対米向け（別冊）

Manual Transaxle

G15M-R
G25M-R

Workshop Manual Supplement

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WARNING

Servicing a vehicle can be dangerous. If you have not received service-related training, the risks of injury, property damage, and failure of servicing increase. The recommended servicing procedures for the vehicle in this workshop manual were developed with Mazda-trained technicians in mind. This manual may be useful to non-Mazda trained technicians, but a technician with our service-related training and experience will be at less risk when performing service operations. However, all users of this manual are expected to at least know general safety procedures.

This manual contains "Warnings" and "Cautions" applicable to risks not normally encountered in a general technician's experience. They should be followed to reduce the risk of injury and the risk that improper service or repair may damage the vehicle or render it unsafe. It is also important to understand that the "Warnings" and "Cautions" are not exhaustive. It is impossible to warn of all the hazardous consequences that might result from failure to follow the procedures.

The procedures recommended and described in this manual are effective methods of performing service and repair. Some require tools specifically designed for a specific purpose. Persons using procedures and tools which are not recommended by Mazda Motor Corporation must satisfy themselves thoroughly that neither personal safety nor safety of the vehicle will be jeopardized.

The contents of this manual, including drawings and specifications, are the latest available at the time of printing, and Mazda Motor Corporation reserves the right to change the vehicle designs and alter the contents of this manual without notice and without incurring obligation.

Parts should be replaced with genuine Mazda replacement parts or with parts which match the quality of genuine Mazda replacement parts. Persons using replacement parts of lesser quality than that of genuine Mazda replacement parts must satisfy themselves thoroughly that neither personal safety nor safety of the vehicle will be jeopardized.

Mazda Motor Corporation is not responsible for any problems which may arise from the use of this manual. The cause of such problems includes but is not limited to insufficient service-related training, use of improper tools, use of replacement parts of lesser quality than that of genuine Mazda replacement parts, or not being aware of any revision of this manual.

Manual Transaxle Workshop Manual Supplement G15M-R G25M-R

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FOREWORD

This manual explains the service points for the above-indicated automotive system. This manual covers all models with the above-indicated automotive system, not any one specific model.

In order to do these procedures safely, quickly, and correctly, you must first read this manual and any other relevant service materials carefully.

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 Mazda dealers. This manual should be kept up-to-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

RELATED MATERIALS

Manual Transaxle Workshop Manual G25M-R 9999–95–191H–98

GENERAL INFORMATION

00
SECTION

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HOW TO USE THIS MANUAL

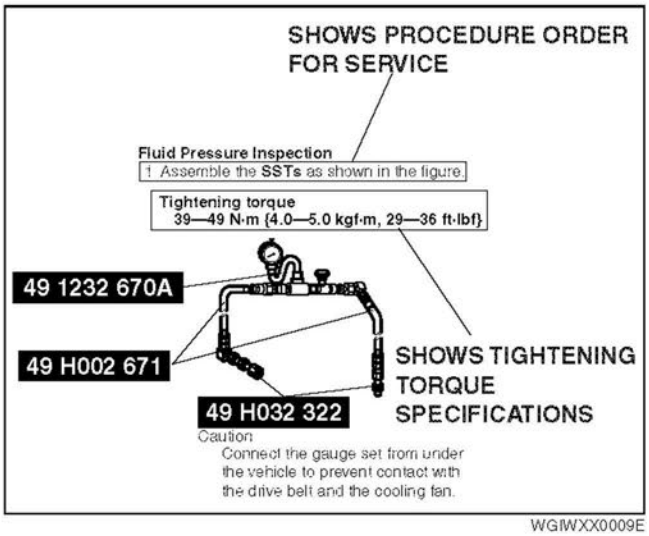
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Range of Topics

- This manual contains procedures for performing all required service operations. The procedures are divided into the following five basic operations:
  — Removal/Installation
  — Disassembly/Assembly
  — Replacement
  — Inspection
  — Adjustment
- Simple operations which can be performed easily just by looking at the vehicle (i.e., removal/installation of parts, jacking, vehicle lifting, cleaning of parts, and visual inspection) have been omitted.

Service Procedure
Inspection, adjustment

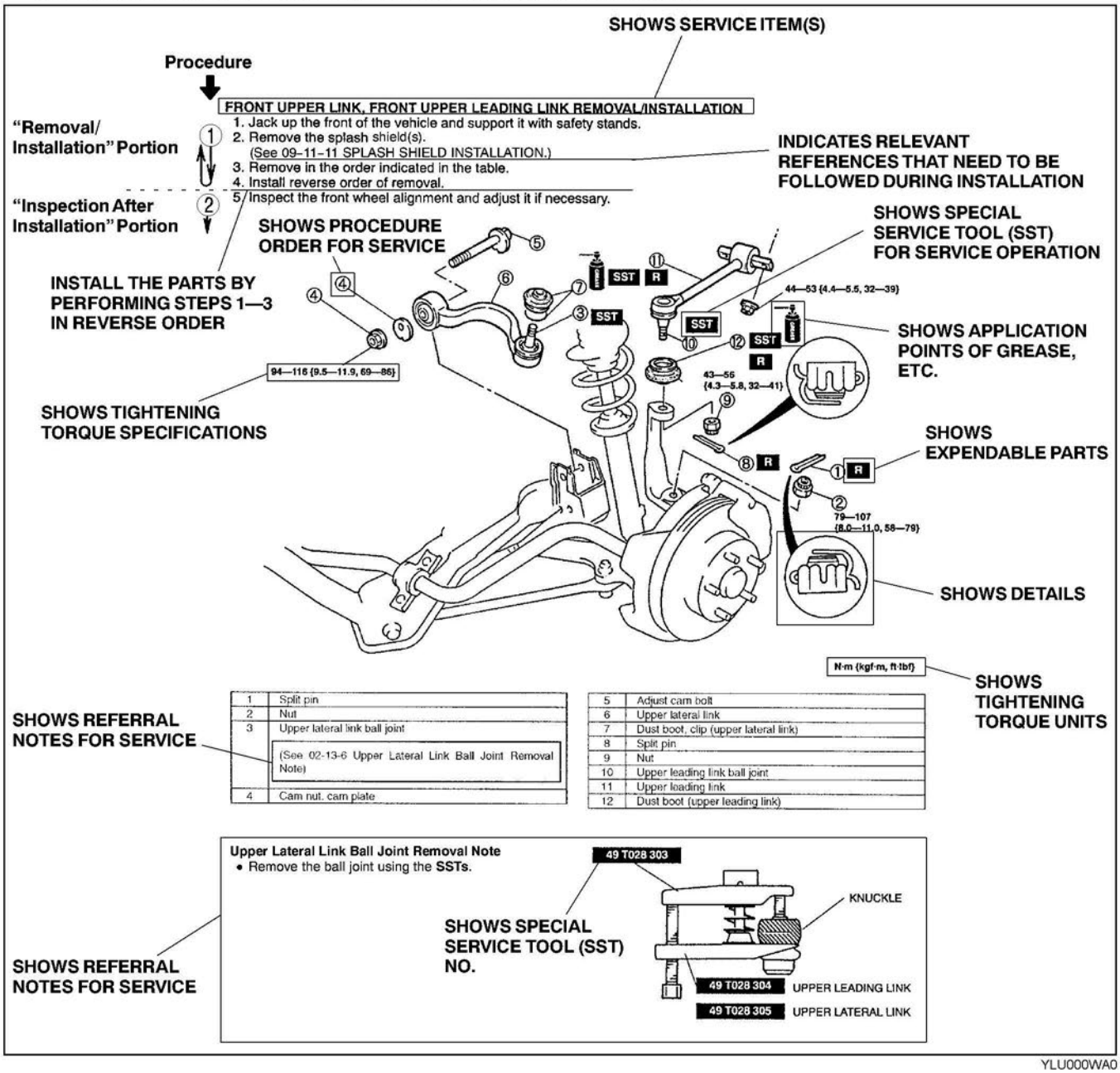
- Inspection and adjustment procedures are divided into steps. Important points regarding the location and contents of the procedures are explained in detail and shown in the illustrations.



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Repair procedure

1. Most repair operations begin with an overview illustration. It identifies the components, shows how the parts fit together, and describes visual part inspection. However, only removal/installation procedures that need to be performed methodically have written instructions.
2. Expendable parts, tightening torques, and symbols for oil, grease, and sealant are shown in the overview illustration. In addition, symbols indicating parts requiring the use of special service tools or equivalent are also shown.
3. Procedure steps are numbered and the part that is the main point of that procedure is shown in the illustration with the corresponding number. Occasionally, there are important points or additional information concerning a procedure. Refer to this information when servicing the related part.



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Symbols

- There are eight symbols indicating oil, grease, fluids, sealant, and the use of **SST** or equivalent. These symbols show application points or use of these materials during service.

Symbol	Meaning	Kind
	Apply oil	New appropriate engine oil or gear oil
	Apply brake fluid	New appropriate brake fluid
	Apply automatic transaxle/ transmission fluid	New appropriate automatic transaxle/ transmission fluid
	Apply grease	Appropriate grease
	Apply sealant	Appropriate sealant
	Apply petroleum jelly	Appropriate petroleum jelly
	Replace part	O-ring, gasket, etc.
	Use SST or equivalent	Appropriate tools

Advisory Messages

- You will find several **Warnings**, **Cautions**, **Notes**, **Specifications** and **Upper and Lower Limits** in this manual.

Warning

- A Warning indicates a situation in which serious injury or death could result if the warning is ignored.

Caution

- A Caution indicates a situation in which damage to the vehicle or parts could result if the caution is ignored.

Note

- A Note provides added information that will help you to complete a particular procedure.

Specification

- The values indicate the allowable range when performing inspections or adjustments.

Upper and lower limits

- The values indicate the upper and lower limits that must not be exceeded when performing inspections or adjustments.

UNITS

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Electric current	A (ampere)
Electric power	W (watt)
Electric resistance	ohm
Electric voltage	V (volt)
Length	mm (millimeter)
	in (inch)
Negative pressure	kPa (kilo pascal)
	mmHg (millimeters of mercury)
	inHg (inches of mercury)
Positive pressure	kPa (kilo pascal)
	kgf/cm^2 (kilogram force per square centimeter)
	psi (pounds per square inch)
Number of revolutions	rpm (revolutions per minute)
Torque	N·m (Newton meter)
	kgf·m (kilogram force meter)
	kgf·cm (kilogram force centimeter)
	ft·lbf (foot pound force)
	in·lbf (inch pound force)
Volume	L (liter)
	US qt (U.S. quart)
	Imp qt (Imperial quart)
	ml (milliliter)
	cc (cubic centimeter)
	cu in (cubic inch)
	fl oz (fluid ounce)
Weight	g (gram)
	oz (ounce)

Conversion to SI Units (Système International d'Unités)

- All numerical values in this manual are based on SI units. Numbers shown in conventional units are converted from these values.

Rounding Off

- Converted values are rounded off to the same number of places as the SI unit value. For example, if the SI unit value is 17.2 and the value after conversion is 37.84, the converted value will be rounded off to 37.8.

Upper and Lower Limits

- When the data indicates upper and lower limits, the converted values are rounded down if the SI unit value is an upper limit and rounded up if the SI unit value is a lower limit. Therefore, converted values for the same SI unit value may differ after conversion. For example, consider 2.7 kgf/cm^2 in the following specifications:

  210—260 kPa {2.1—2.7 kgf/cm^2, 30—38 psi}
  270—310 kPa {2.7—3.2 kgf/cm^2, 39—45 psi}

- The actual converted values for 2.7 kgf/cm^2 are 264 kPa and 38.4 psi. In the first specification, 2.7 is used as an upper limit, so the converted values are rounded down to 260 and 38. In the second specification, 2.7 is used as a lower limit, so the converted values are rounded up to 270 and 39.

FUNDAMENTAL PROCEDURES

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Preparation of Tools and Measuring Equipment

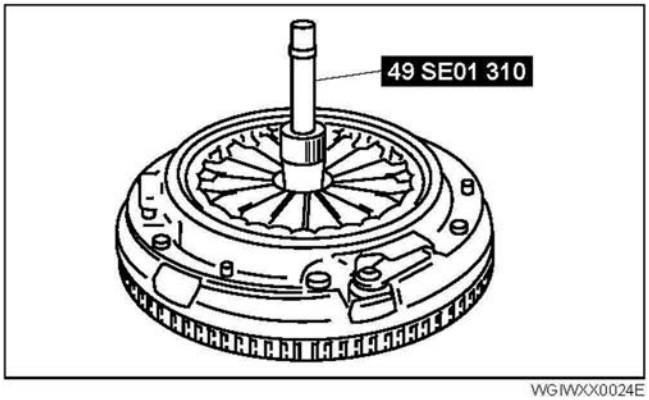
- Be sure that all necessary tools and measuring equipment are available before starting any work.



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Special Service Tools

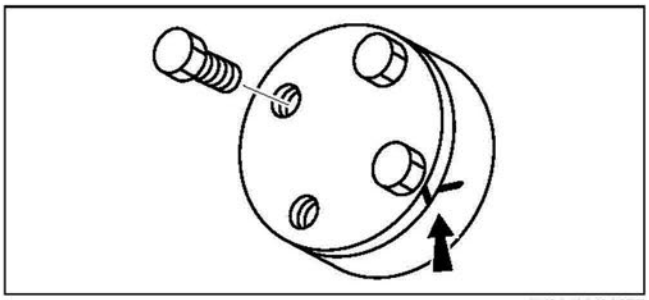
- Use special service tools or equivalent when they are required.



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Disassembly

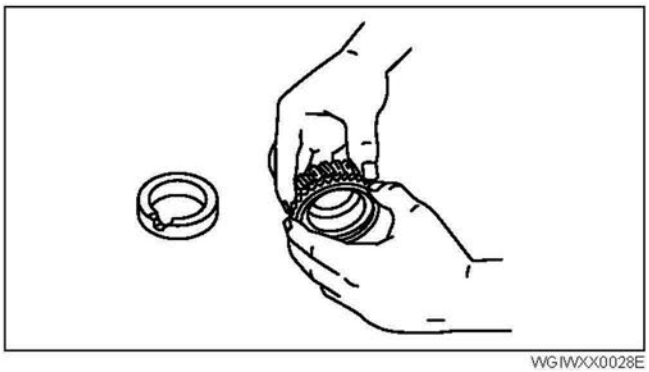
- If the disassembly procedure is complex, requiring many parts to be disassembled, all parts should be marked in a place that will not affect their performance or external appearance and identified so that reassembly can be performed easily and efficiently.



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Inspection During Removal, Disassembly

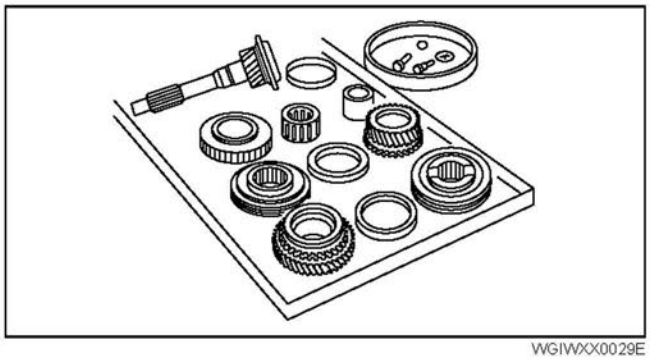
- When removed, each part should be carefully inspected for malfunction, deformation, damage and other problems.



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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.



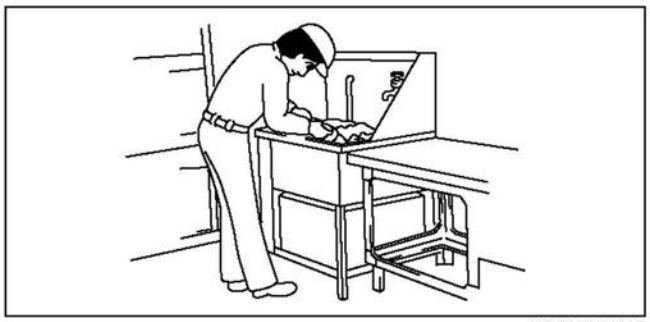
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Cleaning of Parts

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

  Warning

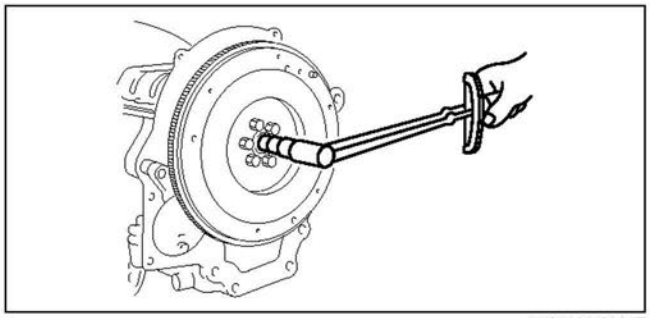
  - **Using compressed air can cause dirt and other particles to fly out causing injury to the eyes. Wear protective eye wear whenever using compressed air.**



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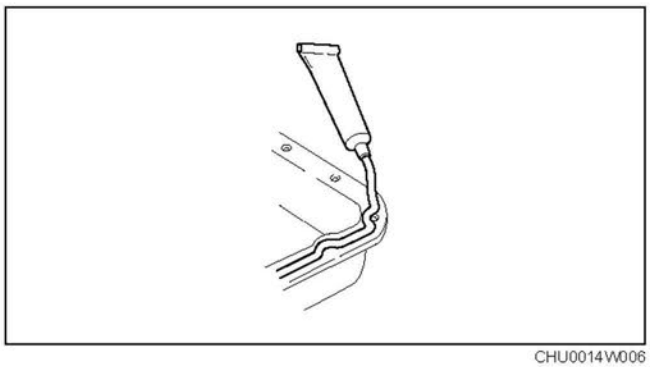
Reassembly

- Standard values, such as torques and certain adjustments, must be strictly observed in the reassembly of all parts.
- If removed, the following parts should be replaced with new ones:
  - — Oil seals
  - — Gaskets
  - — O-rings
  - — Lock washers
  - — Cotter pins
  - — Nylon nuts



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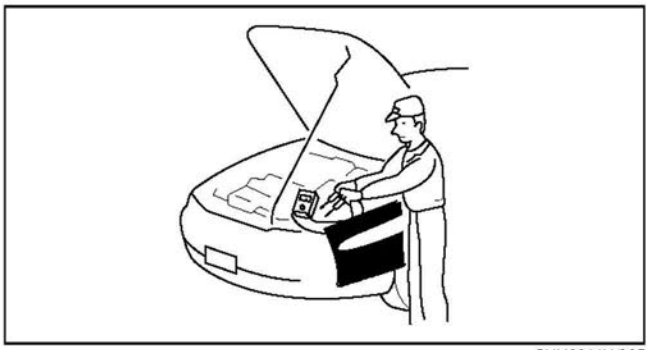
- Depending on location:
  - — Sealant and gaskets, or both, should be applied to specified locations. When sealant is applied, parts should be installed before sealant hardens to prevent leakage.
  - — Oil should be applied to the moving components of parts.
  - — Specified oil or grease should be applied at the prescribed locations (such as oil seals) before reassembly.



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Adjustment

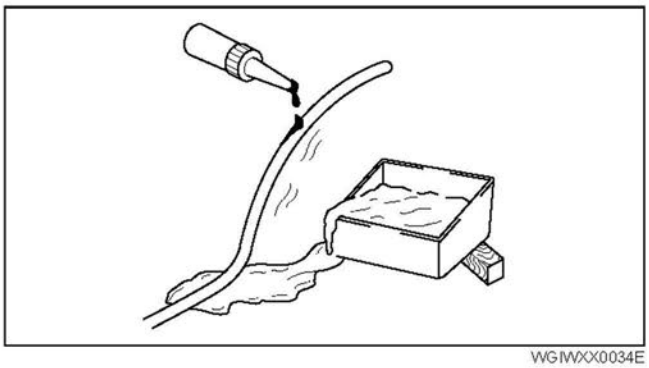
- Use suitable gauges and testers when making adjustments.



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Rubber Parts and Tubing

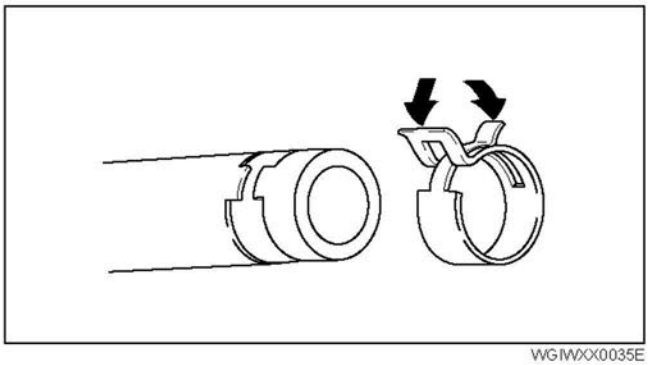
- Prevent gasoline or oil from getting on rubber parts or tubing.



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Hose Clamps

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

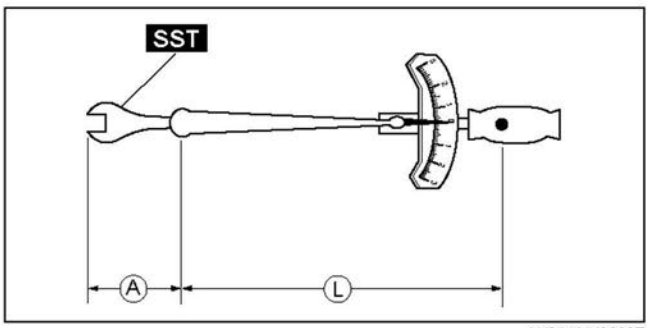


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Torque Formulas

- When using a torque wrench-**SST** or equivalent combination, the written torque must be recalculated due to the extra length that the **SST** or equivalent adds to the torque wrench. Recalculate the torque by using the following formulas. Choose the formula that applies to you.

Torque Unit	Formula
N·m	N·m × [L/(L+A)]
kgf·m	kgf·m × [L/(L+A)]
kgf·cm	kgf·cm × [L/(L+A)]
ft·lbf	ft·lbf × [L/(L+A)]
in·lbf	in·lbf × [L/(L+A)]

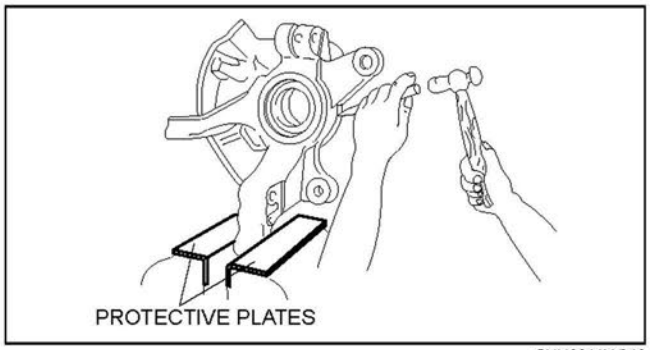


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A : The length of the **SST** past the torque wrench drive.
L : The length of the torque wrench.

Vise

- When using a vise, put protective plates in the jaws of the vise to prevent damage to parts.



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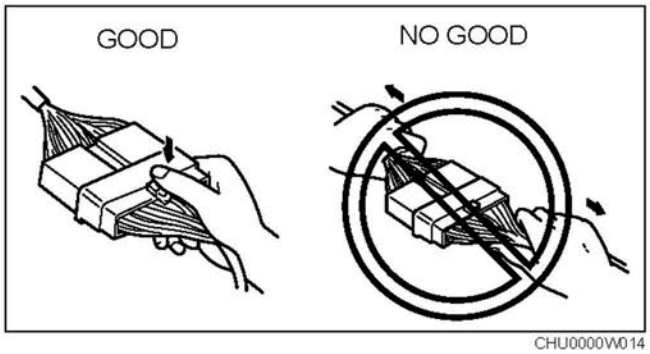
ELECTRICAL SYSTEM

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Connectors

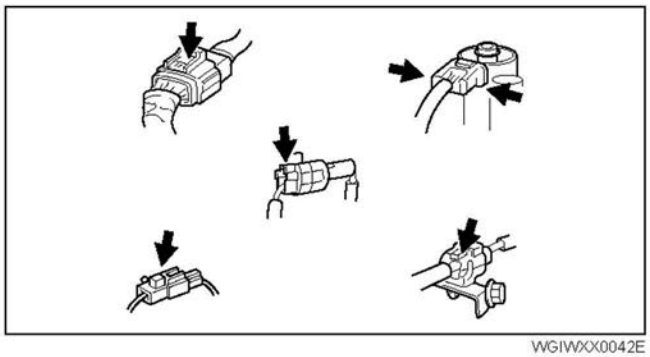
Disconnecting connectors

- When disconnecting connector, grasp the connectors, not the wires.



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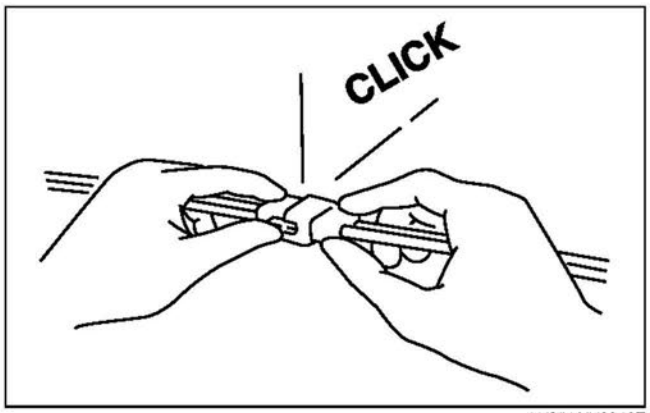
- Connectors can be disconnected by pressing or pulling the lock lever as shown.



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Locking connector

- When locking connectors, listen for a click indicating they are securely locked.



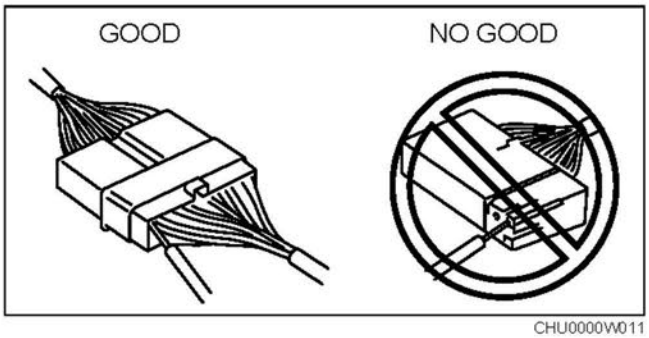
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Inspection

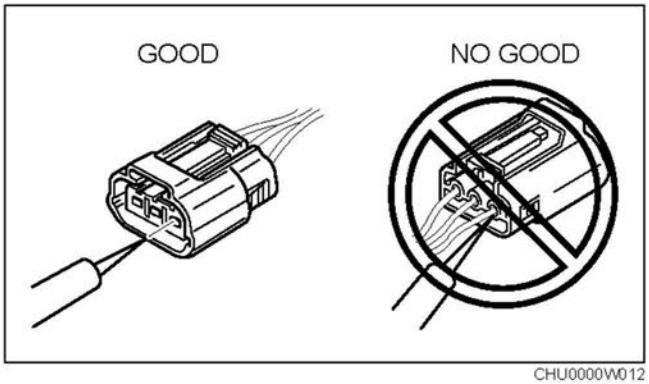
- When a tester is used to inspect for continuity or measuring voltage, insert the tester probe from the wiring harness side.
- Inspect the terminals of waterproof connectors from the connector side since they cannot be accessed from the wiring harness side.

Caution

- **To prevent damage to the terminal, wrap a thin wire around the tester probe before inserting into terminal.**



CHU0000W011



CHU0000W012

SAE STANDARDS

CHU000000003E02

- In accordance with new regulations, SAE (Society of Automotive Engineers) standard names and abbreviations are now used in this manual. The table below lists the names and abbreviations that have been used in Mazda manuals up to now and their SAE equivalents.

SAE Standard		Remark		SAE Standard		Remark
Abbreviation	Name			Abbreviation	Name	
AP	Accelerator Pedal			MAP	Manifold Absolute Pressure	
APP	Accelerator Pedal Position			MAF	Mass Air Flow	
ACL	Air Cleaner			MAF sensor	Mass Air Flow Sensor	
A/C	Air Conditioning			MFL	Multiport Fuel Injection	
A/F	Air Fuel Ratio			OBD	On-board Diagnostic System	
BARO	Barometric Pressure			OL	Open Loop	
B+	Battery Positive Voltage			OC	Oxidation Catalytic Converter	
CMP sensor	Camshaft Position Sensor			O2S	Oxygen Sensor	
LOAD	Calculated Load Value			PNP	Park/Neutral Position	
CAC	Charge Air Cooler			PID	Parameter Identification	
CLS	Closed Loop System			PSP	Power Steering Pressure	
CTP	Closed Throttle Position			PCM	Powertrain Control Module	#3
CPP	Clutch Pedal Position			PAIR	Pulsed Secondary Air Injection	Pulsed injection
CIS	Continuous Fuel Injection System			AIR	Secondary Air Injection	Injection with air pump
CKP sensor	Crankshaft Position Sensor			SAPV	Secondary Air Pulse Valve	
DLC	Data Link Connector			SFI	Sequential Multiport Fuel Injection	
DTM	Diagnostic Test Mode	#1		3GR	Third Gear	
DTC	Diagnostic Test Code(s)			TWC	Three Way Catalytic Converter	
DI	Distributor Ignition			TB	Throttle Body	
DLI	Distributorless Ignition			TP	Throttle Position	
EI	Electronic Ignition	#2		TP sensor	Throttle Position Sensor	
ECT	Engine Coolant Temperature			TCC	Torque Converter Clutch	
EM	Engine Modification			TCM	Transmission (Transaxle) Control Module	
EVAP	Evaporative Emission			TR	Transmission (Transaxle) Range	
EGR	Exhaust Gas Recirculation			TC	Turbocharger	
FC	Fan Control			VSS	Vehicle Speed Sensor	
FF	Flexible Fuel			VR	Voltage Regulator	
4GR	Fourth Gear			VAF sensor	Volume Air Flow Sensor	
GEN	Generator			WU-TWC	Warm Up Three Way Catalytic Converter	#4
GND	Ground			WOP	Wide Open Throttle	
HO2S	Heated Oxygen Sensor	With heater				
IAC	Idle Air Control					
IAT	Intake Air Temperature					
KS	Knock Sensor					
MIL	Malfunction Indicator Lamp					

#1 : Diagnostic trouble codes depend on the diagnostic test mode.
#2 : Controlled by the PCM
#3 : Device that controls engine and powertrain
#4 : Directly connected to exhaust manifold

ABBREVIATIONS

CHU000000011E01

AT	Automatic Transmission
MT	Manual Transmission
SST	Special Service Tool

IDENTIFYING SPECIFICATION

- Because the transaxle construction varies depending on the vehicle's period of manufacture, determine the service specification by referring to the following identification.

Identifying Specification

	Applicable VIN
Type A	Except below
Type B	1YV GF22C*#5 285395—
	1YV GF22D*#5 285395—
	1YV GF22E*#5 285395—
	1YV GF22F*#5 285395—
	4F2 YZ02B*# M00001—
	JM1 BJ222*2# 587695—
	JM1 BJ224*2# 587695—
	JM1 BJ225*2# 587695—
	JM1 BJ226*2# 587695—
	JM1 BJ245*2# 587695—
	JM1 BJ246*2# 587695—

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MANUAL TRANSAXLE ..... 05–15 SERVICE TOOLS 05–60

05–15 MANUAL TRANSAXLE

MANUAL TRANSAXLE
PRECAUTION **05–15–1**
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Assembly Precaution **05–15–1**
MANUAL TRANSAXLE
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5th/Reverse Gear and Housing Parts
Disassembly/Assembly [TYPE B] ... **05–15–7**

MANUAL TRANSAXLE PRECAUTION

W6U515A01

Disassembly Precaution

1. Clean the transaxle exterior thoroughly with a steam cleaner or cleaning solvent before disassembly.

   Warning
   - **Using compressed air can cause dirt and other particles to fly out, causing injury to the eyes. Wear protective eye wear whenever using compressed air.**

2. Clean the removed parts (except sealed bearings) and all sealing surfaces with cleaning solvent, and dry with compressed air.
3. Clean out all holes and passages with compressed air, and verify that there are no obstructions.

Assembly Precaution

1. Replace all O-rings and gaskets with the new ones included in the overhaul kit.
2. Verify that all parts are completely cleaned before assembly.
3. Assemble parts within 10 minutes after applying sealant. Allow all sealants to cure for at least 30 minutes after assembly before filling the transaxle with transaxle oil.
4. Replace bearing races and bearings as sets.

MANUAL TRANSAXLE DISASSEMBLY/ASSEMBLY

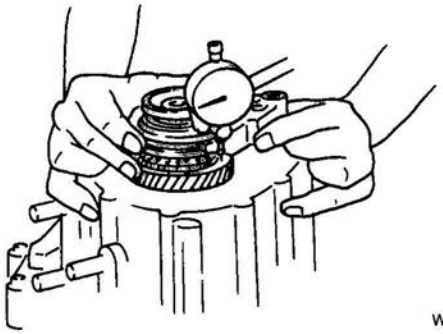
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5th Gear Preinspection

5th gear thrust clearance

1. Measure the 5th gear thrust clearance with a dial indicator.

   Clearance
   0.100—0.220 mm {0.0039—0.0087 in }
   Maximum
   0.270 mm {0.0106 in }

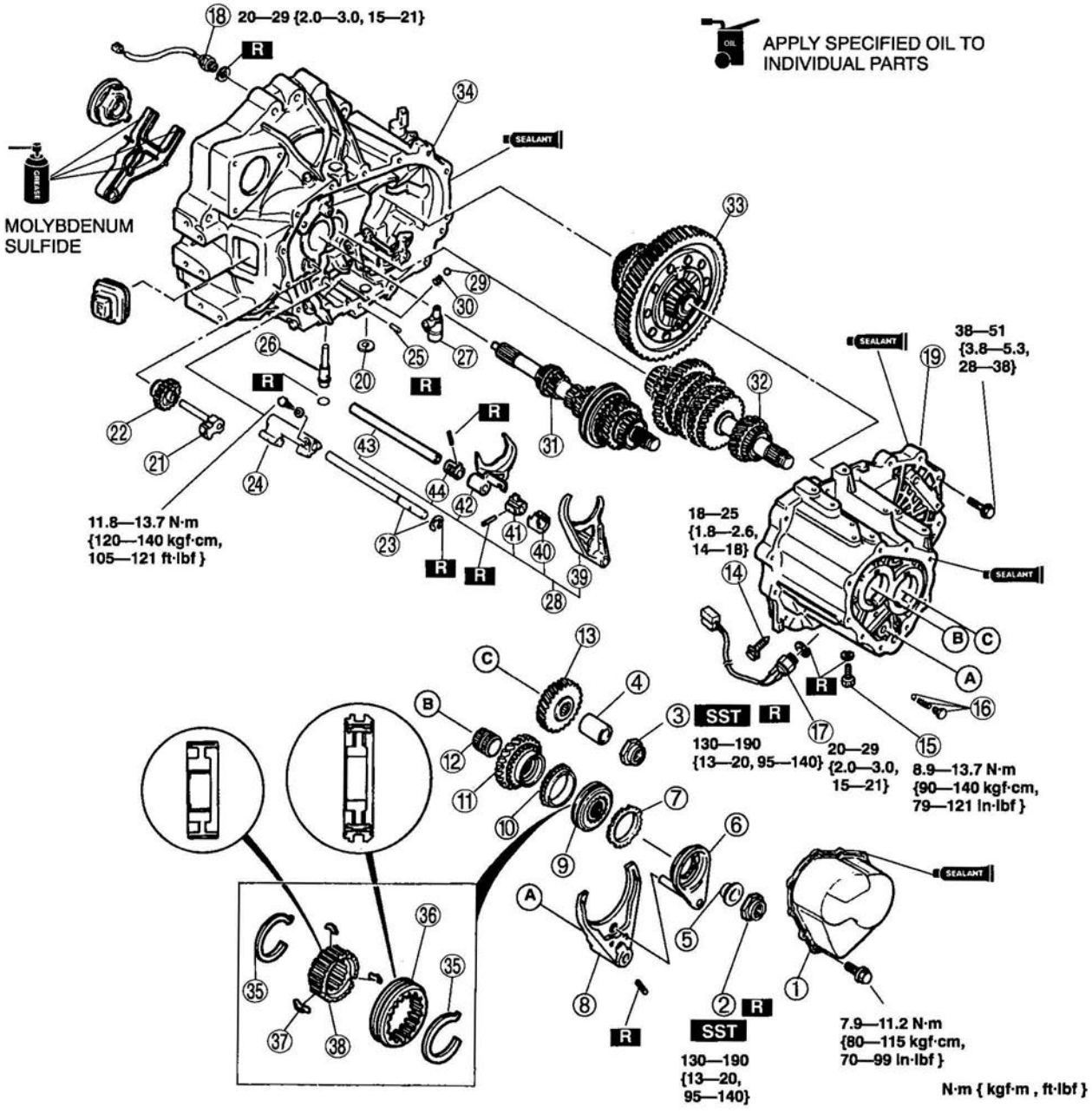


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2. If the clearance exceeds the maximum, inspect the contact surfaces of the 5th gear and the clutch hub. Replace worn or damaged parts.

5th/Reverse Gear and Housing Parts Disassembly/Assembly [TYPE A]

1. Preinspect the thrust clearance of 5th gear before disassembly. (Refer to 5th Gear Preinspection.)
2. Disassemble in the order indicated in the table.
3. Adjust the bearing preload. (Refer to 05–15 MANUAL TRANSAXLE BEARING PRELOAD ADJUSTMENT.)
4. Assemble in the reverse order of disassembly.



W6U515AA1

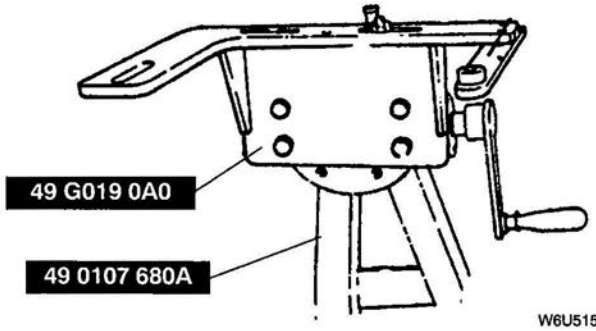
1	Rear cover
2	Locknut (primary shaft) ☞ Disassembly Note ☞ Assembly Note
3	Locknut (secondary shaft) ☞ Disassembly Note ☞ Assembly Note
4	Spacer
5	Reverse synchronizer gear sleeve
6	Primary reverse synchronizer cone
7	Reverse synchronizer ring

8	5th/reverse shift fork ☞ Assembly Note
9	5th/reverse clutch hub component ☞ Assembly Note
10	5th synchronizer ring
11	5th gear
12	Gear sleeve
13	Secondary 5th gear
14	Lock bolt
15	Guide bolt and washer

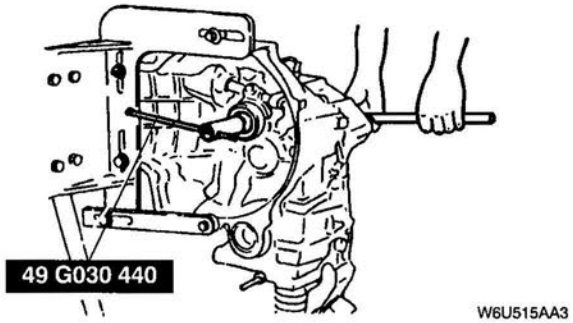
16	Lock bolt, ball, and spring
17	Back-up light switch
18	Neutral switch
19	Transaxle case component ☞ Assembly Note
20	Magnet
21	Reverse idler shaft ☞ Assembly Note
22	Reverse idler gear ☞ Assembly Note
23	5th/reverse shift rod ☞ Assembly Note
24	5th/reverse shift rod end ☞ Assembly Note
25	Pin
26	Crank lever shaft ☞ Assembly Note
27	Crank lever component ☞ Assembly Note
28	Shift fork and shift rod component ☞ Disassembly Note ☞ Assembly Note
29	Steel ball
30	Spring
31	Primary shaft gear component ☞ Assembly Note
32	Secondary shaft gear component ☞ Assembly Note
33	Differential component
34	Clutch housing
35	Synchronizer key springs
36	Clutch hub sleeve
37	Synchronizer keys
38	Clutch hub
39	3rd/4th shift fork
40	Interlock sleeve
41	Control lever
42	1st/2nd shift fork
43	Control rod
44	Control end

Locknut (primary shaft), locknut (secondary shaft) disassembly note

1. Mount the transaxle on the **SST**.



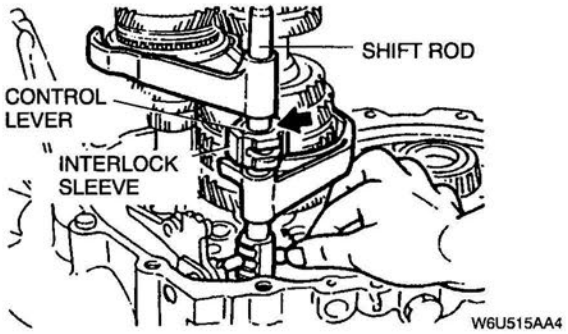
2. Lock the primary shaft by using the **SST**.



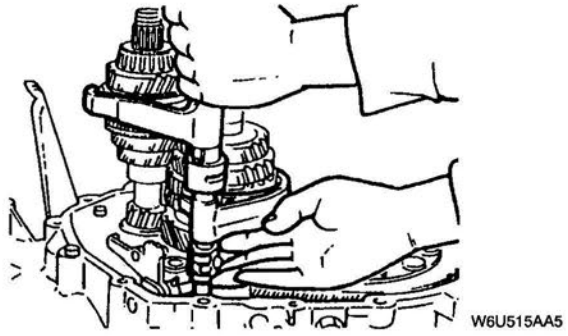
3. Shift to 1st gear to lock the rotation of the primary shaft.
4. Uncrimp the tabs of the locknuts.
5. Remove the locknuts from the primary and secondary shafts.

Shift fork and shift rod component disassembly note

1. Align the ends of the interlock sleeve and of the control lever (arrow). Turn the shift rod counterclockwise.



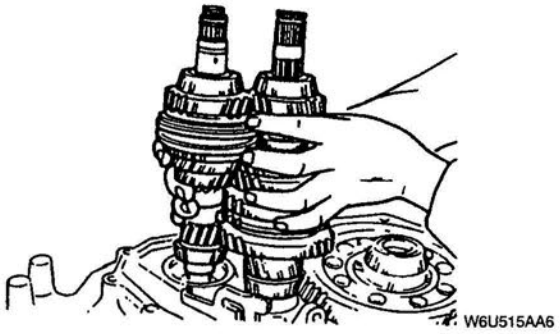
2. While holding the 1st/2nd shift fork with one hand and the 3rd/4th shift fork with the other, raise them both at the same time and shift each of the clutch hub sleeves.



3. Lift the control end and remove the steel ball, and at the same time, remove the control rod from the clutch housing.
4. Separate the shift rod and shift fork component from each of the clutch hub sleeves.

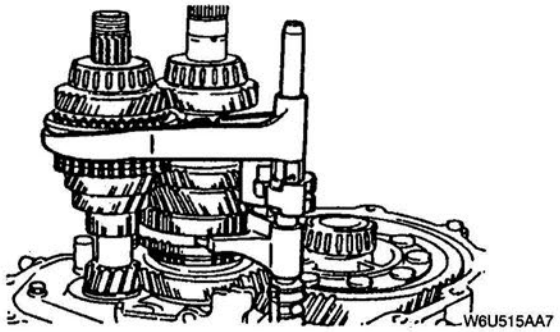
Primary shaft gear component, secondary shaft gear component assembly note

- Install the primary and secondary shaft gear components together.

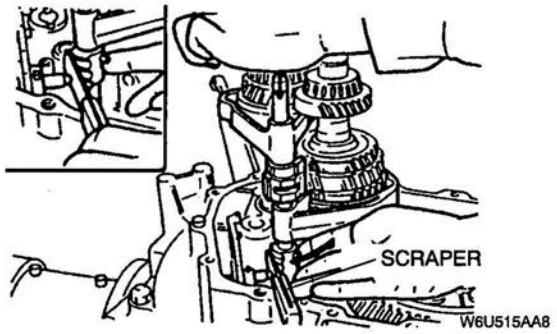


Shift fork and shift rod component assembly note

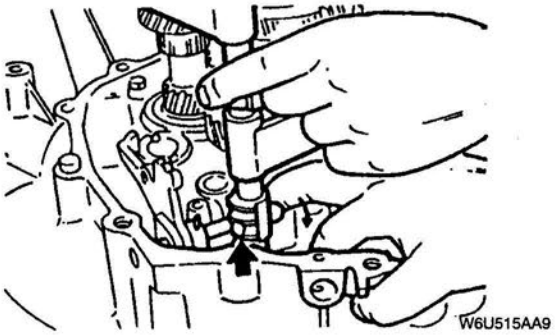
1. Shift to 2nd gear and position the shift fork and shift rod component as shown.



2. Insert the spring seat and spring into the reverse lever shaft. Install the steel ball, and place a scraper so that it contacts the steel ball.
3. With the edge of the control end against the scraper, push the control end in the direction of the arrow so that the ball goes into the shaft. This will line up the rod with the shift rod coupling hole in the clutch housing.

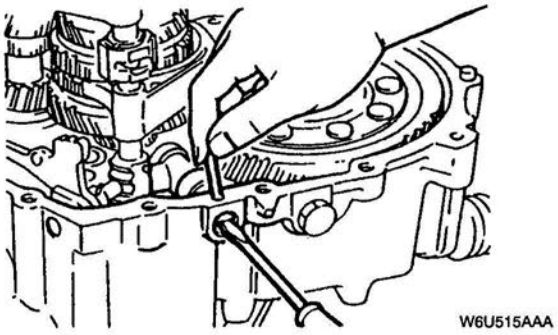


4. Set each clutch hub sleeve to the neutral position, and tap the shift rod from above so that the steel ball goes into the center groove (of the three grooves in the control end).
5. Pull up on the ball part of the control end so that the steel ball goes into the detent in the groove.



Crank lever component, crank lever shaft assembly note

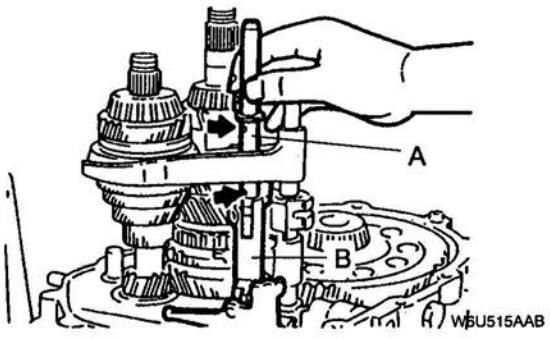
1. Install a new O-ring to the crank lever shaft.
2. Fit the crank lever between the change arm and the control end, and connect the crank lever shaft to the crank lever.
3. Align the pin holes of the crank lever shaft and the clutch housing, and insert a new pin.



5th/reverse shift rod end, 5th/reverse shift rod assembly note

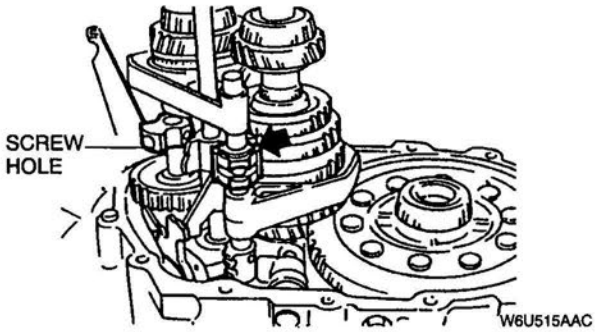
1. Install the shift rod A into the shift rod end B.
2. Align the mark on the shift rod with the mounting bolt hole in the shift rod end as shown in the figure, and tighten the gate mounting bolt.

Tightening torque
11.8—13.7 N·m {120—140 kgf·cm, 105—121 in·lbf }



Reverse idler gear, reverse idler shaft assembly note

1. Install the reverse idler gear and the reverse idler shaft.
2. Attach the magnet to the clutch housing.
3. Align the end of the interlock sleeve with the control lever (arrow), and at the same time, face the reverse idler shaft screw hole in the direction shown in the figure.

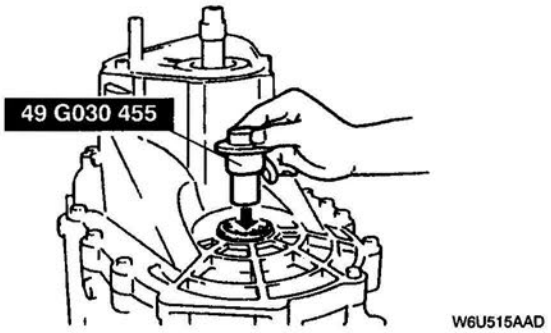


Transaxle case component assembly note

1. Apply a thin coat of sealant to the contact surfaces of the clutch housing and transaxle case, and tighten the transaxle case installation bolts to the specified torque.

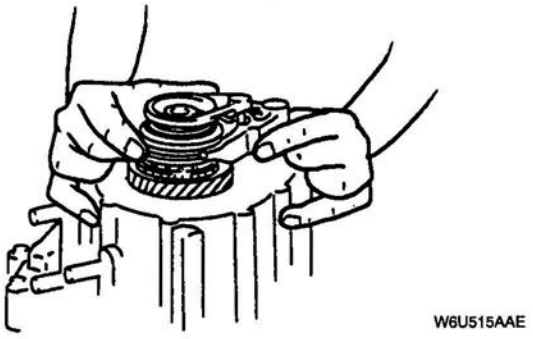
   Tightening torque
   38—51 N·m {3.8—5.3 kgf·m, 28—38 ft·lbf }

2. Insert the **SSTs** through the drive shaft and joint shaft hole.



5th/reverse clutch hub component, 5th/reverse shift fork assembly note

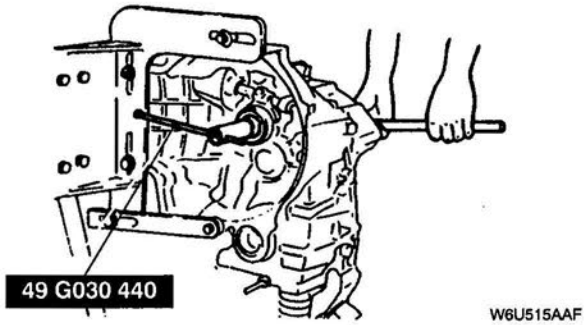
- Install the 5th/reverse clutch hub component and the 5th/reverse shift fork together.



Locknut (primary shaft), locknut (secondary shaft) assembly note

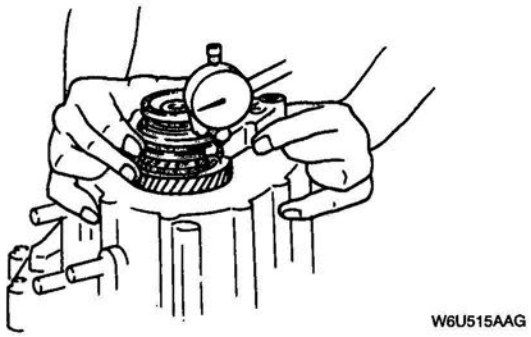
1. Shift to 1st gear.
2. Lock the primary shaft by using the **SST**.
3. Tighten new locknuts onto the primary and secondary shafts.

   Tightening torque
   128—196 N·m {13—20 kgf·m, 95—144 ft·lbf }



4. Stake the locknuts.
5. Measure the 5th gear thrust clearance with a dial indicator.

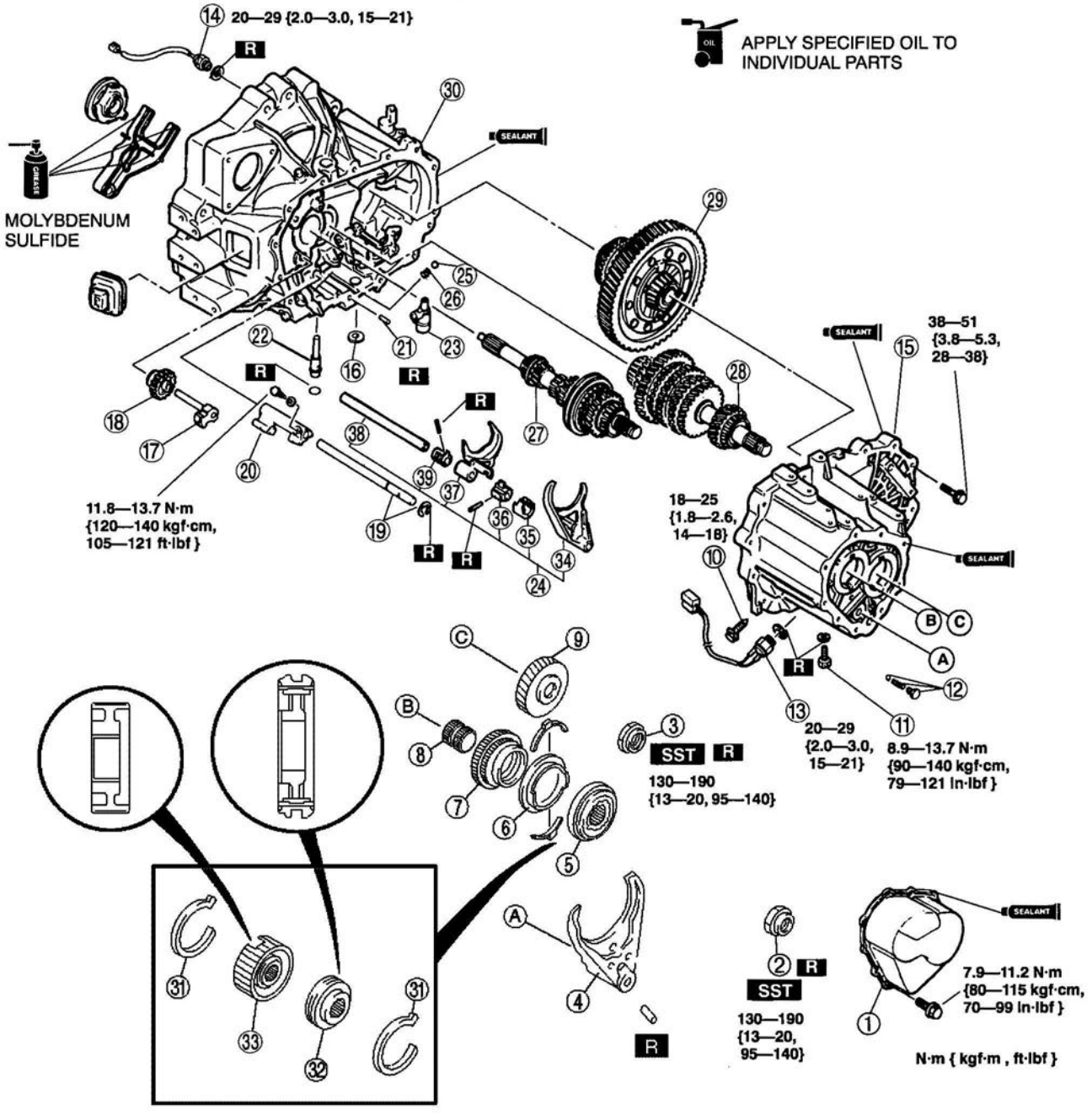
   Clearance
   0.100—0.220 mm {0.0039—0.0087 in }



6. If not as specified, reassemble the transaxle.

5th/Reverse Gear and Housing Parts Disassembly/Assembly [Type B]

1. Preinspect the thrust clearance of 5th gear before disassembly. (Refer to 5th Gear Preinspection.)
2. Disassemble in the order indicated in the table.
3. Adjust the bearing preload. (Refer to 05–15 MANUAL TRANSAXLE BEARING PRELOAD ADJUSTMENT.)
4. Assemble in the reverse order of disassembly.



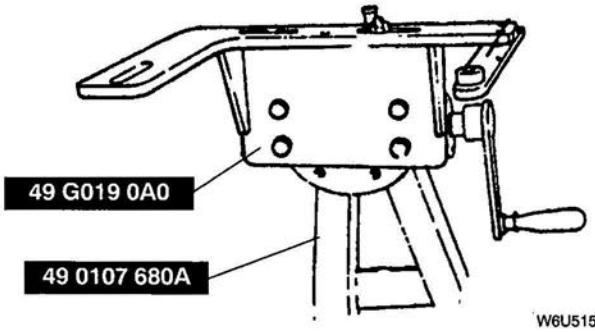
1	Rear cover
2	Locknut (primary shaft) ☞ Disassembly Note ☞ Assembly Note
3	Locknut (secondary shaft) ☞ Disassembly Note ☞ Assembly Note
4	5th/reverse shift fork ☞ Assembly Note
5	5th/reverse clutch hub component ☞ Assembly Note

6	5th synchronizer ring
7	5th gear
8	Gear sleeve
9	Secondary 5th gear
10	Lock bolt
11	Guide bolt and washer
12	Lock bolt, ball, and spring
13	Back-up light switch
14	Neutral switch

15	Transaxle case component ☞ Assembly Note
16	Magnet
17	Reverse idler shaft ☞ Assembly Note
18	Reverse idler gear ☞ Assembly Note
19	5th/reverse shift rod ☞ Assembly Note
20	5th/reverse shift rod end ☞ Assembly Note
21	Pin
22	Crank lever shaft ☞ Assembly Note
23	Crank lever component ☞ Assembly Note
24	Shift fork and shift rod component ☞ Disassembly Note ☞ Assembly Note
25	Steel ball
26	Spring
27	Primary shaft gear component ☞ Assembly Note
28	Secondary shaft gear component ☞ Assembly Note
29	Differential component
30	Clutch housing
31	Synchronizer key springs
32	Clutch hub sleeve
33	Clutch hub
34	3rd/4th shift fork
35	Interlock sleeve
36	Control lever
37	1st/2nd shift fork
38	Control rod
39	Control end

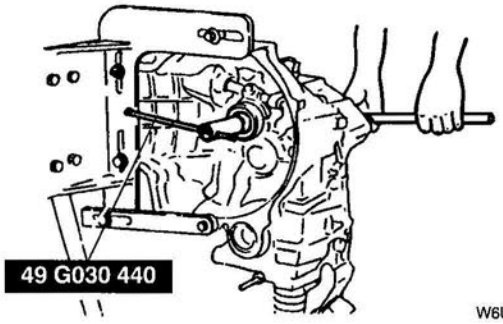
Locknut (primary shaft), locknut (secondary shaft) disassembly note

1. Mount the transaxle on the **SST**.



W6U515AA2

2. Lock the primary shaft by using the **SST**.

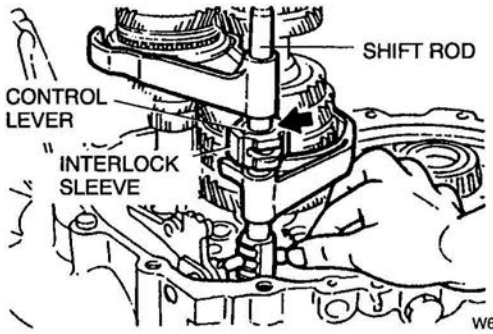


W6U515AA3

3. Shift to 1st gear to lock the rotation of the primary shaft.
4. Uncrimp the tabs of the locknuts.
5. Remove the locknuts from the primary and secondary shafts.

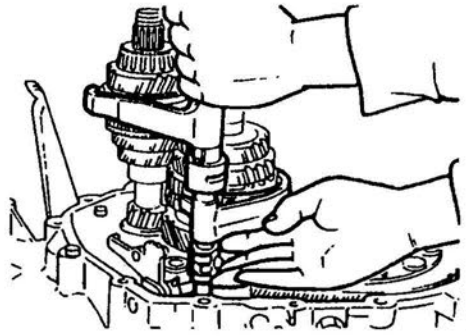
Shift fork and shift rod component disassembly note

1. Align the ends of the interlock sleeve and of the control lever (arrow). Turn the shift rod counterclockwise.



W6U515AA4

2. While holding the 1st/2nd shift fork with one hand and the 3rd/4th shift fork with the other, raise them both at the same time and shift each of the clutch hub sleeves.


W6U515AA5

3. Lift the control end and remove the steel ball, and at the same time, remove the control rod from the clutch housing.
4. Separate the shift rod and shift fork component from each of the clutch hub sleeves.

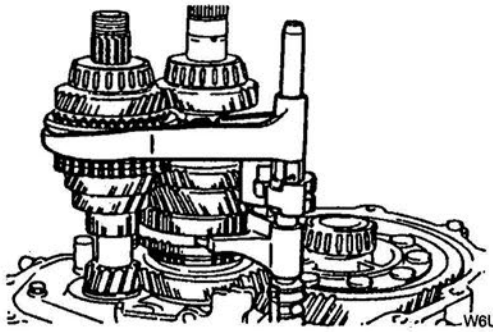
Primary shaft gear component, secondary shaft gear component assembly note

- Install the primary and secondary shaft gear components together.

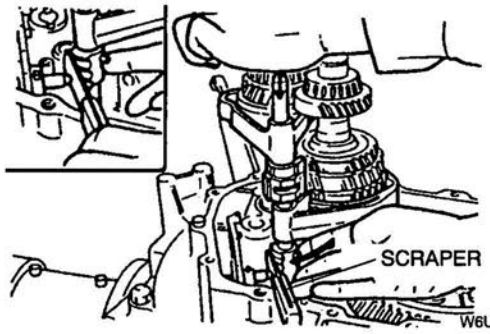

W6U515AA6

Shift fork and shift rod component assembly note

1. Shift to 2nd gear and position the shift fork and shift rod component as shown.

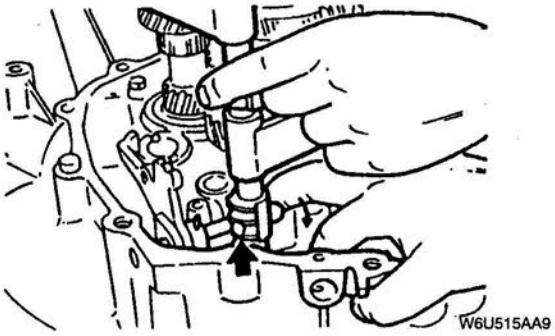

W6U515AA7

2. Insert the spring seat and spring into the reverse lever shaft. Install the steel ball, and place a scraper so that it contacts the steel ball.
3. With the edge of the control end against the scraper, push the control end in the direction of the arrow so that the ball goes into the shaft. This will line up the rod with the shift rod coupling hole in the clutch housing.



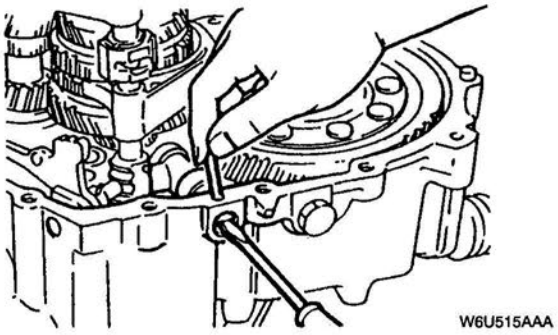
W6U515AA8

4. Set each clutch hub sleeve to the neutral position, and tap the shift rod from above so that the steel ball goes into the center groove (of the three grooves in the control end).
5. Pull up on the ball part of the control end so that the steel ball goes into the detent in the groove.


W6U515AA9

Crank lever component, crank lever shaft assembly note

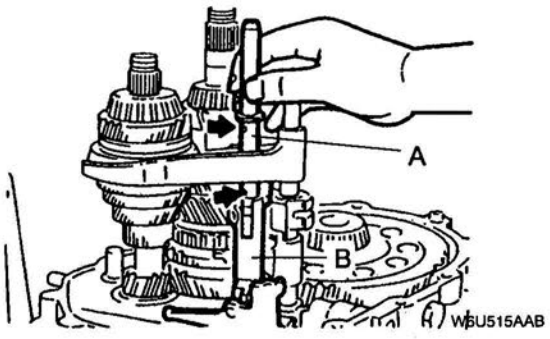
1. Install a new O-ring to the crank lever shaft.
2. Fit the crank lever between the change arm and the control end, and connect the crank lever shaft to the crank lever.
3. Align the pin holes of the crank lever shaft and the clutch housing, and insert a new pin.


W6U515AAA

5th/reverse shift rod end, 5th/reverse shift rod assembly note

1. Install the shift rod A into the shift rod end B.
2. Align the mark on the shift rod with the mounting bolt hole in the shift rod end as shown in the figure, and tighten the gate mounting bolt.

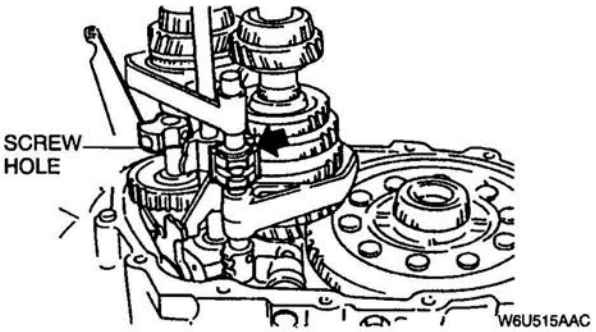
Tightening torque
11.8—13.7 N·m {120—140 kgf·cm, 105—121 in·lbf }



W6U515AAB

Reverse idler gear, reverse idler shaft assembly note

1. Install the reverse idler gear and the reverse idler shaft.
2. Attach the magnet to the clutch housing.
3. Align the end of the interlock sleeve with the control lever (arrow), and at the same time, face the reverse idler shaft screw hole in the direction shown in the figure.

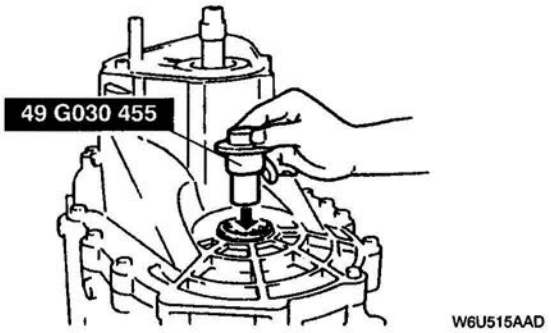


Transaxle case component assembly note

1. Apply a thin coat of sealant to the contact surfaces of the clutch housing and transaxle case, and tighten the transaxle case installation bolts to the specified torque.

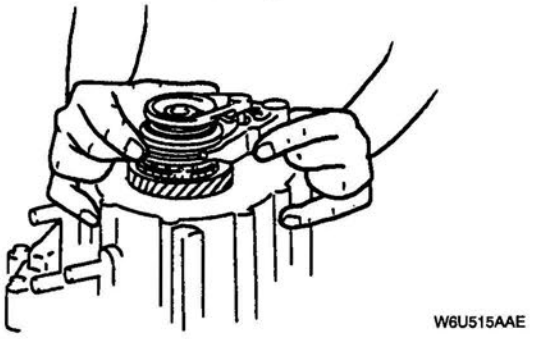
   Tightening torque
   38—51 N·m {3.8—5.3 kgf·m, 28—38 ft·lbf }

2. Insert the **SSTs** through the drive shaft and joint shaft hole.



5th/reverse clutch hub component, 5th/reverse shift fork assembly note

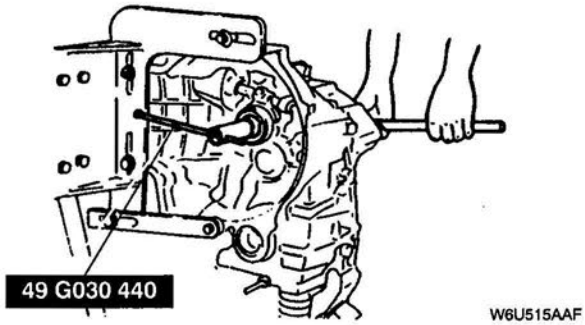
- Install the 5th/reverse clutch hub component and the 5th/reverse shift fork together.



Locknut (primary shaft), locknut (secondary shaft) assembly note

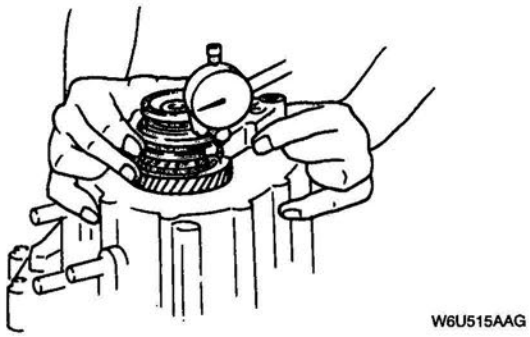
1. Shift to 1st gear.
2. Lock the primary shaft by using the **SST**.
3. Tighten new locknuts onto the primary and secondary shafts.

   Tightening torque
   128—196 N·m {13—20 kgf·m, 95—144 ft·lbf }



4. Stake the locknuts.
5. Measure the 5th gear thrust clearance with a dial indicator.

   Clearance
   0.100—0.220 mm {0.0039—0.0087 in }



6. If not as specified, reassemble the transaxle.

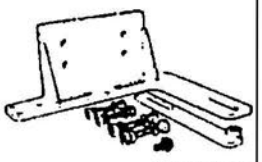
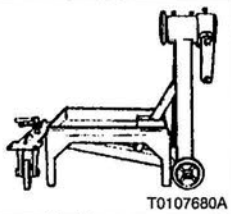
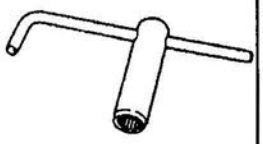
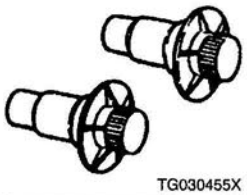
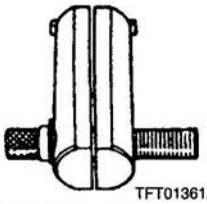
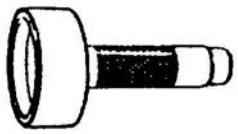
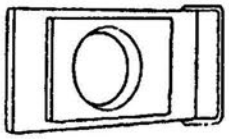
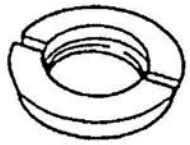
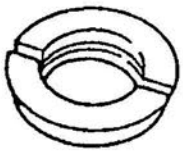
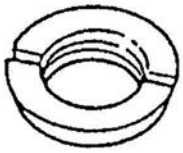
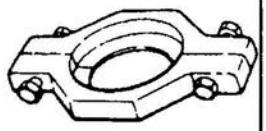
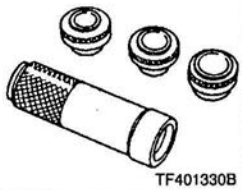
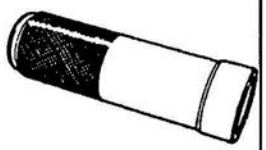
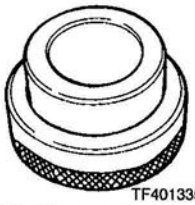
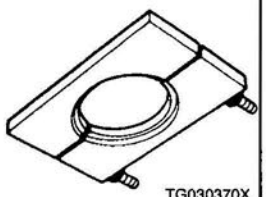
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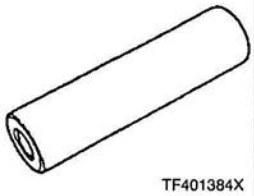
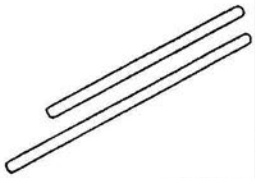
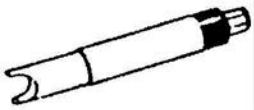
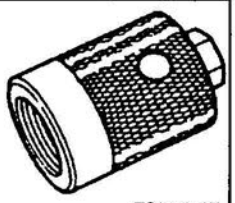
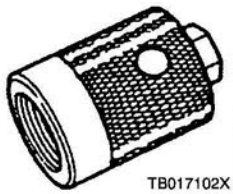
05-60 SERVICE TOOLS

TRANSMISSION/TRANSAXLE SST ... 05-60-1

TRANSMISSION/TRANSAXLE SST

W6U560A01

49 G019 0A0 Transaxle hanger  TG0190A0X	49 0107 680A Engine stand  T0107680A	49 G030 440 Primary shaft holder  TG030440X
49 G030 455 Diff. side gear holder  TG030455X	49 FT01 361 Bearing remover  TFT01361X	49 B001 795 Oil seal installer  TB001795X
49 G017 1A0A Bearing remover set  TG0171A0A	49 F401 366A Plate (Part of 49 G017 1A0A)  TF401366A	49 B017 207 Attachment G (Part of 49 G017 1A0A)  TB017207X
49 B017 208 Attachment H (Part of 49 G017 1A0A)  TB017208X	49 B017 209 Attachment J (Part of 49 G017 1A0A)  TB017209X	49 0636 145 Fan pulley boss puller  T0636145X
49 0839 425C Bearing puller set  T0839425C	49 F401 330B Bearing installer set  TF401330B	49 F401 331 Body (Part of 49 F401 330B)  TF401331X
49 F401 335A Attachment A (Part of 49 F401 330B)  TF401335A	49 F401 336B Attachment B (Part of 49 F401 330B)  TF401336B	49 G030 370 Removing plate  TG030370X
49 G030 380D Shim selector set  TG030380D	49 G030 381 Selector ϕ68 (Part of 49 G030 380D)  TG030381X	49 G030 382A Selector ϕ58 (Part of 49 G030 380D)  TG030382A

49 F401 382A Selector ϕ52 (Part of 49 G030 380D)  TF401382A	49 F401 384 Collar (Part of 49 G030 380D)  TF401384X	49 G019 021 Bolt set (Part of 49 G030 380D)  TG019021X
49 F401 385 Bar (Part of 49 G030 380D)  TF401385X	49 T027 001 Preload adapter (Part of 49 G030 380D)  TT027001X	49 G017 202 Preload adapter  TG017202X
49 G030 338 Attachment E  TG030338X	49 B017 102 Preload adapter  TB017102X	—