MITSUBISHI FUSO

Service Manual

2002 - 2004

Choose a model:

FE FG FH FK FM

FE.FG

SERVICE MANUAL
2002 Model

FOREWORD

This Service Manual contains maintenance and repair methods for the Mitsubishi Fuso Truck FE, FG Series. Read this manual carefully as an aid in providing correct, efficient maintenance. Please note that the information and specifications contained within this manual may change without notice. This is due to product modifications and contined vehicle improvements that are made throughout the model years. Should you encounter any discrepancy in the information provided, please do not hesitate to contact your nearest Mitsubishi Fuso Dealer or Mitsubishi Fuso Truck of America, Inc.

April 2001

HOME

GROUP INDEX

MITSUBISHI
FUSO

How to Read this Manual

MITSUBISHI FUSO TRUCK OF AMERICA, Inc.

Pub No. TWSE0101-H

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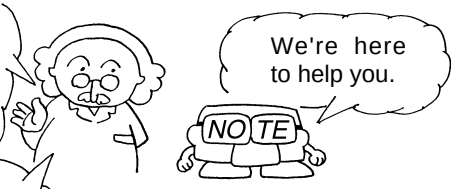
HOW THIS MANUAL IS STRUCTURED

I'm here to explain how to use this manual. To get the most out of your manual, follow along carefully and read all the notes given by my assistant.



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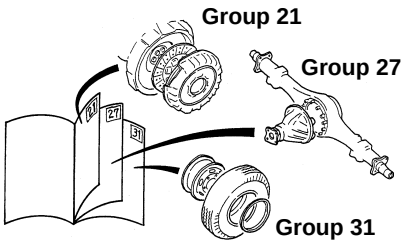
This manual is divided into groups, with one group for each main area of the vehicle.
By way of example, let's look at Group 21, which covers the clutch.



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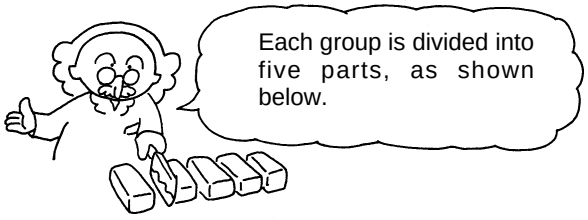


23916

Specifications
Specifications, oil quantities, and other information pertaining to system components.

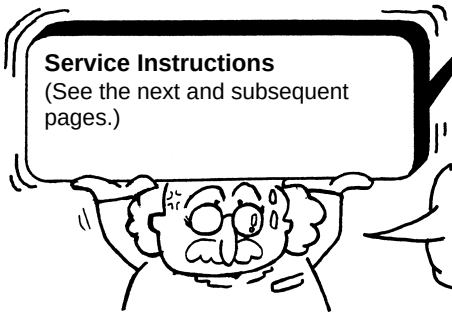
Structure and Operation
Information on the structure and operation of the overall system and its components.

Troubleshooting
An item-by-item guide to fault symptoms and their probable causes.

On-Vehicle Inspection and Adjustment
Instructions for on-vehicle inspection and adjustment operations.

Service Instructions
(See the next and subsequent pages.)

INDEX



The service instructions are the most important parts of this manual. Starting on the next page, you'll learn more about them.

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Service procedures

1

INDEX

SPECIFICATIONS .....

ON-VEHICLE INSPECTION AND ADJUSTMENT
1. Clutch Fluid Replacement and Air Bleeding .....
2. Inspection of Clutch Booster Functionality .....
3. Clutch Pedal Play .....

CLUTCH PEDAL .....
CLUTCH MASTER CYLINDER .....
CLUTCH BOOSTER AND CLUTCH MASTER CYLINDER .....
CLUTCH POWER CYLINDER .....
CLUTCH-PROPER .....
CLUTCH HOUSING .....

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2

The service instructions consist of the parts shown below. Starting on page 7, these parts are described in detail in order of the circled numbers.

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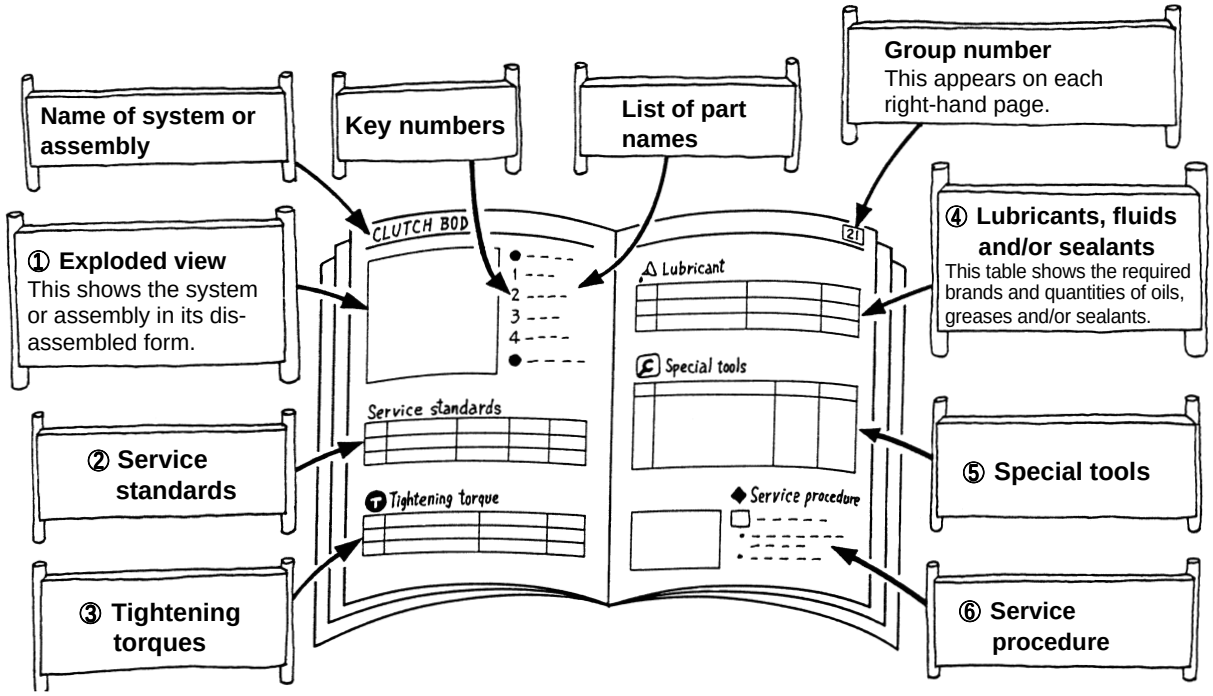

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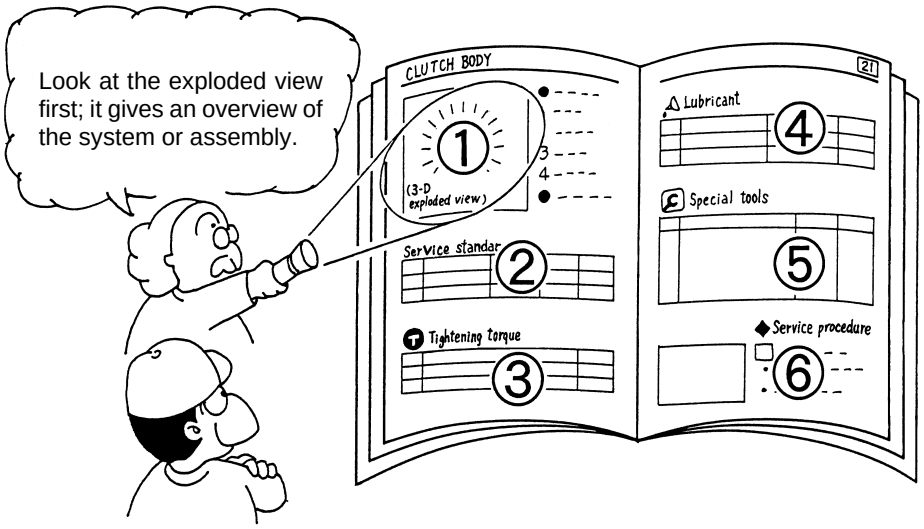
HOW THIS MANUAL IS STRUCTURED

3



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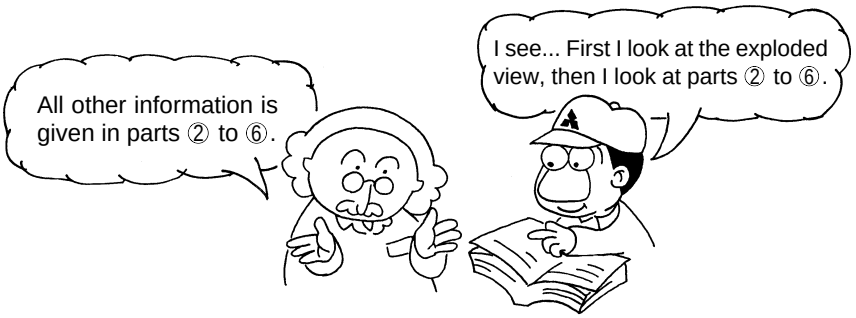
4



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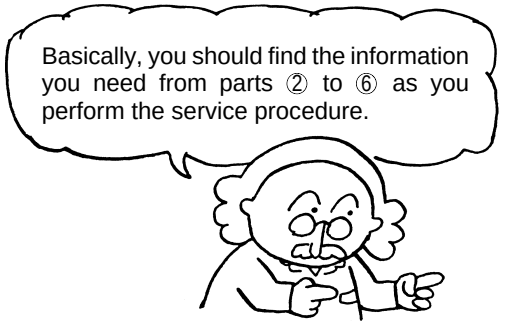
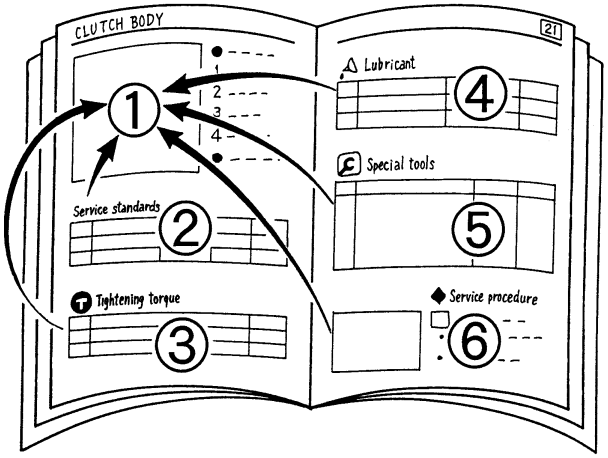
5



20245



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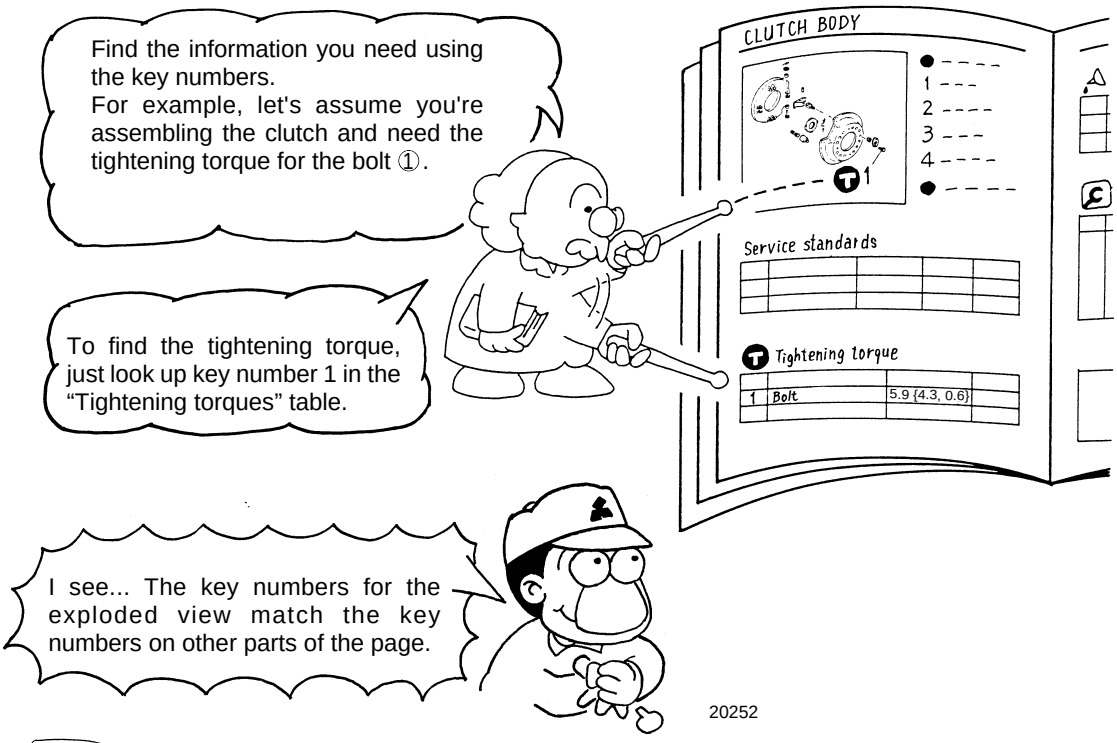
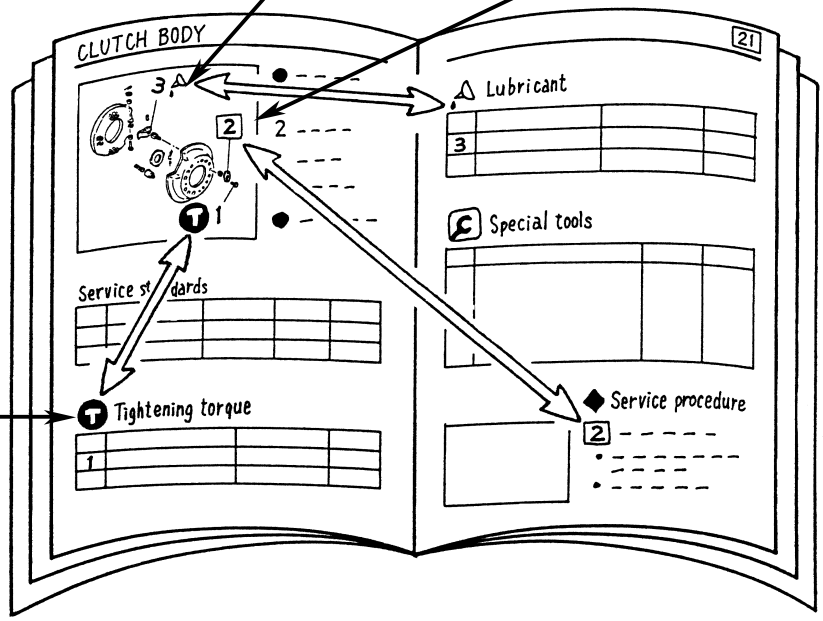
6



NOTE

To help you find information quickly:
Tightening torques are marked with T.
Lubricants, fluids and sealants are marked with △.
And every key number that appears in the service procedure is enclosed with a square.



HOW THIS MANUAL IS STRUCTURED

① Exploded view

1

Explanatory notes for the exploded view are given below. Explanatory notes for the parts list are given on the facing page.

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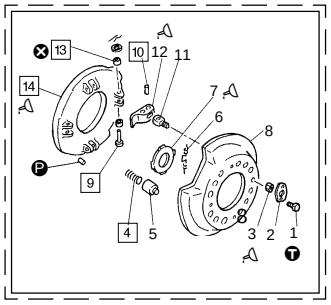
CLUTCH-PROPER <C5>

Pressure Plate-and-Lever Assembly



● **Pre-disassembly operations**
P21 - 44

• **Disassembly sequence**

1	Bolt
2	Lock plate
3	Support nut
4	Pressure spring
5	Pressure spring cap
6	Return spring
7	Release lever plate
8	Clutch cover
9	Release lever pin
10	Support lever pin
11	Support lever
12	Release lever
13	Bushing
14	Pressure plate

Ⓟ Positioning pin
⊗ : Non-reusable part

NOTE
Do not remove the bushing 13 unless it is defective.

● **Assembly sequence**
Reverse the order of disassembly.
Repair kit : Clutch release
Lever kit

● **Post-assembly Inspection and adjustment**
P21 - 44

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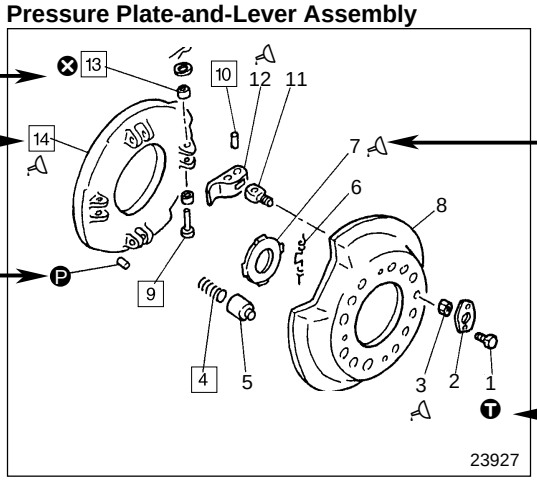
NOTE
This mark indicates a part that cannot be reused.

NOTE
The key number enclosed with a square indicates that the part is mentioned in the service procedure.

NOTE
Ⓟ: Indicates positioning pin.

Pressure Plate-and-Lever Assembly



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NOTE
This mark indicates that lubricant or sealant must be applied to the part.

NOTE
This mark indicates that a tightening torque is specified for the part.

So parts without Ⓣ marks don't have specified tightening torques ?

No, they don't. But every bolt and nut must be tightened to a standard torque. A Ⓣ mark shows either that the part must be tightened to a torque other than the standard torque or that the standard torque cannot be determined from the part's shape or markings.
Standard tightening torques are explained at the bottom of the next page.

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2

NOTE
The key numbers are given here.

● **Pre-disassembly operations**
P21 - 44

NOTE
This shows that certain operations must be performed before disassembly.

● **Disassembly sequence**
1 Bolt
2 Lock plate
3 Support nut
4 Pressure spring
5 Pressure spring cap
6 Return spring
7 Release lever plate
8 Clutch cover
9 Release lever pin
10 Support lever pin
11 Support lever
12 Release lever
13 Bushing
14 Pressure plate

⊗ : Non-reusable part

NOTE
The names of parts are given here.

NOTE
Links to reference information are given as follows:
- P21 - 44
  Refer to the indicated page of the same group.
- Gr 42
  Refer to the indicated group in another manual.

NOTE
The key numbers show the disassembly sequence.

NOTE
Do not remove bushing 13 unless it is faulty.

● **Assembly sequence**
Follow the disassembly sequence in reverse.
Repair kit : Clutch Release Lever kit

● **Post-assembly inspection and adjustment**
P21 - 44

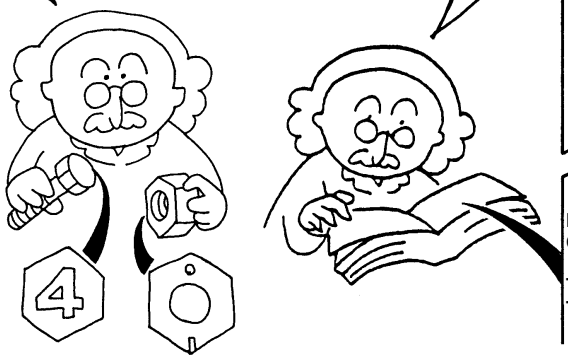
NOTE
This shows that certain operations must be performed after assembly.

NOTE
The name of the specified repair kit (if any) is given here.

NOTE
The assembly sequence is given here. Assembly is usually performed in the opposite order to disassembly. If the assembly sequence is otherwise specified, it is given in terms of key numbers like this:
● **Assembly sequence**
14→12→10→13→11.....

Now let's look at standard tightening torques. Normally, bolts and nuts have numbers or markings to show their material strength.

Tightening torques for bolts and nuts with such numbers and markings are shown in the Table of Standard Tightening Torques that appears in group 00.



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HOW THIS MANUAL IS STRUCTURED

② Service standards

Service standards

Unit : mm {in.}

Location	Maintenance item		Standard value (Basic diameter in [ ])	Limit	Remedy
4	Pressure spring	Installed load (Installed length 49.1 {1.93})	885 N {200 lbf, 90.2 kgf}	750 N {170 lbf,76.7 kgf}	Replace
		Squareness	2.9 {0.11} or less	5.0 {0.20}	Replace
7	Release lever plate height		53.8±0.7 {2.12±0.028}	Relative difference 0.5 {0.020} maximum	Adjust
10, 13	Clearance between release lever pin and bushing		[10 {0.39}] 0.02 to 0.11 {0.00079 to 0.0043}	0.4 {0.016}	Replace
14	Pressure plate	Thickness	23.6±0.1 {0.93±0.0039}	21 {0.83}	Replace
		Flatness	0.05 {0.0020} or less	0.2 {0.0079}	Correct or replace
		Strap bolt hole I.D.	10.2 to 10.25 {0.40 to 0.40}	10.5 {0.41}	Replace

NOTE

Number(s) in this column match the key number(s) on the exploded view ①.

③ Tightening torques

Tightening torque

Unit : N·m {ft.lbs, kgf.m}

Location	Parts to be tightened	Tightening torque	Remarks
1	Bolt (Lock plate mounting)	5.9 to 7.8 {4.3 to 5.8, 0.6 to 0.8}	—

NOTE

Number(s) in this column match the key number(s) on the exploded view ①.

NOTE

If oil or grease must be applied to threads before tightening, the word "Wet" appears in this column.

	Remarks
	Wet

④ Lubricants, fluids and/or sealants

Lubricant

Location	Points of application	Specified lubricant	Quantity
3	Threads and spherical surface of support nut	Anti-seizure compound	As required
7, 12	Sliding surfaces of release lever plate and release lever	Molybdenum disulfide grease [NLGI No.2 (Li soap)]	As required
11, 12	Sliding surfaces of support lever and release lever	Molybdenum disulfide grease [NLGI No.2 (Li soap)]	As required
11, 14	Sliding surfaces of support lever and pressure plate	Molybdenum disulfide grease [NLGI No.2 (Li soap)]	As required

NOTE

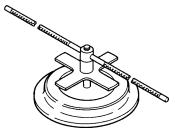
Number(s) in this column match the key number(s) on the exploded view ①.

NOTE

The specified types/brand are shown here.

⑤ Special tools

Special tools Unit : mm {in.}

Location	Tool name and shape	Part No.	Application
8	Clutch Installer  01277	MH061051	Removal and installation of clutch cover

NOTE
Number(s) in this column match the key number(s) on the exploded view ①.
For any special tool that is not a Mitsubishi genuine part, no illustration is shown; only the part number is given, as shown below.

Special tools

Location	Tool name and shape	Part No.	Application
21	Insertion Tool	*910-24461	Installation of O-ring
32	Retainer	*910-24590	Retention of primary piston

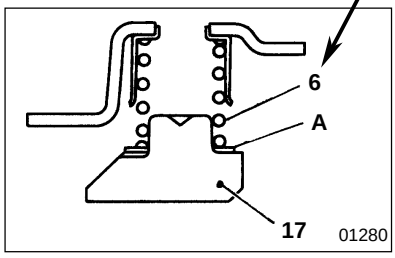
* BOSCH BRAKING SYSTEMS Co. Ltd. product number

⑥ Service procedure

1

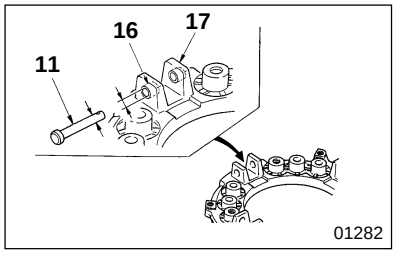
NOTE
Number(s) is this column match the key number(s) exploded view ①.

NOTE
The service procedure gives instructions in order of key numbers.



6 **Installation of pressure spring**
If the pressure plate **17** has been reqround, insert between the pressure plate and pressure spring **6** an adjusting washer **A** whose thickness matches that of the ground off material.

Regrind amount	Thickness and number of washer(s)
Less than 1 mm {0.039 in.}	Not required
1 mm {0.039 in.} (or more) to less than 2 mm {0.079 in.}	1.2 mm {0.047 in.} x 1
2 mm {0.079 in.} (or more) to less than 3 mm {0.12 in.}	1.2 mm {0.047 in.} x 2 or 2.3 mm {0.091 in.} x 1



11 16 **Clearance between release lever pin and bushing**
If the measurement exceeds the specified limit, replace the defective part(s).

NOTE
Perform this check with the bushing 16 press-fitted into the pressure plate 17.

2

Service procedures contain a variety of symbols and other indications. Let's look at some examples.

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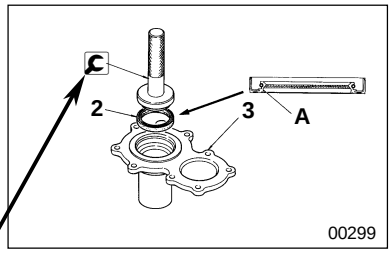
Key number

[Example 1: Special tools]



2 Installation of oil seal

- Apply grease to the lip **A** of the oil seal **2**.
- Using the Oil Seal Installer, fit the oil seal **2** into the front bearing retainer **3**. Make sure the oil seal is aligned as illustrated.

Name of special tool

Every special tool is indicated by a symbol. The text of the service procedure also includes the special tool's name. To see the part number and shape of a special tool, find the tool's key number and name in the "Special tools" table ⑤.

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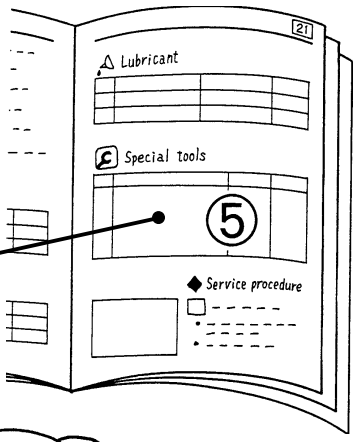

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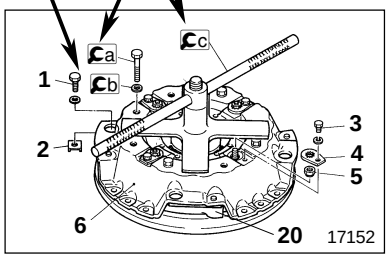
If more than one special tool is used, the symbols are supplemented by letters (for example, a, b and c) to enable cross-referencing between the exploded view and service procedure.

20277



6 Removal and installation of clutch cover

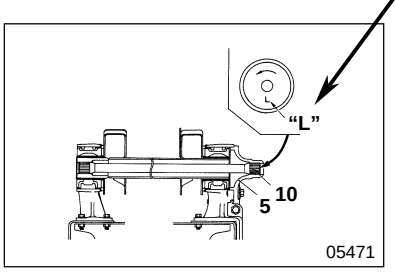
[Removal]

- Compress the pressure spring **8** using the c Clutch Installer, then remove the a Stopper Bolt, b Washer, strap bolt **1**, washer **2**, bolt **3**, lock plate **4** and support nut **5**.
- Gradually loosen the c Clutch Installer until the pressure spring **8** is ineffective, then remove the clutch cover **6**.

3

[Example 2: Identification or mating marks]

NOTE Any mark on an actual part is given in quotation marks " " in the service procedure.

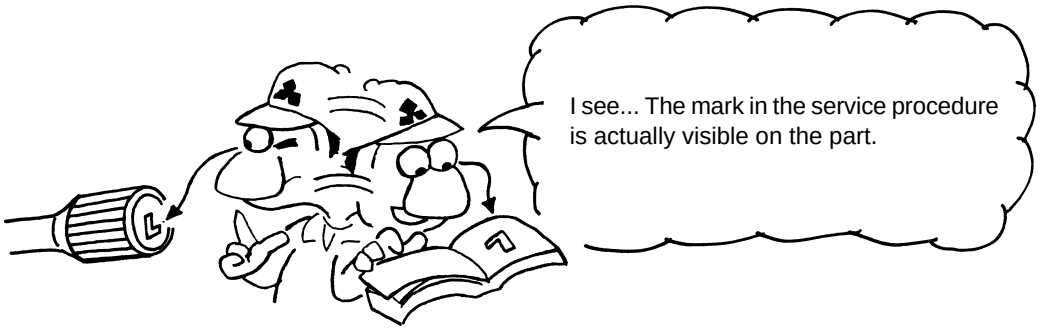


10 Installation of torsion bar

Fit the torsion bar **10** such that the "**L**" identification mark is on the side of the anchor lever **5**.

CAUTION ⚠

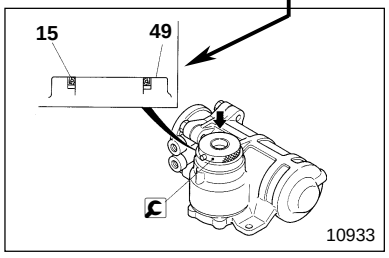
Make sure the torsion bar 10 aligned as specified. If the torsion bar is installed the wrong way around, the torsion direction will be reversed, resulting in damage.



4

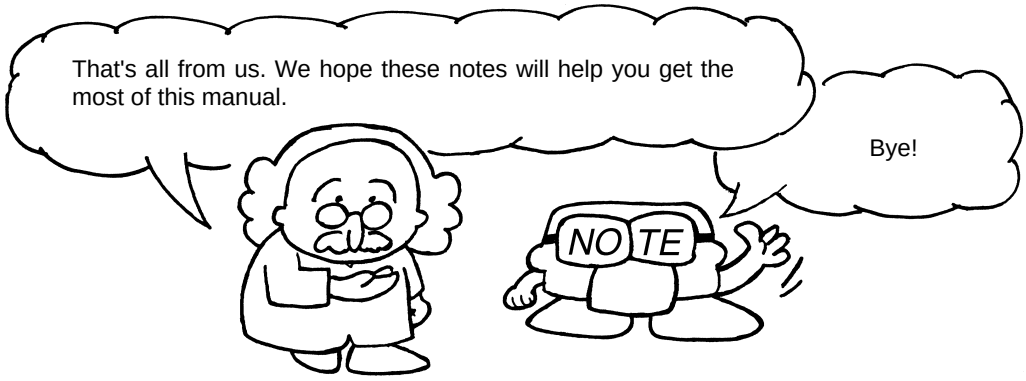
[Example 3 : Alignment of parts]

NOTE All illustrations show the correct alignment/direction of parts relative to each other. Provided the alignment/direction is shown clearly in the exploded view ①, no further explanation is given in the text of the service procedure.

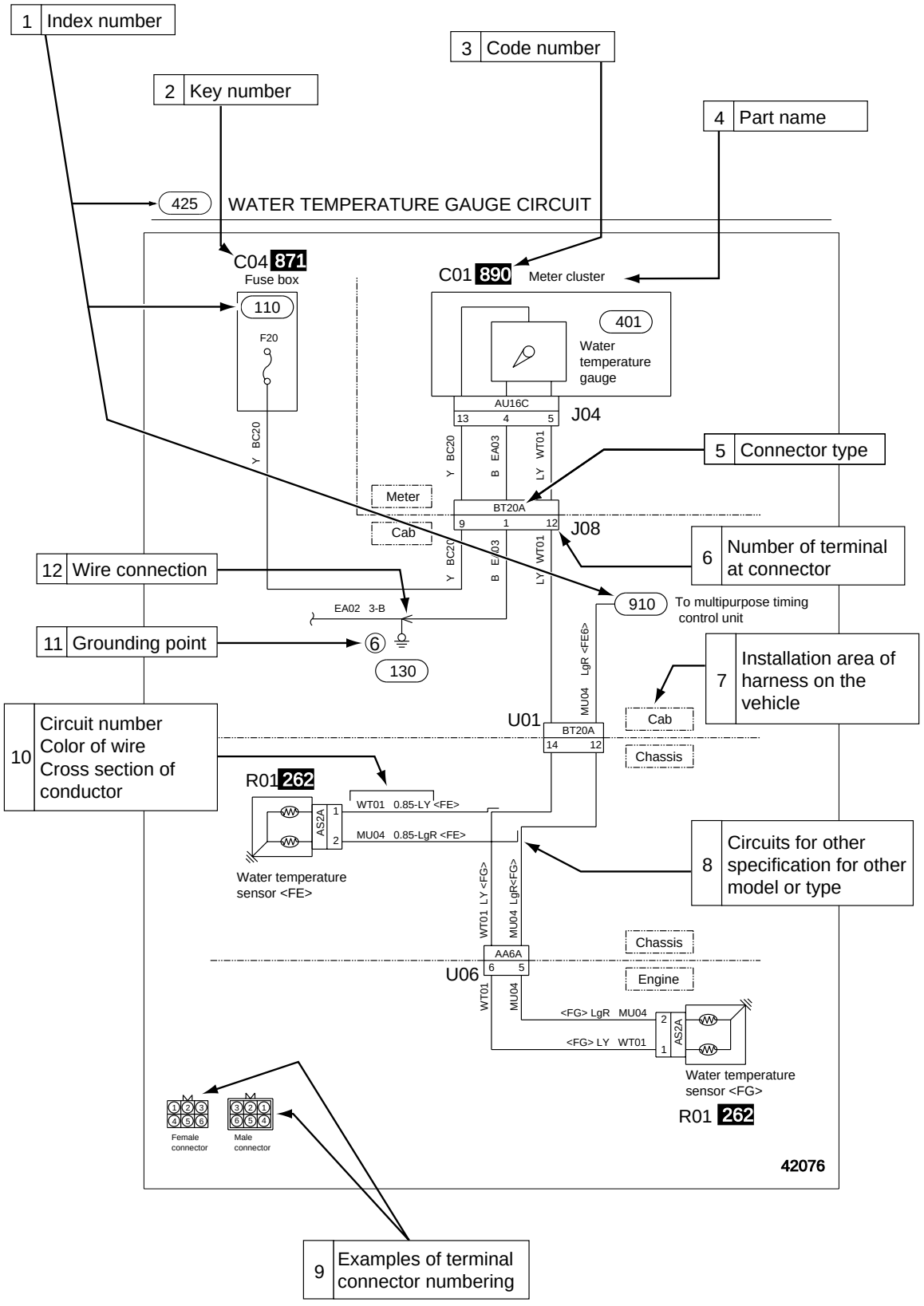


15 Installation of oil seal

Fit the oil seal **15** into the body **49,** making sure it is aligned as illustrated.



HOW TO READ CIRCUITS (GROUP 54)



Ⓟ 43351

1 Index number: (110)

Each circuit has its own Index number respectively and has three digits ((110)).
How to read index number

- By proper using of the index number, it is possible to locate right place immediately since the circuit drawing of this manual book are classified as function by function. (including “Power Circuit” (110) and “Ground Circuit” (130) .)
- How to check the location of circuit drawing in each part
  The circuit drawing which can not be diagramed in one page due to its complicated structure (such as meter cluster and electronic control unit etc.), has its remarked index number to be connected to other circuit drawing. ((401) , (910) , etc.)

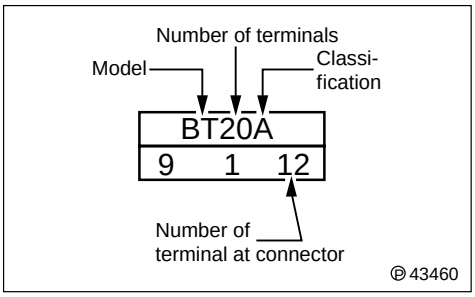
2 Key number: A01~
Key number is the number to indicate the installation position of the parts, and is shown by A01 ~ Z.
The details of the installation position are described in GROUP 10 .

3 Code number: **001** ~
Code number is the number to indicate the one portion of the parts to be checked and has three digits (**001**).
The details of the parts to be checked are described in GROUP 11 .

4 Part name

5 Connector type
Connectors are shown by □ without mentioning Male or Female and in the box it is described model of connector, number of terminals and its classification, etc.
Table of connectors is described in GROUP 14.

6 Number of terminal at connector
Terminal numbers of connector are shown by figures in the box.

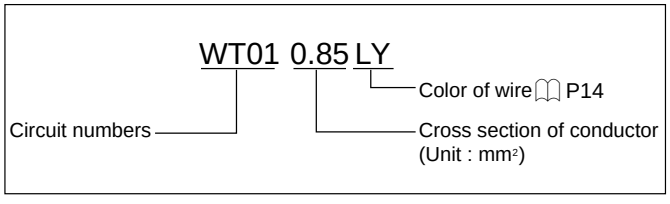


7 Installation area of harness on the vehicle
The location and boundary of the harnesses in the vehicle are shown in the each circuit drawing and it may help to check mounting position of connectors.

8 Circuits for other specification for other model or type

9 Examples of terminal connector numbering
As it is shown, for female connectors, with placing the lock upward then starting to put numbers from the upper left. And when it is male connector, put numbers from the upper right, also with placing the lock upward.

10 Circuit number, color of wire, and cross section of conductor are shown in circuit drawings.



Except for 0.5mm², Wire thickness is described in the circuit drawing. The reason why only wire thickness, 0.5 mm² is not described in the drawings is 0.5mm² is so common and so that the circuit drawing can be seen more easily.
(Examples) 0.5mm²: Y
0.85mm²: 0.85 — LY
3mm²: 3 — B

11 Grounding point
The actual locations of grounding points on the vehicle are shown. Refer to (130) for detailed information.

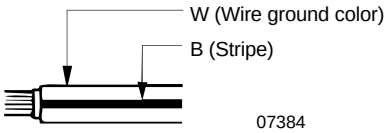
12 Wire connection
When the wires are connected into one point of the harnesses, the circuit drawing shows “Arrow mark”.

CAUTION !
Be careful that direction of the arrow does not show the direction of the electric current flow.

HOW THIS MANUAL IS STRUCTURED

● Wire Colors

Example: WB means a wire whose ground color is white and whose stripe is black.

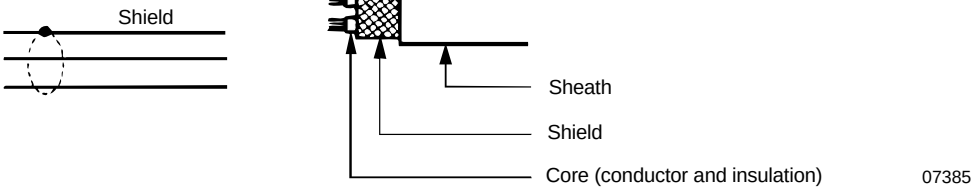


Wire ground color		Wire ground color + Stripe									
W	White	WR	White red	WB	White black	WL	White blue	WG	White green		
B	Black	BW	Black white	BY	Black yellow	BR	Black red				
R	Red	RW	Red white	RB	Red black	RY	Red yellow	RG	Red green	RL	Red blue
Y	Yellow	YR	Yellow red	YB	Yellow black	YG	Yellow green	YL	Yellow blue	YW	Yellow white
G	Green	GW	Green white	GR	Green red	GY	Green yellow	GB	Green black	GL	Green blue
Br	Brown	BrW	Brown white								
L	Blue	LW	Blue white	LR	Blue red	LY	Blue yellow	LB	Blue black	LO	Blue orange
Lg	Yellow green	LgR	Yellow green red	LgY	Yellow green yellow	LgB	Yellow green black	LgW	Yellow green white		
O	Orange										
P	Pink	PB	Pink black								

● Shield Wire

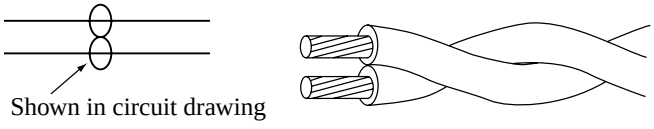
A shield wire is clearly identified as follows:

Example



● Twist wire

Twist wires are made by twisting the core of wires by the constant pitch.
Example:



The terms in this manual are defined as follows.

● This service manual contains important cautionary instructions and supplementary information under the following four headings which identify the nature of the instructions and information:

DANGER⚠ ——— Precautions that should be taken in handling potentially dangerous substances such as battery fluid and coolant additives.

WARNING⚠ ——— Precautionary instructions, which, if not observed, could result in serious injury or death.

CAUTION⚠ ——— Precautionary instructions, which, if not observed, could result in damage to or destruction of equipment or parts.

NOTE Suggestions or supplementary information for more efficient use of equipment or a better understanding.

● **Front and rear**

The terms “front” is the fan side and “rear” the flywheels side of the engine.

● **Left and right**

The terms “right” and “left” shall be used to indicate the side as viewed from the flywheel side of the engine.

● **Terms of service standards**

(1) Standard value

Standard value dimensions in designs indicating: the design dimensions of individual parts, the standard clearance between two parts when assembled, and the standard value for an assembly part, as the case may be.
The figure in [ ] is the basic diameter.

(2) Limit

When the value of a part exceeds this, it is no longer serviceable in respect of performance and strength and must be replaced or repaired.

● **Tightening torque**

Appropriate tightening torque has particular importance in respect of performance. Accordingly, tightening torque is specified in locations that are to be tightened.
Where there is no specified figure for tightening torque, follow the table covering standard tightening torques.
When the item is to be tightened in a “wet” state, wet is indicated. Where there is no indication, read it as dry, and tighten at specified torque.

MITSUBISHI
FUSO

Group 00

General

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BACK

HOME

MITSUBISHI FUSO TRUCK OF AMERICA, Inc.

Pub No. TWSE0101-00

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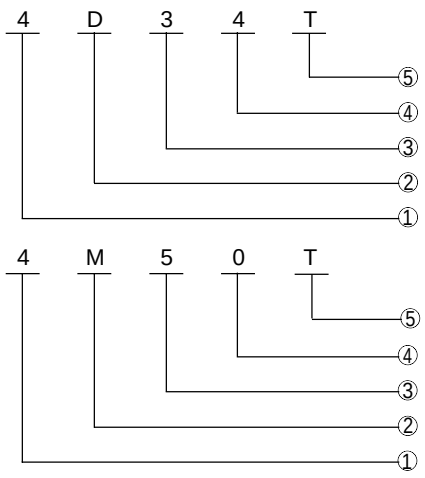
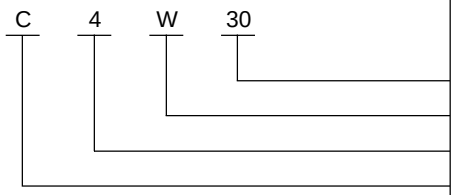
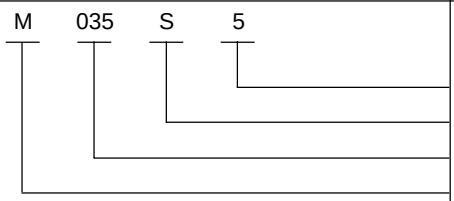
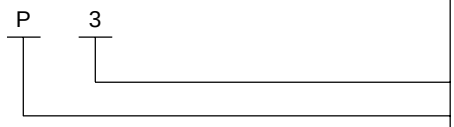
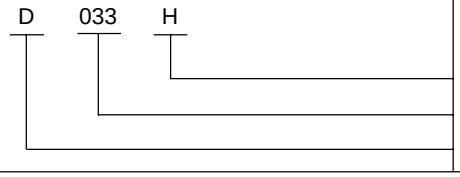
MODEL CODING SYSTEM

Equipment Model

Equipment name	Model description	Code description
Engine		① No. of cylinders (4 : Four cylinders) ② Stands for diesel engine ③ Series number ④ Version number ⑤ With turbocharger
Clutch		Disk outer diameter Facing material (W : Woven) Loading capacity of major type (tonnage) Stands for clutch
Transmission		No. of forward speeds Meshing (S : Synchromesh A : Automatic) Loading capacity of major type (tonnage) Stands for transmission
Propeller shaft		Loading capacity of major type (tonnage) Stands for propeller shaft
Reduction and differential		Teeth shape (H : hypiod gear) Loading capacity of major type (tonnage) Stands for reduction and differential

POWER TRAIN TABLE

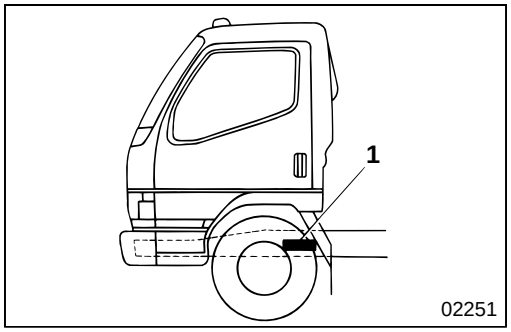
Model	Engine model	Clutch model	Transmission model	Propeller shaft	Rear axle model	Final reduction and gear ratio
FE639 G.V.W. 5445 kg {12000 lb}	4D34T3 145 HP/2900 rpm 275 ft.lbs/1600 rpm (SAE, Gross)	C4W30	M035S5 5.380/0.722	P3	R033T	D033H 5.714
		Torque converter	M035A4 3.018/0.703			
FE639 G.V.W. 6125 kg {13500 lb}	4D34T3 145 HP/2900 rpm 275 ft.lbs/1600 rpm (SAE, Gross)	C4W30	M035S5 5.380/0.722	P3	R033T	D033H 5.714
		Torque converter	M035A4 3.018/0.703			
FE640 G.V.W. 6575 kg {14500 lb}	4M50T2 175 HP/2700 rpm 347 ft.lbs/1800 rpm (SAE, Gross)	Torque converter	M035A4 3.018/0.703	P3	R033T	D033H 5.285
FE649 G.V.W. 6375 kg {14050 lb}	4D34T3 145 HP/2900 rpm 275 ft.lbs/1600 rpm (SAE, Gross)	Torque converter	M035A4 3.018/0.703	P3	R033T	D033H 5.714
FE649 G.V.W. 6575 kg {14500 lb}	4D34T3 145 HP/2900 rpm 275 ft.lbs/1600 rpm (SAE, Gross)	C4W30	M035S5 5.380/0.722	P3	R033T	D033H 5.714
FG639 G.V.W. 5445 kg {12000 lb}	4D34T3 145 HP/2900 rpm 275 (253:*b) ft.lbs/1600 rpm (SAE, Gross)	Torque converter	M035A4+TF3 3.018/0.765	P2 (Front) P3 (Rear)	R033T	D1H modified 5.714 (Front) D033H 5.714 (Rear)
FG649 G.V.W. 6375 kg {14050 lb}	4D34T3 145 HP/2900 rpm 275 (253:*a) ft.lbs/1600 rpm (SAE, Gross)	C4W30	M035S5+TF3 5.380/0.722	P2 (Front) P3 (Rear)	R033T	D1H modified 5.714 (Front) D033H 5.714 (Rear)

*a: Torque cut when 1st/reverse is selected
*b: Torque cut when 4WD/Low is selected

CHASSIS NUMBER AND ENGINE NUMBER/POWER TRAIN LABEL

CHASSIS NUMBER AND ENGINE NUMBER

The serial numbers for chassis and engines are assigned to the respective vehicles and engines in manufacturing sequence: every vehicle and engine has its own numbers. These numbers are required for registration and incidental inspection of the vehicle. Please do not fail to mention these numbers to the dealers when ordering spare parts.

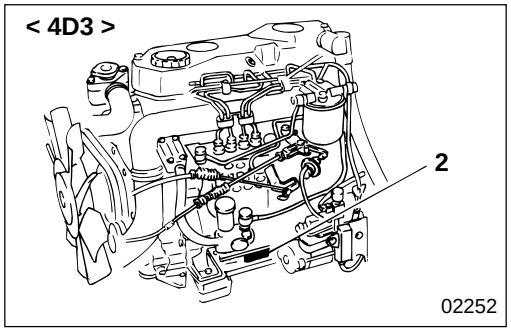


Chassis number

Chassis number **1** is punch-marked on the frame by the left-side front wheel.

Example : FE639C-□□□□□□

- FE639C: Vehicle model
- □□□□□□: Chassis number

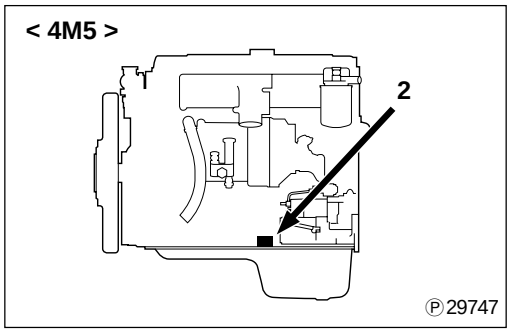


Engine number

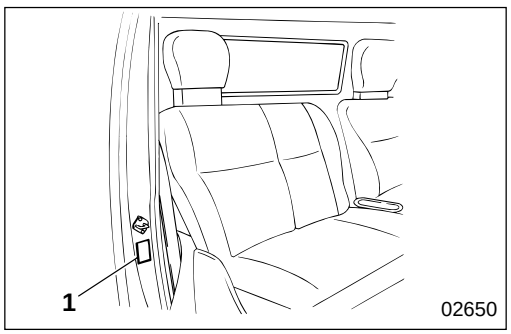
Engine number **2** is punch-marked on the left side of the crankcase.

Example : 4D34-□□□□□□

- 4D34: Engine model
- □□□□□□: Engine number

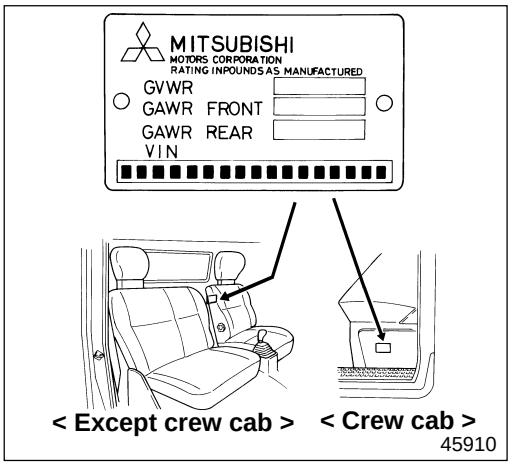


POWER TRAIN LABEL

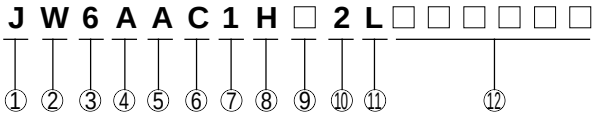


Power train label **1** located in the position illustrated indicates the vehicle model, chassis number and information relevant to the vehicle's power - train components.

VEHICLE IDENTIFICATION NUMBER



The vehicle identification number is punch-marked on the plate, which is attached in the position as illustrated.
The vehicle identification number consists of a 17-digit set of alphanumeric characters. Each digit represents the following specifications.



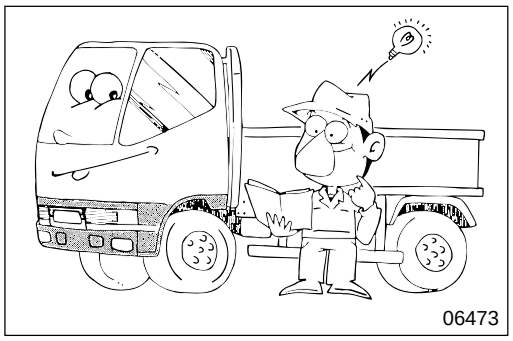
①	Country	J: Japan
②	Make	W: Mitsubishi Fuso
③	Vehicle type	6: Incomplete Vehicle
		7: Truck
④	Gross vehicle weight/Brake system	A: 10001 to 14000 lbs/Hydraulic
		B: 14001 to 16000 lbs/Hydraulic
⑤	Line	A: FE639
		B: FE649
		G: FG639
		H: FE640
		K: FE640□W
		L: FG649
⑥	Series (Wheelbase)	C: 2.6 to 2.98 m {8.53 to 9.48 ft.}
		E: 3.2 to 3.49 m {10.49 to 11.44 ft.}
		F: 3.5 to 3.79 m {11.48 to 12.43 ft.}
		H: 4.1 to 4.39 m {13.45 to 14.40 ft.}
⑦	Cab chassis type	1: Chassis cab
		3: Mixer
⑧	Engine	H: 3.907 ℓ Diesel turbocharged and charge air cooled
		S: 4.899 ℓ Diesel turbocharged and charge air cooled
⑨	Check digit	
⑩	Model year	2: 2002
⑪	Plant	K: Kawasaki-1
		L: Kawasaki-2
		M: Kawasaki-3
⑫	Plant sequential number	

PRECAUTIONS FOR MAINTENANCE OPERATION

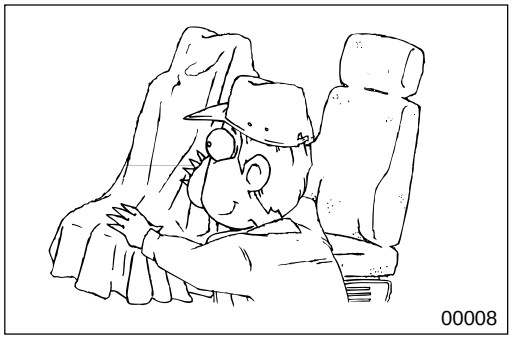
DANGER ⚠

This product contains or emits chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

In order to determine the condition of the vehicle adequately, keep records of the accumulated mileage, operating condition, what the customer's complaint is, and other information that may be necessary. Prepare steps to be taken to perform efficient maintenance procedures.

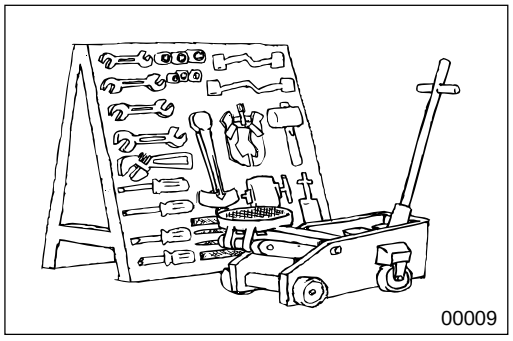

06473

Determine where the fault exists and check for the cause to see whether removal or disassembly of the part is necessary. Then follow the procedure specified by this manual.


00008

Perform maintenance work on level ground.
Prepare the following.

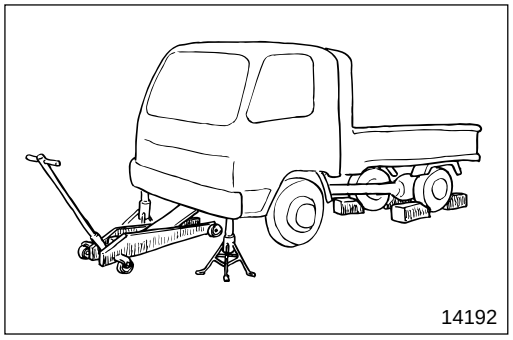
- To prevent the seats, upholstery, floor and bodywork from being spoiled or scratched, cover with workshop sheet cover(s).


00009

- Prepare general and special tools necessary for the maintenance work.

WARNING ⚠

Do not attempt to use tools other than special tools where use of special tools is specified in this manual. This will avoid injury or damage.

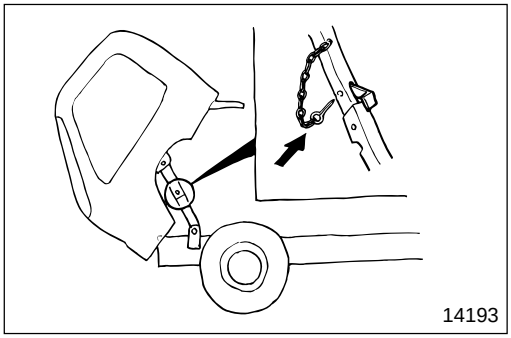

14192

When jacking up the vehicle to work under the vehicle, carry out the following preparatory work:

- Chock the wheels on both sides.
- Jack up the vehicle using a garage jack.
- Support the frame on rigid jack stands.

WARNING ⚠

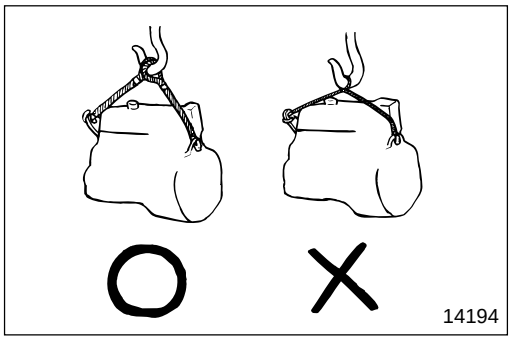
- **Chock the wheels securely so the vehicle does not move.**
- **Do not remove the chocks until the entire operation is completed.**
- **Supporting a vehicle on a garage jack only is extremely dangerous, so always support the frame on rigid jack stands.**
- **Leave the garage jack and rigid jack stands in place until the entire operation is completed. Never remove them during the operation.**


14193

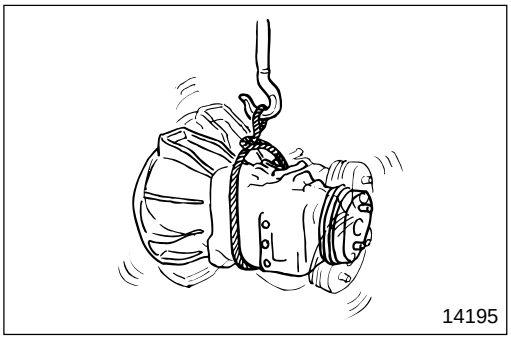
When tilting the cab, be sure to insert the safety pin into the cab stay so that the cab stay remains locked and is not released when the cab is tilted.

Pay special attention to safety when removing or installing heavy items such as engines, transmissions and axles.

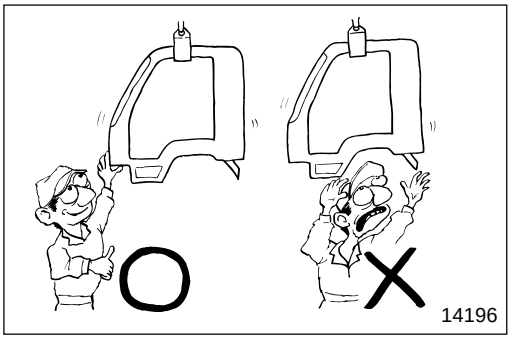
When lifting up heavy items using cables, pay special attention to the following points:


14194

- Check the mass of the item to be lifted and use a cable capable of lifting that mass.

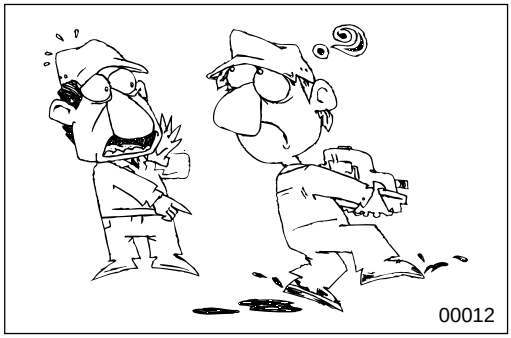

14195

- If you do not have the specified lifting hanger, secure the item using cable taking the point-of-balance of the item into consideration.

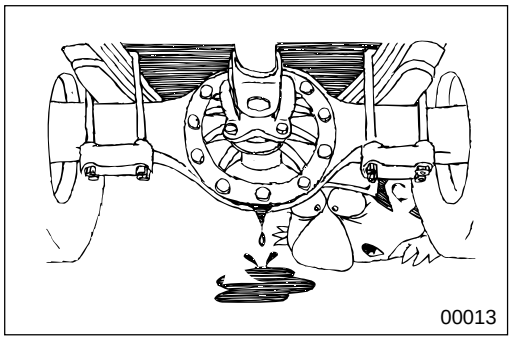

14196

- You must work in a position where you will not be injured even if the cable comes undone and the lifted item falls.

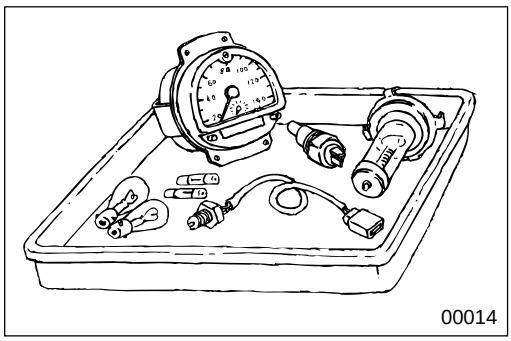
PRECAUTIONS FOR MAINTENANCE OPERATION



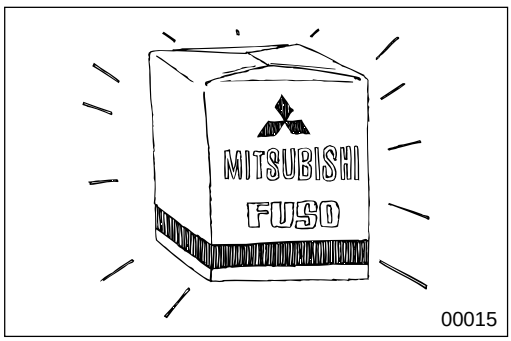
Be particularly careful not to work in shoes that have oily soles and are slippery. When working as a team of two or more, arrange signals in advance and keep confirming safety. Be careful not to accidentally bump switches or levers.



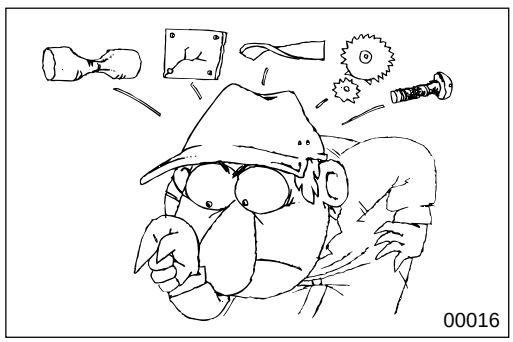
Check for oil leakage before cleaning the area having the fault otherwise you might miss detecting the leakage.



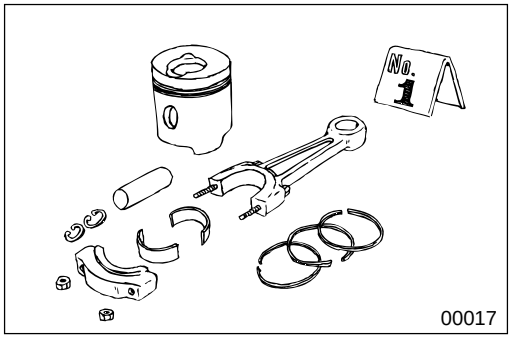
Prepare replacement part(s) beforehand.



Replace oil seals, packing, O-rings and other rubber parts; gaskets and split pins with new parts whenever any of them has been removed. Use only genuine MITSUBISHI replacement parts.



On disassembly, visually inspect all parts for wear and tear, cracks, damage, deformation, degradation, rust, corrosion, smoothness in rotation, fatigue, clogging and any other possible defect.

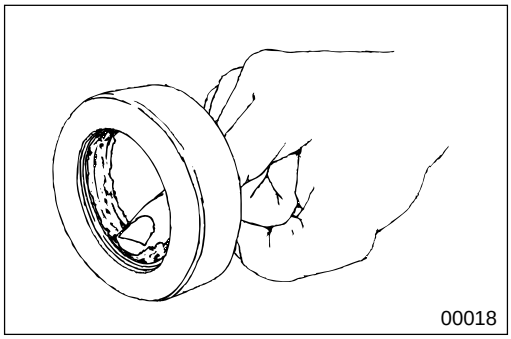


00017

Put alignment marks on part combinations before disassembly and arrange the disassembled parts neatly. This will help avoid mismating of the parts later.
Put the alignment marks, punch marks, etc. where performance and appearance will not be affected.
Cover the area left open after removal of parts to keep it free from dust.

CAUTION⚠

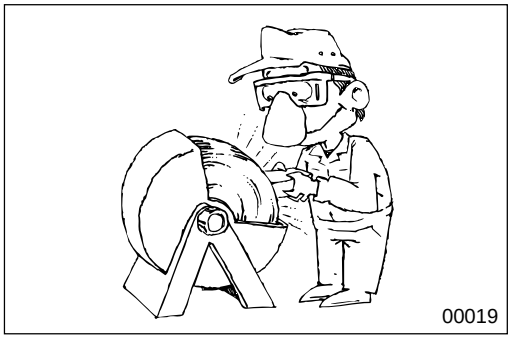
- **Take care to avoid mixing up numerous parts, similar parts, left and right, etc.**
- **Keep new parts for replacement and original (removed) parts separate.**


00018

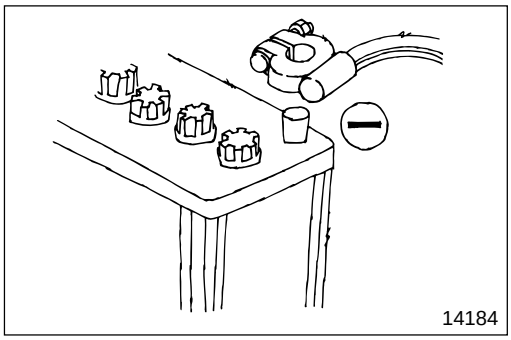
Apply the specified oil or grease to U-packings, oil seals, dust seals and bearings during assembly.
Use only the specified oil, grease, etc. for lubricant, remove the excess immediately after application with a clean rag, etc.

CAUTION⚠

When the specified lubricant, fluid and sealant is not available, you may use an equivalent.


00019

Wear goggles when using a grinder or welder. Pay full attention to safety by wearing gloves when necessary. Watch out for sharp edges, etc. that might injure your hands or fingers.

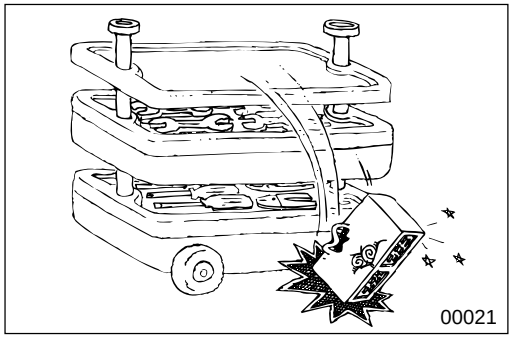

14184

Before carrying out maintenance work on the electric system, disconnect the negative terminal from the batteries to prevent them from short-circuiting.

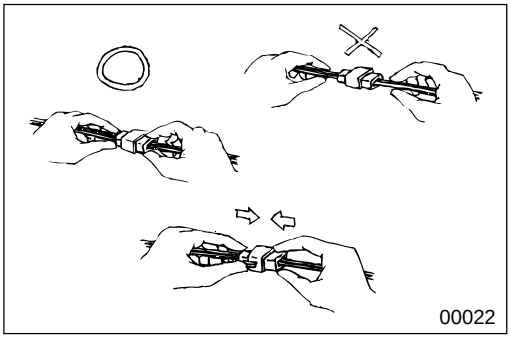
CAUTION⚠

Be sure to turn starter and lighting switches, etc. off before disconnecting or connecting battery terminals, because the semiconductors can become damaged.

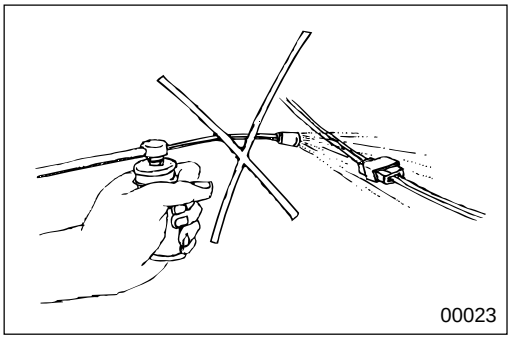
PRECAUTIONS FOR MAINTENANCE OPERATION



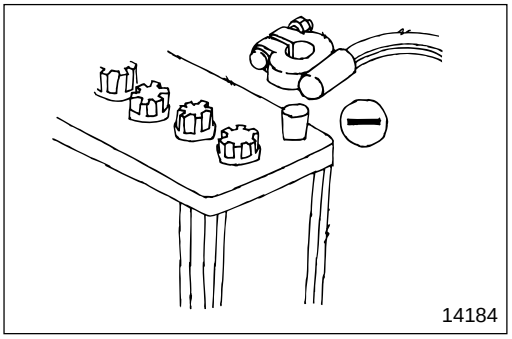
Take care when handling sensors, relays, etc. which are vulnerable to shock and heat. Do not attempt to remove the cover from, or apply paint to, the electronic control unit.



Pull the connector, and not the harness lead, to separate connectors. To separate a lock-type connector, first push toward arrow mark. To reconnect a lock-type connector, press the separated parts until they click together.



When washing the vehicle, cover the electric system parts and instruments with waterproof material beforehand (Cover with vinyl sheet or the like). Keep water away from harness wire connectors and sensors. If any of them should get wet, wipe them off immediately.



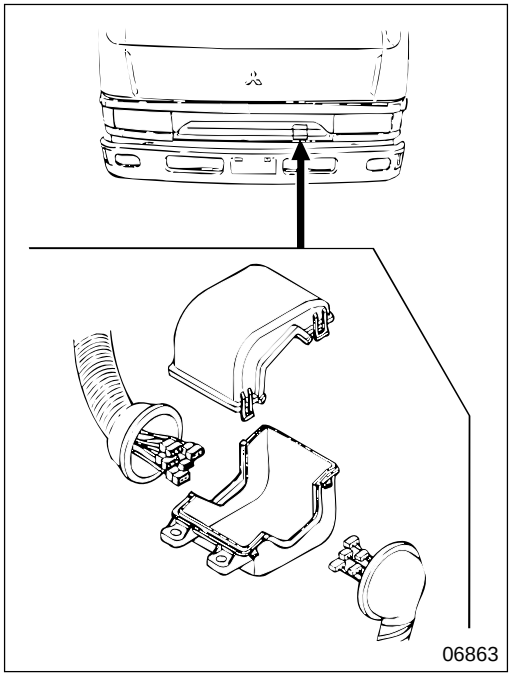
When using an electric welder, such electronic parts that are directly connected to the batteries might be damaged due to the flow of current from the welder that flows through the negative circuit. Parts that have switches might be subject to the same danger if the switches are left on. Therefore, do not fail to observe the following.

A : Welder

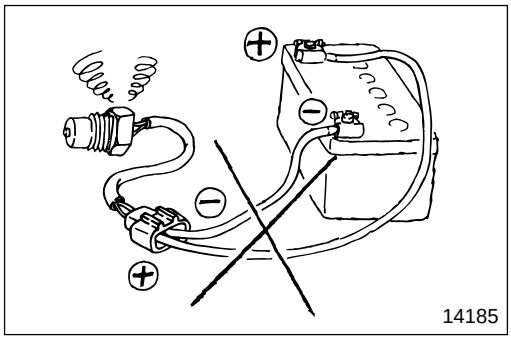
B : Connect the negative terminal of the welder as near as possible to the area that is to be welded.

C : Disconnect the negative cable at the batteries.

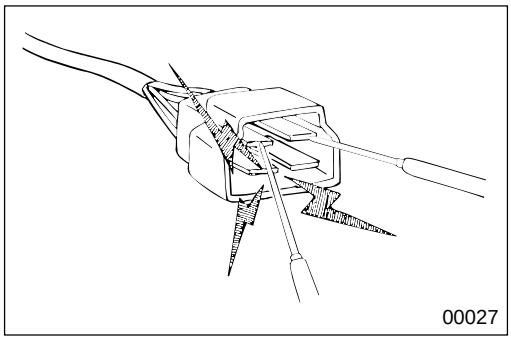
Gr 54 (130)



- Disconnect the negative terminals of batteries.
- Disconnect connections between the cab harness wires and the chassis harness wires.



To apply voltage for testing, check that the positive and negative cables are connected properly, then increase voltage gradually from 0 volt. Do not apply voltage higher than the specified value.
In particular, pay close attention to the electronic control unit and sensors, since they are not always fed by battery voltage.



When using testers or the like for continuity tests, be careful not to allow test probes to touch the wrong terminals.