 ±50 rpm

INSTAL ON THROTTLE BODY

3. Adjust the air bypass solenoid valve (A) by the following procedure.

1) Ground the air bypass solenoid valve (A) terminal (b) shown in the figure.

2) Adjust the idle-up speed by turning the adjusting screw.

Idle speed: MTX (Neutral) 1,080 ± 30 rpm ATX (P range) 1,350 ± 30 rpm

3) Disconnect the jumper wire.

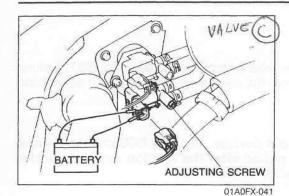
4. Adjust the air bypass solenoid valve (B) by the following procedure.

1) Ground the check connector (black) shown in the figure.

2) Adjust the idle-up speed by turning the adjusting screw.

Idle speed: MTX (Neutral) 1,030 ±50 rpm ATX (P range) 1,700 ±50 rpm

3) Disconnect the jumper wire.



5. Adjust the air bypass solenoid valve © by the following procedure.

1) Disconnect the connector of the air bypass solenoid valve

2) Apply battery voltage to air bypass solenoid valve © terminal.

3) Adjust the idle-up speed by turning the adjusting screw.

Idle speed: MTX (Neutral) 1,250 \pm 25 rpm ATX (P range) 1,600 \pm 25 rpm

4) Install the connector of air bypass solenoid valve ©.

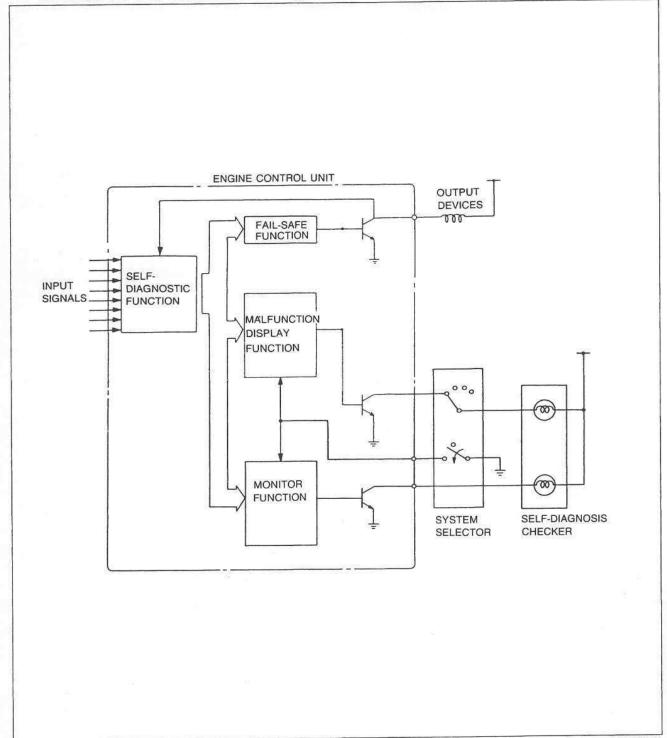
SELF-DIAGNOSIS FUNCTION

DESCRIPTION

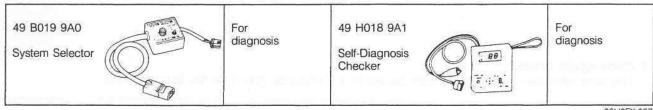
When troubles occur in the main input devices or output devices, check for the cause using the **SST**. Failures of each input and output device are indicated and retrieved from the engine control unit (ECU) as malfunction code numbers.

Note

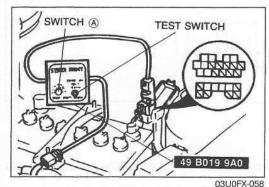
 The ECU constantly checks for malfunction of the input devices. But, the ECU checks for malfunction of output devices only in a three seconds period after the ignition switch is turned ON when the TEN terminal of the diagnosis connector is grounded.



PREPARATION SST

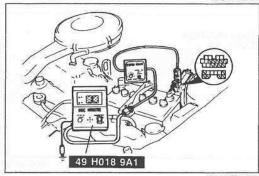


03U0FX-057

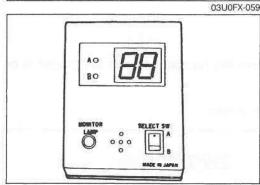


MALFUNCTION CODE NUMBER Inspection Procedure

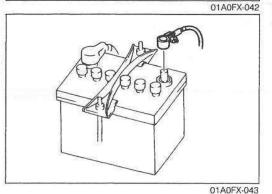
- 1. Connect the SST to the diagnosis connector.
- 2. Set switch (A) to position 1.
- 3. Set TEST SW to SELF-TEST.



- 4. Connect the SST to the System Selector and a ground.
- 5. Set the select switch to position A.



- 6. Tur 7. Ver er s 8. If "8 F–1 wiri 9. If 88 than
- 6. Turn the ignition switch ON.
 - 7. Verify that "88" flashes on the digital display and the buzzer sounds for **3 sec.** after turning the ignition switch ON.
 - 8. If "88" does not flash, check the main relay (Refer to page F–124), power supply circuit, and diagnosis connector wiring.
 - 9. If 88 flashes and the buzzer sounds continuously for more than 20 sec., check for a short circuit between the ECU terminal 1F and the diagnosis connector. Replace the ECU if necessary and perform Steps 3 and 7 again.
 - Note any code numbers and check for the causes by referring to the check sequences shown on pages F-70 through F-78. Repair as necessary.



Note

 Cancel the code numbers by performing the afterrepair procedure following repairs.
 (Refer to page F-79.)

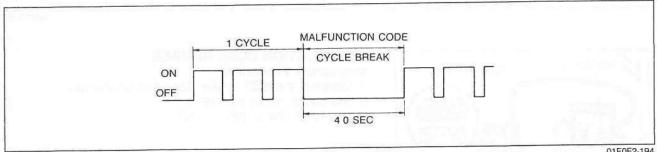
Principle of Code Cycle

Malfunction codes are determined as shown below.

05U0FX-071

1. Code cycle break

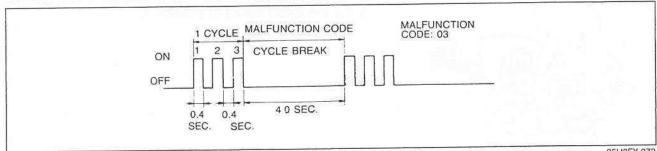
The time between malfunction code cycles is 4.0 seconds (the time the buzzer is off).



01E0F2-194

2. Second digit of malfunction code (ones position)

The digit in the ones position of the malfunction code represents the number of times the buzzer sounds 0.4 second during one cycle.

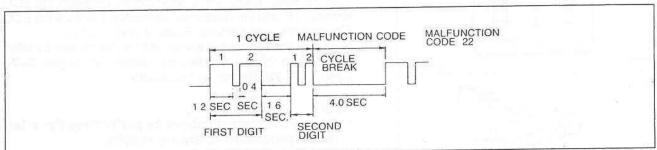


05U0FX-073

3. First digit of malfunction code (tens position)

The digit in the tens position of the malfunction code represents the number of times the buzzer is on 1.2 seconds during one cycle.

The buzzer is off for 1.6 seconds between the long and short pulses.



01E0F2-195

Code Numbers

Sensor or				Malfunction display
subsystem	Condition	Fail-safe	Malfunction Code No.	Output signal pattern
Ne-signal	No Ne-signal while cranking	Stops fuel injection	02	ON OFF
Airflow sensor	Open or short of air- flow sensor circuit	Measures intake air amount by throttle valve opening angle	08	ON OFF
Water thermosensor	Open or short of water thermosensor circuit	Maintains constant 20°C (68°F) command	09	ON OFF
Throttle sensor	Open or short of throttle sensor circuit	Maintains constant 33-degree command	12	ON OFF
Oxygen sensor	Lean signal con- tinues unchanged 2 min. after engine ex- ceeds 2,000 rpm	Cancels engine feedback operation	15	ON OFF
Feedback system	Sensor output continues unchanged 40 sec. after engine exceeds 1,500 rpm	Cancels engine feedback operation	17	ON OFF
Solenoid valve (purge control)	Open or short of purge control sole- noid valve circuit	_	26	ON TOTAL
Air bypass solenoid valve (A)	Open or short of air bypass solenoid valve (A) circuit	_	34	ON OFF
Air bypass solenoid valve ®	Open or short of air bypass solenoid valve ® circuit	_	35	ON OFF

01A0FX-044

Note

The buzzer sounds only for the ones position when using the Digital Code Checker.
 To judge the correct malfunction code number, refer to the digital display.

Caution

- If there is more than one failure present, the code numbers will be indicated in numerical order, lowest number first.
- After repairing a failure, perform the after-repair procedure. (Refer to page F-79.)

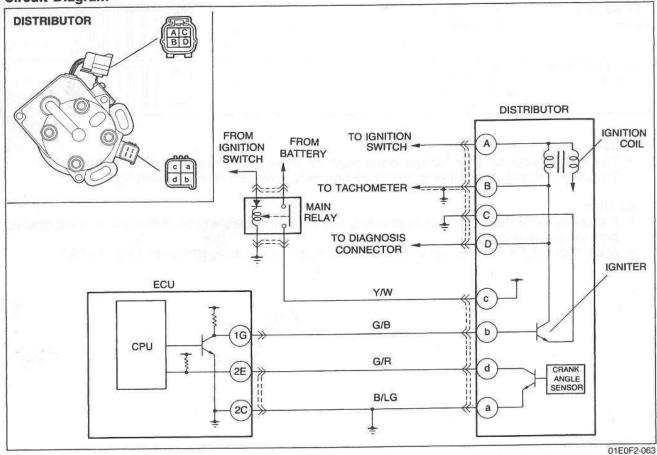
Troubleshooting

If a malfunction code number is shown on the SST, check for the cause by using the chart related to the code number shown.

CODE	No. 02 (DISTRIBUT	FOR Ne-SIGNAL)
STEP	INSPECTION		ACTION
1	Is there a poor connection in distributor circuit	? Yes	Repair or replace wiring
		No	Go to next step
2	Is there continuity between distributor terminal wire (B/LG) and ground?	Yes	Go to next step
	wife (b/Ed) and ground.	No	Check for open circuit in wiring from distributor to ground
	Is there battery voltage at distributor terminal- wire (Y/W)?	Yes	Go to next step
	wile ((/w):	No	Check for open circuit in wiring from distributor to main relay (FUEL INJ relay)
4	there approx. 5V at ECU terminal 2E? (With stributor connector disconnected)	Yes	Go to next step
	distributor commescer discommesses,	No	Replace ECU
5	Is there approx. 5V distributor terminal-wire (G/R)? (At harness-side connector with discon-	Yes	Replace distributor
	nected)	No	Check for short or open circuit in wiring from distributor ECU terminal 2E

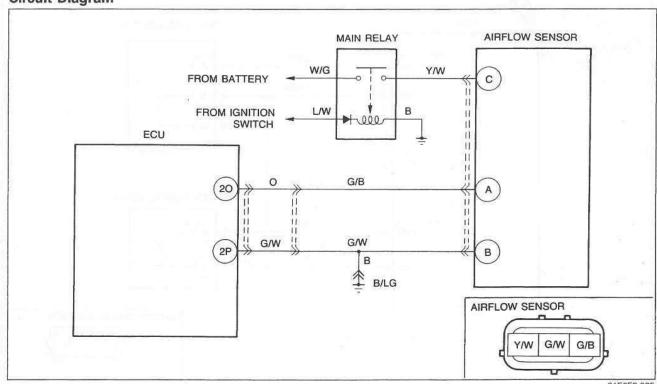
01E0F2-062

Circuit Diagram



CODE	E No.		08 (AIRFLO	RFLOW SENSOR)		
STEP		INSI	PECTION	ACTION			
1	Is there	Is there poor connection in airflow sensor circuit?		Yes	Repair or replace wiring		
				No	Go to next step		
2	Is ECU terminal 20 voltage OK?			Yes	Is same Code present after performing after-repair procedure?		
	Ignit	tion switch ON	Approx. 0.4V	144	⇒ If YES, replace ECU		
		Idle	Approx. 1.2V		⇒ If NO, recheck airflow sensor and ECU for poor connection		
					Go to next step		
3	Is there battery voltage at airflow sensor connector terminal C with airflow sensor connector dis-		Yes	Go to next step			
	connected?			No	Check for short or open circuit in wiring from airflow sensor connector terminal C to main relay. If OK, check main realy		
			the same of the		⇒ If not OK, repair or replace		
4		continuity betweer nd ground?	airflow sensor termi-	Yes	Go to next step		
111	Weight a comment of the comment of t			No	Repair or replace wiring		
5	and B	Is resistance between airflow sensor terminals A and B OK? page F-121		Yes	Is there continuity between ECU terminal 20 and airflow sensor terminal A? If OK, replace airflow sensor		
	Resista	ance: 4 ± 1 k Ω (2	0°C [68°F])		⇒ If not OK, repair or replace		
				No	Replace airflow sensor		

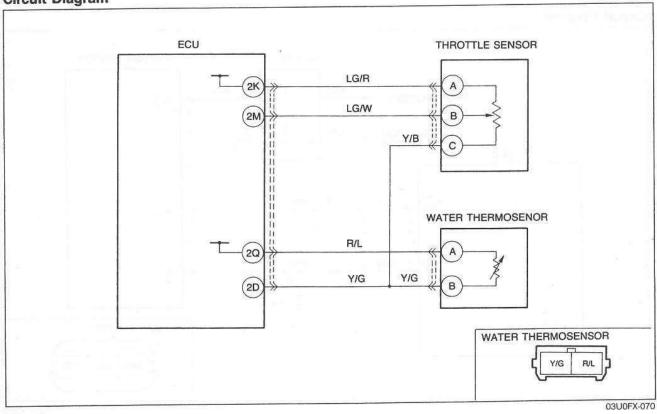
Circuit Diagram



01E0F2-065 F—71

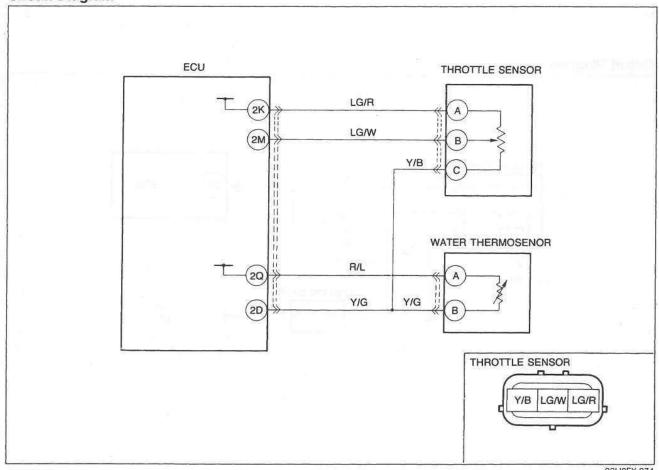
CODE	No.	09 (WA	TER TH	HERMOSENSOR)	
STEP	INS	PECTION		ACTION	
1	Is there a poor connection sor circuit?	n in water thermosen-	Yes	Repair or replace wiring	
			No	Go to next step	
2	Is there continuity between and ECU?	en water thermosensor	Yes	Go to next step	
	Water thermosensor	Nater thermosensor ECU		Repair wiring	
	A (R/L)	2Q (R/L)	T at		
	B (Y/G)	2D (Y/G)			
3	Is resistance of water thermosensor correct?		Yes	Go to next step	
	Coolant temp.	Coolant temp. Resistance (kΩ)		Replace water thermosensor	
	-20°C (-4°F)	14.6—17.8	No	page Resulting Confession Confess	
	20°C (68°F)	2.21-2.69			
	80°C (176°F)	0.29—0.35			
4	Is same Code No. prese procedure?	nt following after-repair	Yes	Go to next step	
		page F-67	No	Water thermosensor and circuit OK	
5	Are ECU terminals 2D ar	nd 2Q voltages correct?	Yes	Replace ECU page F-112	
			No	Check for short circuit in wiring from water thermosensor to ECU	

Circuit Diagram



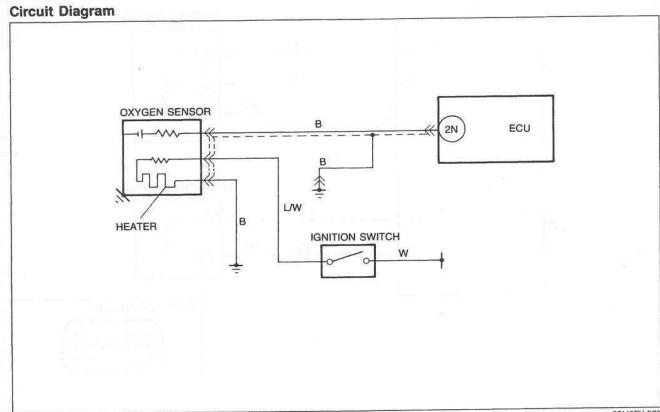
CODE	E No.		12 (7	HROT	TLE SENSOR)	
STEP		INS	SPECTION		ACTION	
1	Is there a poor connection in throttle sensor circuit?		Yes	Repair or replace wiring		
				No	Go to next step	
2	Is there c ECU?		Yes	Go to next step	de o Myral A 1	
	Thro	Throttle sensor ECU		No	Repair wiring	
	A	(LG/R)	2K (LG/R)			
	В	(LG/W)	2M (LG/W)			
		O (Y/B)	2D (Y/G)			
3		esistances between terminals B (LG/W) and C B) correct?		Yes	Go to next step	Aprilla Sizale 1
	Thro	ottle valve	Resistance	No Adjust or replace throttle sensor		
60	Full	ly closed	Below 1 kΩ		H	
	Fu	lly open	Approx. 5 kΩ		\$1-4 mg/r 1	
4	Is ECU te	Is ECU terminal 2M voltage correct? page F-116		Yes	Replace ECU	page F-112
			7 13 7 0 5 5	No	Check for short circuit in wiring from ECU	n throttle sensor to

Circuit Diagram



03U0FX-074 F-73

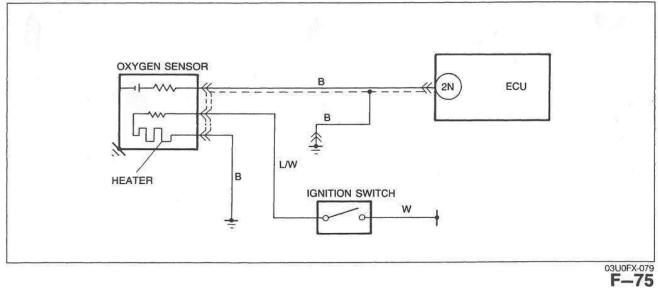
CODE	No. 15 (O	XYGEN SENS	OR — INACTIVATION)		
STEP	INSPECTION		ACTION		
1	Is there a poor connection in oxygen sens	sor Yes	Repair or replace wiring		
	pels 1886 at a		Go to next step		
2	Is oxygen sensor output voltage correct? page F-123		Go to next step		
		No	Replace oxygen sensor		
3	Is there continuity between oxygen sensor and ECU terminal 2N?		Go to next step		
			Repair wiring		
4	Is ECU terminal 2N voltage correct?	Yes	Go to next step		
	page 1–11		Check for short circuit in wiring from oxygen sensor to ECU		
5	Is sensitivity of oxygen sensor correct?	Yes	Replace ECU		
	Li page .	No	Try known good oxygen sensor and check if condition improves page F-1		



03U0FX-077

CODE	No.	17 (F	EEDBA	ACK SYSTEM)
TEP		INSPECTION		ACTION
1	Is same Code No. present after performing after- repair procedure? page F-67		Yes	Go to next step
			No	Check oxygen sensor circuit for poor connection
				 ⇒ If OK, perform troubleshooting Code No.15 ⇒ If not OK, repair or replace connector
2	Check monitor lamp of Self-Diagnosis Checker illuminate at idle after warming-up engine and running it at 2,500—3,000 rpm for 3 minutes ?		Yes	Go to next step Note A/F mixture is rich
			No	Go to Step 5 Note • A/F mixture is lean or misfire occuring
3	Is fuel line pres	sure at idle correct?	Yes	Go to next step
	Fuel line pres		No	High pressure Is fuel return hose clogged or restricted?
	(Vacuum hos disconnected	se to pressure regulator		 ⇒ If OK, replace pressure regulator ⇒ If not OK, repair or replace hose
4	Is there leakage	e of fuel injector?	Yes	Replace injector
		100.	No	Is water thermosensor OK?
				 ⇒ If OK, Go to Step 7 ⇒ If not OK, replace water thermosensor □ page F-121
5	Disconnect each	h high-tension lead at idle; does decrease equally at each cylinder?	Yes	Go to next step
ľ	and constants		No	Go to Step 8

Circuit Diagram



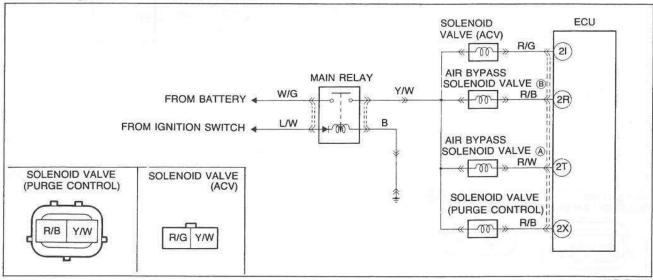
STEP	INSPECTION	Mer - Du	ACTION
6	Is fuel line pressure at idle correct?	Yes	Go to next step
6	Fuel line pressure: 235—275 kPa (2.4—2.8 kg/cm², 34—40 psi) (Vacuum hose to pressure regulator disconnected)	No	Low pressure Check fuel line pressure while pinching fuel return hose If fuel line pressure quickly increases, check pressure regulator If fuel line pressure gradually increases, check for clogging between fuel pump and pressure regulator If not clogged, check fuel pump maximum pressure □ page F-91
7	7 Is there air leakage in intake air system components?		Replace
			Go to Step 10
8	Was misfire found in Step 5 of inspection?	Yes	Repair or replace ignition system
		No	Go to next step
9	Replace injector Is same Code No. present following performing	Yes	Go to next step
	after-repair procedure? page F-67		Replace injector
10	Try known good ECU; does condition improve?		01A0FX-

		LENOID VALV	/ALVE — PURGE CONTROL)	
STEP	INSPECTION		ACTION	
1	Disconnect connector from ECU Is there battery voltage at ECU terminal 2X wire harness (R/B) with ignition switch ON?		Check ECU terminal connector for poor connection ⇒ If OK, replace ECU	
		No	Go to next step	
2	Keep condition Step 1 Is there battery voltage at solenoid valve connec-	Yes onnec-	Repair wiring (R/B)	
	tor terminal-wire (R/B)?		Go to next step	
3	Is solenoid valve OK?	-101 Yes	Check for short or open circuit in wiring from main relay (FUEL INJ relay) to solenoid valve	
		No	Replace solenoid valve	

CODE	■ No. 34 (AIR BYPASS S	OLENOID VALVE (A)
STEP	P INSPECTION		ACTION
1	Disconnect connector from ECU Is there battery voltage at ECU terminal 2T wire harness (R/W) with ignition switch ON?		Check ECU terminal connector for poor connection ⇒ If OK, replace ECU
		No	Go to next step
2	Keep condition as Step 1 Is there battery voltage at solenoid valve connec-	Yes	Repair wiring (R/W)
	tor terminal-wire (R/W)?		Go to next step
3	Is solenoid valve OK? page F-109		Check for short or open circuit in wiring from main relay (FUEL INJ relay) to solenoid valve
			Replace solenoid valve

01A0FX-052

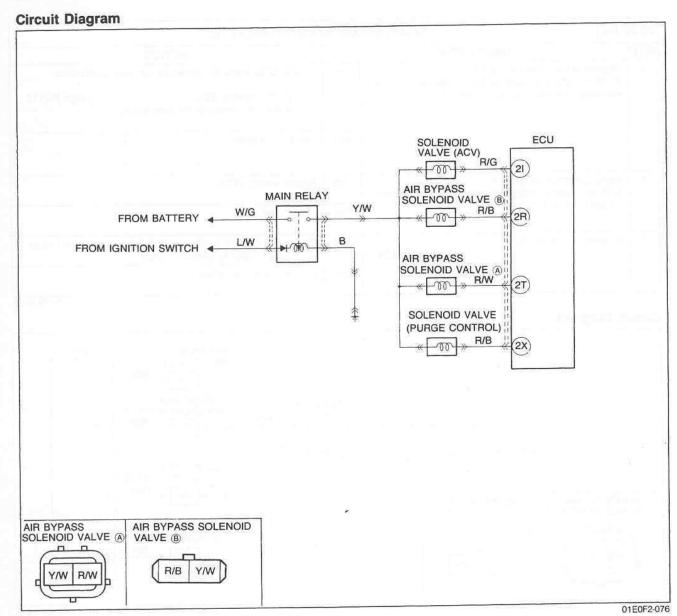
Circuit Diagram

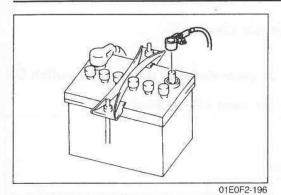


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F-77

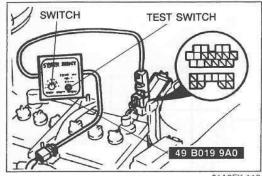
CODE	E No. 35 (AIR	BYPASS S	OLENOID VALVE (B)
STEP	INSPECTION		ACTION
1	Disconnect connector from ECU Is there battery voltage at ECU terminal 2R v (R/B) with ignition switch ON?	Yes vire	Check ECU terminal connector for poor connection ⇒ If OK, replace ECU ⇒ If not OK, repair or replace wiring
		No	Go to next step
2	Keep condition as Step 1 Is there battery voltage at solenoid valve connec-	Yes	Repair wiring (R/B)
	tor terminal-wire (R/B)?	No	Go to next step
3	Is solenoid valve OK?	Yes	Check for short or open circuit in wiring from main relay to solenoid valve
	prin (year)	No	Replace solenoid valve





After-repair Procedure

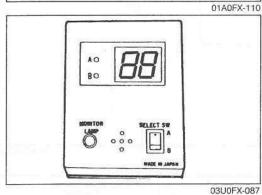
 Cancel the memory of malfunctions from the ECU by disconnecting the negative battery cable and depressing the brake pedal for at least three seconds. Reconnect the negative battery cable.



Connect the SST (System Selector) to the diagnosis connector.

3. Set switch (A) to position 1.

4. Set TEST SW to SELF-TEST.



Connect the SST (Self-Diagnosis Checker) to the System Selector and a ground.

Set the select switch of the Self-Diagnosis Checker to position A.

7. Turn the ignition switch ON.

8. Start and warm up the engine, then run it at **2,000 rpm for three minutes**.

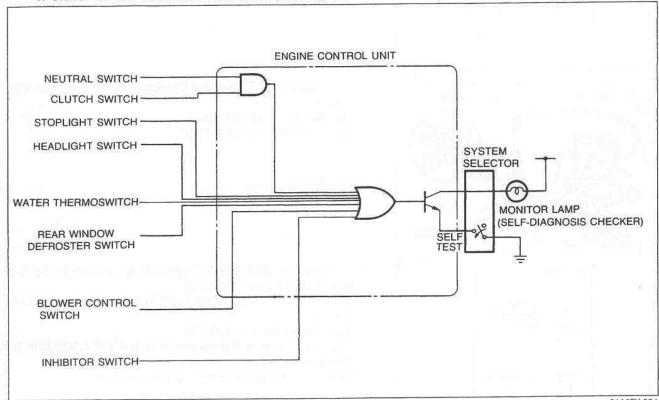
9. Verity that no code numbers are displayed.

SWITCH MONITOR FUNCTION

Individual switches can be inspected by the SST (Self-Diagnosis Checker).

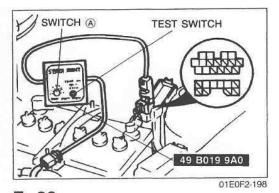
The TEN terminal of the diagnosis connector must be grounded and the ignition switch ON (engine stopped).

• If either of the switches remain activated, the monitor lamp will be illuminated.



01A0FX-054

22.00.0	Self-Diagnosis Che	Self-Diagnosis Checker (Monitor lamp)		
Switch	Light ON	Light OFF	Remark	
Clutch switch (MTX)	Pedal released	Pedal depressed	In gear	
Neutral switch (MTX)	In gear	Neutral	Clutch pedal released	
Stoplight switch	Pedal depressed	Pedal released	_	
Headlight switch	ON	OFF	Headlights/small lights. ON	
Water thermoswitch	ON	OFF	-	
Rear window defroster switch	ON	OFF	_	
Blower switch	ON	OFF		
Inhibitor switch (ATX)	L, S, D or R range	N or P range	- <u>-</u>	

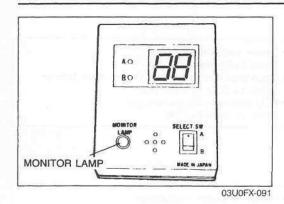


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Inspection Procedure

- 1. Connect the SST (System Selector) to the diagnosis con-
- Set switch (A) to position 1.
 Set TEST SWITCH to SELF-TEST.

SELF-DIAGNOSIS FUNCTION



- Connect the SST (Self-Diagnosis Checker) to the System Selector and a ground.
- Set the select switch of the Self-Diagnosis Checker to position A.
- 6. Turn the ignition switch ON.
- Check if monitor lamp illuminates when each switch is made to function as described below.

Caution

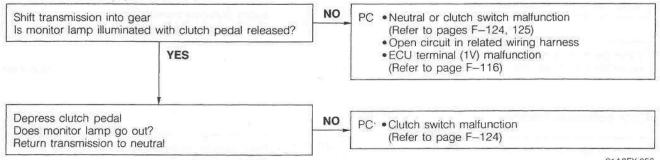
- If either of the switches remain activated, the monitor lamp will be illuminated.
- . Do not start the engine.

Procedure

Set conditions to deactivate each switch Check each switch and related wiring harness · All accessories OFF • Clutch and Neutral switch . Refer to pages F-124, 125 NO :Refer to Section T · Transmission in neutral Stoplight switch Headlight switch Refer to Section T · All pedals released Verify that monitor lamp does not illuminate · Water thermoswitch Refer to Section E · Rear defroster switch :Refer to Section T YES · Blower switch Refer to Section T :Refer to Section K Inhibitor switch Check each switch as described

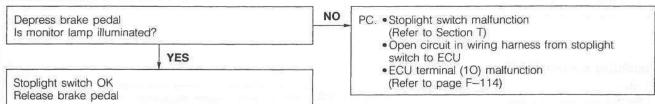
01A0FX-055

Neutral and Clutch Switches (MTX)



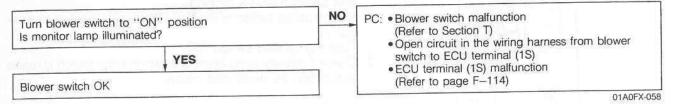
01A0FX-056

Stoplight switch

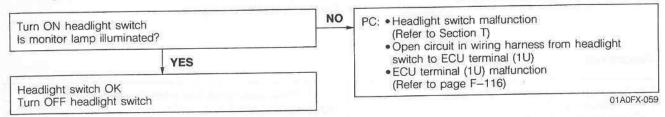


01A0FX-057

Blower switch



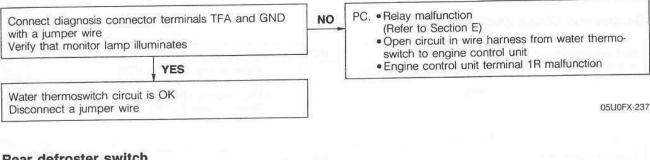
Headlight switch



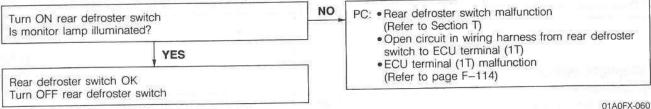
Water thermoswitch circuit (not included in switch inspection)

Warning

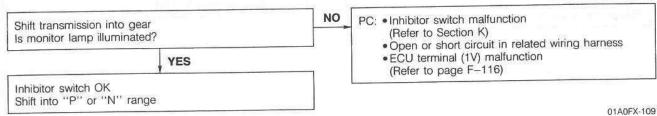
The cooling fan operates when the diagnosis connector terminals TFA and GND are connected with a jumper wire. Use caution.



Rear defroster switch



Inhibitor switch (ATX)

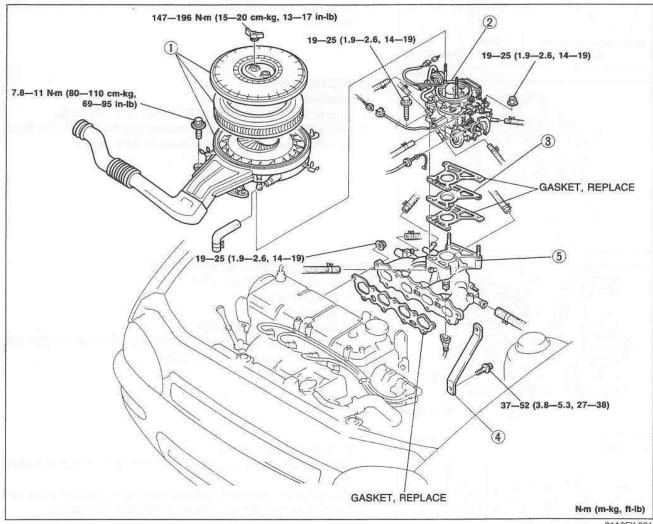


INTAKE AIR SYSTEM

COMPONENT PARTS

Removal / Inspection / Installation

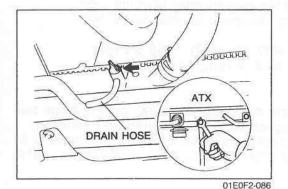
- 1. Remove in the order shown in the figure, referring to Removal Note.
- 2. Visually inspect the intake air system components and repair or replace as necessary.
- 3. Install in the reverse order of removal.



01A0FX-061

1. Air cleaner	
Inspect for excessive dirt or damage	
2. Injection body	
Inspection page	F-84
Disassembly / Assembly page	F-85

3. Baffle Inspection page F-86 4. Intake manifold stay 5. Intake manifold Inspection page F-86



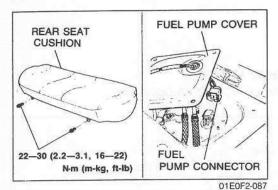
Removal Note Coolant

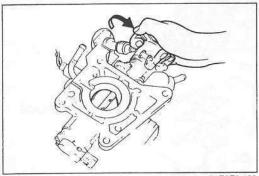
1. Drain the coolant into a suitable container before removing the injection body.

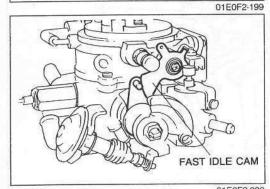
2. Refill with coolant after installation.

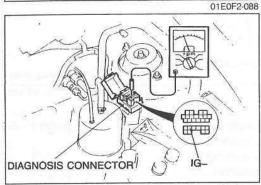
Caution

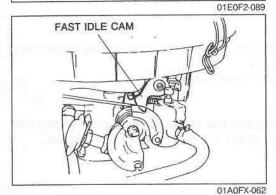
. Before loosening the radiator drain plug verify that the radiator drain hose faces straight down.











F-84

Fuel Pressure Release

Before disconnecting any fuel line, release the fuel pressure from the fuel system to reduce the possibility of injury or fire.

- 1. Start the engine.
- 2. Remove the rear seat cushion.
- 3. Disconnect the fuel pump connector.
- 4. After the engine stalls, turn off the ignition switch.
- Reconnect the fuel pump connector and install the rear seat cushion.

INJECTION BODY Inspection

- 1. Check the injection body for wear and deposits.
- 2. Verify that the throttle valve moves smoothly with the throttle valve lever from fully closed to fully open.

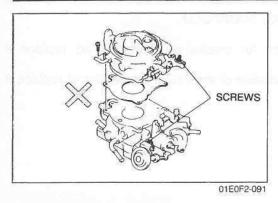
Fast-idle (On-vehicle inspection)

- 1. Turn all electric loads OFF.
 - Blower fan
 - Headlight
 - Rear window defroster
- Verify that the wax rod is contracted and that the fast idle cam is in contact with the roller.
- Connect a tachometer.
- Start the engine and verify that the engine speed is **below** 2,500 rpm.
- 5. Warm up the engine to normal operating temperature and verify that the engine speed gradually decreases.
- After the engine warms up, verify that the wax rod extends fully and that the cam separtes from the roller.
- 7. Verify that the idle speed is within specification.

Idle speed: MTX (Neutral) 750 ± 50 rpm ATX (P range) 1,100 ± 50 rpm

Note

- Water temperature when cam just separates is 61 $^{+5}_{-6}$ °C (142 $^{+41}_{-43}$ °F) (MTX), 55 \pm 8°C (131 \pm 46°F) (ATX).

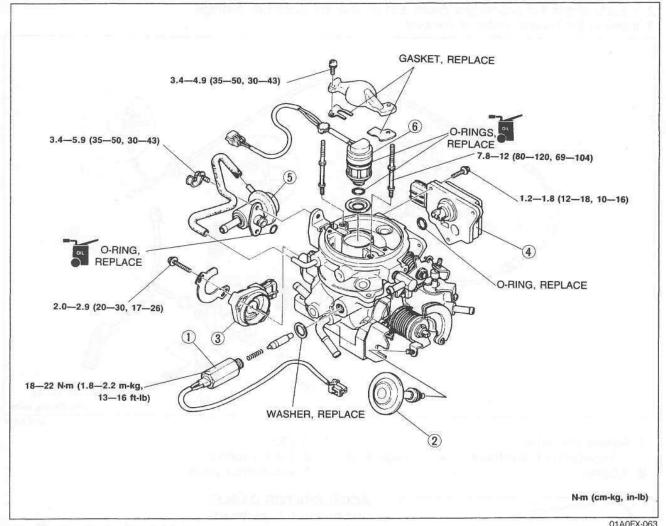


8. Replace the injection body if necessary.

Caution

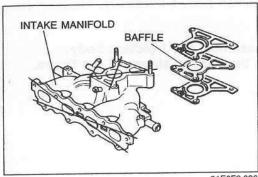
- · Do not disassemble the injection body.
- . Do not turn the screws shown in the figure.

- **Disassembly / Assembly**1. Disassemble in the order shown in the figure.
- 2. Assemble in the reverse order of disassembly.



1. Air bypass solenoid valve (A)
Inspection page F-109
2. Dashpot
Inspection page F-104
3. Throttle sensor
Inspection page F–122
Adjustment page F-122
Removal / Installation page F-122

4. Airflow sensor Inspection	011.01.11.000
5. Pressure regulator Inspection	
6. Injector Inspection (on-vehicle) page F—	regulator tion page F- 94
	tion (on-vehicle)page F- 95



01E0F2-093

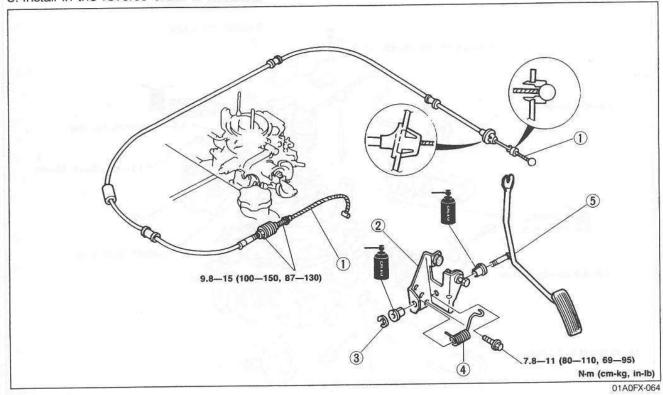
BAFFLE/INTAKE MANIFOLD Inspection

- Visually check for cracks or damage and replace if necessary.
- Check for distortion of the intake manifold and replace if necessary.

ACCELERATOR PEDAL

Removal / Inspection / Installation

- 1. Remove in the order shown in the figure.
- 2. Visually check the accelerator pedal and retainer for cracks or damage.
- 3. Install in the reverse order of removal.



Accelerator cable
 Inspection / Adjustment..... page F–86

01E0F2-095

- 2. Retainer
- A

F-86

- 3. Clip
- 4. Return spring
- 5. Accelerator pedal

ACCELERATOR CABLE Inspection / Adjustment

- Depress the accelerator pedal fully. Verify that the throttle valve is fully opened by turning the throttle lever by hand.
- 2. Inspect the play of the accelerator cable.

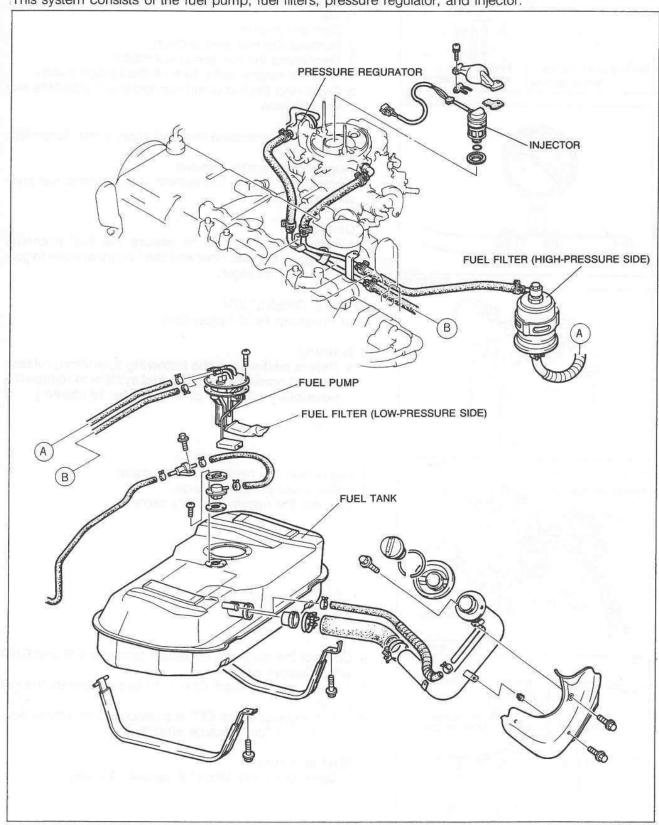
Play: 1-3mm (0.04-0.12 in)

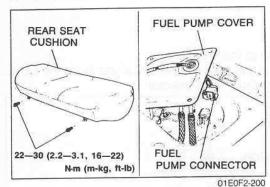
3. Loosen nuts (A) to adjust the play if necessary.

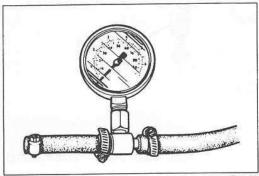
FUEL SYSTEM

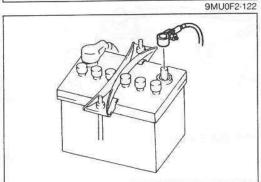
DESCRIPTION

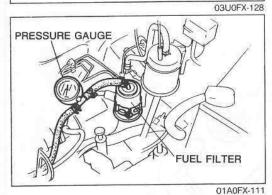
This system supplies the necessary fuel at a constant pressure to the injector. Fuel is metered and injected into the intake manifold according to the injection control signal from the ECU. This system consists of the fuel pump, fuel filters, pressure regulator, and injector.

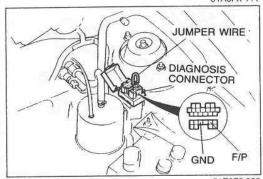












01E0F2-098

PRECAUTION

Fuel Pressure Release and Servicing Fuel System

Fuel in the fuel system remains under high pressure when the engine is not running.

- a) Before disconnecting any fuel line, release the fuel pressure from the fuel system to reduce the possibility of injury or fire.
 - 1. Start the engine.
 - 2. Remove the rear seat cushion.
 - 3. Disconnect the fuel pump connector.
 - 4. After the engine stalls, turn off the ignition switch.
 - Reconnect the fuel pump connector and install the rear seat cushion.
- b) Use a rag as protection from fuel spray when disconnecting the hoses.
 - Plug the hoses after removal.
- c) When inspecting the fuel system, use a suitable fuel pressure gauge.

Caution

 Install hose clamps to secure the fuel pressure gauge to the fuel filter and the fuel main hose to prevent fuel leakage.

SYSTEM OPERATION Fuel Pressure Hold Inspection

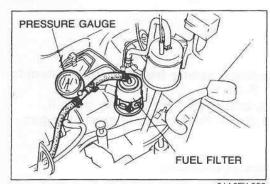
Warning

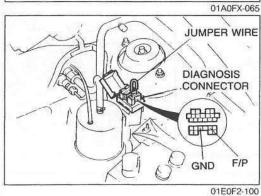
- Before performing the following operation, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to above.)
- 1. Disconnect the negative battery cable.
- 2. Install a fuel pressure gauge.
- 3. Connect the negative battery cable.

- Connect the diagnosis connector terminals F/P and GND with a jumper wire.
- 5. Turn the ignition switch ON for **10 sec.** to operate the fuel pump.
- 6. Turn the ignition switch OFF and disconnect the jumper wire.
- 7. Observe the fuel pressure after 5 min..

Fuel pressure:

More than 147 kPa (1.5 kg/cm², 21 psi)





Fuel Line Pressure Inspection

Warning

- Before performing the following operation, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F–88.)
- 1. Disconnect the negative battery cable.
- 2. Connect a fuel pressure gauge.
- 3. Connect the negative battery cable.
- Connect diagnosis connector terminals F/P and GND with a jumper wire.
- 5. Turn the ignition switch ON.
- 6. Measure the fuel line pressure.

Fuel line pressure: 235—275 kPa (2.4—2.8 kg/cm², 34—40 psi)

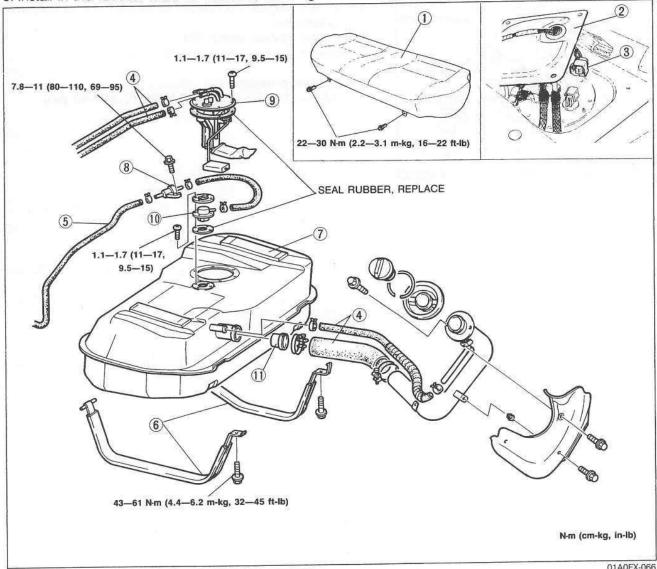
FUEL TANK Removal / Inspection / Installation

Warning

- · Before performing the following operation, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F-88.)
- · When removing the fuel tank, keep sparks, cigarettes, and open flames away from it.
- Before repairing the fuel tank, clean it throughly with steam to remove all explosive gas.

1. Remove in the order shown in the figure.

- 2. Visually inspect the fuel tank components and repair or replace as necessary.
- 3. Install in the reverse order of removal, referring to Installation Note.



01A0FX-066

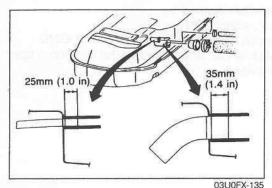
Note

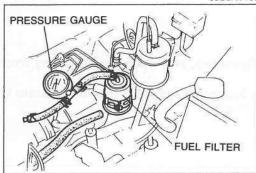
- Drain the fuel from the fuel tank before removing the tank.
- 1. Rear seat cushion
- 2. Fuel pump cover
- 3. Fuel pump connector
- 4. Fuel hoses
- 5. Evaporative hoses
- 6. Fuel tank straps

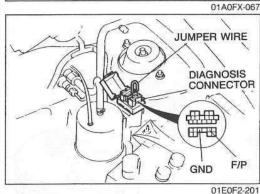
7. Fuel tank

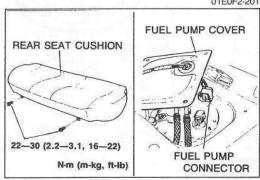
Inspect for cracks and corrosion

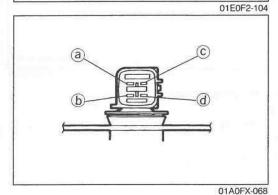
- 8. Check valve (two-way)
- 9. Fuel tank unit
- 10. Fuel vapor valve
- 11. Non-return valve











Installation Note

 Push the ends of the main fuel hose, fuel return hose, and evaporative hoses onto the fuel tank fittings at least 25mm (1.0 in).

2. Push the fuel filler hose onto the fuel tank pipe and filler pipe at least 35mm (1.4 in).

FUEL PUMP Inspection Maximum pressure

Warning

 Before performing the following operation, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F–88.)

 When inspecting fuel system parts, keep sparks, cigarettes, and open flames away from the fuel.

1. Disconnect the negative battery cable.

Connect a fuel pressure gauge to the fuel main pipe and plug the outlet of the fuel pressure gauge as shown. (Install clamps as shown.)

3. Connect the negative battery cable.

 Connect diagnosis connector terminals F/P and GND with a jumper wire.

Turn the ignition switch ON for 10 sec. to operate the fuel pump and measure the fuel pressure.

Fuel pressure: 491—658 kPa (5.0—6.5 kg/cm², 71.1—92.4 psi)

- 6. Turn the ignition switch OFF and disconnect the jumper wire.
- 7. If not as specified, replace the fuel pump.

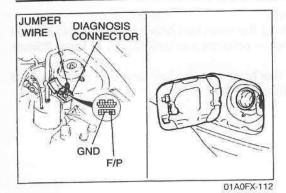
Continuity

1. Remove the rear seat cushion.

2. Disconnect the fuel pump connector.

3. Check for continuity between the terminals (a) and (b) of the connector at the fuel pump shown in the figure.

4. If there is no continuity, replace the fuel pump. (Refer to page F-92.)



Fuel pump operation sound

1. Turn the ignition switch ON.

2. Connect diagnosis connector terminal F/P to GND.

3. Remove the fuel filler cap and verify that the fuel pump operation sound is heard.

Replacement

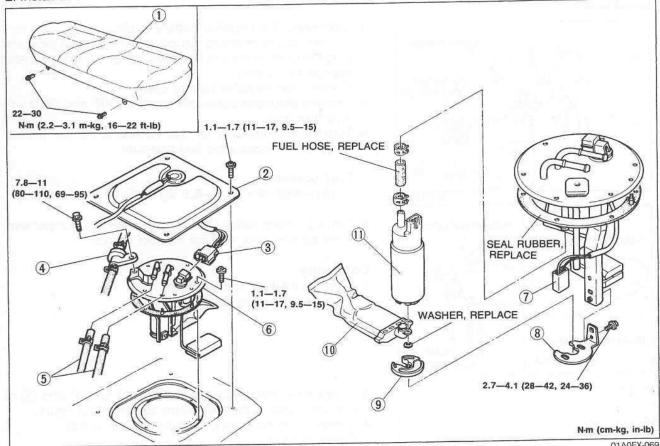
Warning

When replacing the fuel system parts, keep sparks, cigarettes, and open flames away from

 Before performing the following operation, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F-88).

1. Remove in the order shown in the figure.

2. Install in the reverse order of removal.



01A0FX-069

1. Rear seat cushion

2. Fuel pump cover

3. Fuel pump gauge unit connector

4. Check valve

5. Fuel hoses

6. Fuel pump gauge unit

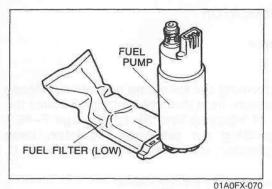
7. Fuel pump connector

8. Bracket

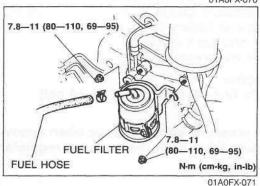
9. Rubber mount

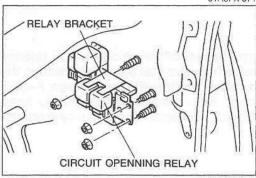
10. Fuel filter

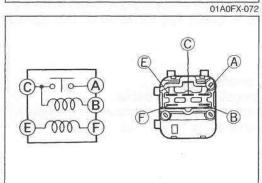
11. Fuel pump



FUEL FILTER Replacement Low-pressure side Refer to page F-92.







01A0FX-073

High-pressure side

The fuel filter must be replaced at the intervals outlined in the maintenance schedule.

Warning

- Before performing the following operation, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F–88.)
- When replacing the fuel filter, keep sparks, cigarettes and open flames away from it.
- 1. Disconnect the fuel hoses from the fuel filter.
- 2. Remove the fuel filter and bracket.
- 3. Install in the reverse order of removal.

CIRCUIT OPENING RELAY Replacement

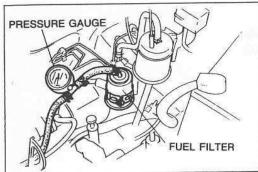
- 1. Disconnect the negative battery terminal.
- 2. Remove the ECU. (Refer to page F-112.)
- 3. Remove the relay bracket.
- 4. Remove the circuit opening relay from the relay bracket.

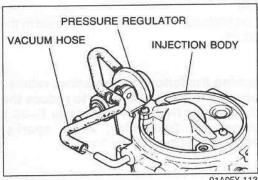
Inspection of Continuity

Check continuity between terinals (A) and (C) in the following condition.

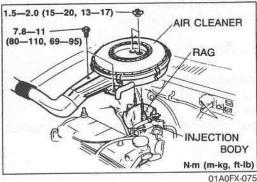
Terminals	Apply 12V	Continuity (A - C)
® ↔ ©	Yes	Yes
	No	No
(E) ↔ (F)	Yes	Yes
	No	No

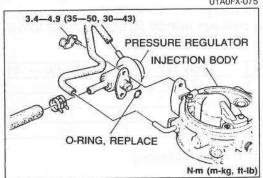
2. Replace the relay if not as specified.





01A0FX-113







01E0F2-119

PRESSURE REGULATOR Inspection Fuel line pressure

Warning

- Before performing the following operation, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F–88.)
- When inspecting the pressure regulator, keep sparks, cigarettes, and open flames away from it.
- 1. Disconnect the negative battery cable.

2. Connect a fuel pressure gauge.

- 3. Connect the negative battery cable.
- 4. Start the engine and run it at idle.
- 5. Measure the fuel line pressure.

Fuel line pressure: 235—275 kPa (2.4—2.8 kg/cm², 34—40 psi)

Note

 The fuel line pressure will not change when removing the vacuum hose from the pressure regulator at idle.

Replacement

Warning

- Before performing the following operation, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F–88.)
- When replacing fuel system components, keep sparks, cigarettes, and open flames away from the fuel.

Caution

- After removing the air cleaner, cover the intake air passage with a clean rag to protect the airflow sensor.
- 1. Remove the air cleaner.

2. Disconnect the negative battery cable.

- 3. Remove the pressure regulator as shown in the figure.
- 4. Install in the reverse order of removal.

INJECTOR

Inspection (On-vehicle)

1. Remove the air cleaner cover.

Caution

Perform the following inspection carefully to protect the airflow sensor from damage.

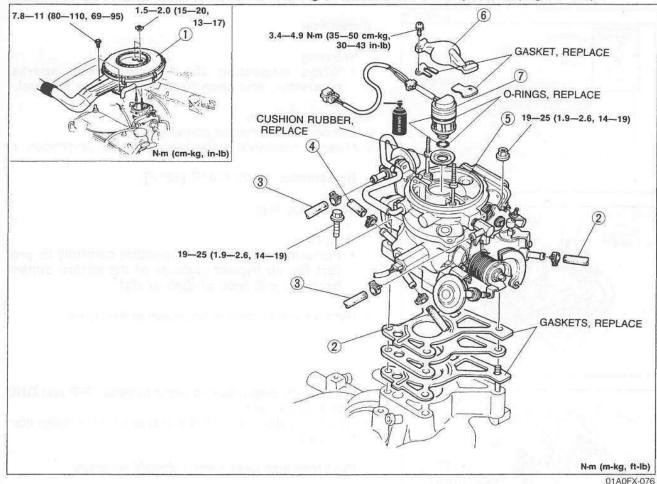
2. Start the engine and run it at idle.

3. Using a sound scope, verify that injector operating sounds are heard.

Removal / Installation

Warning

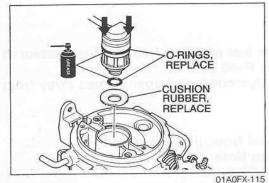
- Before performing the following operation, release the fuel pressure from the fuel system ot reduce the possibility of injury or fire. (Refer to page F-88.)
- When removing the fuel system parts, keep sparks, cigarettes, and open flames away from the fuel.
- 1. Loosen the radiator drain plug and drain the coolant.
- 2. Remove in the order shown in the figure, referring to **Removal Note**. (Refer to page F-95.)
- 3. Install in the reverse order of removal, referring to Installation Note. (Refer to page F-96.)

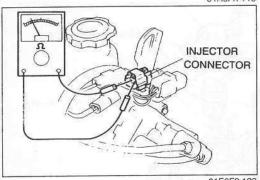


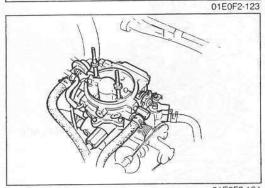
- 1. Air cleaner
- 2. Water hose
- 3. Fuel hose
- 4. Air bypass hose
- INJECTOR NOZZLE 01A0FX-077
- 5. Injection body
- 6. Injector cover
- 7. Injector

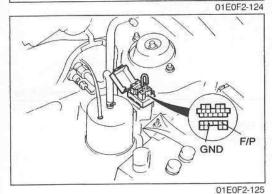
Removal Note

· When replacing the injector, push the injector nozzle out with a plastic or wood stick.









Installation Note

• Use new O-rings, cushion rubber, and gaskets.

Apply a small amount of silicone grease to the O-rings before installation.

 Install the injector squarely into injection body and do not twist it while installing.

 After installation, connect the diagnosis connector, F/P and GND terminals with a jumper wire, and check for fuel leakage with the ignition switch ON. (Refer to page F-96.)

Inspection

Warning

 When inspecting the injector, keep sparks, cigarettes, and open flames away from the fuel.

Injector resistance

1. Disconnect the injector connector.

2. Measure resistance of the injector with an ohmmeter.

Resistance: 1—2Ω (20°C [68°F])

Fuel leakage test

Caution

 Perform the following inspection carefully to protect the air bypass passage of the airflow sensor from the entrance of dust or dirt.

1. Remove the air cleaner as shown in the figure.

2. Connect the diagnosis connector terminals **F/P** and **GND** with a jumper wire.

3. Turn the ignition switch ON and check for fuel leaks from the injector.

Fuel leakage: Less than 1 drop/5 minutes

EXHAUST SYSTEM

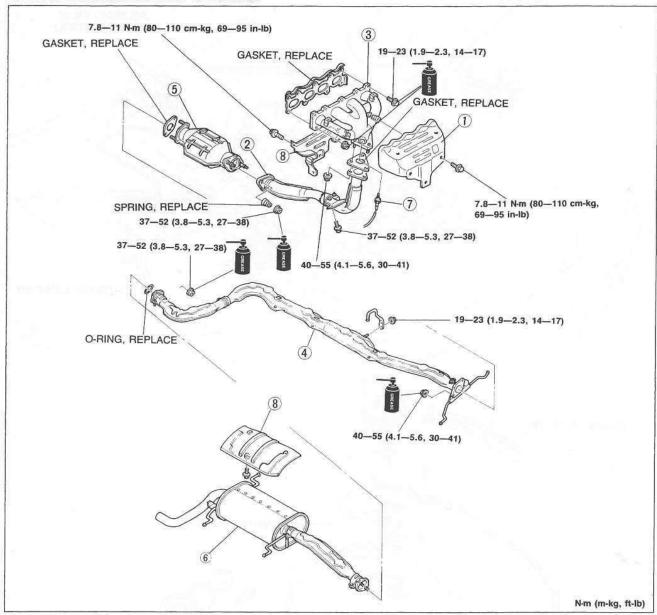
COMPONENT PARTS

Inspection (On-vehicle)

Start the engine and verify that there is no exhaust gas leakage from the exhaust system components.

Removal / Inspection / Installation

- 1. Remove in the order shown in the figure.
- 2. Visually inspect the exhaust system components and repair or replace as necessary.
- 3. Install in the reverse order of removal.



01A0FX-078

- 1. Insulator
- 2. Front pipe

Inspect for deterioration and cracks

3. Exhaust manifold

Inspect for cracks

4. Middle pipe

Inspect for deterioration and cracks

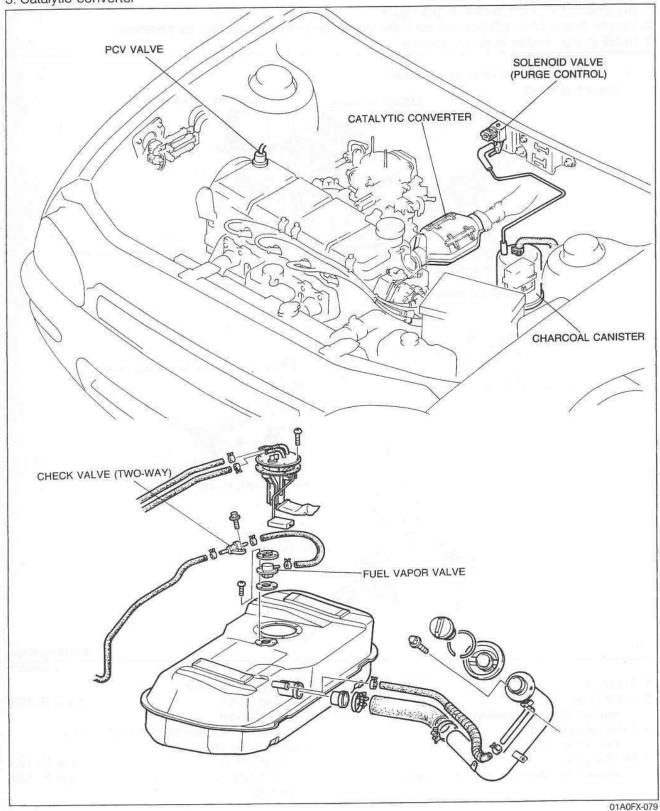
8. Insulator

OUTLINE OF EMISSION CONTROL SYSTEM

STRUCTURAL VIEW

The following systems are employed to reduce CO, HC, and NOx emissions. 1. Positive crankcase ventilation (PCV) system

- 2. Evaporative emission control system
- 3. Catalytic converter



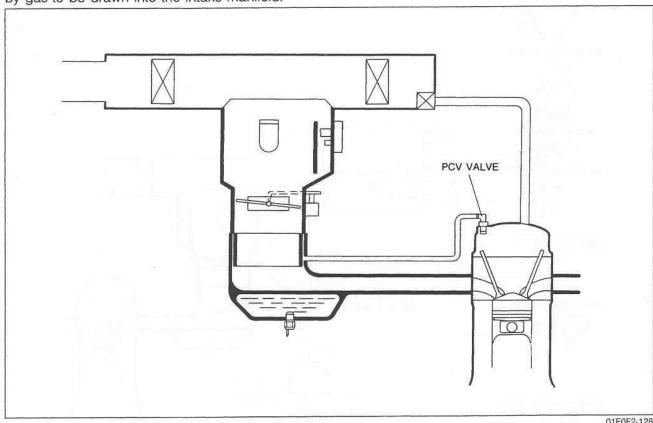
POSITIVE CRANKCASE VENTILATION (PCV) SYSTEM

DESCRIPTION

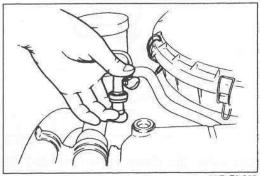
The PCV valve is operated by the intake manifold vacuum.

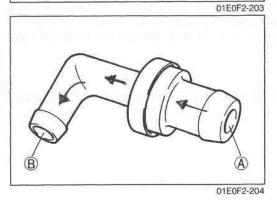
When the engine is running at idle, the PCV valve is opened slightly and a small amount of blowby gas is drawn into the intake manifold to be burned.

As the engine speed rises the PCV valve is opened further, allowing a proportionately larger amount of blowby gas to be drawn into the intake manifold.



01E0F2-128





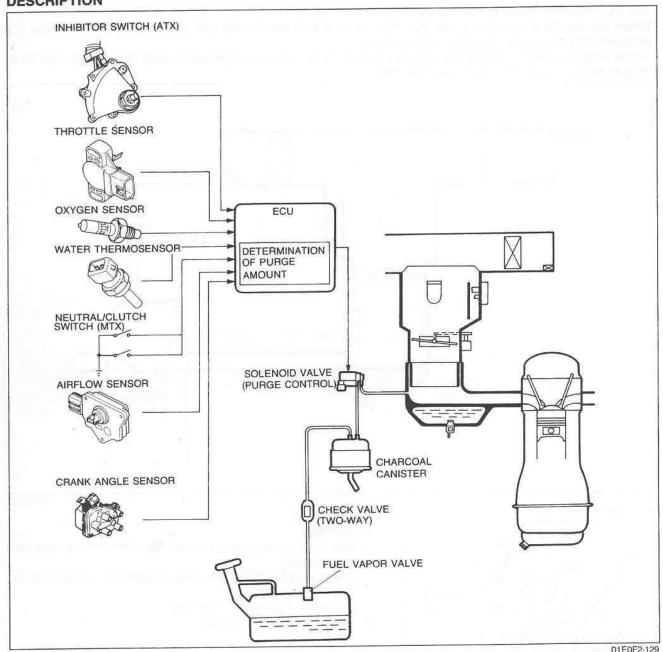
PCV VALVE

Inspection

- 1. Warm up the engine to normal operating temperature and run it at idle.
- 2. Disconnect the PCV valve and the ventilation hose from the cylinder head cover.
- 3. Block the PCV valve opening.
- 4. Verify that vacuum is felt.
- 5. Remove the PCV valve.
- 6. Blow through the valve from port (A) and verify that airflows from of port (B).
- 7. Blow through the valve from port (B) and verify that no airflows from of port (A).
- 8. Replace the PCV valve if not as specified.

EVAPORATIVE EMISSION CONTROL SYSTEM

DESCRIPTION



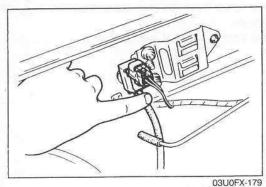
The evaporative emission control system consists of the fuel vapor valve, the check valve (two-way), the charcoal canister, the solenoid valve (purge control), the engine control unit (ECU), and the input devices. The evaporative fumes drawn into the engine and burned is controlled by purge control solenoid valve. The ECU detects the engine's operating conditions by the various input devices and controls the solenoid valve operation by electrical signals according to these values.

Operation

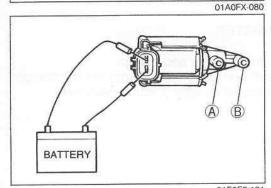
The solenoid valve (purge control) is controlled by signals from the ECU to perform purging of the charcoal canister. Purging is done when these conditions are met:

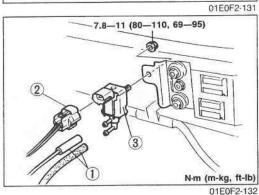
- (1) After warm-up
- (2) Driving in gear
- (3) Accelerator pedal depressed
- (4) Oxygen sensor functioning normally

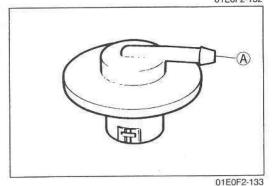
F-100



A B







SYSTEM OPERATION

- 1 Warm up the engine to normal operating temperature and run it at idle.
- Disconnect the vacuum hose from the solenoid valve as shown in the figure, and verify that no vacuum is felt at the solenoid valve.
- 3. If not as specified, check the solenoid valve.

SOLENOID VALVE (PURGE CONTROL) Inspection

- 1. Disconnect the vacuum hoses from the solenoid valve.
- 2. Verify that no air flows through the valve from port (A) to port (B).
- 3. Disconnect the solenoid valve conector and apply 12V.
- Verify that air flows through the valve from port (A) to port
 If no air is felt, measure the resistance of the solenoid valve.

Resistance: 32 \pm 2 Ω

5. If not as specified, replace the solenoid valve.

Removal / Installation

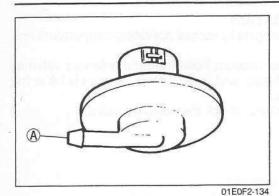
- 1. Disconnect the evaporative hoses from the solenoid valve.
- 2. Disconnect the solenoid valve connector.
- 3. Remove the nut and the solenoid valve.
- 4. Install in the reverse order of removal.

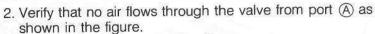
Tightening torque:

7.8-11 N·m (80-110 cm-kg, 69-95 in-lb)

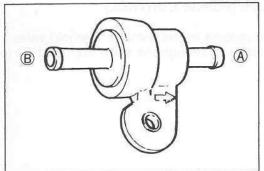
FUEL VAPOR VALVE Inspection

1. Verify that air flows through the valve from port (A) as shown in the figure.





3. Replace the fuel vapor valve if necessary.



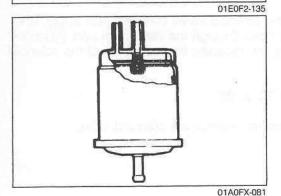
CHECK VALVE (TWO-WAY) Inspection

1. Remove the valve.

2. Check the operation of the valve with a vacuum pump.

Blow through valve from port (A)	No airflow
Apply approx. 37 mmHg (1.46 inHg) vacuum at port (A)	Airflow
Apply approx. 44 mmHg (1.73 inHg) vacuum at port (B)	Airflow

3. Replace the check valve if not as specified.



CHARCOAL CANISTER Inspection

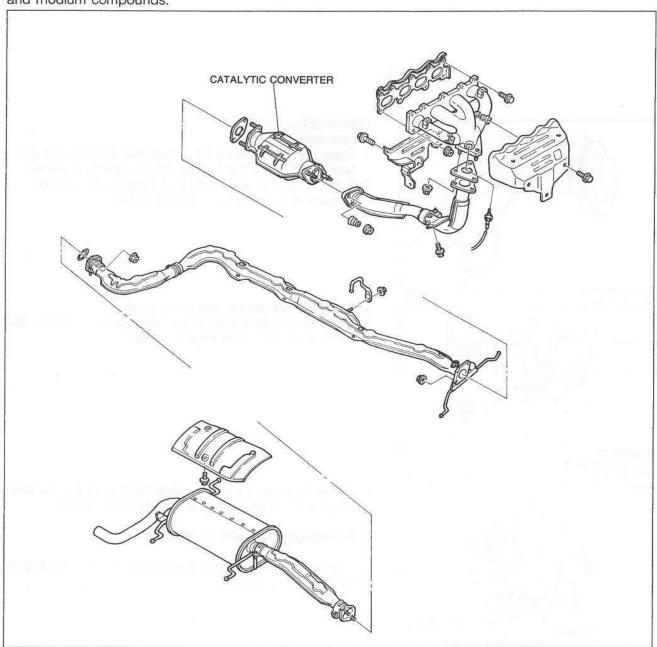
Visually check for damage and cracks.
 Blow air into each port and verify that they are not clogged.

3. Replace the charcoal canister if not as specified.

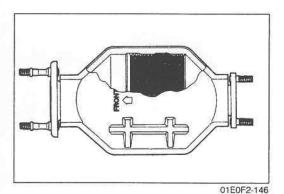
CATALYTIC CONVERTER SYSTEM

DESCRIPTION

The catalytic converter reduces CO, HC, and NOx by chemical reaction. The converter contains platinum and rhodium compounds.



01E0F2-145



CATALYTIC CONVERTER Inspection

Note

· The insulator cannot be removed.

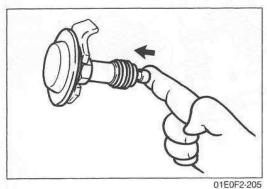
Remove the catalytic converter and visually check for deterioration and cracks.

DECELERATION CONTROL SYSTEM

DESCRIPTION

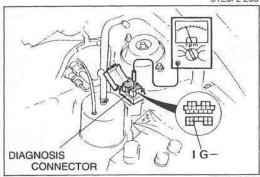
The dashpot is used to prevent the throttle valve from suddenly closing.

03U0FX-185



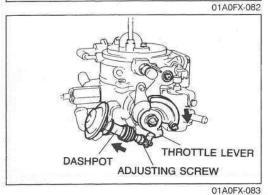
DASHPOT Inspection

- 1. Open the throttle valve fully. Push the dashpot rod with a finger and verify that it goes into the dashpot slowly.
- 2. Release the rod and verify that it comes out quickly.
- 3. Replace the dashpot if not as specified.



4. Warm up the engine and run it at idle.

Connect a tachometer to the diagnosis connector IGterminal and increase engine speed.



6. Slowly decrease the engine speed and verify that the lever touches the dashpot rod at the specified speed.

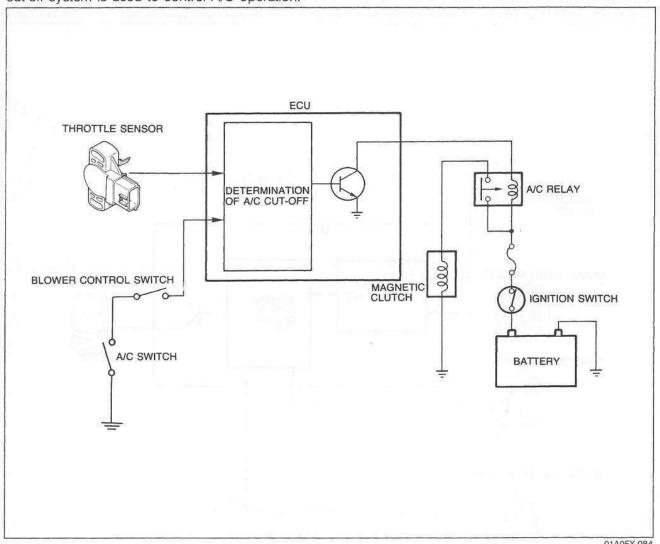
Specification: 2,500 ± 100 rpm

7. If not as specified, loosen the locknut and turn the adjusting screw to adjust.

A/C CUT-OFF SYSTEM

DESCRIPTION

To improve idle smoothness after just starting the engine and to improve acceleration performance, an A/C cut-off system is used to control A/C operation.

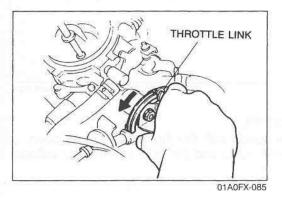


01A0FX-084

Operation

The A/C is cut off under the conditions below.

Engine condition	Purpose	Cut-off period
Throttle valve fully open	1 and the second	Approx. 5 sec.
Acceleration from stop	Improved drivability	Approx. 1 sec.



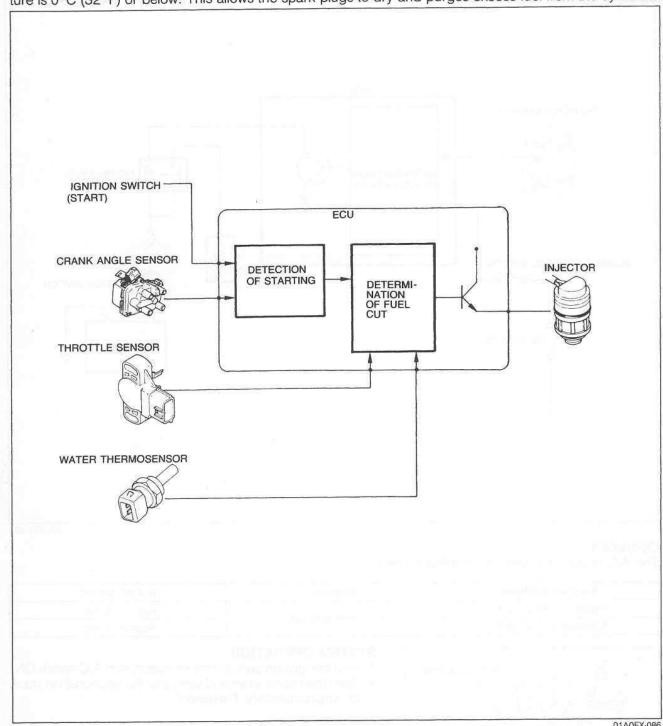
SYSTEM OPERATION

- 1. Turn the ignition switch, blower switch, and A/C switch ON.
- 2. Open the throttle valve and verify that the additional fan stops for approximately 1 second.

DECHOKE CONTROL SYSTEM

DESCRIPTION

To facilitate starting the engine if the spark plugs become fouled, such as when the engine is flooded, fuel injection is cut if the throttle valve is held wide open while cranking the engine if the engine coolant temperature is 0°C (32°F) or below. This allows the spark plugs to dry and purges excess fuel from the cylinders.



01A0FX-086

SYSTEM OPERATION

- 1. Verify that the engine coolant temperature is below 0°C (32°F).
- 2. Verify that the engine will not start when cranked at normal speed with the throttle valve fully open.
- 3. If the engine starts, inspect the throttle sensor. (Refer to page F-122.) and the ECU terminal 1U voltage. (Refer to page F-116.)

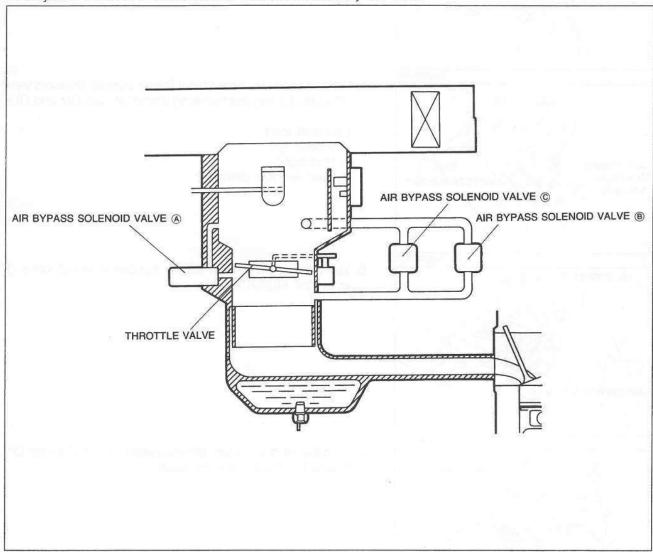
AIR BYPASS CONTROL SYSTEM

DESCRIPTION

The air bypass system operates to improve idle stability and vehicle drivability.

This system supplies throttle valve bypass air into intake manifold according to engine load condition and driving conditions.

This system consists of two solenoid valves controlled by the ECU.

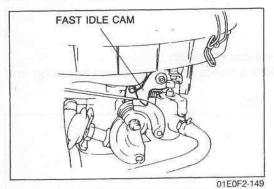


01A0FX-087

Operation of Air Bypass Solenoid Valve

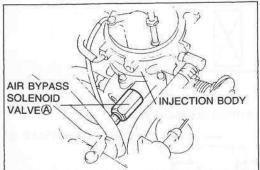
Engine condition	Burnoos	Air bypass solenoid valve					
Engine condition	Purpose	A	B	©			
During cranking	To improve startability	0	0	200			
Ignition switch OFF→ON	To prevent from sticking			0			
*Accessory ON		0					
P/S pressure switch ON	To improve startability	0	0				
A/C switch ON		0	760	0			
Warm up (45°C→80°C)		0					
Select lever N→D (ATX)	To alleviate sudden engine speed drop	0					
During deceleration (deceleration control)	To improve drivability	0	0	e man			

^{*}Accessory is headlights, rear window defroster, blower switch and cooling fan.



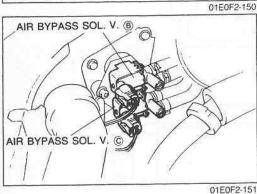
SYSTEM OPERATION

- 1. Warm up the engine to normal operating temperature.
- 2. Verify that the thermowax unit rod extends outward fully and that the cam separates from the roller.
- 3. If the electric cooling fan is operating, wait until it stops.
- 4. Verify that the engine is idling smoothly.

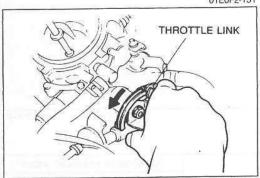


Electrical load

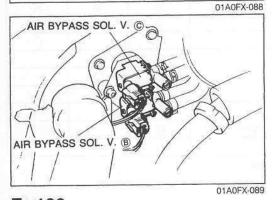
- Blower fan
- Headlight
- Rear window defroster



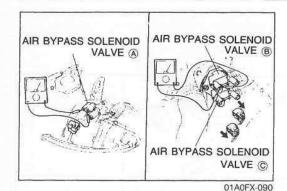
6. Verify that click is from the air bypass solenoid valve (B) when the engine starts.



- 7. Turn the ignition switch, blower switch, and A/C switch ON.
- 8. Rotate the throttle link by hand.

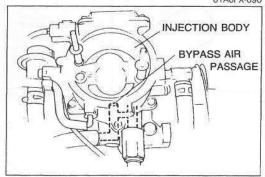


Verify that click is heard from the air bypass solenoid valve©.



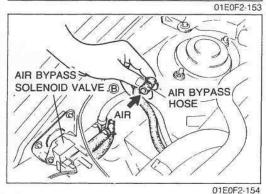
AIR BYPASS SOLENOID VALVE (A), (B), (C) Inspection for continuity

- 1. Disconnect each air bypass solenoid valve connector.
- 2. Inspect for continuity between the solenoid valve connector terminals.
- 3. Replace the air bypass solenoid valve if not as specified.

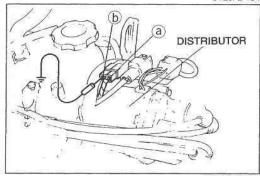


Inspection for Airflow

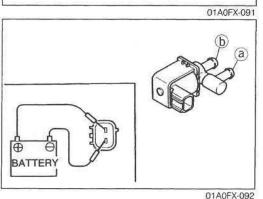
- 1. Inspect air bypass solenoid valve (A).
 - 1) Remove the air cleaner.
 - 2) Close the bypass air passage with tape.



- 3) Disconnect the bypass air hose from the air bypass solenoid valve (A) as shown in the figure.
- 4) Verify that no air flows through air bypass solenoid valve (A) when blowing air lighty into the air bypass hose.



- 5) Turn the ignition switch ON.
- 6) Ground the terminal (b) as shown in the figure.
- 7) Verify that air flows through air bypass solenoid valve (A) when blowing air into the air bypass hose.



- 2. Inspect air bypass solenoid valve (B), (C)
 - 1) Remove air bypass solenoid valve (B) or (C).
 - 2) Blow through the valve from port (a) and verify that no air comes out of port (b).
 - 3) Apply 12V to the solenoid valve connector.
 - 4) Blow through the valve from port (a) and verify that air comes out of port (b).

Adjustment (idle-up speed)

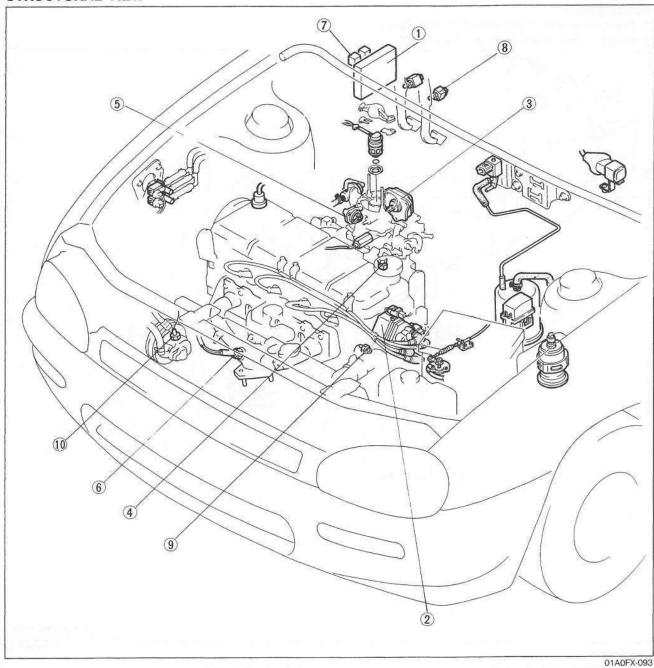
Refer to page F-64.

CONTROL SYSTEM

PREPARATION SST

49 9200 162 Engine Signal Monitor	For inspection of ECU	49 G018 903 Adapter harness	For inspection of ECU
49 G018 904 Sheet OOO 48PIN OOO 19 19 19 19 19 19 19 19 19 19 19 19 19	For inspection of ECU	49 D015 001 Box wrench	For removal of water thermosensor
49 B019 9A0 System Selector	For inspection of ignition timing and idle speed		01E0F2-158

STRUCTURAL VIEW

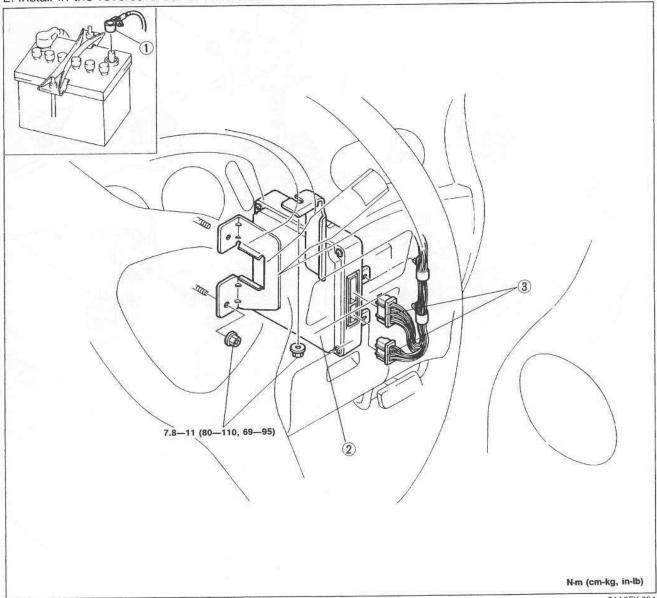


6	Oxygen sensor Inspection	page	F-123
	Replacement	page	F-124
7	. Main relay		
	Replacement	page	F-124
	Inspection	page	F-124
8	. Clutch switch (MTX)		
	Inspection		F-124
	Replacement	page	F-124
9	. Neutral switch (MTX)		
	Inspection		F-125
	Replacement	page	F-125
10	. P/S pressure switch		
	Inspection	page	F-125

ENGINE CONTROL UNIT (ECU)

Replacement

- 1. Remove in the order shown in the figure.
- 2. Install in the reverse order of removal.

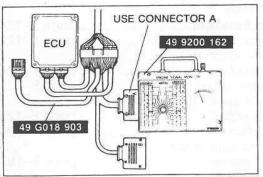


01A0FX-094

1. Negative battery cable

2. ECU

Inspection page F-112

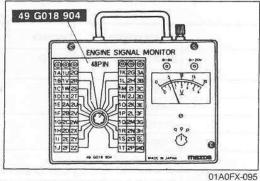


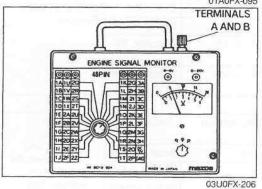
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3. ECU connector

Inspection

Disconnect the ECU connectors.
 Connect the SSTs (Engine Signal Monitor and Adapter Harness) to the ECU as shown.





3. Place the SST (Sheet) on the Engine Signal Monitor.

4. Measure the voltage at each terminal.

(Refer to pages F-114 to F-119.)
5. If any ECU terminal voltage is incorrect, check the related input or output devices and wiring. If no problem is found, replace the ECU. (Refer to above.)

Caution

· Never apply voltage to SST terminals A and B.

Terminal voltage (reference data)

erminal	Input	Output	Connection to	Test	condition	Correct voltage	Remark
1A	-	va te	Battery	Constant		Battery voltage	For backup
1B O Main relay		Main relay		Approx. 0V			
No.			(FUEL INJ relay)	Ignition switch	ON	Battery voltage	
1C	0		Ignition switch	While cranking	- Commercial Commercia	Approx. 10V	
0.00			(ŠTART)	Ignition switch ON		Approx. 0V	
1D		0	Self-Diagnosis Checker (Monitor lamp)	Test switch at "SEI Lamp illuminated for switch OFF→ON	_F-TEST'' or 3-sec after ignition	Approx. 5V	With Self- Diagnosis Check er and System
	e au	Feetler		Lamp not illuminate	ed after 3 sec.	Battery voltage	Selector
				Test switch at "O2 Monitor lamp illumi	MONITOR" at idle	Approx. 5V	
				Test switch at "O2 Monitor lamp not il		Battery voltage	
1E		-	200 0				
1F		0	Self-Diagnosis Checker	Buzzer sounded fo switch OFF→ON	r 3 sec. after ignition	Below 2.5V	With Self- Diagnosis
			(Code Number)	Buzzer not sounde	d after 3 sec.	Battery voltage	Checker and System Selecto
	1		Buzzer sounded		Below 2.5V	With System	
				Buzzer not sounde	d	Battery voltage	Selector test switch at "SELF-TEST"
1G			O Igniter Ignition			Approx. 0V	
10			(in distributor)	Idle		Approx. 0.5V	-
1H	_	-					8 0-8
11		0	Circuit opening		OFF	Approx. 0V	
:EU		relay		ON	Battery voltage		
			00000	Ignition switch	START	Below 1.0V)
					ON (at idle)		
1J		0	A/C relay	Ignition switch ON	A PARTIE OF THE	Battery voltage	
			, ,,,,,,,,		A/C ON	Below 2.5V	<u> </u>
				Idle	A/C OFF	Battery voltage	
1K	0		Diagnosis connector	System Selector tes	Manager Attorney	Battery voltage	
			(TEN terminal)	System Selector ter	st switch at	Below 1.0V	1,000
1L	-	72 	-	1720	-	1.000	-
1M	0		Speed sensor	Ignition switch ON		Approx. 0V or 5V	_
1N	_	-			<u>- 1</u>	1-	_
10	0		Stoplight switch	Brake pedal releas		Below 1.0V	
				The state of the s		Battery voltage	
1P	0		P/S pressure	Ignition switch ON		Battery voltage	
				P/S ON at idle		Below 1.0V	8
				P/S OFF at idle		Battery voltage	
	[n			1	nn –		
	1	2 Y 2W	20 25 20 20 20 20 20 20 20 20 20 20 20 20 20	K212G2E 2C 2.	À IUISIQIOIM	IKILIGIELI	CIA
		2Z 2X					

Incorre	ect voltage	Possible cause							
Always 0V		ROOM 10A fuse burned Open circuit in wiring from ROOM 10A fuse to ECU terminal 1A							
Always 0V	hit was 1	 Main relay malfunction (Refer to page F-124) Open or short circuit in wiring from main relay to ECU terminal 1B 							
Always 0V (Starter	turns)	 Open or short circuit in wiring from ignition switch (MTX), or inhibitor switch (ATX) to ECU terminal 1C 							
Always 0V		 Main relay (FUEL INJ relay) malfunction (Refer to page F-124) Open circuit in wiring from main relay to diagnosis connector terminal +B Open or short circuit in wiring from diagnosis connector terminal MEN to ECU terminal 1D 							
Always battery volta	age	Poor connection at ECU connector ECU malfunction							
Always approx. 5V		ECU malfunction							
Always below	- No display on Self-	Main relay (FUEL INJ relay) malfunction (Refer to page F-124)							
2.5V	Diagnosis Checker	Open circuit in wiring from main relay to diagnosis connector terminal +B							
	"88" displayed and buzzer sounds con- tinuously	Open or short circuit in wiring from diagnosis connector terminal FEN ECU terminal 1F							
Always Battery volt	age	Poor connection at ECU connector ECU malfunction							
Always 0V	of a most in	Short circuit in wiring from igniter to ECU terminal 1G							
	-								
Always 0V		 Main relay (FUEL INJ relay) malfunction (Refer to page F-124) Poor connection at ECU connector Open circuit in wiring from circuit opening relay to ECU terminal 11 							
Always 0V		Open circuit in wiring from A/C relay to ECU terminal 1J							
Always below 1.0V	1 12 1	Short circuit in wiring from diagnosis connector terminal TEN to ECU terminal 1K							
Always battery volta		Open circuit in wiring from diagnosis connector terminal TEN to ECU terminal 1K Open circuit in wiring from diagnosis connector terminal GND to ground							
Always 0V or Appr	ox. 5V	Open or short circuit in wiring from speed switch (Section T) to ECU terminal 1M							
Always below 1.0V	(stoplights OK)	Open circuit in wiring from stoplight switch to ECU terminal 10							
Always below 1.0V		P/S pressure switch malfunction (Refer to page F-125) Short circuit in wiring from P/S pressure switch ECU terminal 1P ECU malfunction							
Always battery volta	age	 P/S pressure switch malfunction (Refer to page F-125) Open circuit in wiring from P/S pressure switch to ECU terminal 1P Open circuit in wiring from P/S pressure switch to ground 							

CONTROL SYSTEM

Terminal	Input	Output	Connection to	Test c	ondition	Correct voltage	Remark		
1Q	0		A/C switch	Ignition switch ON	A/C SW ON and blower control SW ON	Below 1.0V			
		LO III s		managadina ji	A/C SW OFF	Battery voltage			
1R	0		Water thermo switch	Cooling fan operatin temperature over 97 nosis connector tern	°C (207°F) or diag-	Below 1.0V			
				Fan not operating (in	dle)	Battery voltage			
1S	0		Blower control	Blower control switc	n OFF	Battery voltage	Ignition switch		
			switch	Blower control switc	n ON	Below 1.0V	ON		
1T	0		Rear window	Rear window defros	ter switch OFF	Below 1.0V	Ignition switch		
			defroster switch	Rear window defros		Battery voltage	ON		
10	0		Headlight switch	Headlights ON		Battery voltage			
				Headlights OFF		Below 1.0V			
1V	0		Neutral/Clutch switches (MTX)	Neutral position or of depressed	lutch pedal	Below 1.0V			
			me	Others		Battery voltage			
			S Proposition of	no mail community					
		Inhibitor switch (ATX)		N or P range		Below 1.0V			
		pr. Ti	ng w word rosen	Others		Battery voltage	90		
2A	-		Ground (Injector)	Constant		OV	-		
2B	-	-	Ground (Output)	Constant		OV			
2C	25.00	-	Ground (CPU)	Constant		OV			
2D	_	-	Ground (Input)	Constant		OV			
2E	0		Crank angle sensor (in distributor)	Ignition switch ON		Approx. 0V or 5V			
		132.0	(Ne-signal)	Idle	STEET STEET	Approx. 2V			
2F	-	2-3							
2G	100=21	T -		als gentar en au		-			
2H	<u> </u>	_	_	2					
21	(111)	-				= 4	emilie alime		
2J	12-21	-	Ground	MTX		Below 1.0V			
			Open	ATX		Battery voltage			
2K	0		Throttle sensor/EC- AT control unit (ATX)	Constant		Approx. 5V			
2L	_	_		Maria W					

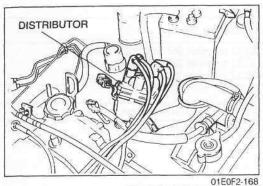
			5		v			1					1					S		1		_		_	_
2 Y	2W	2U	2 S	2 Q	20	2M	2K	2 1	2 G	2 E	2 C	2A	11	1	S	1 Q	10	1M	1K	11	1 G	1 E	11		1
2 Z	2X	2V	2 T	2R	2 P	2 N	2 L	2 J	2 H	2 F	2D	2 A 2 B	1 V	1	Т	1R	1 P	1 N	1L	1J	1 H	1 F	11		1

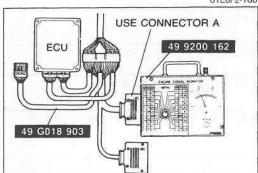
Inco	rrect voltage	Possible cause				
Always 0V	YELL THE MAY	Open circuit in wiring from A/C switch to ECU terminal 1Q				
Always battery v	oltage	A/C switch malfunction (Refer to Section U)				
Always below 1.0 (electric cooling to		Open or short circuit in wiring from fan relay to ECU terminal 1R ECU malfunction				
Always below 1.0	OV (blower fan OK)	Short circuit in wiring from blower control switch to ECU terminal 1S Poor connection at ECU connector ECU malfunction				
Always battery vo	oltage (blower fan OK)	Open circuit in wiring from blower control switch to ECU terminal 1S				
Always below 1.0V	Illumination lamp ON when rear window defroster switch ON	Open or short circuit in wiring from rear window defroster switch to ECU terminal 1T				
	Illumination lamp never ON	 Open circuit in wiring from ignition switch to rear window defroster switch Rear window defroster switch malfunction (Refer to Section T) 				
Always below 1.0	V (Headlights OK)	Open or short circuit in wiring from headlight relay to ECU terminal 1U				
Always below 1.0	V	 Neutral switch malfunction (Refer to page F-125) Clutch switch malfunction (Refer to page F-124) Short circuit in wiring from ECU terminal 1V to neutral or clutch switch 				
Always approx. 1	2V	 Neutral switch malfunction (Refer to page F-125) Clutch switch malfunction (Refer to page F-124) Open circuit in wiring from ECU terminal 1V to neutral or clutch switch Poor connection at ECU connector 				
Always below 1.0	V	 Inhibitor switch malfunction (Refer to Section K) Short circuit wiring from inhibitor switch to ECU terminal 1V 				
Always approx. 1	2V	 Inhibitor switch malfunction (Refer to Section K) Open circuit in wiring from inhibitor switch to ECU terminal 1V 				
Above 0V		 Poor contact at ground terminal Open circuit in wiring from ECU to ground 				
Always approx. 0	V or approx. 2V	Refer to Troubleshooting, Code No.02 (Refer to page F-70)				
	CONTRACT SOL					
Always battery vo	ltage	Open circuit wiring from to ground				
L. L. Hijite						
Always 0V		Short circuit in wiring from ECU terminal 2K to throttle sensor EC-AT ounit (ATX), or in airflow sensor Poor connection at ECU connector ECU malfunction				
		ECU malfunction				

erminal	Input	Output	Connection to	Test c	ondition	Correct voltage	Remark	
21/	0		Throttle sensor EC-	Accelerator pedal re	eleased	Approx. 0.5V	19.	
ZIVI			AT control unit (ATX)	Accelerator pedal fu		Approx. 4.2V	<u> </u>	
2N	0		Oxygen sensor	Ignition switch ON		OV		
214		- 03	J., 9-11	Idle (cold engine)		OV		
				Idle (after warm-up)		0-0.1V		
			of About Known by	Increasing engine s	peed (after warm-up)	0.5—1.0V		
				Deceleration		0-0.4V		
20	0		Airflow sensor	Ignition switch ON		Approx. 0.4V		
20			(positive)	Idle		Approx. 1.2V		
2P		0	Airflow sensor (negative)	Constant		OV	>=	
2Q	0		Water thermo-	Engine coolant tem	perature 20°C (68°F)	Approx. 2.5V	2 <u>2.00</u>	
200		Trained in	sensor	After warm-up		Below 0.5V		
2R		0	Air bypass sole- noid valve ®	Engine cranking an cranking	d few seconds after	Approx. 2.3V	_	
				Other condition		Battery voltage		
2S		-					0 200	
2T		0	Air bypass sole-	Accessory ON		Below 1.0V		
			noid valve (A)	Others condition		Battery voltage		
2U	0	-	Injector (negative)	Constant		OV		
2V		0	Injector (positive)	Ignition switch ON		OV	Engine Signal	
				Idle		Below 1.0V	Monitor: Greer and red lamps flash	
2W		0	Air bypass sole-	THE STATE OF THE S	OFF	Approx. 2.3V	Name of the last o	
200			noid valve ©	A/C switch	ON	Battery voltage	_	
2X		0	Solenoid valve	Ignition switch ON		Battery voltage		
21			(purge control)	Idle		Battery voltage	_	
2Y		0	Main relay	est sentendern.	OFF	OV		
21			Wall Toldy	Ignition switch	ON	Approx. 12V		
2Z		0	EC-AT control unit (ATX)	Engine coolant ten (158°F) at idle	nperature below 70°C	Below 1.0V		
	(^1/)			nperature above 70°C	Battery voltage			

CONTROL SYSTEM

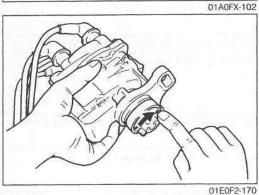
Incorrect voltage	Possible cause
Always constant	 Open circuit in wiring from ECU terminal 2M to throttle sensor Open circuit in wiring from ECU terminal 2K to throttle sensor Open circuit in wiring from ECU terminal 2D to throttle sensor
Always above 1V	Throttle sensor misadjustment
0V after warm-up	 Refer to Troubleshooting, Code No.15 (Refer to page F–74)
Always approx. 1V after warm-up	Refer to Troubleshooting, Code No.17 (Refer to page F-75)
Always approx. 0V or approx. 5V	Refer to Troubleshooting, Code No.08 (Refer to page F-71)
Always 0V	Open circuit in wiring from ECU terminal 2P to airflow sensor
Always approx. 0V or approx. 5V	Refer to Troubleshooting, Code No.09 (Refer to page F-72)
Always 0V	Refer to Troubleshooting, Code No.35 (Refer to page F-78)
Always 0V	Refer to Troubleshooting, Code No.34 (Refer to page F–78)
Always 0V	Open or short circuit in wiring from injector to ECU terminal 2V
Always 0V	Open circuit in wiring from injector to ECU terminal 2V
Always 0V	Open or short circuit in wiring from ECU terminal 2W to air bypass solenoid valve ©
Always approx. 0V or approx. 12V	Refer to Troubleshooting, Code No.26 (Refer to page F-77)
Always 0V	Open circuit in wiring from main relay to ECU terminal 2Y
Always approx. 0V or approx. 12V	Open or short circuit in wiring from ECU terminal 2Z to EC-AT control unit terminal 1N

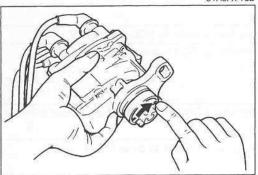






- 1. Remove the distributor. (Refer to Section G.)
- 2. Connect the distributor connector as shown in the figure.
- 3. Connect the high-tension lead.
- 4. Turn the ignition switch ON.
- 5. Connect the SSTs (Engine Signal Monitor and Adapter) to the ECU as shown.
- 6. Set the SSTs (Engine Signal Monitor and Adapter) terminal 2E.





7. Rotate the distributor drive by hand and measure the output voltage.

Specification

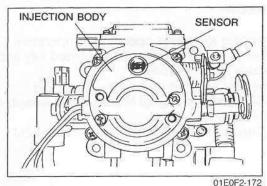
Terminal	Test condition	Voltage	
2E	Rotate distributor one full turn	Approx. 5V (4 pulses)	

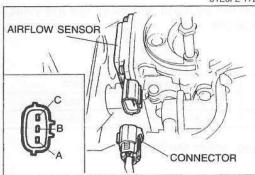
- 8. After the inspection, install the distributor. (Refer to Section G.)
- 9. Start the engine and adjust the ignition timing. (Refer to page F-63.)

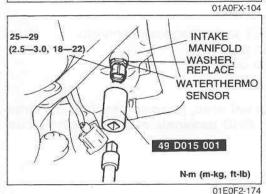
Ignition timing: BTDC 16 ± 1°

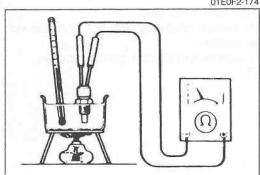
10. Tighten the distributor lock bolts to the specified torque.

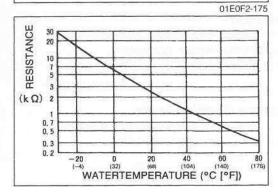
Tightening torque: 16-23 N·m (1.6-2.3 m-kg, 12-16 ft-lb)











AIRFLOW SENSOR (BYPASS HOT-WIRE TYPE) Inspection

- 1. Remove the air cleaner.
- 2. Visually check for an open circuit of the airflow sensor hot wire.
- 3. Check the airflow sensor body for cracks.
- 4. Disconnect the airflow sensor connector.
- 5. Using an ohmmeter, measure resistance between the terminals.

Specification

Terminal	Resistance (20°C [68°F]	
A → B	$4 \pm 1 \text{ k}\Omega$	
A → C	∞	
B → C	∞	

Removal / Installation

Refer to page F-84.

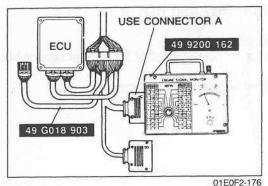
WATER THERMOSENSOR Removal

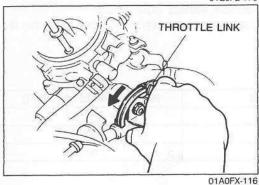
- 1. Disconnect the water thermosensor connector.
- 2. Remove the water thermosensor using the SST.

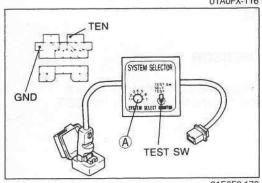
Inspection

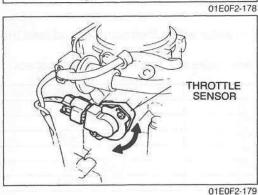
- 1. Place the sensor in water with a thermometer and heat the water gradually.
- 2. Using an ohmmeter, measure resistance of the sensor.

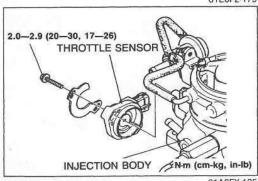
Coolant	Resistance (kΩ)
-20°C (-4°F)	14.6 —17.8
0°C (32°F)	5.2 — 6.5
20°C (68°F)	2.21— 2.69
40°C (104°F)	1.0 — 1.3
60°C (140°F)	0.50— 0.65
80°C (176°F)	0.29— 0.354











01A0FX-105

THROTTLE SENSOR Inspection

- 1. Warm up the engine to normal operating temperature.
- 2. Verify that the thermowax unit rod extends outward fully and the cam separates from the roller.
- 3. Stop the engine and turn the ignition switch to ON.
- Connect the SSTs (Engine Signal Monitor and Adapter Harness) to the ECU as shown.
- 5. Set the SST (Engine Signal Monitor) to terminal 2M.
- 6. Rotate the throttle link by hand and verify that the voltage is within specifications.

Specification

FOU T	Throttle val	ve condition
ECU Terminal	Fully closed	Fully open
2M	0.30-0.80V	4.14—4.46V

7. If not as specified, adjust the throttle sensor.

Adjustment

- 1. Connect the SST to the diagnosis connector.
- 2. Set switch (A) to position 1.
- 3. Set TEST SW to SELF-TEST.

Note

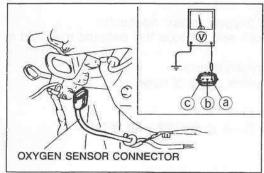
- If the SST is not used, jump across the TEN terminal and the GND terminals of the diagnosis connector.
- 4. Loosen the throttle sensor screws.
- 5. Rotate the throttle sensor gradually and until that the voltage is within specification.
- 6. After adjustment, tighten the throttle sensor screws.
- 7. Remove the SST.

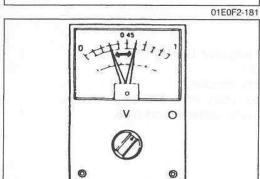
Removal / Installation

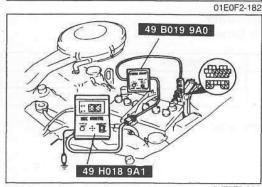
- 1. Turn the ignition switch OFF.
- 2. Disconnect the throttle sensor connector.
- 3. Remove the throttle sensor.

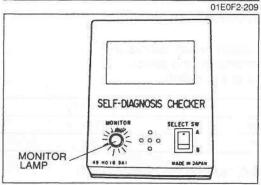
Caution

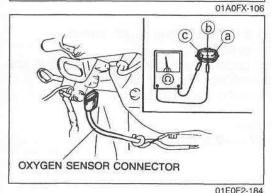
- · Do not drop the throttle sensor.
- 4. Adjust the throttle sensor after installation. (Refer to page F–122.)











OXYGEN SENSOR

Inspection of Terminal Voltage

- 1. Warm up the engine to normal operating temperature and run it at idle.
- 2. Disconnect the oxygen sensor connector.
- Connect a voltmeter between the oxygen sensor and a ground.
- 4. Measure the voltage while increasing and decreasing the engine speed suddenly several times.

Specification

Engine condition	Voltage (V)
While deceleration	Below 0.4
While acceleration	Above 0.5

5. Replace the oxygen sensor if not as specified.

Inspection of Sensitivity

- 1. Warm up the engine to normal operating temperature.
- Connect the SSTs (System Selector and Self-Diagnosis Checker) to the diagnosis connector as shown.
- 3. Set switch (A) to position 1.
- 4. Set TEST SW to O2 MONITOR.
- Increase the engine speed to between 2,000 and 3,000 rpm, and verify that the monitor lamp flashes for 10 sec..
 If not as specified, replace the oxygen sensor.
 (Refer to page F-124.)

Monitor lamp: Flashes more than 8 times/10 seconds

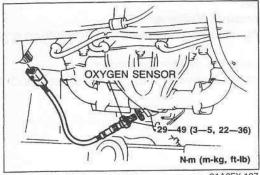
6. Replace the oxygen sensor if not as specified.

Inspection of Heater

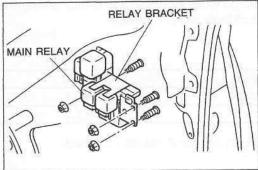
1. Measure resistance between terminals © and (b).

Resistance: 6Ω (20°C [68°F])

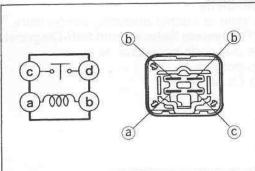
2. Replace the heater if not as specified.



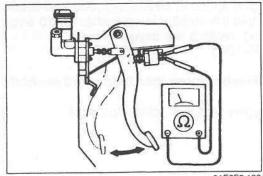
01A0FX-107



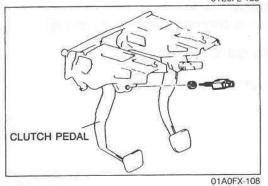
01E0F2-186



01E0F2-187



01E0F2-188



F-124

Replacement

- 1. Disconnect the oxygen sensor connector.
- 2. Remove the bolts and remove the exhaust manifold insulator.
- 3. Remove the oxygen sensor.
- 4. Install in the reverse order of removal.

Tightening torque:

29-49 N·m (3-5 m-kg, 22-36 ft-lb)

MAIN RELAY

Replacement

- 1. Disconnect the negative battery terminal.
- 2. Remove the ECU.
- 3. Remove the relay bracket.
- 4. Remove the main relay from the relay bracket.
- 5. Install in the reverse order of removal.

Inspection of Continuity

1. Check continuity between terminals © and @.

Terminals	Apply 12V	Continuity
0 0	Yes	Yes
(a) ↔ (b)	No	No

2. Replace the main relay if necessary.

CLUTCH SWITCH (MTX)

Inspection

- 1. Disconnect the clutch switch connector.
- 2. Connect an ohmmeter to the switch.
- 3. Check continuity of the switch.

Pedal	Continuity	
Depressed	Yes	
Released	No	

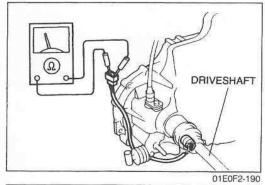
4. If not as specified, replace the clutch switch.

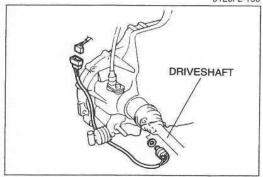
Replacement

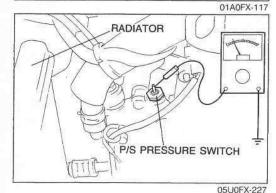
- 1. Loosen the nuts and remove the clutch switch.
- 2. Install the clutch switch.
- 3. Adjust the clutch pedal height referring to the above and the height specifications. (Refer to Section H.)
- 4. Tighten the nuts to the specified torque.

Tightening torque:

20-25 N·m (2.0-2.5 m-kg, 14-18 ft-lb)







NEUTRAL SWITCH (MTX) Inspection

- 1. Disconnect the neutral switch connector shown in the figure.
- 2. Connect an ohmmeter to the switch.
- 3. Check continuity of the switch.

Transaxle	Continuity
Neutral	Yes
Other ranges	No

4. If not as specified, replace the neutral switch.

Replacement

- 1. Disconnect the neutral switch connector.
- 2. Remove the bracket.
- 3. Remove the neutral switch.
- 4. Install in the reverse order of removal.

Tightening torque: 20—29 N·m (2.0—3.0 m-kg, 14—22 ft-lb)

POWER STEERING PRESSURE SWITCH Inspection

- 1. Disconnect the P/S pressure switch connector.
- 2. Connect an ohmmeter to the switch.
- 3. Start the engine and let it idle. Check continuity of the switch while turning the steering wheel.

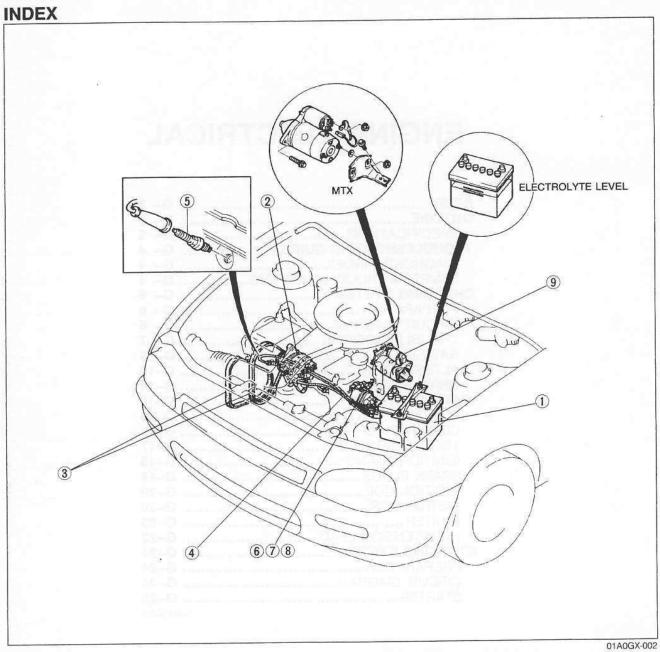
P/S	Continuity
Turning	Yes
Not turning	No

4. If not as specified, replace the P/S pressure switch.

ENGINE ELECTRICAL

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6. Ignition coil (in the distributor) Inspection	page	G-20
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OUTLINE

SPECIFICATIONS

Item		B3		
iteili	Voltage	V	12 34B19L-S (33AH)	
Battery	Type and capacity	(20-hour rate)		
Dark current		mA l	Max. 20	
	Туре		A.C.	
	Output	V-A	12-65	
	Regulator type		Transistorized (built-in IC regulator)	
A 4.	Regulated voltage	V	14.1—14.7	
Alternator	2 11 4 4	Standard	25 (0.98)	
	Brush length mm (in)	Minimum	6 (0.24)	
	Drive belt deflection	New	5.5—7.0 (0.21—0.27)	
	mm (in)/98 N, 10 kg, 22 lb	Used	6.0-7.5 (0.23-0.29)	
	Туре		Direct	
Starter	Output	V-kW	12-0.85···(MTX) 12-0.95···(ATX)	
		Standard	17 (0.65)	
	Brush length mm (in)	Minimum	11 5 (0.45)	
Distributor	Spark advance type		ESA	
Ignition timin (TEN termina	g al of diagnosis connector ground)	BTDC	16 ± 1°	
r 10 or	D	Primary coil winding	0.68—0.84Ω	
Ignition coil	Resistance (20°C [68°F])	Secondary coil winding	9.6—14.4kΩ	
Spark plug	and the second	NGK	BKR5E-11* BKR6E-11	
	Туре	NIPPONDENSO	K16PR-U11* K20PR-U11	
	Plug gap	mm (in)	1.0—1.1 (0.039—0 043)	
Firing order			1-3-4-2	

^{* .} standard plug

TROUBLESHOOTING GUIDE

DIAGNOSTIC INDEX

No.	Troubleshooting items	Page
1	Will not crank—starter motor does not operate	G- 4
2	Will not crank—starter motor spins	G- 4
3	Cranks slowly	G- 5
4	Alternator warning lamp illuminates while engine running	G- 5
5	Discharged battery	G- 5
6	Misfire	G-17
О	Misure	01A0G

SYMPTOM TROUBLESHOOTING

1	Will not crank—	motor does not operate		
STEP	INSPECTION	ACTION		
1	Does engine crank with fully charged battery?	Yes	Check charging system	□ page G-7
		No	Go to next step	
2	Is battery voltage present at terminal B? TERMINAL B		Go to next step	
		No	Check wiring harness	
3	Is battery voltage present at terminal S with ignition switch in START position?	Yes	Check magnetic switch Check field coil Check armature	□ page G–29 □ page G–30 □ page G–31
	TERMINAL S	No	Check inhibitor switch (ATX) Check ignition switch Check wiring harness	Section K

01A0GX-004

2	Will not crank—starter motor spins				
STEP 1	INSPECTION	ACTION			
	Is drive pinion pushed out while cranking (click is heard when pushed out)?	Yes	Remove starter and check flywheel ring gear teeth and starter drive pinion teeth		
		No	Check magnetic switch	☞ page G-29	

01A0GX-005

3	Cranks slowly					
STEP	INSPECTION	ACTION				
1	Does engine crank normally with fully charged battery?	Yes	Check charging system	□ page G-7		
		No	Go to next step	EST WATER		
2	Are starter cable connections loose or corroded?	Yes	Repair or replace connection			
		No	Check starter for binding (such as brush and armature.)	COUNT TRANS		

01E0GX-006

4	Alternator warning lamp illuminates while engine running				
STEP	INSPECTION		ACTION		
1	Is battery voltage correct at idle? Specification: 14.1—14.7V	Yes	Check wiring harness between alter tor L terminal and alternator warnin lamp	rna- g	
	errica de la companya della companya	No	Check charging system		

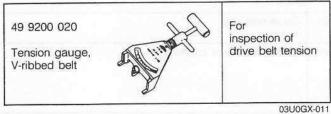
01E0GX-007

5	Discharged battery				
STEP	INSPECTION	ACTION			
1	Check charging system; is it OK?	Yes	Turn ignition switch ON and measure dark current as shown		
			Dork outroot: Polow 20mA		
2			Dark current: Below 20mA		
		No	Repair or replace parts as necessary		

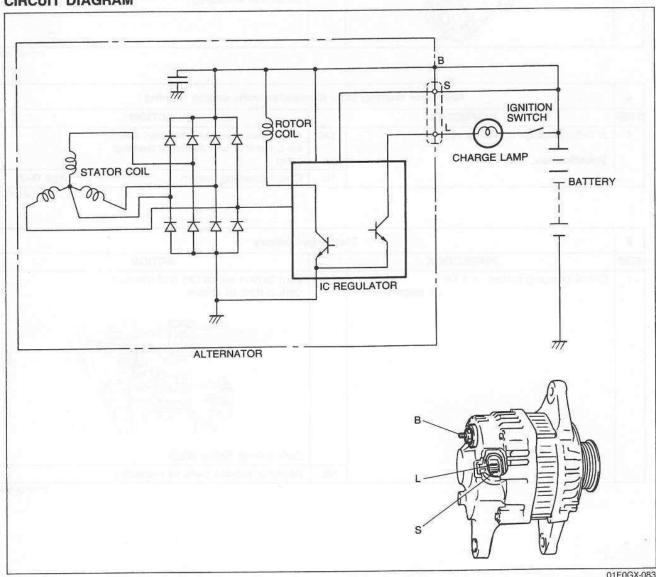
01E0GX-008

CHARGING SYSTEM

PREPARATION SST



CIRCUIT DIAGRAM



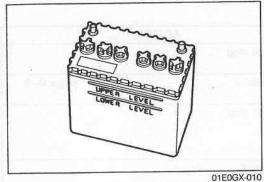
The alternator has a self-diagnostic function to warn of the following problems in the charging system. If a problem arises, the alternator warning lamp illuminates.

- Terminal S circuit open
 No voltage output
- 3. Field coil circuit open
- 4. Terminal B circuit open
- 5. Voltage output too high

G-6

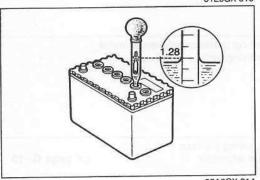
TROUBLESHOOTING

STEP		INSPECTION	NC		ACTION	
1	Check battery v	oltage; is it corre	ct?	Yes	Go to next step	
	Specification:	Above 12.4V		No	Check battery	□ page G–8
2 Start engine; does alternator warning lamp go out?		Yes	Go to next step			
	CHANGE		No	Go to Step 4		
3	Is voltage at alto Specification:	3.50			Check wiring harness between ter L and warning lamp	rminal
	B L S	Ign: ON (V) Approx. 12 Approx. 1 Approx. 12	Idle (V) 14.1—14.7 14.1—14.7 14.1—14.7			
	E L S		0	No	Check wiring harness Replace alternator	□ page G-10
4	 Connect an ammeter (70A min) between terminal B and harness Start engine Turn all electrical loads ON and depress brake pedal Is output current 65A or more at 2,500—3,000 rpm? 		Yes	Charging system normal	egrent's mind	
	Caution • Do not ground terminal B				10 Th Jacobs	
				No	Go to next step	9000 places
5	Is drive belt tension OK? N (kg, lb)			Yes	Replace alternator	⊏ page G-10
	Drive belt	New 451—785	Used 392—588			
	Alternator A/C and P/S	(46—80, 101—176) 491—589 (50—60,	(40—60, 88—132) 422—491 (43—50,	No	Adjust drive belt tension Replace drive belt	
	A/C and F/S	110—132)	95—110)			



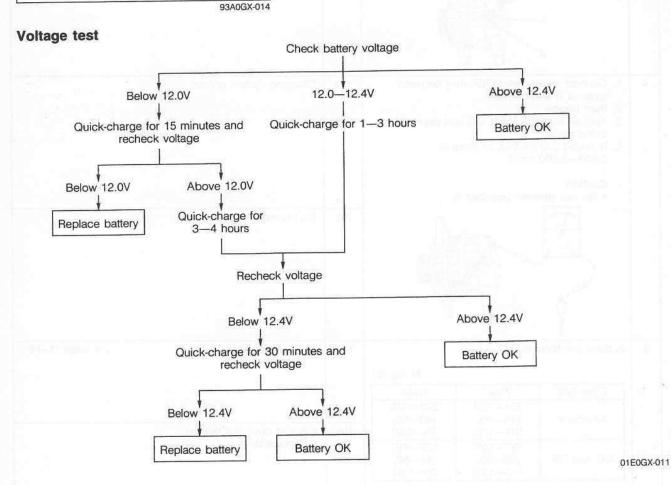
BATTERY Inspection Electrolyte level

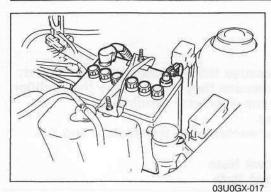
- Check if the electrolyte level lies between the upper and lower lines.
- 2. If low, add distilled water; do not overfill.



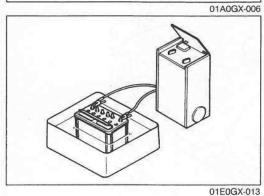
Specific gravity of electrolyteMeasure the specific gravity with a hydrometer.

Specification: 1.27-1.29 (at 20°C [68°F])





1.28 LINE 1.24 OK BECHARGING 40 (164) 80 (176) TEMPERATURE (°C[°F])



Terminal and cable

- Check the tightness of the terminals to ensure good electrical connections.
- 2. Check for corroded or frayed battery cables.
- 3. Check the rubber protector on the positive terminal for proper coverage.
- 4. Clean the terminals if necessary, and coat them with grease.

Recharging

Battery	Slow charge (A)	Quick charge (A)
34B19L-S	Under 3	Max. 20

Slow-charging

It is not necessary to remove the vent caps.

Quick-charging

Remove the battery from the vehicle and remove the vent caps.

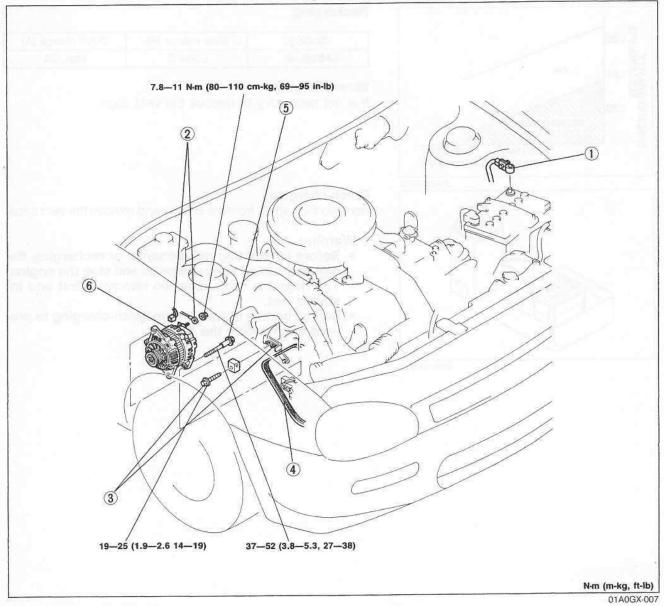
Warning

- Before performing maintenance or recharging the battery, turn off all accessories and stop the engine.
- The negative cable must be removed first and installed last.
- Set the battery in water when quick-charging to prevent overheating the battery.

ALTERNATOR Removal / Installation

Caution

- Be sure the battery connections are not reversed because this will damage the rectifier.
- Do not use high-voltage testers such as a megger because they will damage the rectifier.
- Remember that battery voltage is always present at the alternator terminal B.
- Do not ground terminal L while the engine is running.
- Do not start the engine while the connector is disconnected from terminals L and S.
- 1. Remove in the order shown in the figure, referring to Removal Note.
- 2. Install in the reverse order of removal, referring to Installation Note.



1. Negative battery cable

2. Connector

3. Mounting bolt, adjust nut

4. Drive belt

TIVE DEIL	
Inspection	page G-14
Adjustment	page G-14
Replacement	

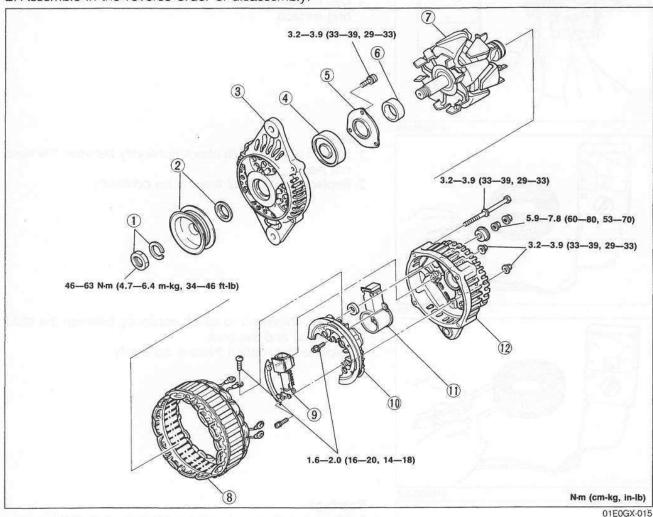
- 5. Mounting bolt
- 6. Alternator

Disassembly / Assembly...... page G-11 Inspection...... page G-12

Removal / Installation Note

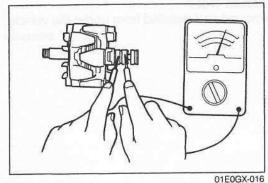
The alternator is removed and installed from under the vehicle. 01E0GX-094

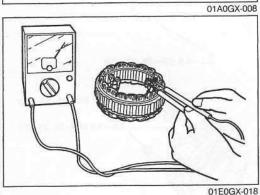
- **Disassembly / Assembly**1. Disassemble in the order shown in the figure.
- 2. Assemble in the reverse order of disassembly.

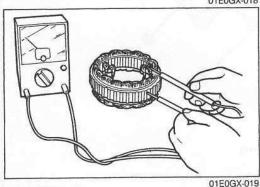


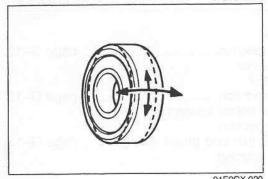
1. Nut set			
2. Pulley set			
3. Front cover			
4. Bearing			
Inspection		page	G-12
Retainer			
Spacer			
7. Rotor			
Inspection	***************************************	page	G-12

	OTEOGX-OT
8. Stator	maga C 11
Inspection	page G-1
9. Regulator	
10. Rectifier	
Inspection	page G-13
11. Brush holder assembly	
Inspection	
(Brush and brush spring)	page G-13
12. Rear bracket	The Control of the Co









01E0GX-020

Inspection Rotor

1. Use an ohmmeter to measure the resistance between the slip rings.

Specification: 2.4-2.90 (at 20°C [68°F])

- 2. If not within specification, replace the rotor.
- 3. (1) Use an ohmmeter to check continuity between each slip ring and the core.
 - (2) Replace the rotor if there is continuity.
- 4. Use fine sandpaper to smooth any roughness on the slip ring surface.

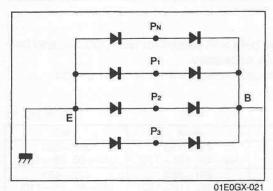
Stator

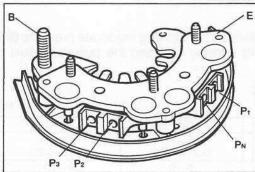
- 1. Use an ohmmeter to check continuity between the stator coil leads.
- 2. Replace the stator if there is no continuity.

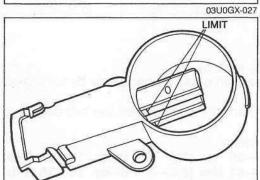
- 3. Use an ohmmeter to check continuity between the stator coil leads and the core.
- 4. Replace the stator if there is continuity.

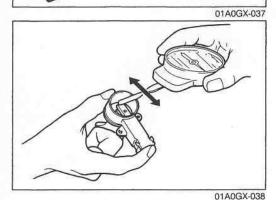
Bearings

- 1. Check for abnormal noise, looseness, and sticking.
- 2. Replace the bearing(s) if necessary.









Rectifier

Caution

- Don't use megger tester to prevent the rectifier from breaking down.
- 1. Use an **analog** ohmmeter to check continuity of the diodes.

Negative	Positive	Continuity	
E	Dr. Do Do Du	Yes	
В	P1, P2, P3, PN	No	
P1, P2, P3, PN	E	No	
	В	Yes	

2. Replace the rectifier if necessary.

Brush

If a brush is worn almost to the limit or beyond, replace all the brushes.

Standard: 25.0mm (0.984 in) Minimum: 6.0mm (0.236 in)

Brush spring

- 1. Use a spring pressure gauge to measure the force of the brush spring.
- 2. Replace the spring if not within.

Standard force:

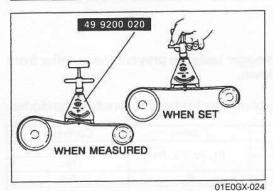
2.9-3.9 N (300-400 g, 10.6-14.1 oz)

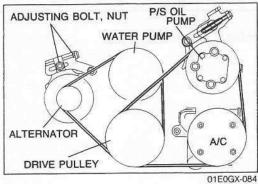
Minimum:

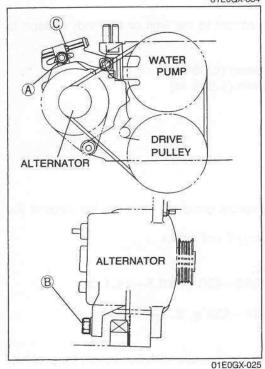
0.8—1.2 N (80—120 g, 2.8—4.2 oz)

Note

Read the spring pressure with the brush tip projecting 2mm (0.079 in).







DRIVE BELT Inspection

 Check the drive belts and pulleys for wear, cracks, and fraying. Replace as necessary.

2. Measure drive belt tension with a tension gauge.

Tension

N (kg, lb)

Drive belt	New	Used	
Alternator	451—785 (46—80, 101—176)	392—588 (40—60, 88—132)	
A/C and P/S	491—589 (50—60, 110—132)	422—491 (43—50, 95—110)	

Measure the deflection by applying moderate pressure (98 N, 10 kg, 22 lb) midway between the pulleys. Adjust if necessary.

Deflection

mm (in)

Drive belt	New	Used
Alternator	5.5—7.0 (0.21—0.28)	6.0—7.5 (0.23—0.30)
A/C and P/S	8—9 (0.31—0.35)	9—10 (0.35—0.39)

Adjustment

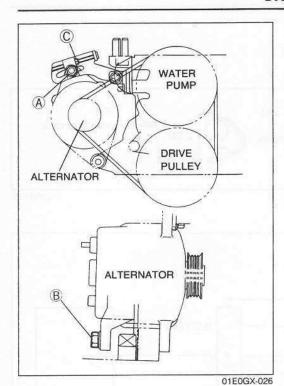
1. Loosen bolts (A) and (B).

Move the alternator in or out as necessary by turning adjusting nut ©.

3. Tighten bolts (A) and (B) and recheck the belt deflection.

Tightening torques

Bolt (a): 19-26 N·m (1.9-2.6 m-kg, 14-18 ft-lb) Bolt (B): 38-51 N·m (3.8-5.3 m-kg, 28-38 ft-lb)



Replacement

1. Remove the A/C and P/S drive belt, if equipped.

Note

- · Refer to B Section.
- 2. Loosen alternator bolts (A) and (B).
- 3. Remove the alternator belt.
- 4. Install the new alternator belt and adjust it to specifications.
- 5. Tighten all bolts to the specified torques.

Tightening torques
Mounting bolt:
38—51 N·m (3.8—5.3 m-kg, 28—38 ft-lb)
Adjusting bolt:
19—26 N·m (1.9—2.6 m-kg, 14—18 ft-lb)

6. Install the A/C and P/S drive belt if equipped, and adjust it to specification.

Note

· Refer to B Section.

IGNITION SYSTEM

PREPARATION SST



For self-diagnosis and inspection of ignition timing

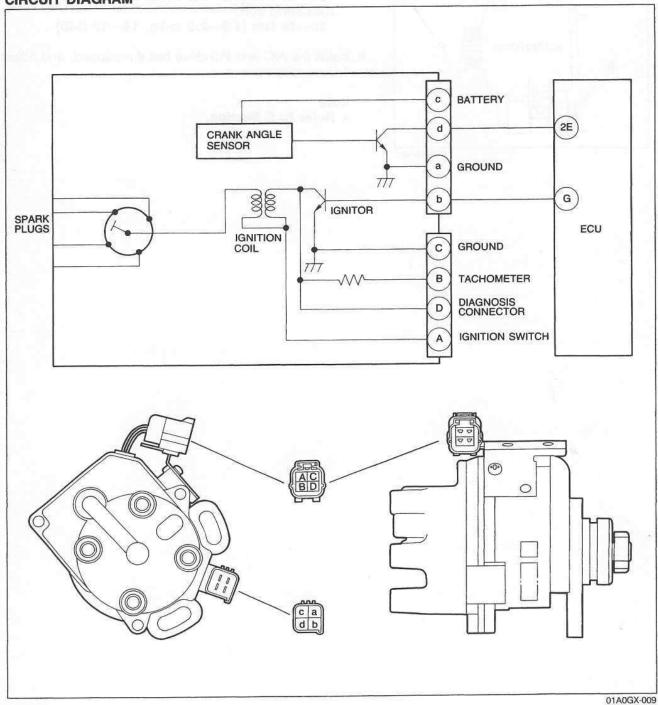
49 H018 9A1 Self-Diagnosis Checker



For self-diagnosis

01E0GX-027

CIRCUIT DIAGRAM

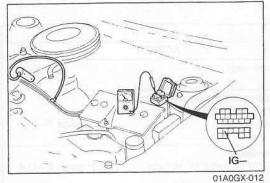


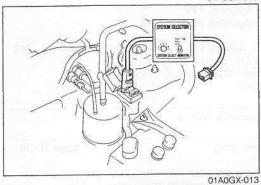
G-16

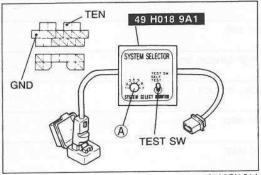
TROUBLESHOOTING

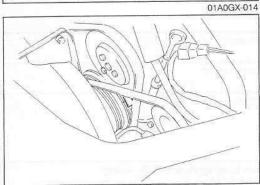
6	United that the ball of the second soll of	Mi	sfire	
TEP	INSPECTION	16 74 11	ACTION	
1	Is "00" displayed on Self-Diagnosis Checker with ignition switch ON?	Yes	Go to next step	
	page F-67	No	Malfunction code no. displayed Check for cause (Refer to specified check sequence)	□ page F–67
		BATTO	"88" flashes Check ECU terminal 1F voltage Voltage: Approx. 12V (Ignition switch ON)	☑ page F–114
	49 H018 9A1		 ⇒ If OK, replace ECU ⇒ If not OK, check wiring harness between ECU and Self-Diagnosis Checker 	page F-112
2	Remove spark plug; is there a strong blue spark while engine is cranking?	Yes	Ignition system is normal	
		No	Check spark plug	□ page G-20
31			If OK, Go to next step If not OK, clean or replace spark plug	
3	Is resistance of high-tension leads OK?	Yes	Go to next step	
10	Specification: 16 kΩ per 1m (3.28 ft) r page G-23	No	Replace high-tension leads	
4	Are there corrosion, damage or cracks on the distributor cap and rotor?	Yes	Replace cap or rotor	
	□ page G-23	No	Go to next step	
5	Is ignition coil normal?	Yes	Go to next step	
		No	Replace ignition coil	
6	Are distributor connector and ECU connector connected?	Yes	Go to next step	
		No	Connect connectors	
7	Measure voltage of (A) terminal (distributor top connector); is it correct? Voltage: Approx. 12V	Yes	Go to next step	
		No	Check main fuse, ignition switch, wiring harness, and ECU	
8	Is ECU normal? □ page F-112	Yes	Replace distributor	
	ettyrei per	No	Replace ECU	

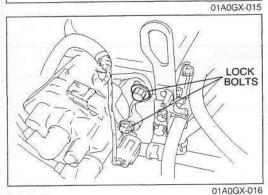
01A0GX-010











G-18

IGNITION TIMING Adjustment

- Warm up the engine to normal operating temperature and run it at idle (P range [ATX] or neutral [MTX]).
- 2. Turn all electrical loads OFF.
- 3. Turn the A/C switch OFF.
- Connect a test tachometer to the diagnosis connector IGterminal.
- 5. Connect the SST to the diagnosis connector.

Set switch A on the System Selector to position 1 and TEST SWITCH to SELF-TEST.

Note

- To create the test condition without using the System Selector, connect terminals TEN and GND of the diagnosis connector with a jumper wire.
- 7. Check the idle speed and set it to the specified speed if necessary.

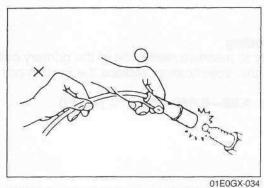
Idle speed: 600—650 rpm (MTX) 810—860 rpm (ATX)

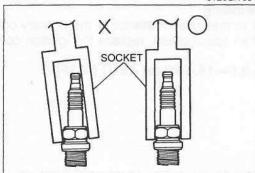
8. Check the ignition timing.

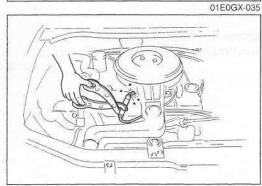
Specification: BTDC 16 ± 1°

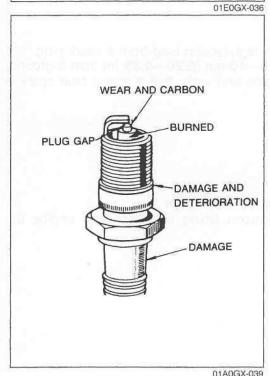
- If the ignition timing is not as specified, loosen the distributor lock bolts and turn the distributor to make the adjustment.
- 10. Tighten the distributor lock bolts to specified torque.

Tightening torque: 16—23 N·m (1.6—2.3 m-kg, 12—16 ft-lb)









SPARK PLUGS

Removal / Installation

1. Remove and install the high-tension leads carefully.

Caution

- When the spark plug lead is to be pulled off, pull on the boot itself, not the wire.
- 2. Remove and install the spark plug with a plug socket.

Caution

- Be sure the socket must be fit squarely over the spark plug.
- 3. Apply antiseize compound or molybdenum-based lubricant to the spark plug threads.
- 4. Tighten the spark plug to the specified torque.

Tightening torque: 15—23 N·m (1.5—2.3 m-kg, 11—17 ft-lb)

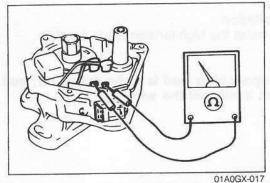
Inspection

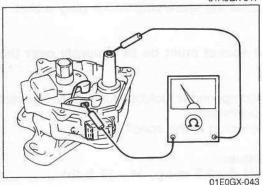
- 1. Remove the spark plug.
- 2. Connect the spark plug to a high-tension lead.
- 3. Hold the high-tension lead with insulated pliers **5—10mm (0.20—0.39 in)** from a ground.
- 4. Crank the engine and verify that there is a strong blue spark.

Note

- If there is no spark, replace the spark plug or hightension lead as necessary.
- 5. Check the following. If a problem is found, replace the spark plug.
 - Damaged insulation
 - Worn electrodes
 - Carbon deposits
 If cleaning is necessary, use a plug cleaner or a wire brush. Clean the upper insulator also
 - Damaged gasket
 - Burned condition

Plug gap: 1.0-1.1mm (0.039-0.043 in)





IGNITION COIL Inspection

Primary coil winding

Use an ohmmeter to measure resistance of the primary coil winding. If not within specification, replace the ignition coil.

Specification: 0.68—0.84Ω (at 20°C [68°F])

Secondary coil winding

Use an ohmmeter to measure resistance of the primary coil winding. If not within specification, replace the ignition coil.

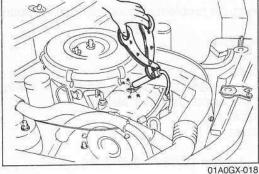
Specification: 9.6—14.4 kΩ (at 20°C [68°F])

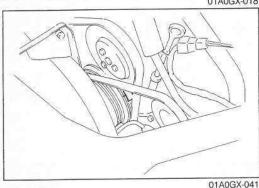
Replacement

1. Replace the distributor. (Refer to page G-21.)

2. Adjust the ignition timing. (Refer to page G-18.)

01A0GX-040





DISTRIBUTOR Spark Test

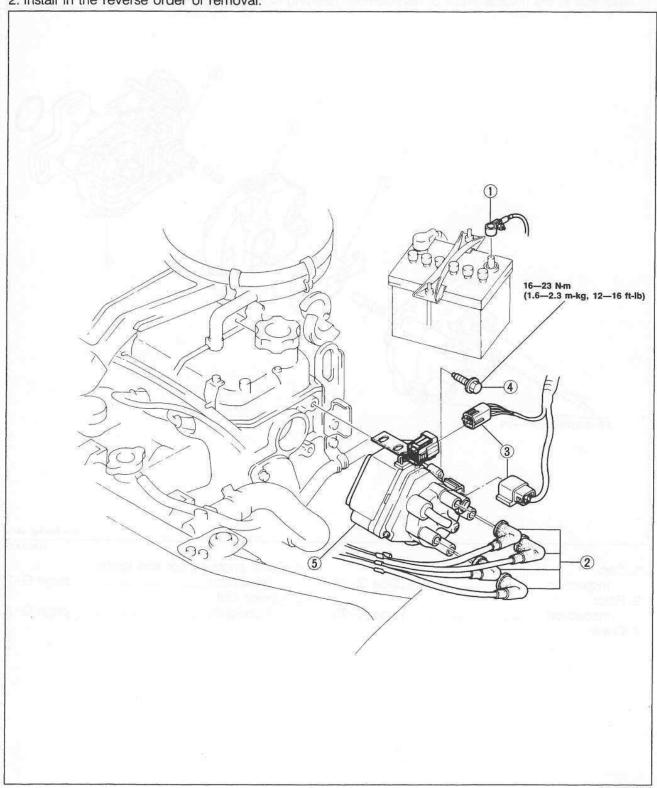
- 1. Disconnect the high-tension lead from a spark plug.
- 2. Hold the lead 5—10mm (0.20—0.39 in) from a ground.
- 3. Crank the engine and verify that a strong blue spark is visible.

Electronic Advance Inspection

Verify that the ignition timing advances with engine acceleration.

Removal / Installation

- Remove in the order shown in the figure.
 Install in the reverse order of removal.



01A0GX-019

1.	Negative	battery	cable
4200		F133	76.0

2. High-tension lead Inspection...... page G-23

3. Connector

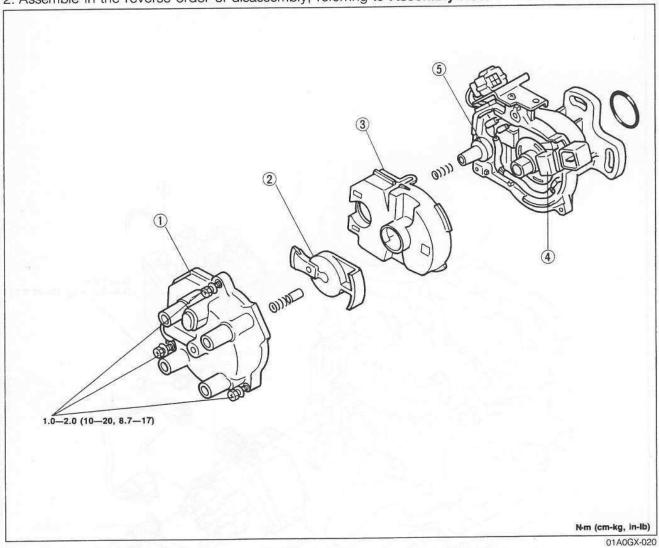
4.	Mounting	bolt
	Distribute a	

5. DISTributor		
Disassembly / Assembly	page	G-2
Inspection	page	G-2

Disassembly / Assembly

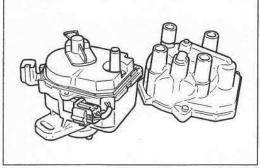
1. Disassemble in the order shown in the figure.

2. Assemble in the reverse order of disassembly, referring to Assembly Note.



1. Cap		4. Cran
Inspection	. page G-23	Ins
2. Rotor		Ignition
Inspection	. page G-23	Ins
3. Cover		

Crank angle sensor and igniter		
Inspection	page	G-23
5. Ignition coil		
Inspection	page	G-20



01E0GX-055

Inspection Cap and rotor

- 1. Check for corrosion, damage, and cracks.
- 2. Replace if necessary.

IGNITER Inspection

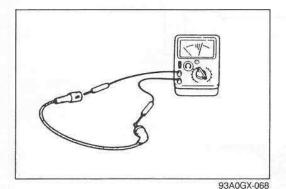
- 1. Check the ECU. (Refer to page F-112.)
- 2. Check the condition of the connector, distributor cap, rotor, ignition coil, and high-tension leads.
- 3. If all are normal but misfire still occurs, replace the igniter.

01A0GX-021

Replacement

- 1. Replace the distributor. (Refer to page G-21.)
- 2. Adjust the ignition timing. (Refer to page G-18.)

01A0GX-022



HIGH-TENSION LEAD Inspection

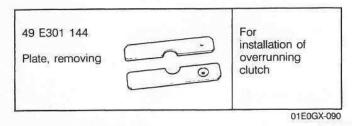
1. Measure resistance of high-tension lead.

Specification: 16 k Ω per 1 m (3.28 ft)

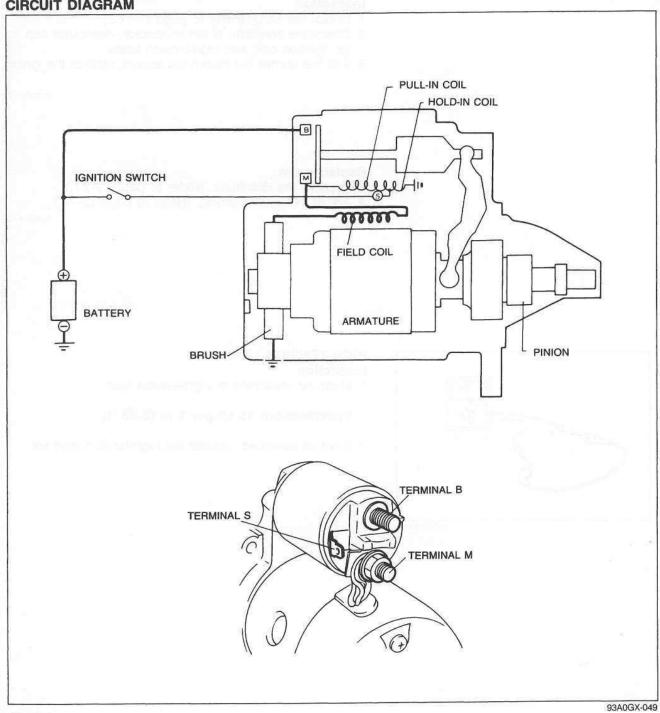
2. If not as specified, replace the high-tension lead set.

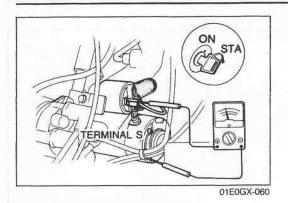
STARTING SYSTEM

PREPARATION SST



CIRCUIT DIAGRAM





STARTER

Inspection (on vehicle)

1. Measure the battery voltage.

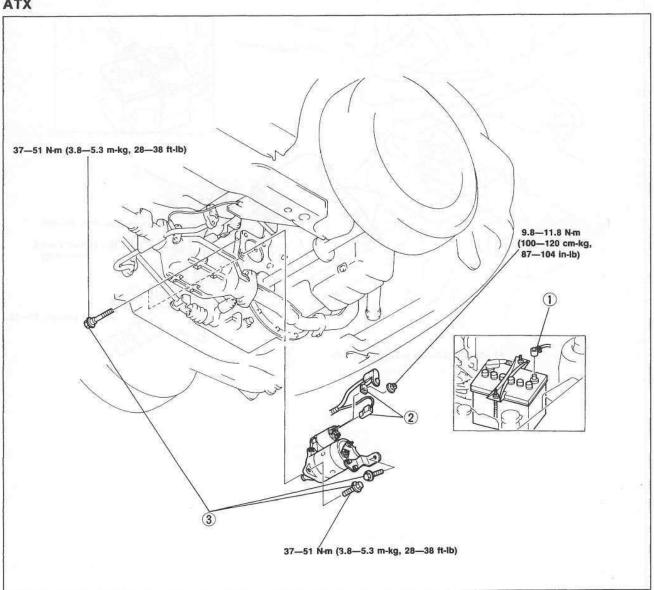
Specification: Above 12.4V

- 2. Crank the engine, and verify that the starter turns smoothly.
- 3. If the starter does not turn, check the voltage of terminal S.
- 4. If the voltage is above 8V, remove and inspect the starter. If the voltage is below 8V, check the wiring harness, ignition switch, and inhibitor swtich (ATX).

Removal / Installation

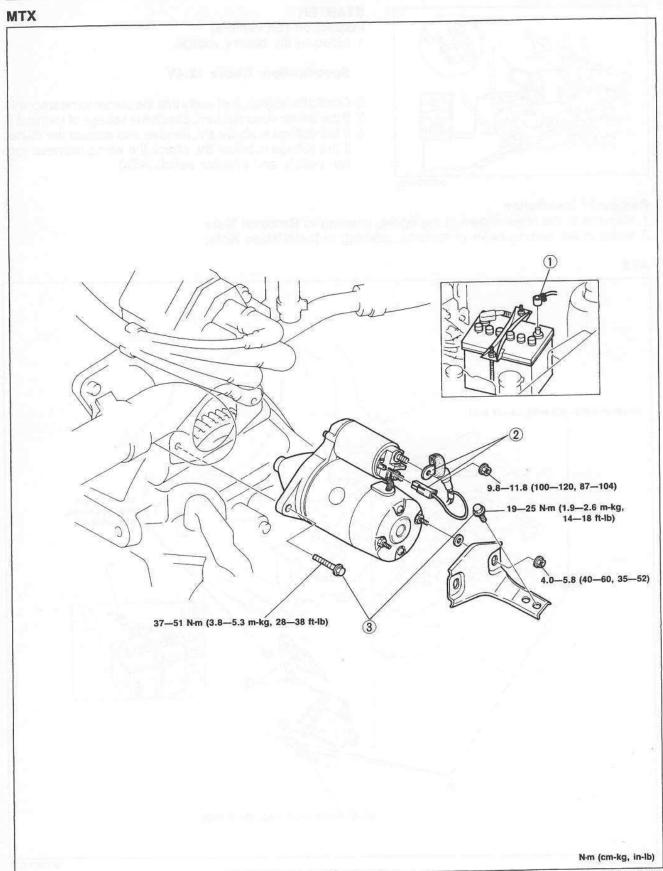
- 1. Remove in the order shown in the figure, referring to **Removal Note**.
- 2. Install in the reverse order of removal, referring to Installation Note.

ATX



01A0GX-023

- 1. Negative battery cable
- 2. S terminal, B terminal connector
- 3. Mounting bolt



01A0GX-024

1. Negative battery cable

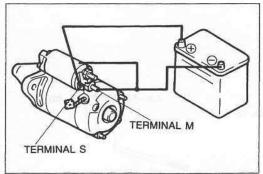
2. Terminal connectors S and B 3. Mounting bolt

Removal / Installation Note ATX

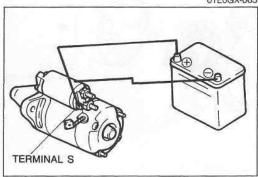
The starter is removed and installed from below the vehicle.

The starter is removed and installed from above.

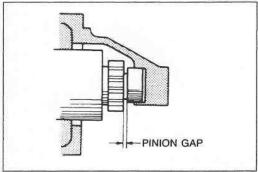
01A0GX-025



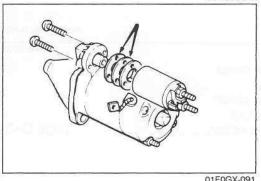
01E0GX-065



5BU05X-024



01A0GX-026



01E0GX-091

Performance Inspection Magnetic switch

Disconnect the terminal M wire, and perform the following tests.

The switch is normal if the pinion ejects outward when the battery is connected as shown in the figure.

Caution

 Do not apply power continuously for more than 10 seconds.

Hold-in test

After completing the pull-in test, disconnect the wire from terminal M (with the pinion left ejected). The holdin coil is functioning properly if the pinion does not return.

Adjustment of pinion gap

1. Disconnect the wiring from terminal M.

2. When the battery is connected between terminal S and the starter body, the pinion will be ejected and then stop. Measure the clearance (pinion gap) between the pinion and the stopper.

Note

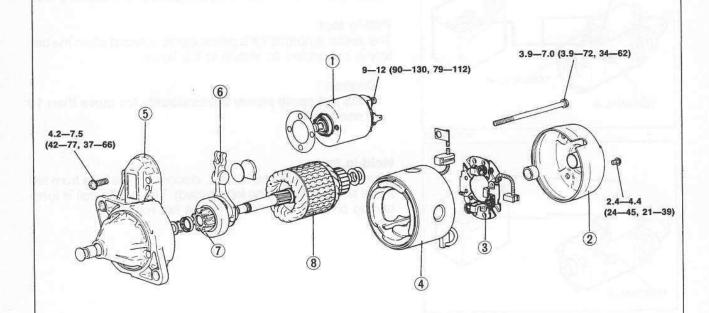
 Do not apply power continuously for more than 10 seconds.

Pinion gap: 0.5-2.0mm (0.020-0.078 in)

3. If the pinion gap is not within specification, make adjustment by increasing or decreasing the number of washers between the magnetic switch and the drive housing. (The gap becomes smaller as the number of washers is increased.)

Disassembly / Assembly

Disassemble in the order shown in the figure, referring to **Disassembly Note**.
 Assemble in the reverse order of disassembly, referring to **Assembly Note**.

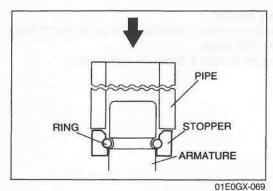


N-m (cm-kg, in-lb)

01A0GX-027

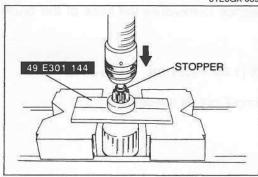
1. Magnetic switch Inspection..... page G-29 2. Rear cover 3. Brush holder assembly Inspection..... page G-30 4. Field coil Inspection...... page G-30

- 5. Front cover
- 6. Lever
- 7. Drive pinion
- 8. Armature Inspection..... page G-31



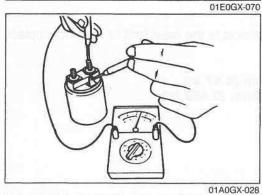
Disassembly Note Drive pinion

Remove the stopper for the overrunning clutch with a pipe as shown.



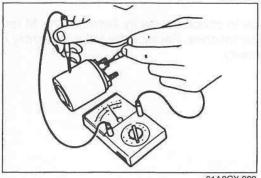
Assembly Note Drive pinion

- 1. Set the drive pinion onto the armature and install the ring.
- 2. Install the stopper with the SST and press it, as shown.

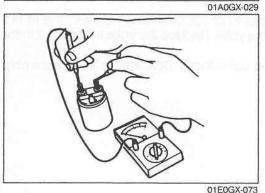


Inspection Magnetic switch

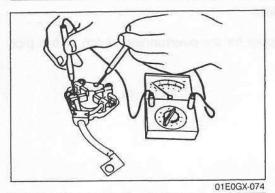
 Use an ohmmeter to check continuity between the S and M terminals. Replace the magnetic switch if there is no continuity.



Use an ohmmeter to check continuity between the S terminal and the body. Replace the magnetic switch if there is no continuity.

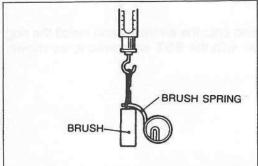


Use an ohmmeter to check continuity between the M and B terminals. Replace the magnetic switch if there is continuity.



Brush and brush holder

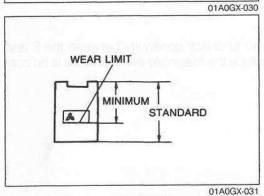
Use an ohmmeter to check continuity between each insulated brush and the plate.
 Replace the brush holder if there is continuity.



2. Use a spring balance to measure the force of the brush spring.

Standard: 18.9—23.1 N (1.89—2.31 kg, 4.18—5.12 lb)

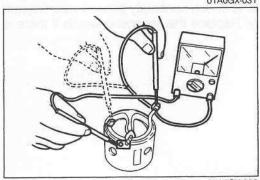
3. Replace the spring if not as specified.



Brush

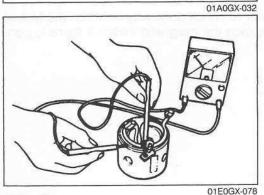
If a brush is worn almost to the wear limit or beyond, replace all the brushes.

Standard: 17mm (0.67 in) Minimum: 11.5mm (0.453 in)

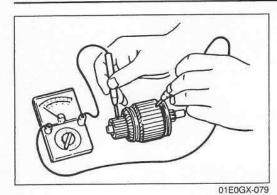


Field coil

Use an ohmmeter to check continuity between the M terminal wire and the brushes. Replace the yoke assembly if there is no continuity.

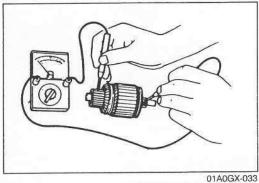


- Use an ohmmeter to check continuity between the M terminal wire and the yoke. Replace the yoke assembly if there is continuity.
- 3. Check if the field coil is loose. Replace the yoke assembly if it is.

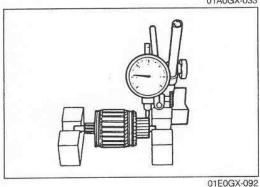


Armature

 Use an ohmmeter to check continuity between the commutator and the core. Replace the armature it there is continuity.

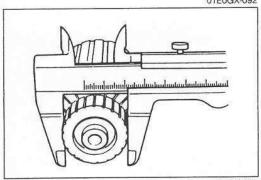


Use an ohmmeter to check continuity between the commutator and the shaft. Replace the armature if there is continuity.



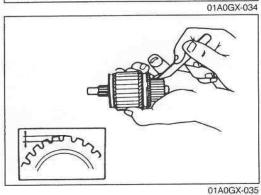
 Place the armature on V-blocks, and measure the runout with a dial indicator.
 If the runout is not within specification, repair it with a lathe or replace the armature.

Runout: 0.05mm (0.002 in)



- Replace the armature if the outer diameter of the commutator is almost at or less than the minimum.
- 5. If the commutator surface is dirty, wipe it with a cloth; if it is rough, repair it with a lathe or fine sandpaper.

Grind limit: 31.4mm (1.23 in)



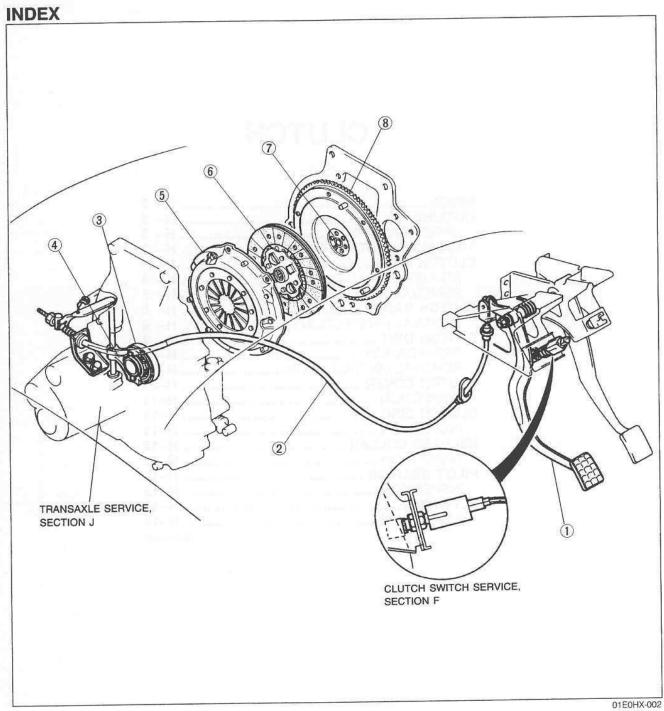
If the depth of the mold between segments is almost at or less than the minimum, undercut the grooves to the standard depth.

Depth : 0.5-0.8mm (0.02-0.03 in)

Minimum: 0.2mm (0.008 in)

CLUTCH

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REMOVAL / INSPECTION / INSTALLATION	H- 5
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REMOVAL / INSPECTION / INSTALLATION	
CLUTCH UNIT	H-7
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PILOT BEARING	H - 12
INSPECTION	
FLYWHEEL	
INSPECTION	H-12
018	E0HX-00



1	Clutch pedal			
***	Inspection / Adjustment	page	H–	4
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2.	Clutch cable			
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4.	Release fork			
	Removal / Installation	page	H-	8

5. Clutch cover	(Particular)
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6. Clutch disc	
Removal / Installation	page H- 8
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7. Pilot bearing	
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8 Flywheel	
Removal / Installation	page H- 8
Inspection	page H-12



OUTLINE

SPECIFICATIONS

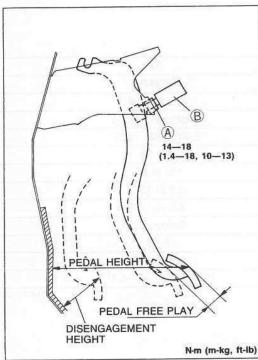
		Engine/Transaxle Model	B3
Item	Item		B5M-R
Clutch control			Mechanical
01 1 1	Туре	The state of the s	Diaphragm spring
Clutch cover Set load		N (kg, lb)	2,943 (300, 660)
Clutch disc	Outer diame	eter mm (in)	180 (7)
	Inner diame	ter mm (in)	125 (4.92)
	T ,	Pressure plate mm (in)	3.2 (0.126)
	Thickness	Flywheel side mm (in)	3.0 (0.118)
Clutch pedal	Туре		Suspended
	Pedal ratio		5.83
	Full stroke	mm (in)	138 (5.433)
	Height (With carpet)		196—207 (7.72—8.15)

01A0HX-003

TROUBLESHOOTING GUIDE

Problem	Possible Cause	Action	Page
Slipping	Clutch disc facing worn excessively Clutch disc facing surface hardened or oiled Pressure plate damaged Diaphragm spring damaged or weakened Insufficient clutch pedal play Clutch pedal sticking Flywheel damaged	Replace Repair or replace Repair or replace Replace Adjust Repair or replace Repair or replace	H- 8, 11 H- 8 H- 8 H- 8 H- 4 H- 5 H- 8
Faulty disengagement	Excessive runout or damaged clutch disc Clutch disc splines rusted or worn Clutch disc oiled Diaphragm spring weakened Excessive clutch pedal play	Replace Remove rust or replace Repair or replace Replace Adjust	H- 8, 11 H- 8 H- 8 H- 8 H- 4
Clutch vibrates when accelerating	Clutch disc oiled Torsion rubbers weakened Clutch disc facing hardened or damaged Clutch disc facing rivets loose Diaphragm spring weakened Pressure plate damaged or excessive runout Flywheel surface hardened or damaged Loose or worn engine mount	Repair or replace Replace Repair or replace Replace Replace Replace Replace Repair or replace Tighten or replace	H- 8 H- 8 H- 8 H- 8 H- 8 H- 8 H- 8 Refer to Sections B, J
Clutch pedal sticking	Pedal shaft not properly lubricated	Lubricate or replace	H- 5
Abnormal noise	Clutch release collar damaged Poor lubrication of release collar sleeve Torsion rubbers weakened Excessive crankshaft end play Pilot bearing worn or damaged Worn pivot points of release fork	Replace Lubricate or replace Replace Repair Replace Repair or replace	H- 8, 11 H- 8 H- 8 Refer to Section B H- 8, 12 H- 8

01A0HX-001



01A0HX-002

CLUTCH PEDAL

ADJUSTMENT Clutch Pedal Height Inspection

 Measure the distance from the upper surface of the pedal pad to the carpet.

Pedal height: (With carpet) 196—207mm (7.72—8.15 in)

2. If necessary, adjust the pedal height.

Adjustment

1. Disconnect the clutch switch connector.

2. Loosen locknut (A) and turn clutch switch (B) until the height is correct.

3. Tighten locknut (A).

Tightening torque: 14—18 N·m (1.4—1.8 m-kg, 10—13 ft-lb)

4. After adjustment, measure the pedal free play.

Clutch Pedal Free Play Inspection

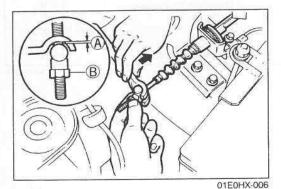
Depress the clutch pedal by hand until clutch resistance is felt.

Pedal free play: 9-15mm (0.35-0.59 in)

2. If necessary, adjust the pedal free play.

Verify that the disengagement height (from the uppersurface of the pedal to the carpet) is correct when the pedal is fully depressed.

Minimum disengagement height: 85mm (3.35 in) (With carpet)



H-4

Adjustment

1. Pull the release lever as shown in the figure. Then turn the adjusting nut (B) until the recommended clearance (A) between the pin and the release lever is obtained.

Standard clearance: 1.95—2.05mm (0.077—0.081 in)

2. Measure the clutch pedal play.

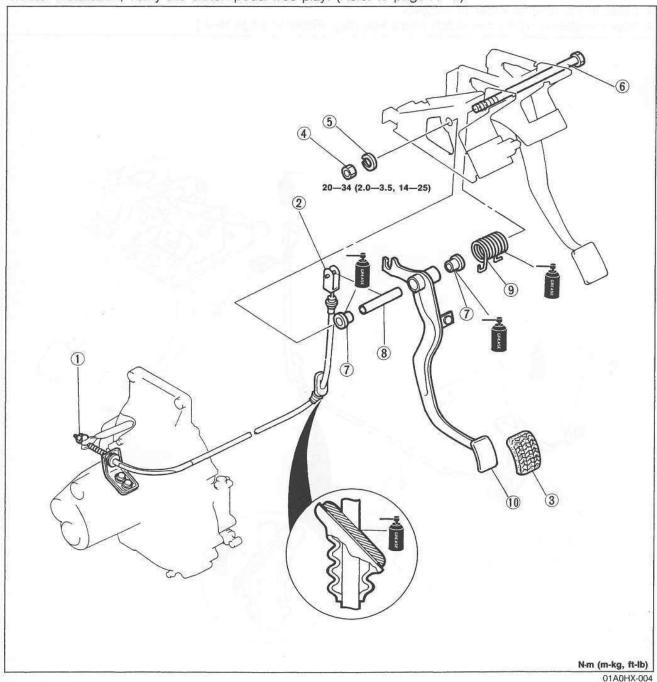
H

REMOVAL / INSPECTION / INSTALLATION

- 1. Remove in the order shown in the figure.
- 2. Inspect all parts and repair or replace as necessary.

Note

- Apply lithium based grease to the bushing and pins before installation.
- 3. Install in the reverse order of removal.
- 4. After installation, verify the clutch pedal free play. (Refer to page H-4.)



- 1. Adjusting nut
- 2. Clutch cable
- 3. Pedal pad
- 4. Nut
- 5. Lock washer

- 6. Bolt
- 7. Bushing
- 8. Spacer
- 9. Spring
- 10. Clutch pedal

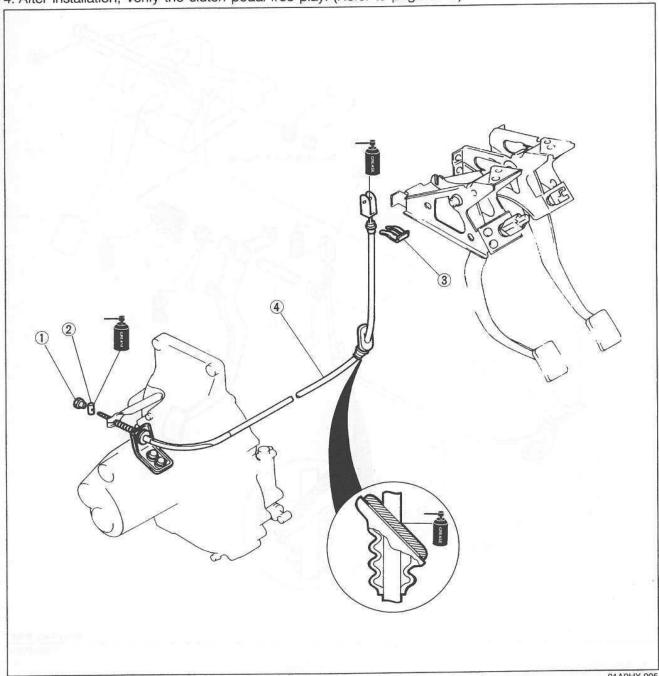
CLUTCH CABLE

REMOVAL / INSPECTION / INSTALLATION

- 1. Remove in the order shown in the figure.
- 2. Inspect all parts and repair or replace as necessary.

Note

- Apply lithium based grease to the pin and the release lever before installation.
- 3. Install in the reverse order of removal.
- 4. After installation, verify the clutch pedal free play. (Refer to page H-4.)



01A0HX-005

- 1. Adjusting nut
- 2. Pin
- 3. Clip

4. Clutch cable Inspect for damage Adjustment page H-4

CLUTCH UNIT

PREPARATION SST

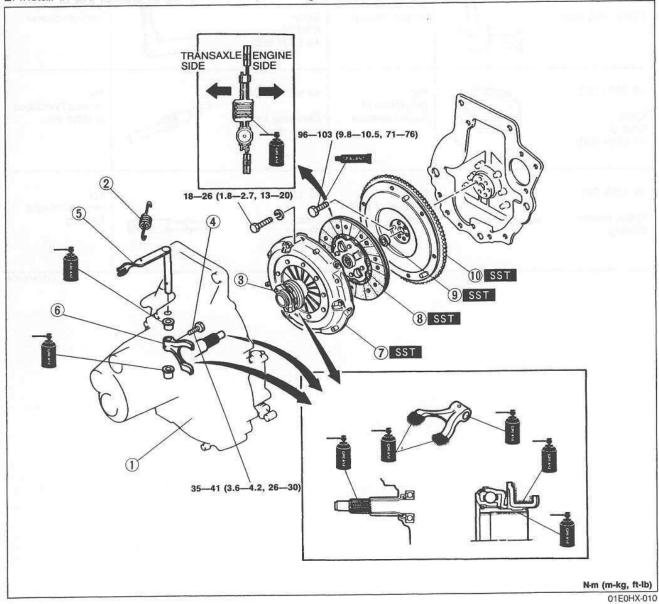
49 E301 060 Brake, ring gear	For prevention of engine rotation	49 E301 061 Body (Part of 49 E301 060)	For prevention of engine rotation
49 E301 062 Collar (Part of 49 E301 060)	For prevention of engine rotation	49 SE01 310A Centering tool, clutch disc	For removal / installation of clutch disc
49 1285 071 Puller, needle bearing	For removal of pilot bearing	49 1285 073 Chuck (Part of 49 1285 071)	For removal of pilot bearing

01E0HX-009

REMOVAL / INSTALLATION

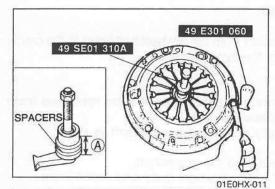
Note

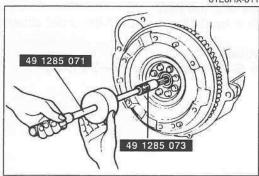
- Do not remove the pilot bearing if not necessary.
- 1. Remove in the order shown in the figure, referring to Removal Note.
- 2. Install in the reverse order of removal, referring to Installation Note.

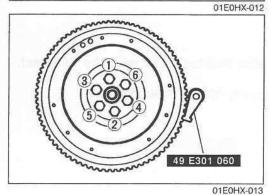


1. Transaxle Service	Section J
2. Return spring	
3. Release collar Inspection	page H-12
4. Reamer bolt	
5. Release lever	
6. Release fork	
7. Clutch cover	
Removal Note	page H- 9
Inspection	page H-11
Installation Note	page H-11

8. Clutch disc	
Removal Note	page H- 9
Inspection	page H-11
Installation Note	page H-10
9. Pilot bearing	
Removal Note	page H- 9
Inspection	page H-12
Installation Note	page H-10
10. Flywheel	
Removal Note	page H- 9
Inspection	page H-12
Installation Note	page H-10







Removal Note Clutch cover and disc

1. Install the SST.

Caution

- Put spacers between the (49 E301 060) and the cylinder block, setting dimesion (A) as shown in the figure to 13mm (0.51 in). (Except B3 ATX)
- Loosen each bolt one turn at a time in a crisscross pattern until spring tension is released. Then remove the clutch cover and disc.

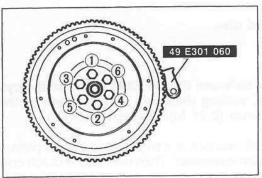
Pilot bearing

Remove the pilot bearing with the **SST** if necessary.

Flywheel

Note

- After removing the flywheel, inspect for oil leakage past the crankshaft rear oil seal.
 If necessary, replace the oil seal.
 (Refer to Section B.)
- 1. Hold the flywheel with the SST.
- 2. Remove the bolts in the sequence shown in the figure in steps.
- 3. Remove the flywheel.



01E0HX-014

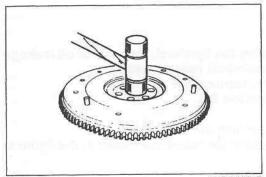
Installation Note Flywheel

 Remove the sealant from the flywheel bolt holes in the crankshaft and from the flywheel bolts.

Caution

- If all the previous sealant cannot be removed from a bolt, replace the bolt.
- · Do not apply sealant if a new bolt is used.
- 2. Set the flywheel onto the crankshaft.
- 3. Apply sealant to the flywheel bolts and install them.
- 4. Hold the flywheel with the SST.
- 5. Tighten the bolts in two or three steps in the order shown.

Tightening torque: 96—103 N·m (9.8—10.5 m-kg, 71—76 ft-lb)

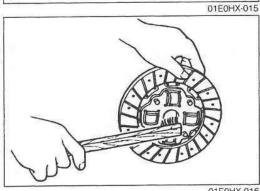


Pilot bearing

Note

Install the pilot bearing flush with the flywheel.

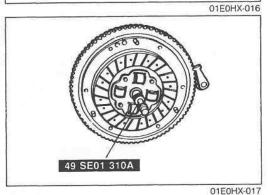
Install the new bearing with a plastic hammer.



Clutch disc

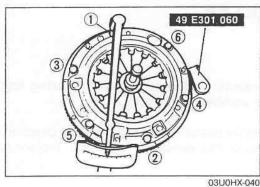
- 1. Clean the clutch disc splines and main drive gear splines.
- 2. Lightly grease the splines with molybdenum grease.

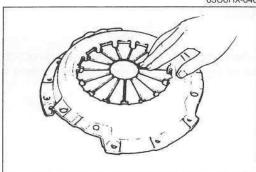
3. Set the clutch disc onto the flywheel with the SST.

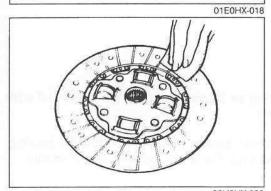


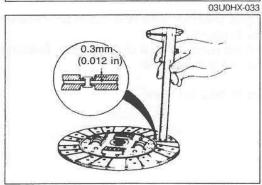
H - 10

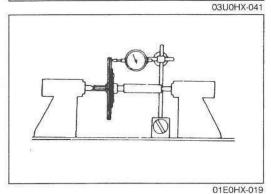












Clutch cover

- 1. Install the SST.
- 2. Align the dowel holes with the flywheel dowels.
- 3. Tighten the bolts evenly and gradually in the pattern shown.

Tightening torque: 18—26 N·m (1.8—2.7 m-kg, 13—20 ft-lb)

CLUTCH COVER

INSPECTION

Note

- Minor scoring or burning should be removed with emery paper.
- 1. Inspect the contact surface of the clutch disc for scoring, cracks, and burning. Repair or replace as necessary.
- Inspect the contact surface of the clutch release bearing for wear and cracks.Replace the clutch cover if cracked or worn.

CLUTCH DISC

INSPECTION

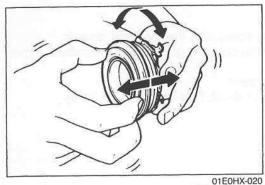
Note

- · Use sandpaper if the trouble is minor.
- 1. Inspect the lining surface for burning and oil contamination. Replace the clutch disc if it is badly burned or oil soaked.
- 2. Inspect for loose facing rivets and rubbers. Replace the clutch disc if either is loose.
- Measure the thickness of the lining at a rivet head on both sides with vernier calipers.
 Replace the clutch disc if its thickness is less than minimum.

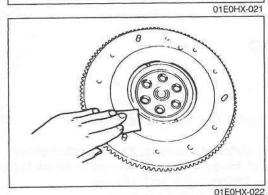
Minimum thickness: 0.3mm (0.012 in)

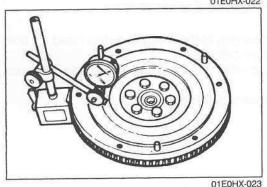
4. Measure the clutch disc runout with a dial indicator. Replace the clutch disc if runout is excessive.

Runout: 0.7mm (0.027 in) max.



OTEOHX-020





RELEASE COLLAR

INSPECTION

Note

 The clutch release collar is a sealed bearing and must not be washed in solvent.

Turn the bearing while applying force in the axial direction. If the bearing sticks or has excessive resistance, replace it.

PILOT BEARING

INSPECTION

Turn the bearing while applying force in the axial direction. If the bearing sticks or has excessive resistance, replace it.

FLYWHEEL

INSPECTION

Note

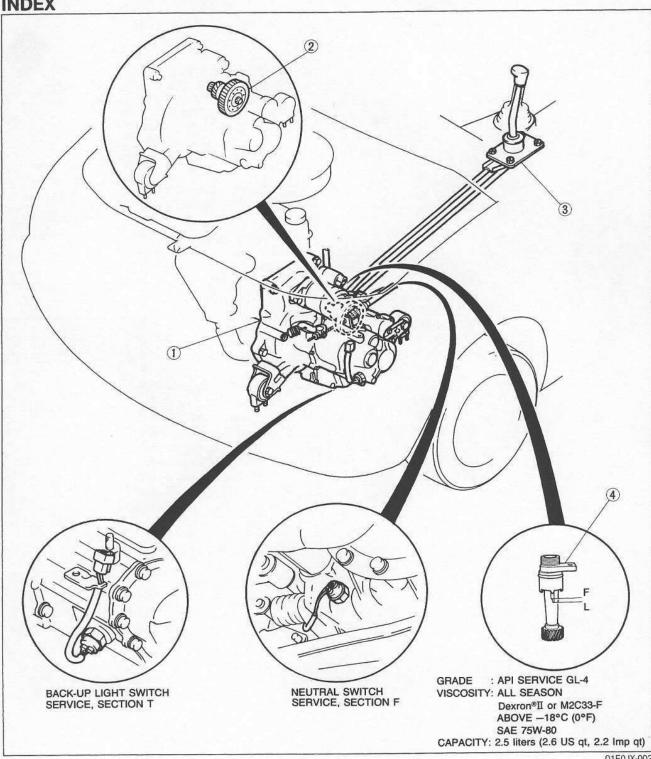
- Minor scoring or burning should be removed with emery paper.
- Inspect the contact surface of the clutch disc for scoring, cracks, and burning. Repair or replace as necessary.
- 2. Inspect the ring gear teeth for wear and damage. If necessary, replace the flywheel.
- 3. Measure the flywheel runout with a dial indicator. Replace the flywheel if runout is excessive.

Runout: 0.2mm (0.008 in) max.

MANUAL TRANSAXLE

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STRUCTURAL VIEW
POWERFLOW
TROUBLESHOOTING GUIDE J-
TRANSAXLE OIL
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REPLACEMENT
TRANSAXLE J- 9
PREPARATION
REMOVAL
DISASSEMBLY
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OVERHAUL J-64
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3. Shift mechanism	
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4. Transaxle oil	
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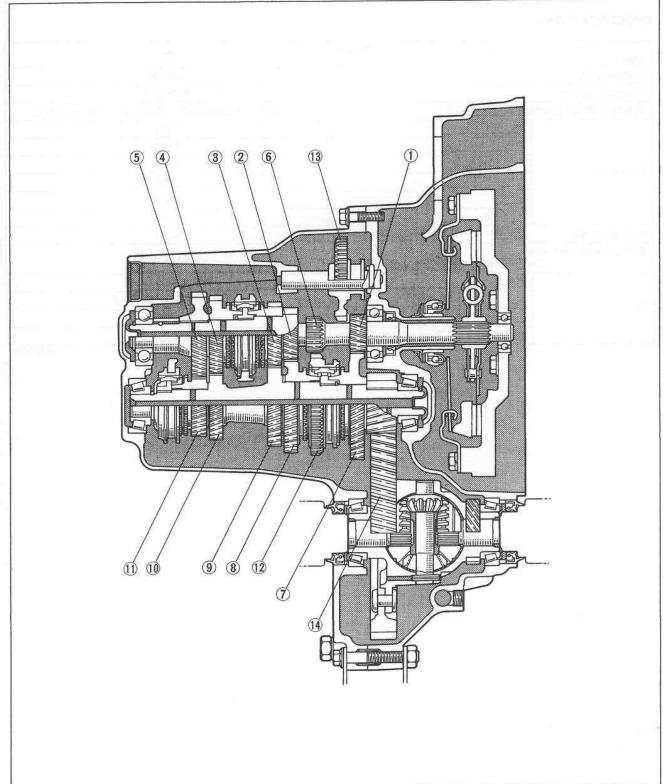
OUTLINE

SPECIFICATIONS

Item		В3		
Transaxle type		B5M-R		
Transaxle contro			Floor shift	
Synchronization	mechanism		Forward: Synchromesh	Reverse: Selective sliding
	1st		3.454	
	2nd		1.944	
0	3rd		1.392	
Gear ratio	4th		1.030	
	5th		0.810	
	Reverse		3.583	
Final gear ratio		4.058		
Speedometer gear ratio (Driven gear number/Drive gear number)		0.91 (21/23)		
	Grade			vice GL-4
0.1	V(All season	Dexron®II	or M2C33-F
Oil	Viscosity	Above -18°C (0°F)	SAE	75W-80
	Capacity	liters (US qt, Imp qt)	2.5 (2	2.6, 2.2)

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STRUCTURAL VIEW

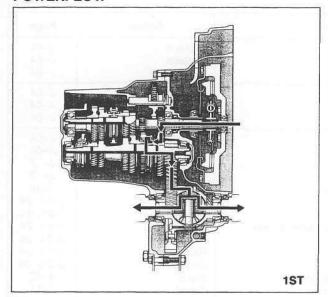


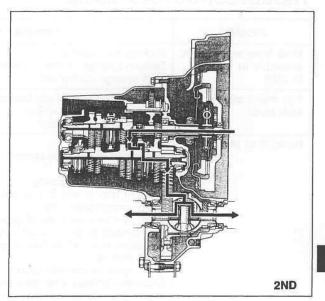
03U0J1-004

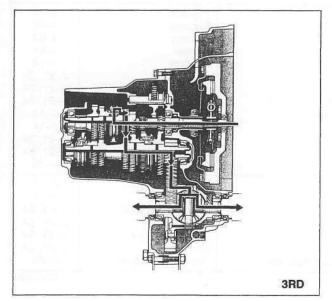
- 1. Primary 1st gear
- 2. Primary 2nd gear
- 3. Primary 3rd gear 4. Primary 4th gear
- 5. Primary 5th gear

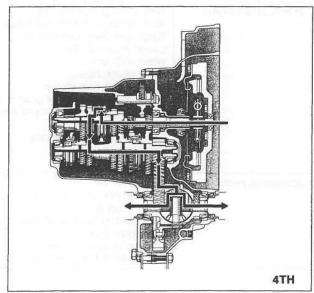
- 6. Primary reverse gear 7. Secondary 1st gear 8. Secondary 2nd gear 9. Secondary 3rd gear
- 10. Secondary 4th gear
- 11. Secondary 5th gear
- 12. Secondary reverse gear
- 13. Reverse idler gear
- 14. Differential

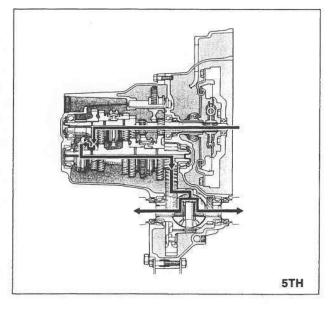
POWERFLOW

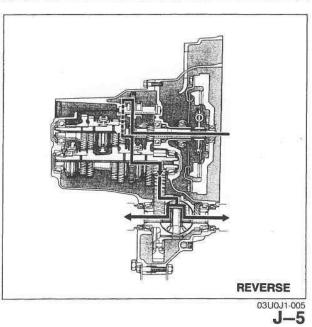






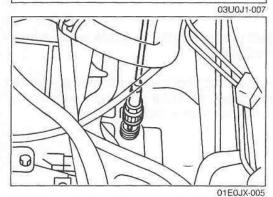


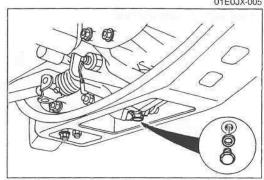


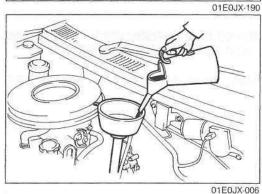


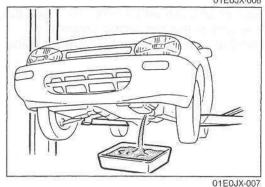
TROUBLESHOOTING GUIDE

Problem	Possible cause	Action	Page
Shift lever won't shift smoothly or is hard to shift	Sticking shift lever ball Sticking change control rod joint Bent change control rod	Replace Replace Replace	J-64 J-64 J-64
Too much play in shift lever	Worn change control rod bushing Weak shift lever ball spring Worn shift lever ball seat	Replace Replace Replace	J-64 J-64 J-64
Difficult to shift	Bent change rod No grease in transaxle control Insufficient oil Deterioration of oil quality Wear or play of shift fork or shift rod Worn synchronizer ring Worn synchronizer cone of gear Bad contact of synchronizer ring and cone of gear Excessive longitudinal play of gears Worn bearing Worn synchronizer key spring Excessive primary shaft gear bearing preload Improperly adjusted change guide plate	Replace Lubricate Add oil Replace oil Replace Replace Replace Replace Replace Replace Replace Replace Replace Adjust Adjust	J-64 J-64 J-7 J-14 J-21, 24 J-21, 24 J-21, 24 J-21, 24 J-21, 24 J-38 J-17
Won't stay in gear	Bent change control rod Worn change control rod bushing Weak shift lever ball spring Loose extension bar Worn shift fork Worn clutch hub Worn clutch hub sleeve Worn sliding surface of gear or shaft Worn steel sliding groove of control end Weak detent spring Excessive thrust clearance Worn bearing Loose engine mount	Replace Replace Replace Tighten Replace Replace Replace Replace Replace Replace Replace Replace Replace Righten	J-64 J-64 J-64 J-14 J-21, 24 J-21, 24 J-14 J-14 J-21, 24 J-21, 24 J-56
Abnormal noise	Insufficient oil Deterioration of oil quality Worn bearing Worn sliding surface of gear or shaft Damaged gear teeth Foreign material in gears Damaged differential gear or excessive backlash	Add oil Replace oil Adjust or replace Replace Replace Replace Replace Replace Replace or adjust	J- 7 J- 7 J-21, 24 J-21, 24 J-21, 24 J-60









TRANSAXLE OIL

INSPECTION

Note

- · Park the vehicle on level ground.
- Disconnect the speedometer cable and remove the speedometer driven gear.
- 2. Verify that the oil level is between the F and L.
- 3. Install the speedometer driven gear.

Tightening torque: 7.8—12 N·m (0.8—1.2 m-kg, 5.8—8.7 ft-lb)

4. Connect the speedometer cable.

REPLACEMENT

- Disconnect the speedometer cable and remove the speedometer driven gear.
- Remove the drain plug and washer. Drain the oil into a suitable container.
- 3. Install a new washer and the drain plug.

Tightening torque: 24—35 N·m (2.4—3.6 m-kg, 17—26 ft-lb)

4. Add the necessary amount of the specified oil through the speedometer driven gear hole.

Specified oil

Grade: API service GL-4

Viscosity: All-season Dexron® II or M2C33-F Above -18°C (0°F) SAE 75W-80

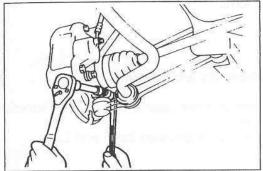
Capacity: 2.5 liters (2.6 US qt, 2.2 Imp qt)

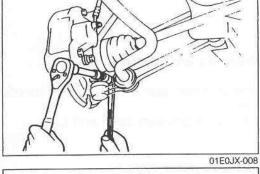
- 5. Verify the oil level.
- 6. Install the speedometer driven gear and connect the speedometer cable.

Oil seal

Replacement (On-vehicle)

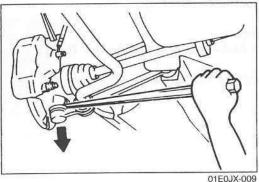
- 1. Jack up the vehicle and support it with safety stands.
- 2. Drain the transaxle oil.
- 3. Remove the front wheel.
- 4. Remove the splash shield.
- 5. Separate the front stabilizer from the lower arm.





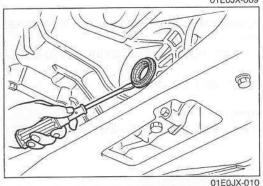
Caution

- Do not damage the dust boots.
- 6. Remove the clinch bolt and pull the lower arm downward to separate the knuckle from the lower arm ball joint.
- 7. Loosen the nut and disconnect the tie-rod end with the SST.

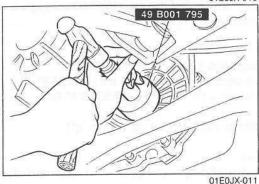


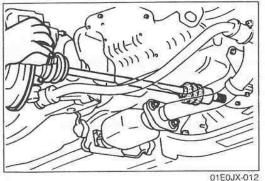
Caution

- Do not subject the tripod joint to shock when removing the driveshaft.
- 8. Disconnect the driveshaft from the transaxle by prying with a bar inserted between the outer ring and the transaxle.
- 9. Suspend the driveshaft with a rope.
- 10. Remove the oil seal with a screwdriver.



- Tap in until the oil seal installer contacts the case.
- · Coat the oil seal lip with transaxle oil.
- 11. Tap the new oil seal into the transaxle case with the SST.





- 12. Replace the driveshaft end clip with a new one. Insert the driveshaft with the split of the clip facing upward.
- 13. Pull out on the driveshaft to verify that it is held firmly in place.

TRANSAXLE

PREPARATION

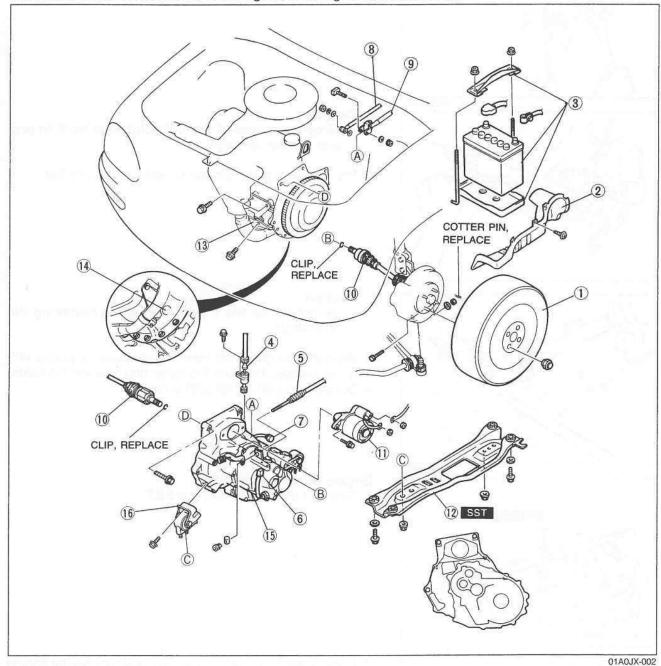
49 G017 5A0	•	For support of engine	49 G017 501	For support of engine
Support, engine	- T		Bar (Part of 49 G017 5A0)	7 7 7
49 G017 502 Support (Part of 49 G017 5A0)	BB	For support of engine	49 G017 503 Hook (Part of 49 G017 5A0)	For support of engine
49 0107 680A Engine stand		For disassembly and assembly of transaxle	49 D017 2A2A Shim selector set	For adjustment of bearing preload
49 G019 0A0 Hanger, transaxle		For disassembly and assembly of transaxle	49 F401 384 Collar (Part of 49 D017 2A2A)	For adjustment of bearing preload
49 G019 001 Body (Part of 49 G019 0A0)		For disassembly and assembly of transaxle	49 F401 385 Bar (Part of 49 D017 2A2A)	For adjustment of bearing preload
49 G019 002 Stay (Part of 49 G019 0A0)		For disassembly and assembly of transaxle	49 F401 381B Selector φ60 (Part of 49 F401 381A)	For adjustment of bearing preload
49 G019 003 Bolt set (Part of 49 G019 0A0)	66666	For disassembly and assembly of transaxle	49 G019 019 Bolt set (Part of 49 D017 2A2A)	For adjustment of bearing preload
49 D017 101 Adaptor, preload		For adjustment of bearing preload	49 B001 795 Installer, oil seal	For installation of oil seal

TRANSAXLE

49 FT01 361 Remover, bearing		For removal of bearing outer race	49 B027 002A Adapter, preload (Part of 49 D017 2A2A)	For adjustment of bearing preload
49 G030 795 Installer, oil seal		For installation of oil seal	49 0180 510B Attachment, steering worm bearing preload measuring	For adjustment of bearing preload
49 D017 2A1 Installer set, bearing	999	For installation of bearing	49 G030 797 Body (Part of 49 G030 795)	For installation of oil seal
49 F401 331 Body (Part of 49 D017 2A1)		For installation of bearing	49 G030 796 Body (Part of 49 G030 795)	For installation of oil seal
49 D017 201 Attachment (Part of 49 D017 2A1)		For installation of gear	49 0839 425C Puller set, bearing	For removal of bearing
49 0710 520 Puller, bearing		For removal of gear	49 0862 428 Attachment, bearing puller (Part of 49 0839 425C)	For removal of bearing
49 0636 145 Puller, fan pulley boss		For removal of gear	49 0839 426 Attachment, bearing puller (Part of 49 0839 425C)	For removal of bearing

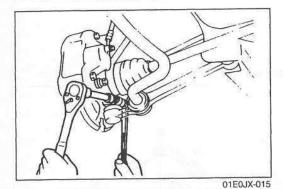
REMOVAL

- Disconnect the negative battery cable.
 Raise the vehicle on a vehicle hoist.
- 3. Drain the transaxle oil into a suitable container.
- 4. Remove in the order shown in the figure, referring to Removal Note.



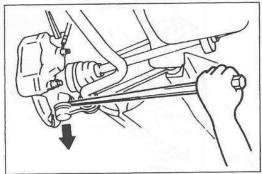
- 1. Wheel and tire
- 2. Splash shield
- 3. Battery, battery carrier
- 4. Speedometer cable
- 5. Clutch cable
- 6. Back-up light switch connector
- 7. Neutral switch connector
- 8. Extension bar
- 9. Control rod

10. Driveshafts	
Removal Note	page J-12
11. Starter	
12. Engine mounting member	
Removal Note	page J-12
13. Exhaust pipe bracket	
14. Stiffner	
15. Transaxle	
Removal Note	page J-13
16. Engine mount No.2	



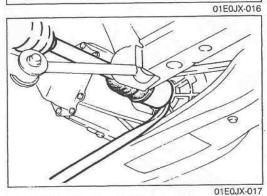
Removal Note Driveshaft

1. Remove the ball joint clinch bolt.



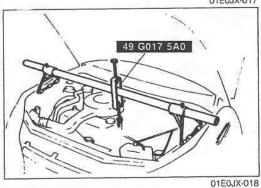
Caution

- Wrap a rag around the ball joint dust boot to protect it from damage.
- 2. Pry the lower arm from the knuckle with a pry bar.



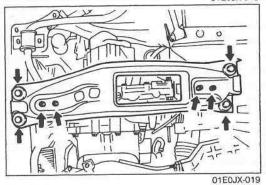
Caution

- Do not shock the tripod joint when removing the driveshaft.
- Separate the driveshaft from the transaxle by prying with a bar inserted between the outer ring and the transaxle.
- 4. Suspend the driveshaft with a rope.

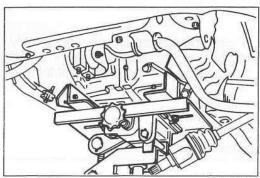


Engine mounting member

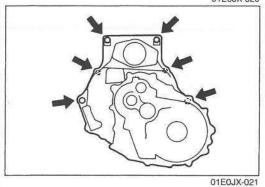
1. Suspend the engine with the SST.



2. Remove the bolts and nuts shown, and remove the engine mounting member.







Transaxle

- Loosen the SST (engine support) and lean the engine toward the transaxle.
 Support the transaxle with a jack.

- 3. Remove the transaxle mounting bolts.4. Remove the transaxle.

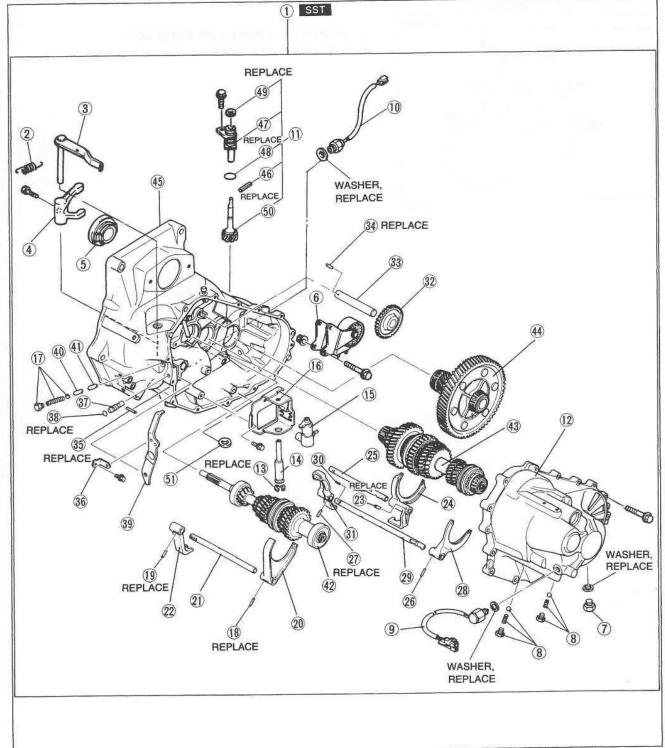
DISASSEMBLY

Precaution

- 1. Clean the transaxle exterior thoroughly with a steam cleaner or cleaning solvent before disassembly.
- 2. Clean the removed parts (except sealed bearings) and all sealing surfaces with cleaning solvent, and dry with compressed air. Clean out all holes and passages with a compressed air, and check that there are no obstructions.
- 3. Wear eye protection when using compressed air to clean components.

Housing Parts

Disassemble in the order shown in the figure, referring to Disassembly Note.

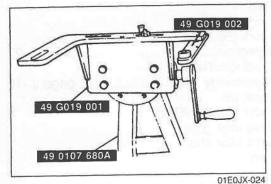


J

TRANSAXLE

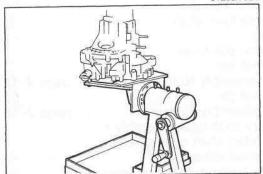
1. Transaxle	26. Roll pin
Disassembly Note page J-16	27. Roll pin
2. Return spring	28. Shift fork (5th/Rev)
3. Clutch lever	Inspection page J-27
4. Clutch release fork	29. Shift rod (5th/Rev)
5. Clutch release collar	Disassembly Note page J-16
Inspection page J-27	30. Interlock pin
6. Engine mount No.1	31. Shift rod end (5th/Rev)
7. Drain plug	32. Reverse idler gear
8. Plug, spring, steel ball	33. Reverse idler shaft
9. Back-up light switch	34. Roll pin
10. Neutral switch	35. Pin
11. Speedometer driven gear assembly	36. Lever set spring
12. Transaxle case assembly	37. Reverse lever shaft
13. Retaining ring	38. O-ring
14. Crank lever shaft	39. Reverse shift lever
15. Crank lever assembly	40. Interlock pin
16. Base plate unit	Disassembly Note page J-16
17. Plug, spring, steel ball	41. Interlock pin
18. Roll pin	Disassembly Note page J-16
19. Roll pin	42. Primary shaft gear assembly
20. Shift fork (3rd/4th)	43. Secondary shaft gear assembly
Inspectionpage J-27	44. Differential assembly
21. Shift rod (3rd/4th)	45. Clutch housing assembly
Disassembly Note page J-16	46. Roll pin
22. Shift rod end (3rd/4th)	47. Speedometer gear sleeve
23. Roll pin	48. O-ring
24. Shift fork (1st/2nd)	49. Oil seal
Inspectionpage J-27	Disassembly Note page J-16
25. Shift rod (1st/2nd)	50. Driven gear
Disassembly Note page J-16	51. Magnet
550 MM 550	01E0JX-023

TRANSAXLE



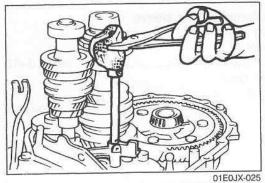
Disassembly Note Transaxle

Mount the transaxle on the SST.



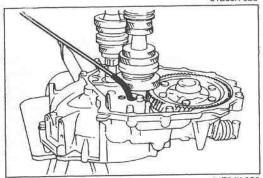
Shift rod

Wrap the shift rod with a rag and turn it with pliers while pulling it out.



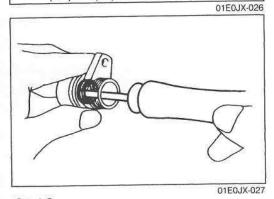
Interlock pin

Remove the interlock pin with a magnet.



Oil seal

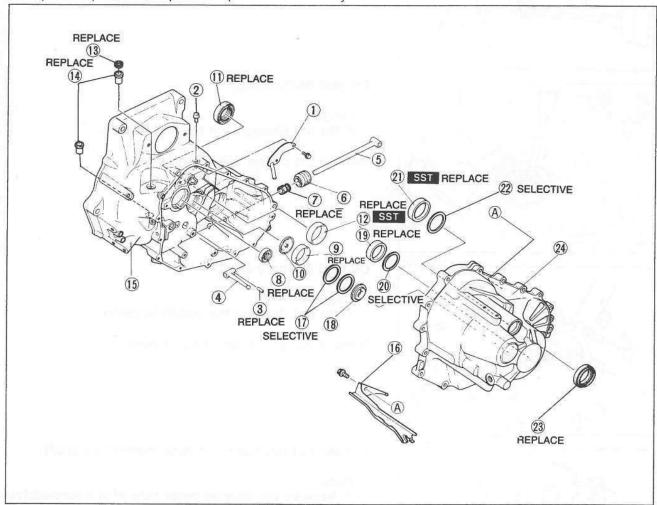
Remove the speedometer driven gear oil seal as shown in the figure.



Clutch Housing and Transaxle Case Components

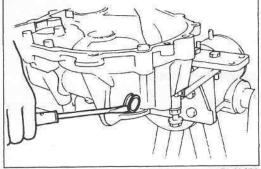
Caution

- Do not remove an oil seal if not necessary.
- 1. Disassemble in the order shown in the figure, referring to Disassembly Note.
- 2. Inspect all parts and repair or replace as necessary.



1. Baffle plate
2. Bleeder
3. Roll pin
4. Change arm
5. Change rod assembly
6. Boot
7. Oil seal (change rod)
Disassembly Note page J-18
8. Oil seal (primary shaft)
Disassembly Note page J-18
9. Bearing outer race (secondary shaft)
Disassembly Notepage J-18
0. Funnel
Disassembly Note page J-18
Oil seal (differential)
Disassembly Note page J-18
Bearing outer race (differential)
Disassembly Note page J-19

01E0JX-028
13. Oil seal
14. Bushing
15. Clutch housing
16. Oil passage
17. Adjustment shim
18. Funnel
Disassembly Note page J-19
19. Bearing outer race
Disassembly Note page J-20
20. Adjustment shim (secondary shaft)
Disassembly Note page J-20
21. Bearing outer race (differential)
Disassembly Note page J-19
22. Adjustment shim
23. Oil seal (differential)
Disassembly Note page J-18
24. Transaxle case

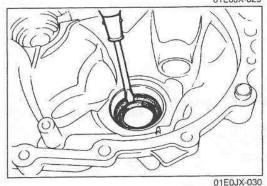


01E0JX-029

Disassembly Note Oil seal (change rod)

Do not damage the clutch housing.

Remove the oil seal with a screwdriver.

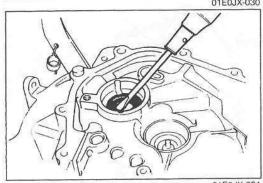


Oil seal (differential)

Caution

Do not damage the clutch housing.

Remove the oil seal with a screwdriver.

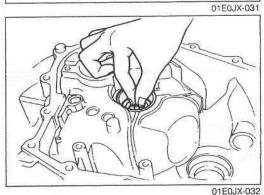


Oil seal (primary shaft)

Caution

Do not damage the clutch housing.

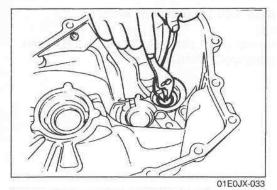
Remove the oil seal with a screwdriver.



Funnel and bearing outer race (secondary shaft)

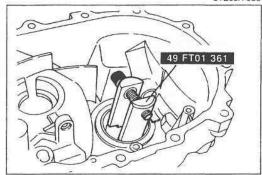
- Remove the bearing outer race with a screwdriver if necessary.
 - 1) Insert a screwdriver between the clutch housing and bearing outer race.
 - 2) Pry the bearing outer race free.

Remove the bearing outer race by lifting out the funnel and race together.



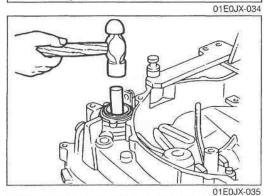
Funnel

Remove the funnel with pliers.



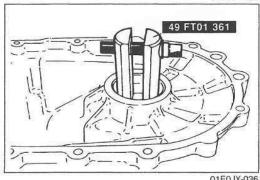
Bearing outer race (differential)

1. Install the **SST** to the bearing outer race.



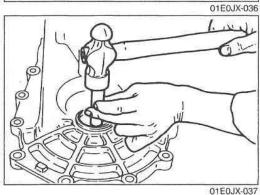
2. Turn over the clutch housing.

3. Remove the bearing outer race with a suitable pipe.



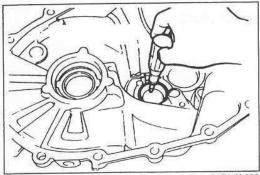
Bearing outer race and adjustment shim (differential)

1. Install the SST to the bearing outer race.



2. Turn over the clutch housing.

3. Tap the **SST** with a pipe through the driveshaft hole to remove the bearing outer race.



01E0JX-038

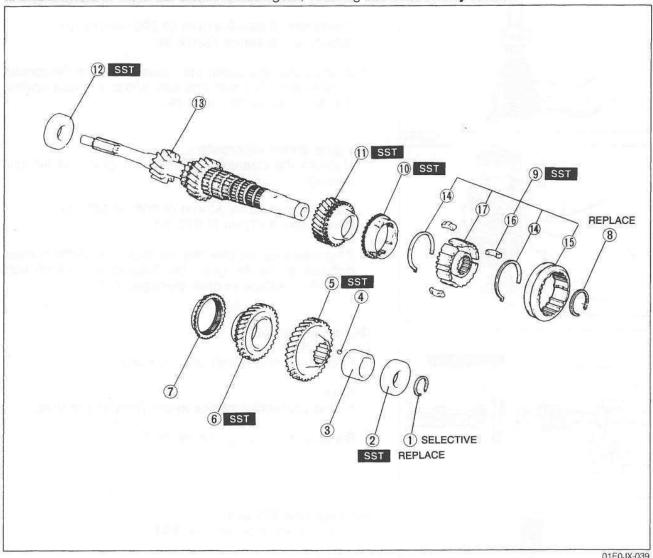
Bearing outer race and adjustment shim (secondary shaft)

1. Pull out the bearing outer race as shown in the figure.

2. Remove the adjustment shim.

Primary Shaft Assembly

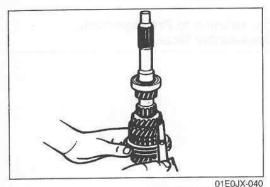
Measure the thrust clearances of all gears before disassembly, referring to Preinspection.
 Disassemble in the order shown in the figure, referring to Disassembly Note.

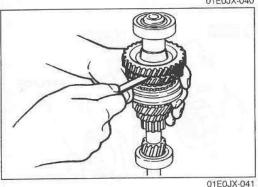


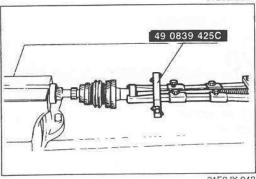
Retaining ring	
2. Bearing (5th)	
Disassembly Note	
Inspection	bage J-28
3. Spacer	
4. Steel ball	
5. 5th gear	
Disassembly Note	page J-22
Inspect gear teeth for damage, we cracks	ear, and
6. 4th gear	
Disassembly Note	page J-22
Inspection	
7. Synchronizer ring	
Inspection	page J-27
8. Retaining ring	PLANCE CONTRACTOR
9. Clutch hub assembly (3rd/4th)	
Disassembly Note	page J-22
Inspection	

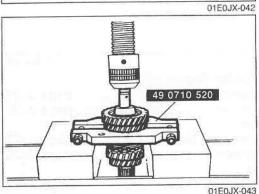
	OIL	007 003
10. Synchronizer ring Disassembly Note Inspection		
11. 3rd gear Disassembly Note		
Inspection		
12. Bearing Disassembly Note Inspection		
13. Primary shaft Inspection		
14. Synchronizer spring 15. Clutch hub sleeve (3rd/4th)	13-	
Inspection	page	J-27
17. Clutch hub (3rd/4th)		

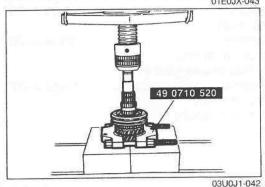
TRANSAXLE











Preinspection 3rd gear thrust clearance

1. Measure the clearance between 3rd gear and 2nd gear.

Clearance: 0.06—0.41mm (0.002—0.016 in) Maximum: 0.46mm (0.018 in)

2. If the clearance exceeds the maximum, check the contact surfaces of the 3rd gear, 2nd gear, and clutch hub (3rd/4th). Replace worn or damaged parts.

4th gear thrust clearance

1. Measure the clearance between 4th gear and the ball bearing.

Clearance: 0.22-0.52mm (0.009-0.020 in) Maximum: 0.57mm (0.022 in)

2. If the clearance exceeds the maximum, check the contact surfaces of the 4th gear, ball bearing, and clutch hub (3rd/4th). Replace worn or damaged parts.

Disassembly Note Bearing (5th)

1. Place the primary shaft gear in a vise.

Note

- Use protective plates in the jaws of the vise.
- 2. Remove the bearing with the SST.

4th gear and 5th gear

1. Install the 4th gear with the SST.

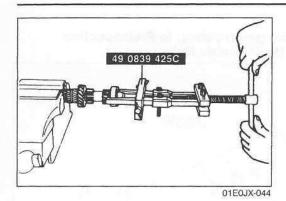
Caution

- Hold the shaft with one hand so that it does not fall.
- 2. Remove the 4th gear and 5th gear with the SST.

Clutch hub assembly (3rd/4th), synchronizer ring (3rd) and 3rd gear

- Hold the shaft with one hand so that it does not fall.
- 1. Remove the retaining ring.
- 2. Remove the clutch hub assembly (3rd/4th), synchronizer ring (3rd) and 3rd gear with the SST.

J - 22



Bearing

Note

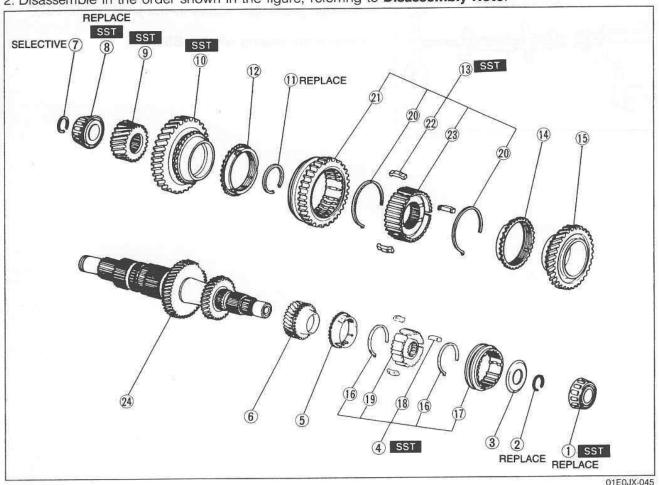
· Use protective plates in the jaws of the vise.

Remove the bearing with the SST.

Secondary Shaft Assembly

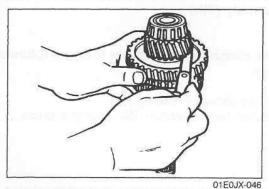
1. Measure the thrust clearance of 1st gear, 2nd gear, and 5th gear, referring to Preinspection.

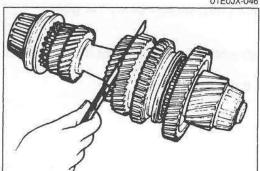
2. Disassemble in the order shown in the figure, referring to Disassembly Note.

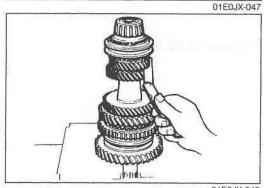


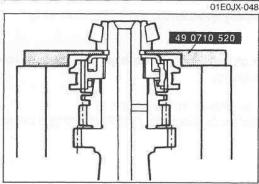
1. Bearing inner race (5th) Disassembly Note..... page J-25 Inspect for damage and rough rotation 2. Retaining ring 3. Washer 4. Clutch hub assembly (5th) Disassembly Note..... page J-26 Inspection...... page J-29 5. Synchronizer ring Inspection..... page J-27 6.5th gear Inspection...... page J-29 7. Retaining ring 8. Bearing inner race (1st) Disassembly Note...... page J-26 Inspect for damage and rough rotation 9. Pinion gear Disassembly Note.....page J-26 Inspect gear teeth for damage, wear, and cracks 10. 1st gear Disassembly Note......page J-26 Inspection..... page J-29 11. Retaining ring

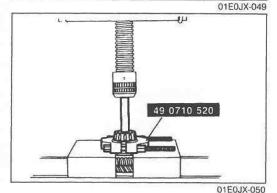
	01E03X-045
12. Synchronizer ring	
Disassembly Note	page J-26
Inspection	page J-27
13. Clutch hub assembly (1st/2nd)	
Disassembly Note	page J-26
Inspection	page J-29
14. Synchronizer ring	
Disassembly	page J-26
Inspection	page J-27
15. 2nd gear	
Inspection	page J-29
16. Synchronizer spring	
17. Clutch hub sleeve (5th)	
Inspection	page J-27
18. Synchronizer key	
19. Clutch hub (5th)	
20. Synchronizer spring	
21. Clutch hub sleeve (1st/2nd)	
Inspection:	page J-27
22. Synchronizer key	
23. Clutch hub (1st/2nd)	
24. Secondary shaft	The state of the state of
Inspection	page J-29











Preinspection

1st gear thrust clearance

1. Measure the clearance between 1st gear and the pinion gear.

Clearance: 0.22—0.62mm (0.008—0.024 in) Maximum: 0.67mm (0.026 in)

If the clearance exceeds the maximum, check the contact surfaces of the 1st gear, pinion gear of the secondary shaft gear, and clutch hub assembly (1st/2nd). Replace worn or damaged parts.

2nd gear thrust clearance

1. Measure the clearance between 2nd gear and secondary 3rd gear.

Clearance: 0.06—0.21mm (0.002—0.008 in) Maximum: 0.26mm (0.010 in)

2. If the clearance exceeds the maximum, check the contact surfaces of the 2nd gear, secondary 3rd gear, and clutch hub assembly (1st/2nd). Replace worn or damaged parts.

5th gear thrust clearance

1. Measure the clearance between 5th gear and secondary 4th gear.

Clearance: 0.06—0.21mm (0.002—0.008 in) Maximum: 0.26mm (0.010 in)

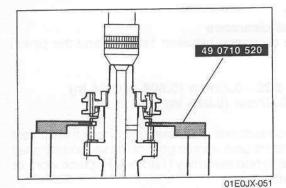
2. If the clearance exceeds the maximum, check the contact surfaces of the 5th gear, secondary 4th gear, and clutch hub assembly (5th). Replace worn or damaged parts.

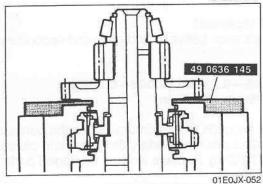
Disassembly Note Bearing inner race (5th)

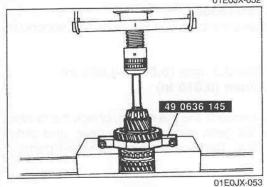
Caution

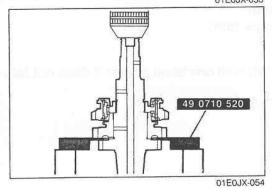
- · Hold the shaft with one hand so that it does not fall.
- 1. Set the SST to the 5th gear.
- 2. Remove the bearing outer race with a suitable pipe.

Pipe diameter: 20mm (0.79 in)









Clutch hub assembly (5th)

Note

- Remove the clutch hub assembly (5th) as follows if necessary.
- 1. Install the SST as shown in the figure.
- 2. Remove the clutch hub assembly (5th) using a press.

Bearing inner race (1st), pinion gear, 1st gear

Caution

- · Hold the shaft with one hand so that it does not fall.
- 1. Set the SST to the 1st gear.
- 2. Remove the bearing inner race with a suitable pipe.

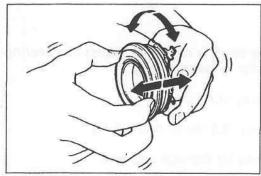
Pipe diameter: 20mm (0.79 in)

Clutch hub assembly (1st/2nd), synchronizer ring

Note

- Remove the clutch hub assembly (1st/2nd) as follows if necessary.
- 1. Install the SST as shown in the figure.
- 2. Remove the clutch hub assembly (1st/2nd) using a press.

TRANSAXLE

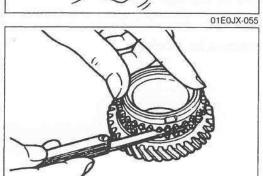


INSPECTION

Inspect all parts and repair or replace as necessary.

Clutch release collar

Inspect the clutch release collar for roughness or noise while turning.

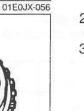


Synchronizer ring

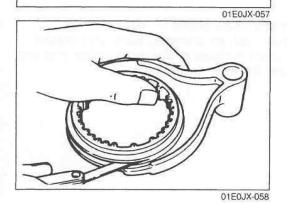
Note

- Set the synchronizer ring squarely in the gear; then measure around the circumference.
- 1. Measure the clearance between the synchronizer ring and flank surface of the gear.

Standard clearance: 1.5mm (0.059 in) Minimum: 0.8mm (0.015 in)



- Inspect the synchronizer ring teeth for damage, wear, and cracks.
- 3. Inspect the taper surface for wear or cracks.



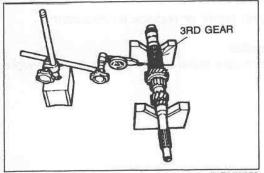
Shift fork, clutch hub sleeve

1. Measure the clearance between the shift fork and clutch hub sleeve groove.

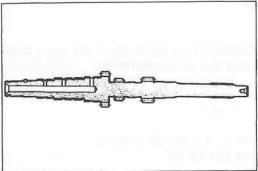
Standard clealance

(1st/2nd): 0.100—0.358mm (0.004—0.014 in) (3rd/4th): 0.150—0.458mm (0.006—0.018 in) (5th) : 0.150—0.458mm (0.006—0.018 in) Maximum (1st/2nd): 0.408mm (0.016 in) (3rd/4th): 0.508mm (0.020 in)

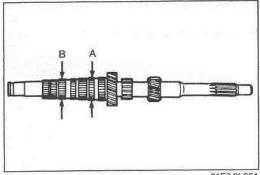
(5th) : 0.508mm (0.020 in)



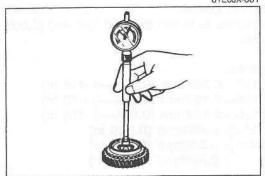
01E0JX-059



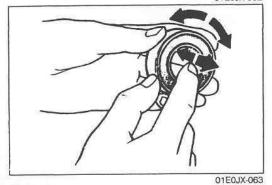
01E0JX-060



01E0JX-061



01E0JX-062



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Primary Shaft

Note

- · If the primary shaft is replaced, adjust the bearing preload. (Refer to page J-39.)
- 1. Inspect the primary shaft runout.

Maximum runout: 0.015mm (0.0006 in)

- 2. Inspect the splines for damage and wear.
- 3. Inspect the gear teeth for damage, wear, and cracks.
- 4. Inspect the oil passage for blockage.

3rd gear, 4th gear

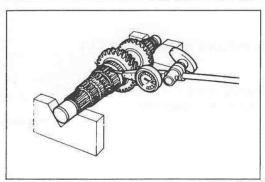
1. Measure the clearance between the shaft and gears.

	Shaft side (outer diameter)	Gear side (inner diameter)
3rd gear side A	32.945—32.970 (1.297—1.298)	33.000—33.025 (1.299—1.300)
4th gear side B	28.545—28.570 (1.123—1.125)	28.600—28.621 (1.126—1.127)

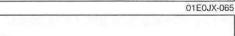
- 2. Inspect the synchronizer cones for wear.
- 3. Inspect the gear teeth for damage, wear, and cracks.
- 4. Inspect the contact surfaces of the synchronizer ring and the 3rd/4th gear for wear and cracks.

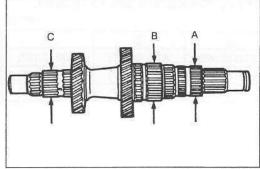
Bearing

Inspect the bearing for damage or rough rotation.

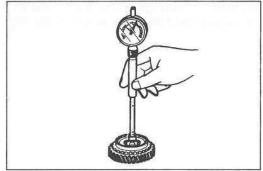


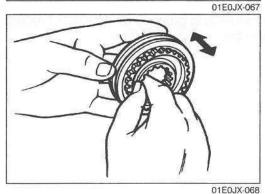
01E0JX-064





01E0JX-066





Secondary Shaft

Note

- · If the secondary shaft is replaced, adjust the bearing preload. (Refer to page J-39.)
- 1. Inspect the secondary shaft runout.

Maximum runout: 0.015mm (0.001 in)

- 2. Inspect the splines for damage and wear.
- 3. Inspect the gear teeth for damage, wear, and cracks.
- 4. Inspect the oil passage for blockage.

1st gear, 2nd gear, 5th gear

1. Measure the clearance between the shaft and the gear. mm (in)

	Shaft side (outer diameter)	Gear side (inner diameter)
1st gear side A	32.945—32.970 (1.297—1.298)	33.000—33.025 (1.299—1.300)
2nd gear side B	39.945—39.970 (1.573—1.574)	40.000—40.025 (1.575—1.576)
5th gear side C	28.545—28.570 (1.124—1.125)	28.600—28.621 (1.126—1.127)

- 2. Inspect the synchronizer cones for wear.
- 3. Inspect the gear teeth for damage, wear, and cracks.
- 4. Inspect the contact surfaces of the synchronizer ring and the 1st/2nd and 5th gear for wear and cracks.

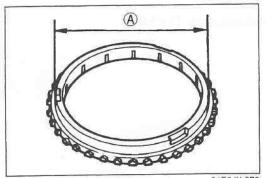
Clutch hub assembly

- 1. Inspect the clutch hub sleeve and hub operation.
- 2. Inspect the gear teeth for damage, wear, and cracks.
- 3. Inspect the synchronizer key for damage, wear, and cracks.

ASSEMBLY Precaution

- 1. All O-rings and gaskets must be replaced with the new ones included in the overhaul kit.
- 2. Verify that all parts are completely clean before assembly.
- 3. Assemble parts within 10 minutes after applying sealant.
 Allow all sealant to cure at least 30 minutes after assembly before filling the transaxle with oil.
- 4. A bearing outer race and bearing inner race must be replaced as an assembly.

01E0JX-069



Clutch hub assembly

Note

Synchronizer ring diameters are as follows.

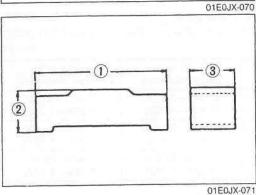
mm (in)

	A
1st	55.7 (2.193)
2nd	55.7 (2.193)
3rd and 4th	49.7 (1.957)
5th	43.7 (1.720)

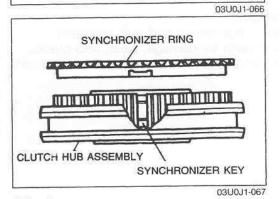


mm (in)

	1	2	3
1st/2nd	17.00 (0.669)	4.25 (0.167)	5.00 (0.197)
3rd/4th	14.00 (0.551)	4.25 (0.167)	5.00 (0.197)
5th/Rev	14.00 (0.551)	4.25 (0.167)	5.00 (0.197)



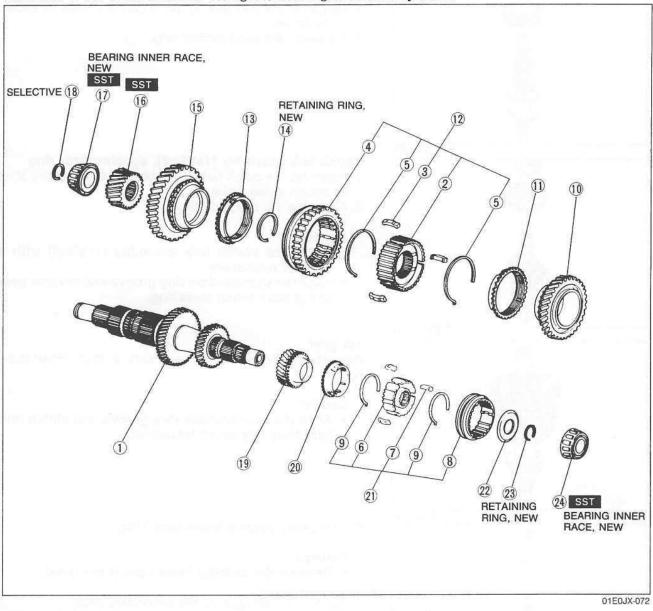
 Install the synchronizer key springs in the clutch hub with the hooks in the grooves to hold the three synchronizer keys in place.



2. Align the synchronizer ring grooves with the synchronizer key during assembly.

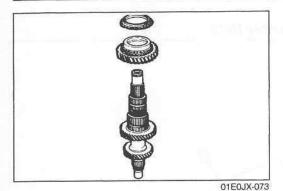
Secondary Shaft Assembly

Assemble in the order shown in the figure, referring to Assembly Note.



1. Secondary shaft 2. Clutch hub (1st/2nd) 3. Synchronizer key 4. Clutch hub sleeve 5. Synchronizer key spring 6. Clutch hub 7. Synchronizer key 8. Clutch hub sleeve (5th) 9. Synchronizer key spring 10. 2nd gear Assembly Note..... page J-32 11. Synchronizer ring Assembly Note..... page J-32 12. Clutch hub assembly (1st/2nd) Assembly Note..... page J-32 13. Synchronizer ring Assembly Note..... page J-32

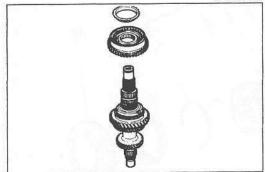
	UIE	UJA-0/2
14. Retaining ring		
15. 1st gear		
Assembly Note	page	J - 32
16. Pinion gear		
Assembly Note	page	J - 32
17. Bearing inner race (1st)	(C) (CO)	
Assembly Note	page	J - 32
18. Retaining ring		
Assembly Note	page	J - 33
19. 5th gear		
20. Synchronizer ring		
21. Clutch hub assembly (5th)		
Assembly Note	page	J - 33
22. Washer		
23. Retaining ring		
24. Bearing inner race (5th)		
Assembly Note	page	J-33



Assembly note 2nd gear, synchronizer ring

1. Assemble the 2nd gear to the secondary shaft as shown in the figure.

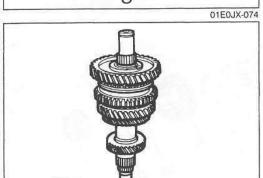
2. Assemble the synchronizer ring.



Clutch hub assembly (1st/2nd), synchronizer ring

1. Assemble the clutch hub assembly to the secondary shaft as shown in the figure.

2. Assemble the synchronizer ring.



Caution

 Install the clutch hub assembly (1st/2nd) with a press if necessary.

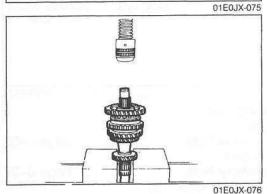
 Align the synchronizer ring groove and reverse gear key groove when installing.

1st gear

Assemble the 1st gear to the secondary shaft as shown in the figure.

Caution

 Align the synchronizer ring groove and clutch hub assembly key when installing.



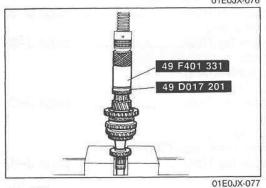
Pinion gear, bearing inner race (1st)

Caution

Replace the bearing inner race if removed.

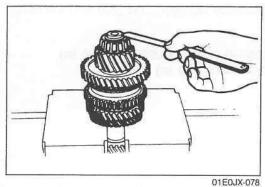
1. Support the 4th gear of the secondary shaft.

2. Install the plain end of pinion gear with the bottom up.



3. Set the **SST** to the new bearing inner race as shown in the figure.

J - 32



Retaining ring

Caution

- Replace the retaining ring if removed.
- 1. Install the retaining ring.
- 2. Measure the clearance between the retaining ring and secondary shaft groove.

Clearance: 0-0.1mm (0-0.004 in)

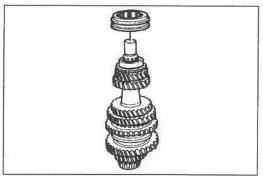
3. If not as specified, select the proper retaining ring from the chart below and install it.

Retaining ring thickness:

mm (in)

2.0 (0.079)	2.1 (0.082)	2.2 (0.086)	2.3 (0.090)	2.4 (0.094)
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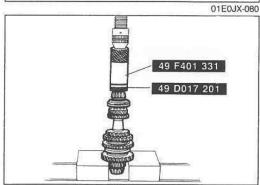
01E0JX-079



Clutch hub assembly (5th)

Install the clutch hub assembly onto the secondary shaft.

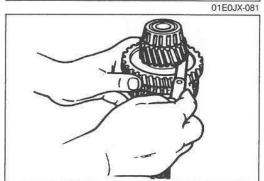
 Install the clutch hub assembly (5th) with a press if necessary.



Bearing inner race (5th)

Caution

- Replace the bearing inner race if removed.
- 1. Support the 1st gear of the secondary shaft and press the bearing inner race on.
- 2. Install the new bearing inner race using the SST and press, as shown in the figure.

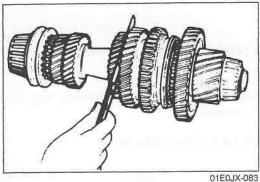


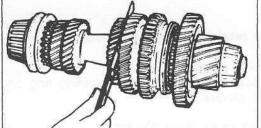
01E0JX-082

3. Measure the clearance between 1st gear and the pinion gear.

Clearance: 0.22-0.62mm (0.008-0.024 in)

Maximum: 0.67mm (0.026 in)



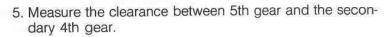


dary 3rd gear.

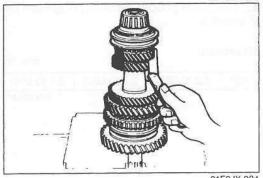
4. Measure the clearance between 2nd gear and the secon-

Clearance: 0.06-0.21mm (0.002-0.008 in)

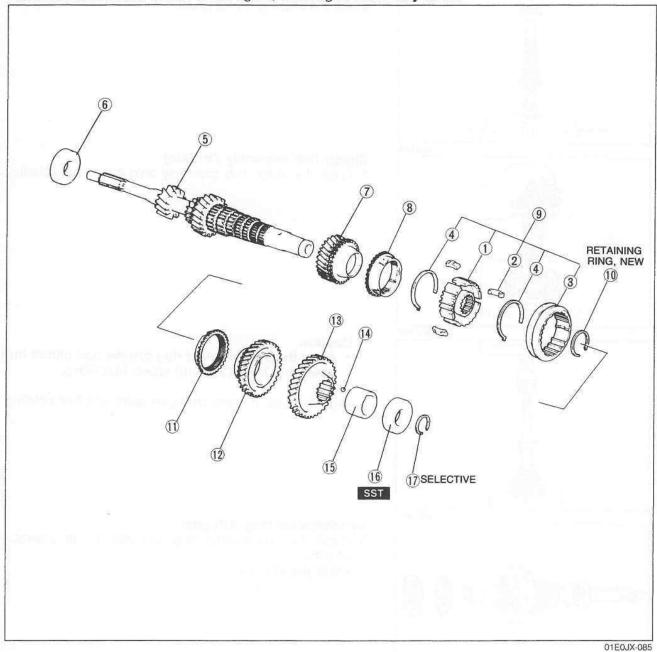
Maximum: 0.26mm (0.010 in)



Clearance: 0.06—0.21mm (0.002—0.008 in) Maximum: 0.26mm (0.010 in)



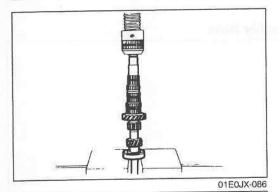
Primary Shaft AssemblyAssemble in the order shown in the figure, referring to **Assembly Note**.



1. Clutch hub (3rd/4th)	
2. Synchronizer key	
3. Clutch hub sleeve	
4. Synchronizer key spring	
5. Primary shaft	
6. Bearing (1st)	
Assembly Note	page J-36
7. 3rd gear	
8. Synchronizer ring	
9. Clutch hub assembly (3rd/4th)	
Assembly Note	page J-36
0. Retaining ring	
Synchronizer ring	
Assembly Note	page J-36

12. 4th gear	1 00
Assembly Note13. 5th gear	page J-36
Assembly Note	page J-36
14. Steel ball	
Assembly Note	page J-37
15. Spacer	
Assembly Note	page J-37
16. Bearing (5th)	
Assembly Note	page J-3/
17. Retaining ring	
Assembly Note	page J-3/

TRANSAXLE



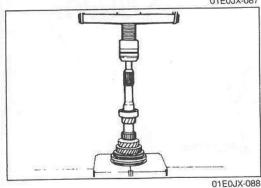
Assembly Note Bearing (1st)

Install the bearing with a press.



Clutch hub assembly (3rd/4th)

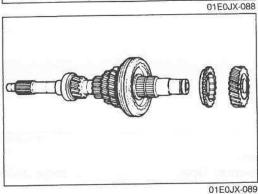
1. Press the clutch hub assembly onto the primary shaft.



Caution

 Align the synchronizer ring groove and clutch hub assembly keys (3rd/4th) when installing.

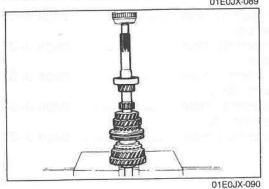
2. Align the clutch hub and shaft gear spline and then installing.



Synchronizer ring, 4th gear

1. Install the synchronizer ring and clutch hub assembly (3rd/4th).

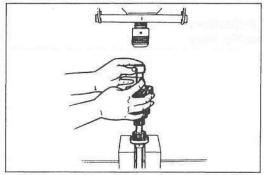
2. Install the 4th gear.

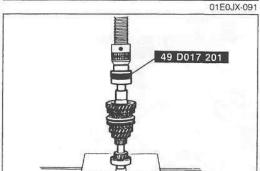


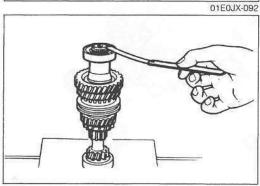
5th gear

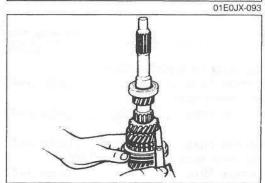
Caution

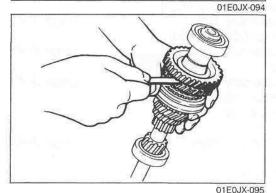
- Align the synchronizer ring groove and clutch hub assembly keys (3rd/4th) when installing.
- 1. Align the clutch hub and primary shaft splines.
- 2. Press the 5th gear on.











Steel ball, spacer

Hold the steel ball with a finger, and install the spacer.

Bearing (5th)

Caution

Replace the ball bearing if removed.

Install the ball bearing with the SST and a press.

Retaining ring

Caution

- Replace the retaining ring if removed.
- 1. Install the retaining ring.
- Measure the clearance between retaining ring and the primary shaft.

Clearance: 0—0.1mm (0—0.004 in)

3. If not as specified, select the proper retaining ring from the chart below and install it.

Retaining ring

mm (in)

2.0 (0.079) 2.1 (0.082) 2.2 (0.086) 2.3 (0.090) 2.4 (0.094)

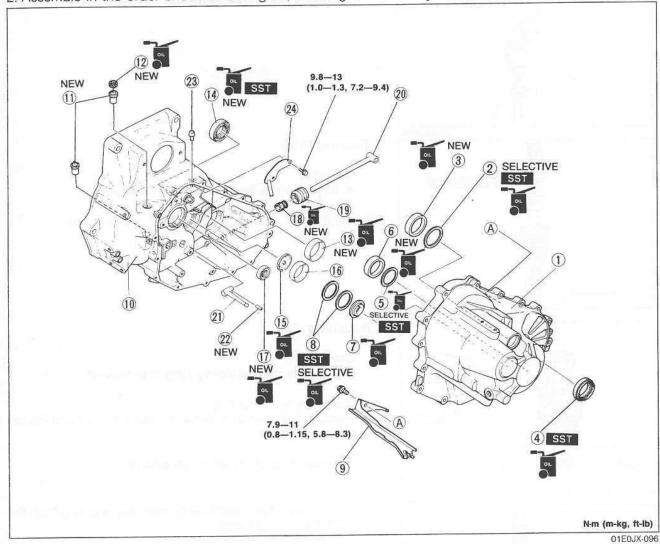
Note

- The following inspection is to verify proper assembly of the primary shaft.
- Measure the clearance between the 3rd gear and 2nd gear. (Refer to page J-22.)
- Measure the clearance between the 4th gear and ball bearing. (Refer to page J-22.)

Clutch Housing and Transaxle Case Components

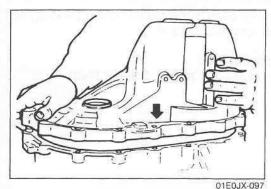
1. Select the adjustment shim(s), referring to Bearing Preload Adjustment.

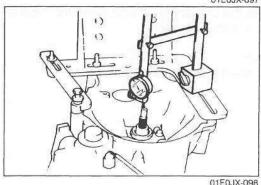
2. Assemble in the order shown in the figure, referring to Assembly Note.



1. Transaxle case 2. Adjustment shim Assembly Note..... page J-45 3. Bearing outer race (differential) Assembly Note...... page J-45 4. Oil seal (differential) Assembly Note..... page J-45 5. Adjustment shim Assembly Note..... page J-45 6. Bearing outer race (secondary shaft) Assembly Note...... page J-45 7. Funnel Assembly Note..... page J-46 8. Adjustment shim Assembly Note...... page J-46 9. Oil passage 10. Clutch housing 11. Bushing 12. Oil seal

		01E03X-096
13. Bearing out	er race (differential)	pago 1 46
14. Oil seal (diffe	Note	. page 1–40
Assembly	Note	. page J-46
15. Funnel		
Assembly	Note	. page J-47
16. Bearing out	er race (secondary sha	aft)
Assembly	Note	. page J-47
17. Oil seal (prin	mary shaft)	
Assembly	Note	. page J-47
18. Oil seal (cha	ange rod)	
Assembly	Note	. page J-47
19. Boot		
Assembly	Note	. page J-47
20. Change rod		
21. Change arm	1	
22. Roll pin		
Assembly	Note	. page J-48
23. Bleeder		
24. Baffle plate		





Adjustment shim selection

Select the shim(s) as follows.

Primary shaft assembly

- 1. Set the primary shaft assembly into the clutch housing.
- 2. Install the transaxle case to the clutch housing and tighten the bolts to the specified torque.

Tightening torque:

19-26 N·m (1.9-2.6 m-kg, 14-19 ft-lb)

3. Mount a dial indicator to the transaxle hanger and measure the primary shaft thrust clearance.

Clearance: 0-0.1mm (0-0.004 in)

Caution

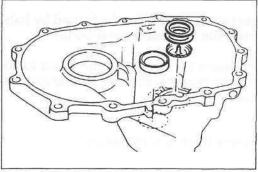
- . Do not use more than three (3) shims.
- 4. Select the closest shim on the thin side from the table for adjustment of the primary shaft.

Adjustment shim thickness:

mm (in)

0.30 (0.012)	0 40 (0.016)	0 50 (0 019)
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01E0JX-099



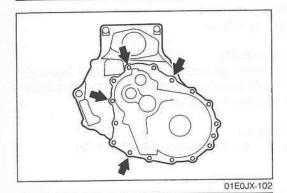
01E0JX-100

Secondary shaft assembly

Caution

- · Do not install the secondary shaft shim.
- Apply petroleum jelly to prevent the shim from falling when installing it.
- 1. Remove the transaxle case and install the proper adjustment shim for the primary shaft.
- 2. Install the primary shaft gear assembly and the secondary shaft gear assembly.
 - Do not install the secondary shaft shim at this time.
- 3. Shift the gears to 4th gear.

TRANSAXLE



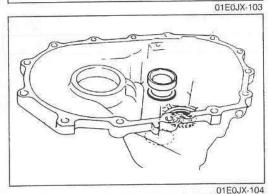
4. Install the transaxle case to the clutch housing and tighten the bolts to the specified torque.

Tightening torque: 19—26 N·m (1.9—2.6 m-kg, 14—19 ft-lb)

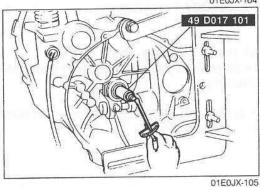


Set the SST onto the primary shaft and measure the starting torque with a torque wrench.

Starting torque: 0-147 N·m (0-15 m-kg, 0-108 ft-lb)



- 6. Remove the transaxle case and the bearing outer race.
- Install the shim removed during disassembly and the bearing outer race.



Caution

- Verify that the primary shaft can be turned by hand after tightening the transaxle case bolts.
- 8. Using the **SST** measure the starting torque with a torque wrench and select the proper shim if the starting torque is greater than in Step 4.

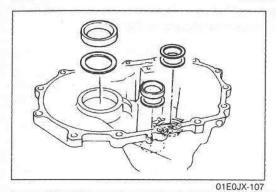
Caution

Do not use more than two (2) shims.

Adjustment shim thickness:

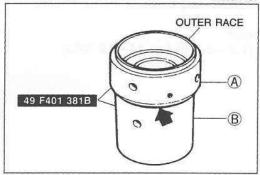
mm (in)

0.30 (0.011)	0.35 (0.013)	0.40 (0.016)	0.45 (0.018)
0.50 (0.020)	0.55 (0.021)	0.60 (0.023)	01E0JX-106



Differential

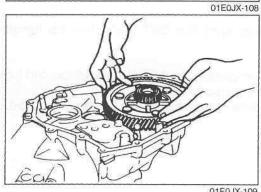
1. Remove the bearing outer races from the transaxle case and remove the adjustment shims.



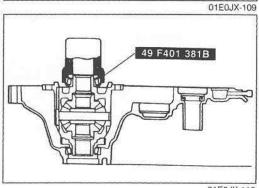
Note

 Turn A and B until the gap (arrow) in the figure is eliminated.

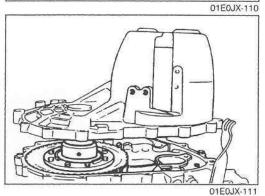
2. Install the differential side bearing outer race to the **SST** (selector).



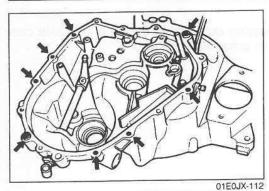
3. Set the bearing outer race and differential assembly into the clutch housing.



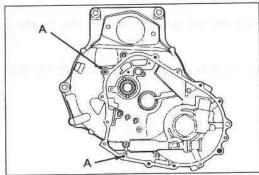
4. Set the bearing outer race and **SST** onto the differential assembly as shown in the figure.



5. Slide the transaxle case over the differential assembly.

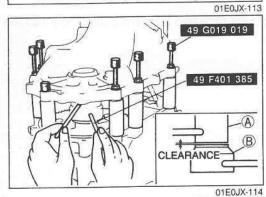


6. Set the **SST (collars)** between the transaxle case and clutch housing in the positions shown in the figure.



7. Tighten the SST (bolt set) to the specified torque.

Tightening torque: 19—26 N·m (1.9—2.6 m-kg, 14—19 ft-lb)

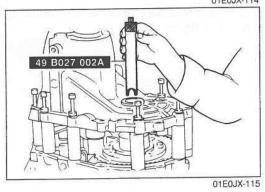


Note

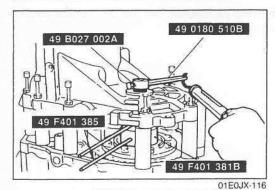
 Turn the bars until the SST (selector) no longer turns.

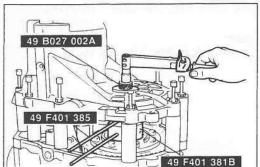
8. Mount the bars on parts (A) and (B) of the selector, and turn the selector so the gap is widened.

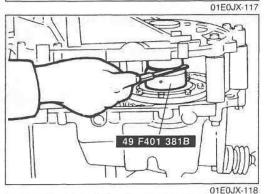
9. Turn in the reverse direction until the gap is eliminated.

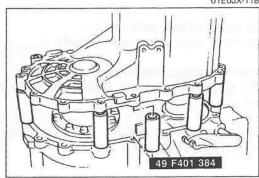


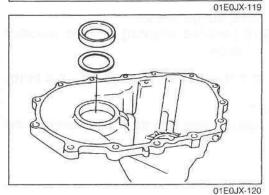
10. Install the **SST** to the differential pinion shaft through the transaxle case.











Note

· Procedure work with a pull scale.

· Procedure 12 work with a torque wrench.

11. Turn the **SST** with a pull scale. Adjust the **SST** (preload adapter) until the specified preload.

Preload: 0.5—0.7 N·m (5—7.6 cm-kg, 4.3—6.6 in-lb) Pull scale: 500—760 g (17.7—26.8 oz)

12. Turn the **SST** with a torque wrench. Adjust the **SST** (selector) with the bars until the specified preload is obtained.

Preload: 0.5-0.7 N·m (5-7.6 cm-kg, 4.3-6.6 in-lb)

13. Remove the SST.

- Measure the gap around the entire circumference of the SST (selector).
- 15. Select the proper adjustment shim(s) to be used for the differential by referring to the table and selecting the shim which is nearest (on the thick side) to the largest measured clearance in the selector.

Adjustment shim thickness:

mm (in)

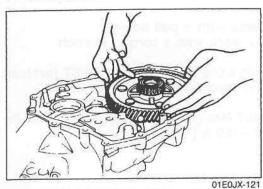
0.10 (0.004)	0.15 (0.006)	0.20 (0.008)	0.25 (0.010)	0.30 (0.012)
0.35 (0.014)	0.40 (0.016)	0.45 (0.018)	0.50 (0.020)	0.55 (0.022)
0.60 (0.024)	0.65 (0.026)	0.70 (0.028)	0.75 (0.030)	0.80 (0.031)
0.85 (0.033)	0.90 (0.035)			

16. Remove the SST (bolts).

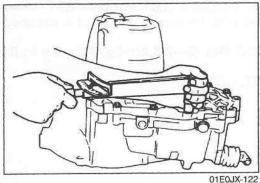
17. Remove the transaxle case and the SST (collars).

18. Remove the bearing outer race from the SST (selector).

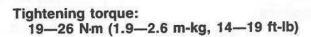
19. Install the selected shim(s) and bearing outer race to the transaxle case.



20. Measure the preload as follows. Set the differential assembly into the clutch housing.

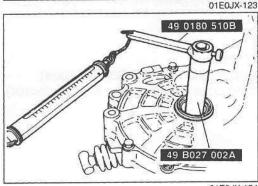


21. Install the transaxle case onto the clutch housing.





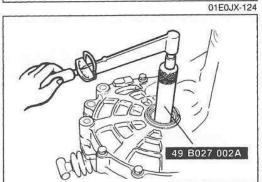
22. Install the **SST** to the differential side gear through the transaxle case.



Note

- Procedure 23 work with a pull scale.
 Procedure 24 work with a torque wrench.
- Turn the SST (preload attachment) with a pull scale.
 Readjust the SST (preload adaptor) until the specified preload when not apply.

Preload: 0.5—0.7 N·m (5—7.6 cm-kg, 4.3—6.6 in-lb)
Pull scale: 500—760 g (17.7—26.8 oz)

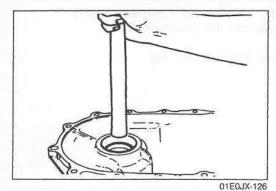


01E0JX-125

24. Turn the SST with a torque wrench. Readjust the SST (preload adaptor) until the specified preload when not apply.

Preload: 0.5-0.7 N·m (5-7.6 cm-kg, 4.3-6.6 in-lb)

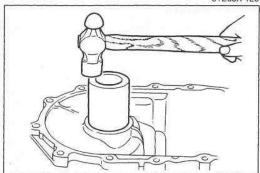
- 25. Remove the SST.
- 26. Remove the transaxle case and then the differential assembly.



Assembly Note

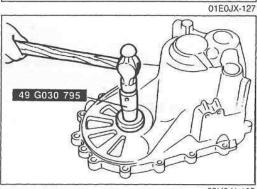
Adjustment shim and bearing outer race (differential)

1. Set the adjustment shim and new bearing outer race into the transaxle case.



After mounting the clutch housing onto the transaxle hanger, tap in the differential bearing outer races with a hammer until it is flush with the end of the transaxle case.

Pipe diameter: 59mm (2.32 in)

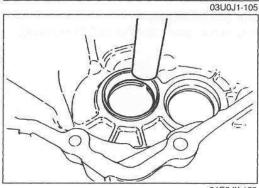


Oil seal (differential)

Caution

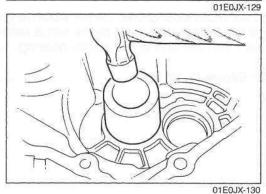
 Apply transaxle oil to the outer circumference of the oil seal.

Install the new oil seal with the SST.



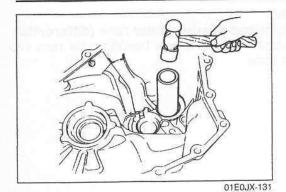
Adjustment shim, bearing outer race (secondary shaft)

1. Install the adjustment shim and bearing outer race into the clutch housing.



After mounting the clutch housing onto the transaxle hanger, tap in the differential bearing outer races with a hammer until it is flush with the end of the clutch housing.

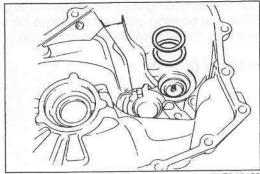
Pipe diameter: 47mm (1.85 in)



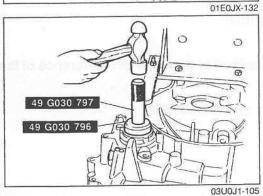
Adjustment shim and funnel (primary shaft)

1. Install the funnel into the transaxle case.

Pipe diameter: 40mm (1.57 in)



2. Install the adjustment shim(s).

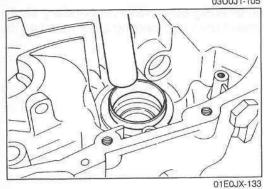


Oil seal (differential)

Caution

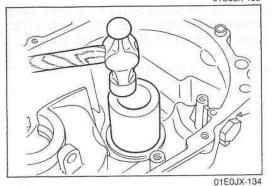
 Apply transaxle oil to the outer circumference of the oil seal.

Install the new oil seal with the SST.



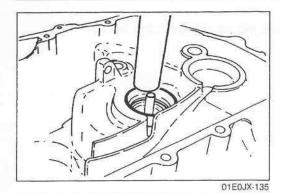
Bearing outer race (differential)

1. Install the bearing outer race into the clutch housing.



After mounting the clutch housing onto the transaxle hanger, tap in the differential bearing outer races with a hammer until it is flush with the end of the clutch housing.

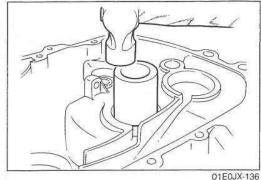
Pipe diameter: 59mm (2.32 in)



Funnel and bearing outer race (secondary shaft)

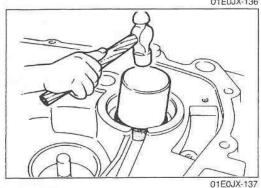
Note

· Install the funnel which has the extra hole.



- 1. Set the funnel and bearing outer race into the clutch housing.
- 2. Tap the bearing outer race with a suitable pipe until it is fully seated in the clutch housing.

Pipe diameter: 50mm (1.97 in)



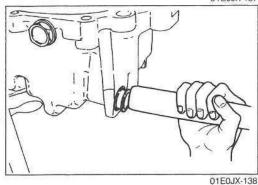
Oil seal (primary shaft gear)

Caution

 Apply transaxle oil to the outer circumference of the oil seal.

Install the new oil seal with a suitable pipe.

Pipe diameter: 38mm (1.50 in)

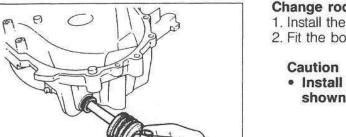


Oil seal (change rod)

Caution

 Apply transaxle oil to the outer circumference of the oil seal.

Tap the new oil seal in until it is fully seated.



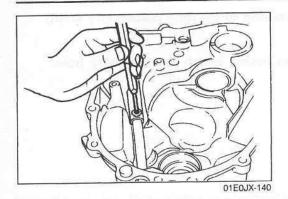
01E0JX-139

Change rod and boot

- 1. Install the change rod and boot into the transaxle.
- 2. Fit the boot over the seal.

 Install the boot with the air bleed downward as shown in the figure.

AIR BLEED



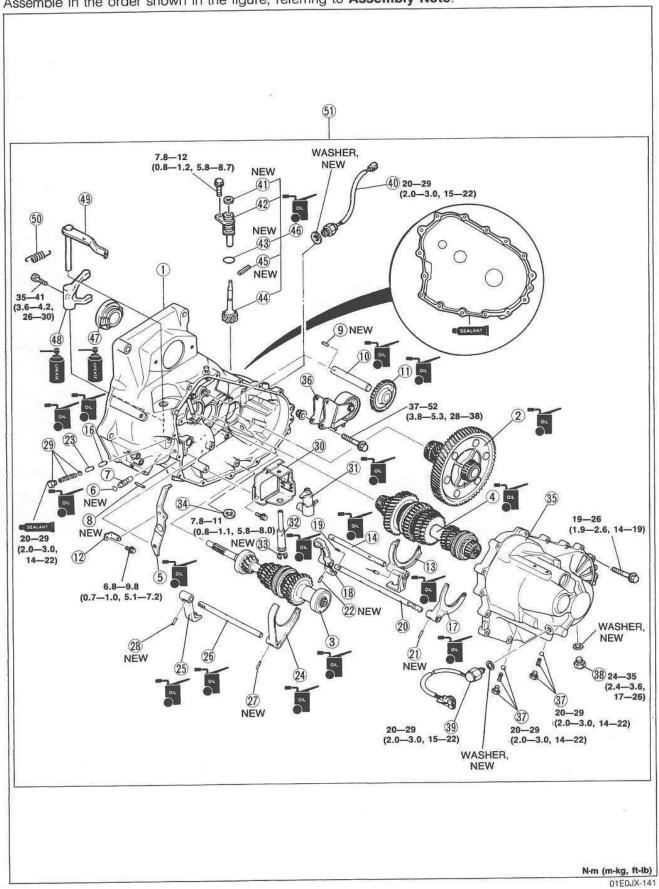
Roll pin Install the new roll pin as shown in the figure.

J

MEMO

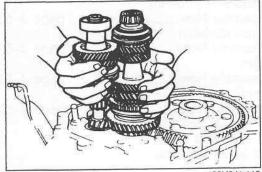
Housing Parts

Assemble in the order shown in the figure, referring to Assembly Note.



TRANSAXLE

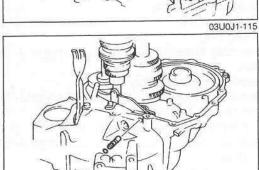
1. Clutch housing assembly	25. Shift rod end (3rd/4th)
2. Differential assembly	Assembly Note page J-53
Primary shaft gear assembly	26. Shift rod (3rd/4th)
Assembly Note page J-52	Assembly Note page J-53
4. Secondary shaft gear assembly	27. Roll pin
Assembly Note page J-52	Assembly Note page J-53
5. Reverse shift lever	28. Roll pin
Assembly Note page J–52	Assembly Note page J-53
6. O-ring	29. Plug, spring (3rd/4th), steel ball
7. Reverse lever shaft	30. Base plate unit
Assembly Note page J–52	31. Crank lever assembly
8. Pin	32. Crank lever shaft
Roll pin Reverse idler shaft	Assembly Note page J-54
	Assembly Note page 3-34
11. Hoverse later goal	- 11 11 ag 1 a 1
Assembly Note page J-52	35. Transaxle case assembly
12. Lever set spring	Assembly Note page J–54
13. Shift fork (1st/2nd)	36. Engine mount No.1
Assembly Note page J-52	37. Plug, spring (1st/2nd, 5th/Rev), steel ball
14. Shift rod (1st/2nd)	Assembly Note page J-54
Assembly Note page J-52	38. Drain plug
15. Roll pin	39. Back-up light switch
Assembly Note page J-52	40. Neutral switch
16. Interlock pin	41. Oil seal
Assembly Note page J-52	Assembly Note page J-55
17. Shift fork (5th/Rev)	42. Speedometer gear sleeve
Assembly Note page J-53	43. O-ring
18. Shift rod end (5th/Rev)	44. Driven gear
Assembly Note page J-53	45. Roll pin
19. Interlock pin	Assembly Note page J-55
Assembly Note page J-53	46. Speedometer driven gear assembly
20. Shift rod (5th/Rev)	47. Clutch release collar
Assembly Note page J-53	Assembly Note page J-55
21. Roll pin	48. Clutch release fork
Assembly Note page J-53	Assembly Note page J-55
22. Roll pin	49. Clutch lever
Assembly Note page J-53	Assembly Note page J-55
23. Interlock pin	50. Return spring
Assembly Note page J-53	51. Transaxle
24. Shift fork (3rd/4th)	01E0JX-142
Assembly Note page J–53	UTEON 172
Assembly Note page 0-00	



Assembly Note

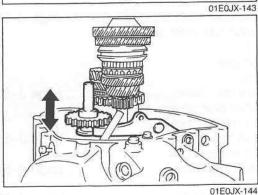
Primary shaft gear assembly and secondary shaft gear assembly

Install the primary shaft gear assembly and the secondary shaft gear assembly together.



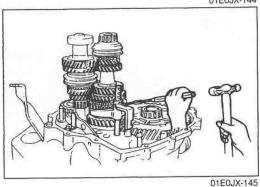
Reverse shift lever, reverse lever shaft

- Apply transaxle oil to the new O-ring and then install the reverse lever shaft.
- Install the reverse shift lever and then install the reverse lever shaft.
- 3. Install the new pin.



Reverse idler gear

Install the reverse idler gear and the reverse idler shaft.



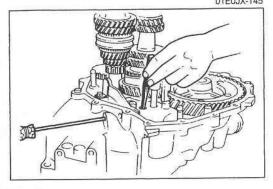
Shift rod (1st/2nd), shift fork (1st/2nd), roll pin, interlock pin

Caution

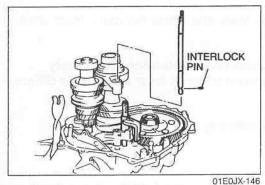
- The mark (indicated by the arrow in the figure) and the shift rod end mounting bolt hole must be in the same direction.
- 1. Install the shift fork and the shift rod.

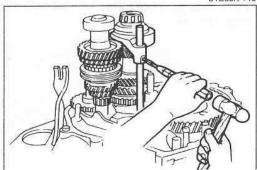
Caution

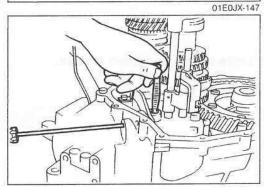
- When installing the roll pin, be careful not to damage the shift rod.
- 2. Install the new roll pin.
- 3. Install the interlock pin.

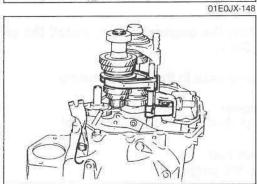


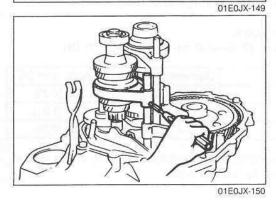
J-52











Shift rod (5th/Rev), shift fork (5th/Rev), shift rod end (5th/Rev), roll pin, interlock pin

Caution

- Install the interlock pin into the hole of clutch housing as shown in the figure.
- 1. Install the interlock pin to the shift rod and install the shift rod.

Caution

When installing the roll pin, be careful not to damage the shift rod.

Note

mm (in)

Roll pin size	Diameter	Length
Shift fork (5th/Rev)	5.0 (0.20)	22 (0.87)
Shift rod end (5th/Rev)	5.0 (0.20)	20 (0.79)

- 2. Install the new roll pin.
- 3. Install the interlock pin.

Shift rod (3rd/4th), shift fork (3rd/4th), shift rod end (3rd/4th), roll pin

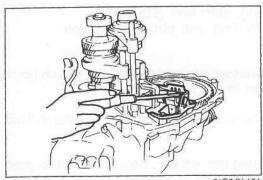
Caution

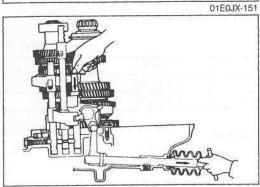
- Install the interlock pin into the hole of clutch housing as shown in the figure.
- 1. Install the interlock pin to the shift rod and install the shift rod.

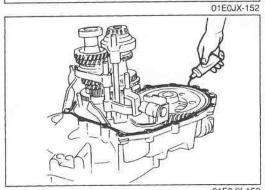
Caution

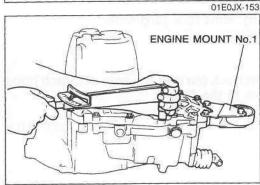
- When installing the roll pin, be careful not to damage the shift rod.
- 2. Install the new roll pin.

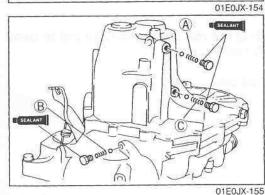
TRANSAXLE











Retaining ring

1. Install the crank lever and install the crank lever shaft.

Caution

- · Verify the installing a retaining ring surely.
- Install the groove of crank lever shaft to the differential end.
- 2. Install the new retaining ring.
- 3. Shift the gears to 3rd gear and hold the shift rod with one hand so that it does not fall.

Transaxle case assembly

Note

- Tighten the bolts to the specified torque.
- 1. Apply sealant and install the transaxle case.

Caution

- When installing the transaxle case, install the engine mount No.1.
- 2. Install the transaxle case to the clutch housing.

Tightening torque: 19—26 N·m (1.9—2.6 m-kg, 14—19 ft-lb)

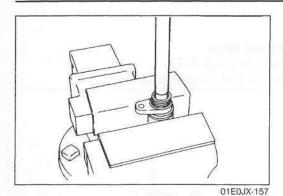
Plug, spring, steel ball

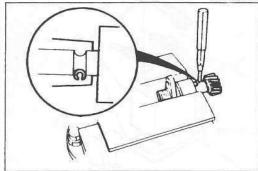
- 1. Apply sealant to the plugs.
- 2. Install the steel balls, springs and plugs.

Tightening torque: 20—29 N·m (2.0—3.0 m-kg, 14—22 ft-lb)

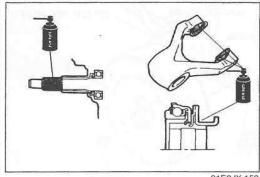
Spring	Diameter mm (in)	Length mm (in)
A	7.2 (0.28)	22.5 (0.89)
(B)	7.2 (0.28)	33.2 (1.31)
0	7.2 (0.28)	22.5 (0.89)

3. Confirm that the transaxle operates smoothly when shifted. If not, reassembly the transaxle.

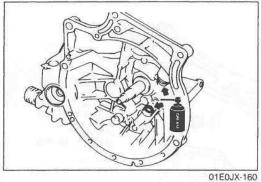




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01E0JX-159



Oil seal

- 1. Place the speedometer gear sleeve in a vice.
- 2. Tap the new oil seal into the speedometer gear sleeve using a suitable pipe.

Pipe diameter: 15mm (0.59 in)

Roll pin

Install the new roll pin as shown in the figure.

Clutch release fork, clutch release color

Apply grease as shown in the figure.

Clutch lever

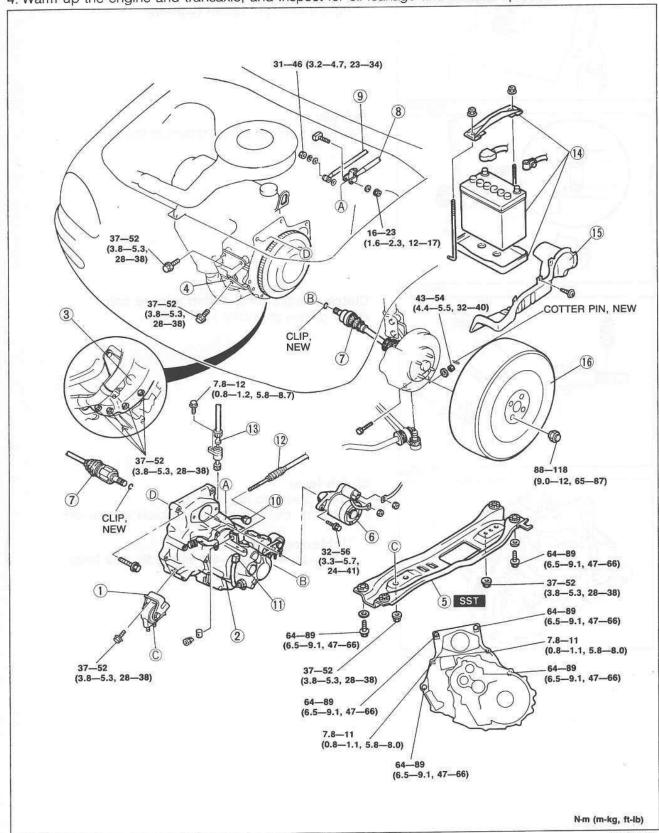
- Apply grease to the bushing.
 Install the clutch lever to the clutch release fork.

Tightening torque:

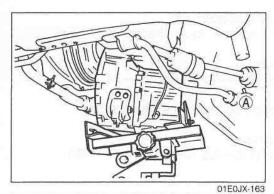
35-41 N·m (3.6-4.2 m-kg, 26-30 ft-lb)

INSTALLATION

- 1. Raise the vehicle and support with safety stands.
- 2. Install in the order shown in the fighre, refferring to Installation Note.
- 3. Add the specified amount of the specified transaxle oil. (Refer to page J-7.)
- 4. Warm up the engine and transaxle, and inspect for oil leakage and trasaxle operation.

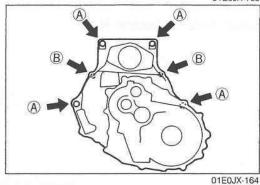


1. Engine mount No.2	9. Extension bar
2. Transaxle	Installation Note page J-58
Installation Note page J-57	10. Neutral switch connector
3. Stiffner	11. Back-up light switch connector
4. Exhaust pipe bracket	12. Clutch cable
5. Engine mount member	Installation Notepage J-58
Installation Note page J-57	13. Speedometer cable
6. Starter	Installation Note page J-58
7. Driveshaft	14. Battery, battery carrier
Installation Note page J-58	15. Splash shied
8. Control rod	16. Wheel and tire
Installation Note page J-58	01A0JX-003



Installation Note **Transaxle**

1. Set the transaxle on a jack and lift it into place.

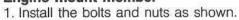


2. Install the transaxle bolts.

Tightening torque

A: 64-89 N·m (6.5-9.1 m-kg, 47-66 ft-lb) B: 7.3-11 Nm (0.8-1.1 m-kg, 5.8-8.0 ft-lb)

Engine mount member

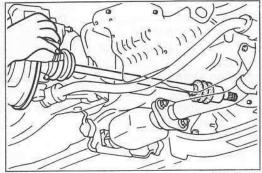


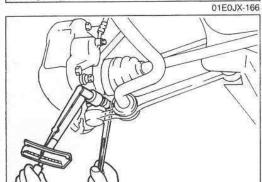
Tightening torque

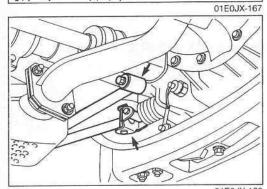
(A): 64-89 N·m (6.5-9.1 m-kg, 47-66 ft-lb) B: 37-52 N·m (3.8-5.3 m-kg, 28-38 ft-lb)

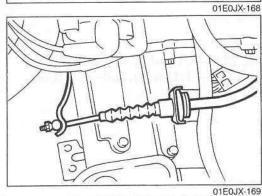
Caution

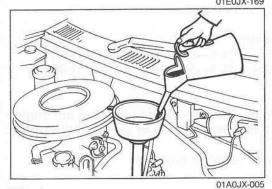
- Before install the engine mount member, put engine mount No.1 and No.2 studs in the installing hole.
- 2. Remove the SST (Engine support).











Driveshaft

Caution

- Verify that the oil seal is not damaged.
- Do not damage the oil seal.
- 1. Insert the new clip with the end-gap at the top of the groove.
- 2. Apply transaxle oil around the oil seal lip. Install the driveshaft.
- Verify that the driveshaft is correctly seated by pulling on the shaft.
- 4. Connect the lower arm to the knuckle and tighten the clinch bolt

Tightening torque: 43—54 N·m (4.4—5.5 m-kg, 32—40 ft-lb)

Extension bar and control rod

1. Install the extension bar to the transaxle.

Tightening torque: 31—46 N·m (3.2—4.7 m-kg, 23—34 ft-lb)

2. Install the change control rod to the transaxle.

Tightening torque: 16—23 N·m (1.6—2.3 m-kg, 12—17 ft-lb)

Clutch cable

Install the clutch cable. (Refer to Section H.)

Speedometer cable

- Add the specified amount of the specified transaxle oil thought the speedometer driven gear installation hole.
- 2. Install the speedometer driven gear.

Tightening torque: 7.8—12 N·m (0.8—1.2 m-kg, 5.8—8.7 ft-lb)

Connect the speedometer cable to the speedometer driven gear.

DIFFERENTIAL

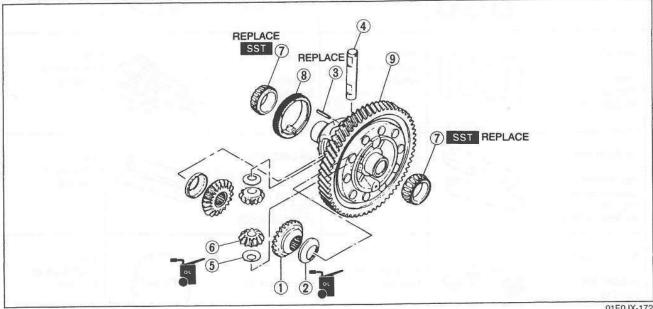
PREPARATION SST

49 B017 2A0 Remover set, bearing		For removal of bearing	49 D027 002 Attachment L (Part of 49 B017 2A0)	For removal of bearing
49 F401 366A Plate (Part of 49 B017 2A0)		For removal of bearing	49 0839 425C Puller set, bearing	For removal of bearing
49 0839 428 Attachment, bearing puller (Part of 49 0839 425C)		For removal of bearing	49 0862 426 Attachment, bearing puller (Part of 49 0839 425C)	For removal of bearing
49 D017 2A1 Installer set, bearing	999	For installation of bearing	49 F401 337A Attachment C (Part of 49 D017 2A1)	For installation of bearing

DISASSEMBLY / INSPECTION / ASSEMBLY

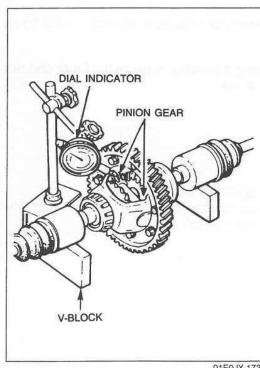
Caution

- Do not remove the inner race if not necessary.
- 1. Before disassembly, inspect the backlash of side gears, referring to Preinspection.
- 2. Disassemble in the order shown in the figure, referring to Disassembly Note.
- 3. Inspect all parts and repair or replace as necessary.
- 4. Measure the backlash after assembly, referring to Backlash of Pinion Gears.



- 1. Side gear Inspect for wear and cracks
- 2. Washer
- 3. Roll pin Disassembly Note..... page J-61
- 4. Pinion shaft
- 5. Thrust washer

- 6. Pinion gear Inspect for wear and cracks
- 7. Side bearing inner race Disassembly Note..... page J-61 Inspect for wear and cracks
- 8. Speedometer drive gear
- 9. Ring gear and gear case Inspect for wear and cracks



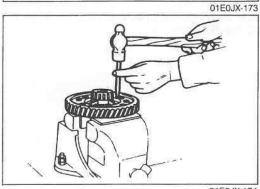
Preinspection Backlash of pinion gears

Measure the backlash as follows.

- Install the left and right driveshafts into the differential assembly.
- 2. Measure the backlash of both pinion gears.

Backlash : 0—0.1mm (0—0.004 in) Maximum: 0.5mm (0.020 in)

3. If the backlash is not as specified, replace the differential as an assembly.

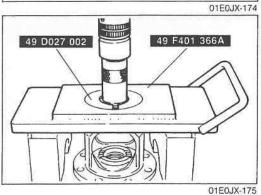


Disassembly Note Roll pin

Caution

- · Use protective plates in the vise.
- Insert the punch into the roll pin hole from the ring gear side.

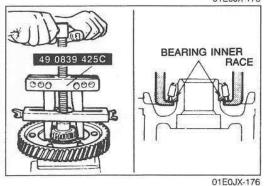
Secure the gear case in a vice and tap out the roll pin.



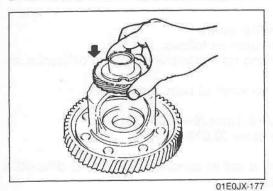
Side bearing inner race

Caution

- When replacing a bearing, replace the inner and outer races as a set.
- 1. Remove the bearing inner race (speedometer drive gear side) with the **SST**.
- 2. Remove the bearing inner race (ring gear side) with the SST.



DIFFERENTIAL

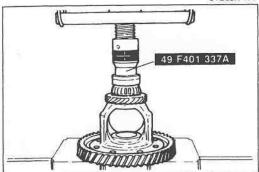


Assembly

1. Install the speedometer drive gear as shown in the figure.

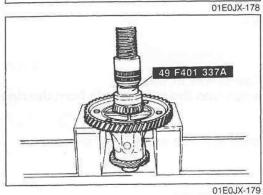
Caution

When replacing a bearing, replace the inner and outer races as a set.

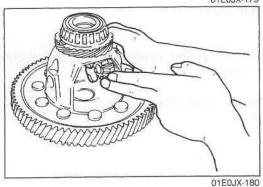


2. Install the new bearing inner race.

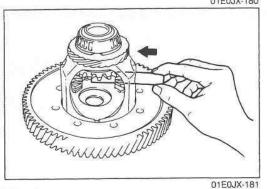
(1) Install the new bearing inner race (speedometer drive gear side) with a press and the **SST**.



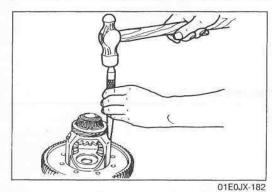
(2) Install the new bearing inner race. (ring gear side) with a press and the **SST**.



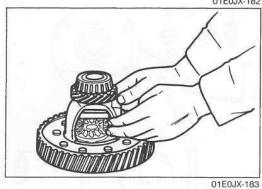
3. Set the pinion gears and thrust washer into the gear case.



4. Insert the pinion shaft.



5. Install a new roll pin and stake the case to prevent it from working out.



6. Install the side gears and washers.

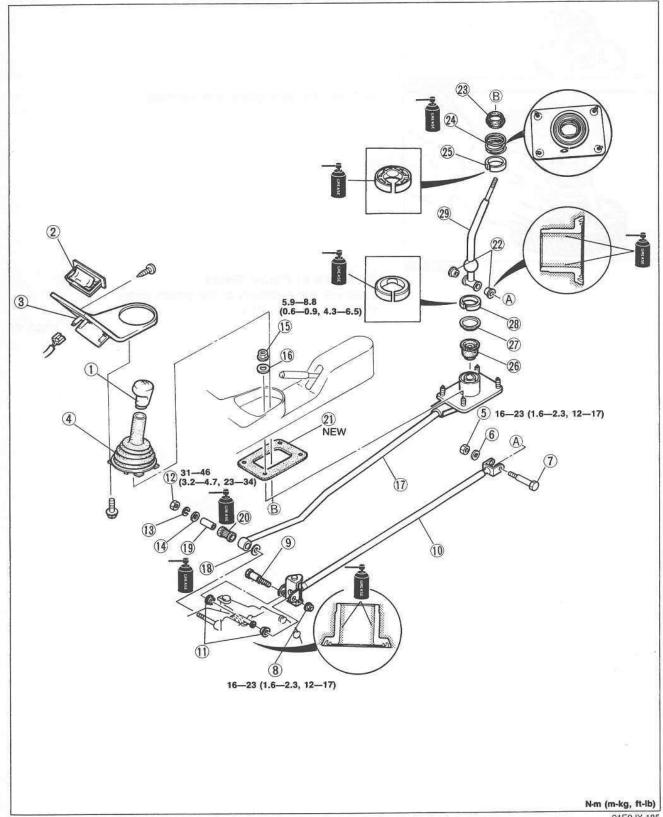
Backlash of Pinion Gears

Recheck the backlash of the pinion gears. (Refer to page J-61.)

SHIFT MECHANISM

OVERHAUL

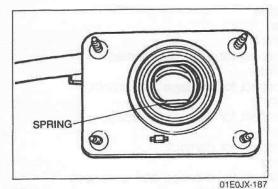
- 1. Disassemble in the order shown in the figure.
- Inspect all parts and repair or replace as necessary.
 Assemble in the reverse order of disassembly, referring to Assembly Note.

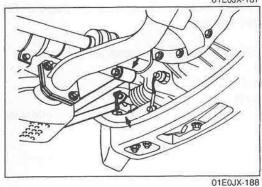


J

SHIFT MECHANISM

1. Shift lever knob	18. Washer
2. Ashtray	19. Pipe
3. Front console	20. Bushing
4. Boot	Inspect for wear and damage.
5. Nut	21. Insulator
6. Washer	Inspect for damage and cracks
7. Bolt	22. Bushing
8. Nut	Inspect for wear and damage
9. Bolt	23. Boot
10. Control rod	Inspect for damage
Inspect for bending	24. Spring
Assembly Note page J-66	Inspect for damage and weakness
11. Bushing	Assembly Note page J-66
Inspect for wear and damage	25. Ball seat (upper)
12. Nut	26. Boot
13. Washer	Inspect for wear and damage
14. Washer	27. Holder
15. Nut	28. Ball seat (lower)
16. Washer	29. Shift lever
17. Extension bar	01E0JX-186
Inspect for bending Assembly Note page .1–66	





Assembly Note Spring

- 1. Apply grease to the spring.
- 2. Assemble the spring as shown in the figure.

Extension bar

- Assemble the insulator to the bracket of the extension bar and install the nuts and washers.
- 2. Connect the extension bar to the transaxle, then to the body.

Tightening torque

Transaxle:

5.9—8.8 N·m (0.6—0.9 m-kg, 4.3—6.5 ft-lb)

Shift lever:

31-46 N·m (3.2-4.7 m-kg, 23-34 ft-lb)

Control rod

- 1. Install the control rod.
- 2. Verify smooth operation of the shift mechanism.