

FOREWORD

This manual covers the service procedures of the TOYOTA FORKLIFT 7FGU/7FDU15 - 32 series and 7FGCU20 - 32 series. Please use this manual for providing quick, correct servicing of the corresponding forklift models.

This manual deals with the above models as of October **1999**. Please understand that disagreement can take place between the descriptions in the manual and actual vehicles due to change in design and specifications. Any change or modifications thereafter will be informed by Toyota Industrial Equipment Parts & Service News.

For the service procedures of the mounted engine, read the repair manuals listed below as reference together with this manual.

(Reference)

Repair manuals related to this manual are as follows:

TOYOTA INDUSTRIAL EQUIPMENT 4Y ENGINE
REPAIR MANUAL (No. CE602-1)

TOYOTA INDUSTRIAL EQUIPMENT 1DZ-II ENGINE
REPAIR MANUAL (No. CE618-1)

TOYOTA Material Handling Company
A Division of TOYOTA INDUSTRIES CORPORATION

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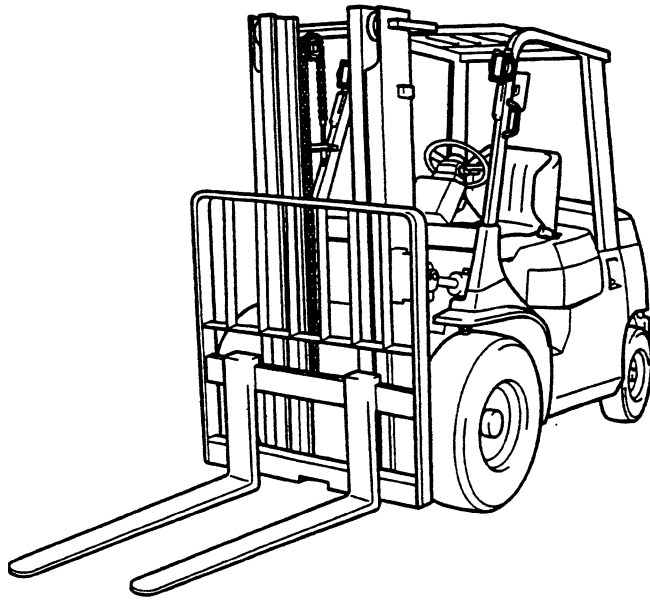
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GENERAL

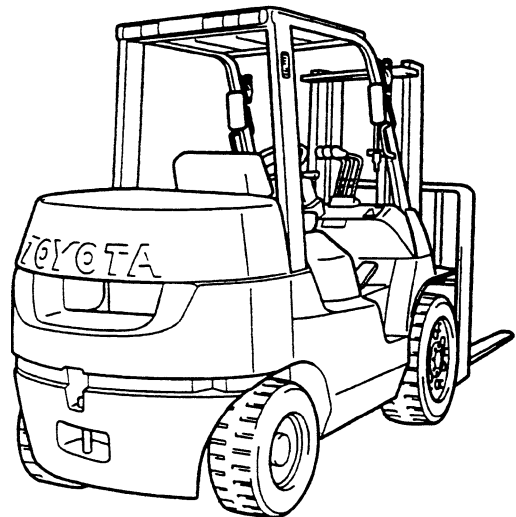
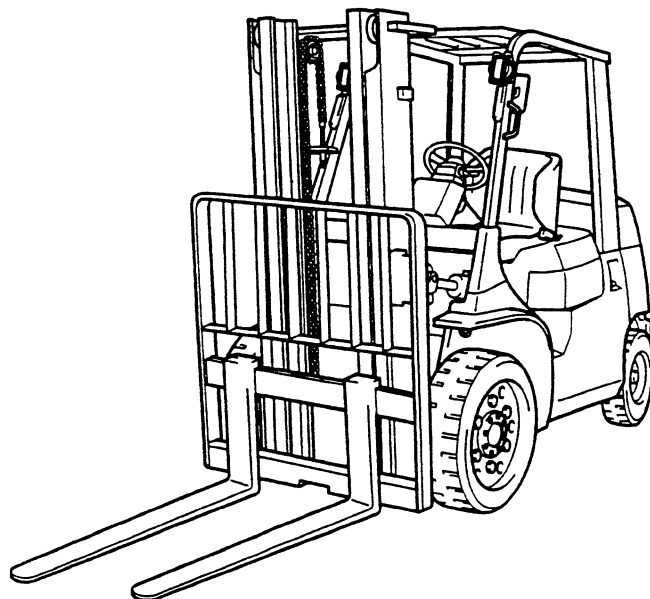
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EXTERIOR VIEWS

Pneumatic tire model



Cushion tire model



VEHICLE MODEL

Pneumatic Tire Models (Pn)

| Classification | | Load Capacity | Vehicle Model | Transmission Type | Engine | |
|----------------|-------|---------------|---------------|-------------------|--------|----------|
| Series | Model | | | | | |
| Pn1 ton series | Pn15 | 3000 lbs | 7FGU15 | T/C | 4Y | Gasoline |
| | | | 7FDU15 | T/C | 1DZ-II | Diesel |
| | Pn18 | 3500 lbs | 7FGU18 | T/C | 4Y | Gasoline |
| | | | 7FDU18 | T/C | 1DZ-II | Diesel |
| Pn2 ton series | Pn20 | 4000 lbs | 7FGU20 | T/C | 4Y | Gasoline |
| | | | 7FDU20 | T/C | 1DZ-II | Diesel |
| | Pn25 | 5000 lbs | 7FGU25 | T/C | 4Y | Gasoline |
| | | | 7FDU25 | T/C | 1DZ-II | Diesel |
| Pn3 ton series | Pn30 | 6000 lbs | 7FGU30 | T/C | 4Y | Gasoline |
| | | | 7FDU30 | T/C | 1DZ-II | Diesel |
| | Pn32 | 6500 lbs | * 7FGU32 | T/C | 4Y | Gasoline |
| | | | * 7FDU32 | T/C | 1DZ-II | Diesel |

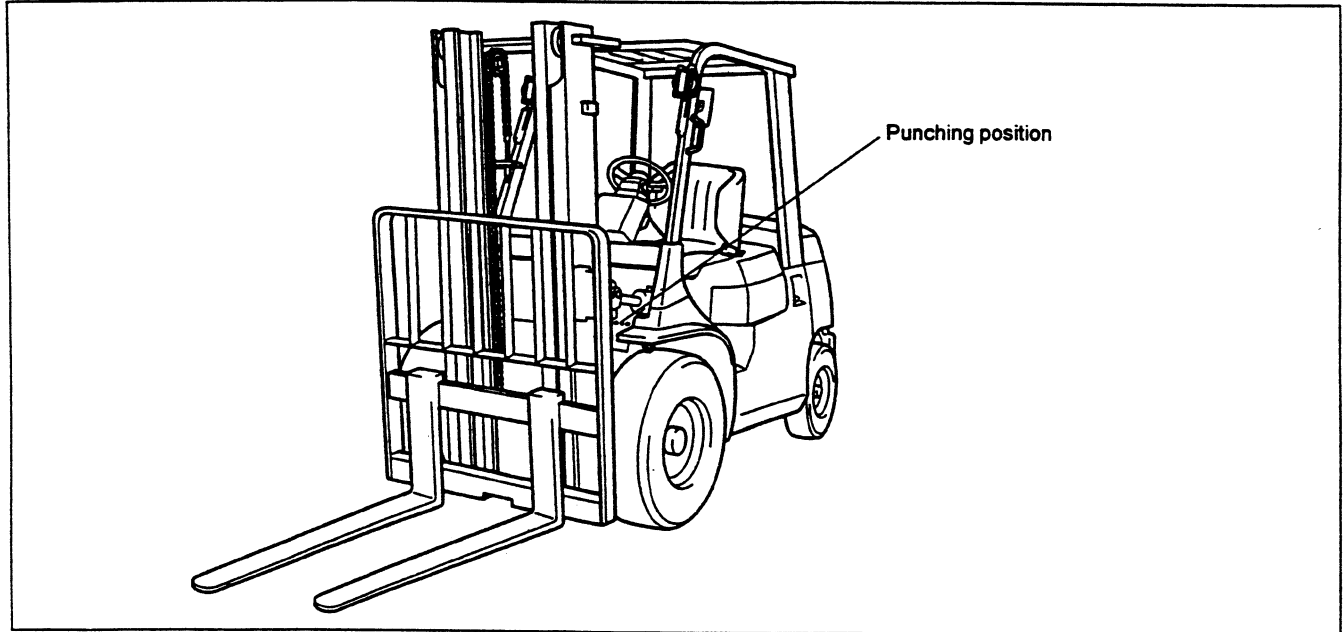
Cushion Tire Models (Cu)

| Classification | | Load Capacity | Vehicle Model | Transmission Type | Engine | |
|----------------|-------|---------------|---------------|-------------------|--------|----------|
| Series | Model | | | | | |
| Cu2 ton series | Cu20 | 4000 lbs | 7FGCU20 | TIC | 4Y | Gasoline |
| | Cu25 | 5000 lbs | 7FGCU25 | TIC | 4Y | Gasoline |
| Cu3 ton series | Cu30 | 6000 lbs | 7FGCU30 | TIC | 4Y | Gasoline |
| | Cu32 | 6500 lbs | * 7FGCU32 | TIC | 4Y | Gasoline |

*: USA and CANADA Only

FRAME NUMBER

Frame No. Punching Position



| | Series | Engine | Vehicle model | Punching format |
|----------------|--------------|--------|----------------|-------------------|
| Pneumatic tire | 1 ton series | 4Y | 7FGU15 | 7FGU18 - 60011 |
| | | | 7FGU18 | |
| | | 1DZ-II | 7FDU15 | 7FDU18 - 60011 |
| | | | 7FDU18 | |
| | 2 ton series | 4Y | 7FGU20 | 7FGU25 - 60011 |
| | | | 7FGU25 | |
| | | 1DZ-II | 7FDU20 | 7FDU25 - 60011 |
| | | | 7FDU25 | |
| | 3 ton series | 4Y | 7FGU30 | 7FGU32 - 60011 |
| | | | 7FGU32 | |
| 1DZ-II | | 7FDU30 | 7FDU32 - 60011 | |
| | | 7FDU32 | | |
| Cushion tire | 2 ton series | 4Y | 7FGCU20 | 7FGCU25 - 60011 |
| | | | 7FGCU25 | * 7FGCU25 @ 60011 |
| | 3 ton series | 4Y | 7FGCU30 | 7FGCU32 - 60011 |
| | | | 7FGCU32 | * 7FGCU32 @ 60011 |

*: EEC spec.

HOW TO USE THIS MANUAL

EXPLANATION METHOD

1. Operation procedure

(1) The operation procedure is described in either pattern **A** or pattern **B** below.

Pattern A: Explanation of each operation step with illustration.

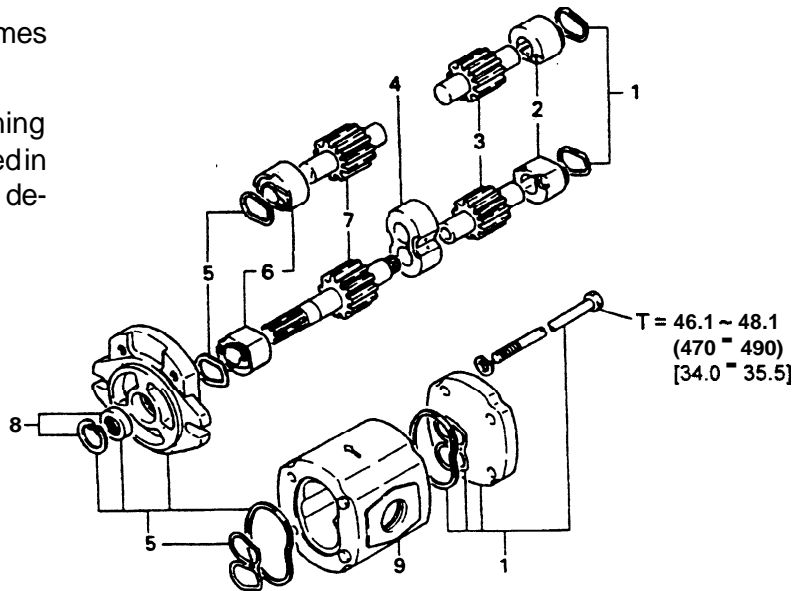
Pattern B: Explanation of operation procedure **by** indicating step numbers in one illustration, followed by explanation of cautions and notes summarized as point operations.

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Example of description in pattern B

DISASSEMBLY-INSPECTION-REASSEMBLY Tightening torque unit T = N·m (kgf-cm) [ft-lbf]

- Step Nos. are partially sometimes omitted in illustrations.
- When a part requiring tightening torque instruction is not indicated in the illustration, the part name is described in the illustration frame.



Disassembly Procedure

- 1 Remove the cover. [Point 1]
- 2 Remove the bushing [Point 2] ← Operation explained later
- 3 Remove the gear.

Point Operations Explanation of key point for operation with an illustration

[Point 1]



Disassembly: Put a match mark when removing the pump cover.

[Point 2]

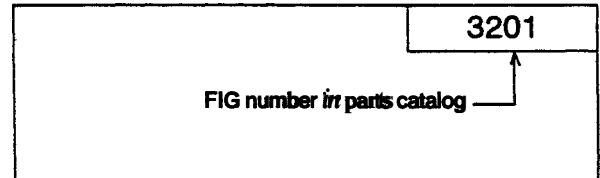
Inspection: Measure the bush inside diameter.

Limit: 19.12 mm (0.7528 in)

2. How to read components figures

- (1) The components figure uses the illustration in the parts catalog for the vehicle model. Please refer to the catalog for checking the part name.
The number at the right shoulder of each components figure indicates the Fig. number in the parts catalog.

(Example)



3. Matters omitted in this manual

- (1) This manual omits description of the following jobs, **but** perform them in actual operation:
- ① Cleaning and washing of removed parts as required
 - ② Visual inspection (partially described)

TERMINOLOGY**Caution:**

Important matters negligence of which may cause physical damage. Be sure to observe them.

Note:

Important items negligence of which may cause breakage or breakdown. And operation procedure requiring special attention.

Standard: Values showing allowable range in inspection and adjustment.

Limit: Maximum or minimum allowable value in inspection or adjustment.

ABBREVIATIONS

| Abbreviation (code) | Meaning | Abbreviation (code) | Meaning |
|---------------------|------------------------------|---------------------|---------------------------------------|
| ASSY | Assembly | RH | Right hand |
| Cu | Cushion tire models | SAE | Society of Automotive Engineers (USA) |
| LH | Left hand | SAS | System of active stability |
| LLC | Long life coolant | SST | Special service tool |
| M/T | Manual transmission | STD | Standard |
| NMR | No-load maximum speed | T = | Tightening torque |
| OPT | Option | T/C | Torque converter & transmission |
| O/S | Oversize | O O T | Number of teeth (O O) |
| Pn | Pneumatic tire models | U/S | Undersize |
| PS | Power steering | W/ | With |
| QFV | 4-stage mast (Quadruple) | L/ | Less |

OPERATIONAL TIPS

1. Safe operation

- (1) After jacking up, **always** support with wooden blocks or rigid stands.
- (2) When hoisting the vehicle or its heavy component, use wire **rope(s)** with a sufficient reserve in load capacity.
- (3) Always disconnect the battery terminal before the inspection or servicing of electrical parts.

2. Tactful operation

- (1) Prepare the mechanic tools, necessary measuring instruments (circuit tester, megger, oil pressure gauge, etc.) and **SSTs** before starting operation.
- (2) Before disconnecting wiring, always check the cable color and wiring state.
- (3) When overhauling functional parts, complicated portions or related mechanisms, arrange the parts neatly to prevent confusion.
- (4) When disassembling and inspecting such a precision part as the control valve, use clean tools and operate in a clean location.
- (5) Follow the described procedures for disassembly, inspection and reassembly.
- (6) Replace, gaskets, packing's and O-rings with new ones each time they are disassembled.
- (7) Use genuine Toyota parts for replacement.
- (8) Use specified bolts and nuts. Observe the specified tightening torque at the time of reassembly. Tighten to the center of the specified tightening torque range.
If no tightening torque is specified, tighten the bolt or nut according to the standard tightening torque table.

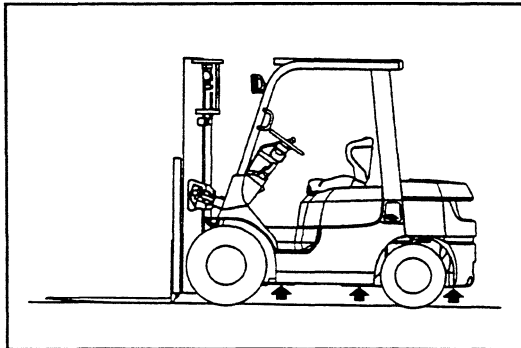
3. Grasping the trouble state

When a trouble occurs, do not attempt immediate disassembly or replacement but first check if the trouble requires disassembly or replacement for remedying.

4. Disposal of waste fluid, etc.

When draining waste fluid from the vehicle, receive it in a container.

If any oil, fuel, coolant, oil filter, battery or other harmful substance is directly discharged or scrapped without permission, it will either adversely affect human health or destroy the environment. Always sort waste fluids, etc. and treat them properly by requesting disposal by specialized companies.



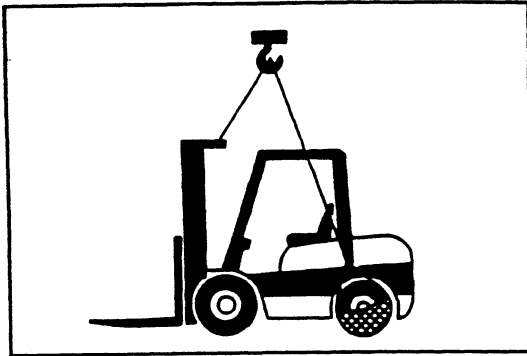
5. Jack up points

Front side:

Jack up at the bottom surface of the frame.

Rear side:

Jack up at the under the counterweight or the bottom surface of the frame.



HOISTING THE VEHICLE

When hoisting the vehicle, use the mast hook on the front of the vehicle and a wire net on the rear wheel.

Caution:

- Use wire ropes having sufficient strength.
- Never hoist the forklift by the weight hook holes or head guard.

ATTENTIVE POINTS ON SAS

1. Reference should be made to separate manual "New Model Feature 7FGU/7FDU15-32 Pub. No. PU015" for the explanations of SAS functions and operations.
2. Read Section 15 SAS "Precautions for Repair" on Page 15-7 in this repair manual in advance.
3. Whenever the repair or replacement is performed to the place where relative to SAS function, re-setting procedure by which the SAS regain proper function must be performed. (See Page 15-19)
4. The warning on the SAS caution label must be confirmed when the modification or change is such as to change the original specification.
If improper, change the label. (See Page 15-10)
5. Care should always be exercised for safety operation whenever you operate the truck.
Make distinction between the SAS featured trucks and those of none, because the control features are different.
6. The SAS oil control valves comprise many precision valves. Since dirty or contaminated hydraulic oil will adversely affect the functions of these valves, always wash the parts clean at the time of installation after disassembly or for replacement of hydraulic parts (valves, piping, etc.). Periodic replacement of the hydraulic oil is very important.
7. Since this vehicle uses high-precision electronic devices, modification of electrical parts may cause faults. Always use genuine Toyota parts when replacing or installing electrical parts (auxiliary equipment, optional parts, etc.).

CIRCUIT TESTER

Circuit testers are available in both the analog and digital types. They should be used selectively according to the purpose of measurement.

Analog type: This type is convenient for observing movement during operation, but the measured value should only be used for reference or rough judgement.

Digital type: Fairly accurate reading is possible, but it is difficult to observe the variation or movement.

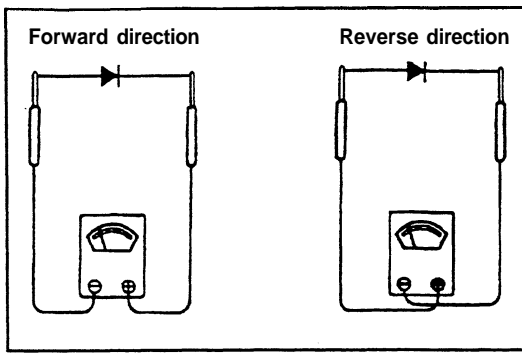
1. Difference in measurement results with the digital type and analog type

* The result may be different between measurements with the analog type and digital type.

Always use a circuit tester according to its operation manual.

Cautions when the polarities are different between the analog type and digital type are described below.

(1) Analog circuit tester

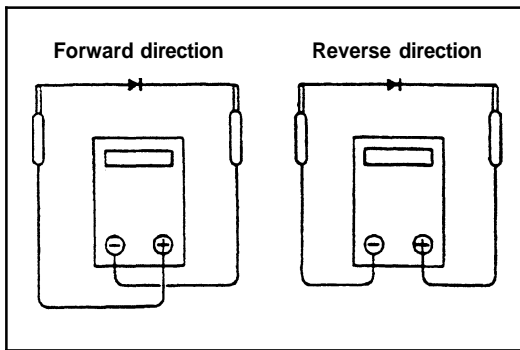


Measurement result example

Tester range: $k\Omega$ range

| | |
|---------|-------------------|
| | Analog type |
| Forward | Continuity exists |
| | 11 $k\Omega$ |
| Reverse | No continuity |
| | ∞ |

(2) Digital circuit tester



Measurement result example

Tester range: $M\Omega$ range

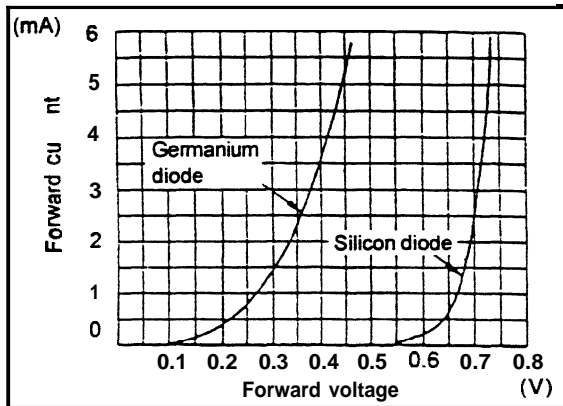
| | |
|---------|-------------------|
| | Digital type |
| Forward | No continuity |
| | 1 |
| Reverse | Continuity exists |
| | 2 $M\Omega$ |

Difference in result of measurement with circuit tester

The circuit tester power supply voltage depends on the tester type. 1.5 V, 3.0 V or 6.0 V is used.

The resistance of a semiconductor such as a diode varies with the circuit tester power supply voltage.

The diode characteristics are shown in the figure below.

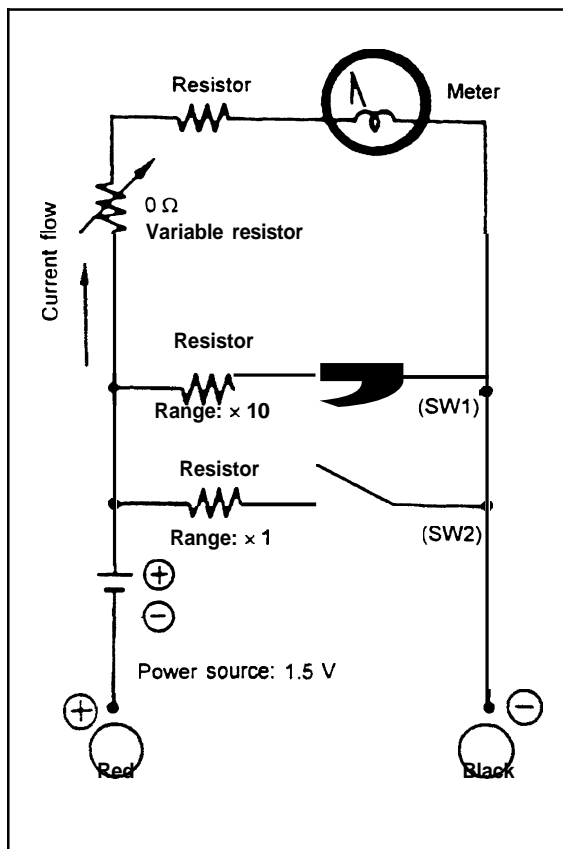


The resistance values of the same semiconductor measured with two types of circuit testers having different power supply voltages are different.

This manual describes the results of measurement with a circuit tester whose power supply voltage is 3.0 V.

3. Difference in measurement result by measurement range (analog type)

In the analog type circuit tester, changing the measurement range switches over the internal circuit to vary the circuit resistance. Even when the same diode is measured, the measurement result varies with the measurement range.



Always use the range described in the repair manual for measurement.







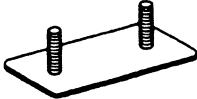


STANDARD BOLT & NUT TIGHTENING TORQUE

Standard bolt and tightening torques are not indicated.
 Judge the standard tightening torque as shown below.

1. Find out the type of the bolt from the list below and then find the bolt tightening torque from the table.
2. The nut tightening torque can be judged from the mating bolt type.

BOLT STRENGTH TYPE IDENTIFICATION METHOD

IDENTIFICATION BY BOLT SHAPE

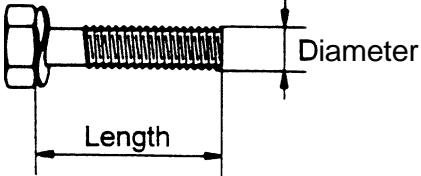
| | Shape and class | Class |
|---------------------|--|--|
| Hexagon head bolt |  Bolt head No. | 4 = 4T 5 = 5T 6 = 6T 7 = 7T 8 = 8T |
| |  No mark | 4T |
| Hexagon flange bolt | No mark | 4T |
| Hexagon head bolt |  Two protruding lines | 5T |
| Hexagon flange bolt |  Two protruding lines | 6T |
| Hexagon head bolt |  Three protruding lines | 7T |
| Hexagon head bolt |  Four protruding lines | 8T |
| Welded bolt |  | 4T |
| Stud bolt |  No mark | 4T |
| |  Grooved | 6T |

IDENTIFICATION BY PART NO.

Hexagon head bolt

Parts No. 91611-40625

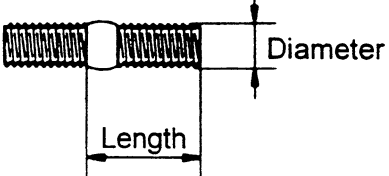
└───┬───┘ Length (mm)
└───┬───┘ Diameter (mm)
└───┬───┘ Class



Stud bolt

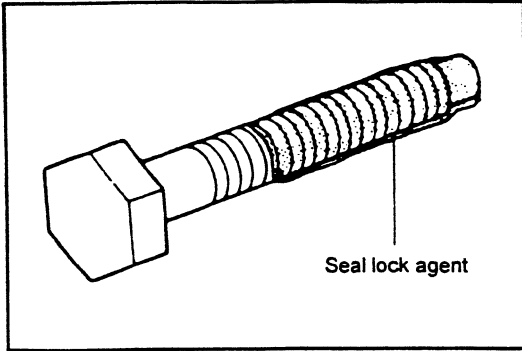
Part No. 92132-40614

└───┬───┘ Length (mm)
└───┬───┘ Diameter (mm)
└───┬───┘ Class



TIGHTENING TORQUE TABLE

| Class | Diameter mm | Pitch mm | Specified torque | | | | | |
|-------|----------------|-------------|----------------------|-------------|------------------|------------------------|-----------------------------|------------------|
| | | | Hexagon head bolt | | | Hexagon flange bolt | | |
| | | | N·m | kgf·cm | ft-lbf | N·m | kgf·cm | ft-lbf |
| 4T | 6 | 1.0 | 5.4 | 55 | 48 in-lbf | 5.9 | 60 145 | 52 in-lbf |
| | 8 | 1.25 | 13 | 130 | 9 | 14 | | 10 |
| | 10 | 1.25 | 25 | 260 | 19 | 28 | 290 | 21 |
| | 12 | 1.25 | 47 | 480 | 35 | 53 | 540 | 39 |
| | 14 | 1.5 | 75 | 760 | 55 | 83 | 850 | 61 |
| | 16 | 1.5 | 113 | 1150 | 83 | — | — | — |
| 5T | 6 | 1.0 | 6.4 | 65 | 56 in-lbf | 7.5 | 75 | 65 in-lbf |
| | 8 | 1.25 | 16 | 160 | 12 | 18 | 175 | 13 |
| | 10 | 1.25 | 32 | 330 | 24 | 36 | 360 | 26 |
| | 12 | 1.25 | 59 | 600 | 43 | 65 | 670 | 48 |
| | 14 | 1.5 | 91 | 930 | 67 | 100 | 1050 | 76 |
| | 16 | 1.5 | 137 | 1400 | 101 | 157 | 1600 | 116 |
| 6T | 6 | 1.0 | 7.8 | 80 | 69 in-lbf | 8.8 | 90 | 78 in-lbf |
| | 8 | 1.25 | 19 | 195 | 14 | 21 | 215 | 16 |
| | 10 | 1.25 | 38 | 400 | 29 | 43 | 440 | 32 |
| | 12 | 1.25 | 72 | 730 | 53 | 79 | 810 | 59 |
| | 14 | 1.5 | 110 | 1100 | 80 | 123 | 1250 | 90 |
| | 16 | 1.5 | 170 | 1750 | 127 | 191 | 1950 | 1141 |
| 7T | 6 | 1.0 | 11 | 110 | 8 | 12 | 120 | 9 |
| | 8 | 1.25 | 25 | 260 | 19 | 28 | 290 | 21 |
| | 10 | 1.25 | 52 | 530 | 38 | 58 | 590 | 43 |
| | 12 | 1.25 | 95 | 970 | 70 | 103 | 1050 | 76 |
| | 14 | 1.5 | 147 | 1500 | 108 | 167 | 1700 | 123 |
| | 16 | 1.5 | 226 | 2300 | 166 | — | — | — |
| 8T | 6 | 1.0 | 12 | 125 | 9 | 14 | 145 | 9 |
| | 8 | 1.25 | 29 | 300 | 22 | 32 | 330 | 24 |
| | 10 | 1.25 | 61 | 620 | 45 | 68 | 690 | 50 |
| | 12 | 1.25 | 108 | 1100 | 80 | 123 | 1250 | 90 |
| | 14 | 1.5 | 172 | 1750 | 127 | | 2000 | 145 |
| | 16 | 1.5 | 265 | 2700 | 195 | 299 | 3050 | 221 |



PRECOAT BOLTS

(Bolts with seal lock agent coating on threads)

1. Do not use the precoat bolt as it is in either of the following cases:
 - (a) After it is removed.
 - (b) When the precoat bolt is moved (loosened or tightened) by tightness check, etc.

Note:

For torque check, use the lower limit of the allowable tightening torque range. If the bolt moves, retighten it according to the steps below.

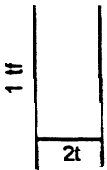
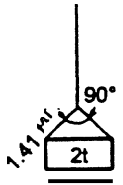
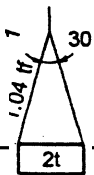
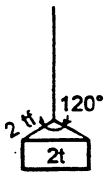
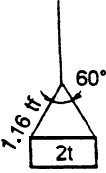
2. Method for reuse of precoat bolts
 - (1) Wash the bolt and threaded hole. (The threaded hole must be washed even for replacement of the bolt.)
 - (2) Perfectly dry the washed parts by air blowing.
 - (3) Coat the specified seal lock agent to the threaded portion of the bolt.

HIGH PRESSURE HOSE FITTING TIGHTENING TORQUE

1. When connecting a high pressure hose, wipe the hose fitting and mating nipple contact surfaces with clean cloth to remove foreign matters and dirt. Also check no dent or other damage on the contact surfaces before installation.
2. When connecting a high pressure hose, hold the hose to align the fitting with the nipple and tighten the fitting.
3. The maximum tightening torque must not exceed twice the standard tightening torque.

| Nominal diameter of screw | Standard tightening torque N·m (kgf·cm) [ft·lbf] | | Hose inside diameter mm (in) |
|---------------------------|--|---|------------------------------|
| | Standard | Tightening range | |
| 7/16 — 20UNF | 25 (250) [18.1] | 24 ~ 26 (240 ~ 270) [17.4 ~ 19.51] | 6 (0.24) |
| 9/16 — 18UNF | 49 (500) [36.21] | 47 ~ 52 (480 ~ 530) [34.7 ~ 38.31] | 9 (0.35) |
| 3/4 — 16UNF | 59 (600) [43.41] | 56 ~ 62 (570 ~ 630) [41.2 ~ 45.61] | 12 (0.47) |
| 7/8 — 14UNF | 59 (600) [43.41] | 56 ~ 62 (570 ~ 630) [41.2 ~ 45.61] | 12 (0.47), 15 (0.59) |
| 1·1/16 — 12UNF | 118 (1200) [86.8] | 112 ~ 123 (1140 ~ 1250) [82.5 ~ 90.41] | 19 (0.75) |
| 1·5/16 — 12UNF | 137 (1400) [101.3] | 130 ~ 144 (1330 ~ 1470) [96.2 ~ 106.41] | 25 (0.98) |
| PF1/4 | 25 (250) [18.1] | 24 ~ 26 (240 ~ 270) [17.4 ~ 19.51] | 6 (0.24) |
| PF3/8 | 49 (500) [36.21] | 47 ~ 52 (480 ~ 530) [34.7 ~ 38.31] | 9 (0.35) |
| PF1/2 | 59 (600) [43.41] | 56 ~ 62 (570 ~ 630) [41.2 ~ 45.61] | 12 (0.47) |
| PF3/4 | 118 (1200) [86.81] | 112 ~ 123 (1140 ~ 1250) [82.5 ~ 90.41] | 19 (0.75) |
| PF1 | 137 (1400) [101.3] | 130 ~ 144 (1330 ~ 1470) [96.2 ~ 106.41] | 25 (0.98) |

WIRE ROPE SUSPENSION ANGLE LIST

| Lifting angle | Tension | Compression | Suspension method | Lifting angle | Tension | Compression | Suspension method |
|---------------|-----------|-------------|--|---------------|-----------|-------------|---|
| 0° | 1.00 time | 0 time |  | 90° | 1.41 time | 1.00 time |  |
| 30° | 1.04 time | 0.27 time |  | 120° | 2.00 time | 1.73 time |  |
| 60° | 1.16 time | 0.58 time |  | | | | |

SAFE LOAD FOR EACH WIRE ROPE SUSPENSION ANGLE unit: N (tf) [lbf]

| Rope diameter | Cutting load | Single-rope suspension | Two-rope suspension | | | | Four-rope suspension | | | |
|---------------------|----------------------------|-----------------------------|---------------------------|---------------------------|--------------------------|--------------------------|---------------------------|---------------------------|----------------------------|---------------------------|
| | | | 0° | 0° | 30° | 60° | 90° | 0° | 30° | 60° |
| 6mm (0.24 in) | 21380 (2.18) [4807] | 3040 (0.31) [683.6] | 6080 (0.62) [1367] | 5880 (0.6) [1323] | 5200 (0.53) [1169] | 4310 (0.44) [970] | 12160 (1.24) [2734] | 11770 (1.2) [2646] | 10400 (1.06) [2337] | 8630 (0.88) [1940] |
| 8 mm (0.32 in) | 31480 (3.21) [7078] | 4410 (0.45) [992.3] | 8830 (0.9) [1985] | 8530 (0.87) [1918] | 7650 (0.78) [1720] | 6280 (0.64) [1411] | 17650 (1.8) [3969] | 17060 (1.74) [3937] | 15300 (1.561) [3440] | 12550 (1.28) [2322] |
| 10 mm (0.4 in) | 49230 (5.02) [11.69] | 6960 (0.71) [1565.6] | 14020 (1.43) [3153] | 13440 (1.37) [3021] | 11770 (1.2) [2646] | 9810 (1.0) [2205] | 27460 (2.8) [6174] | 26480 (2.7) [5954] | 23540 (2.4) [5292] | 19610 (2.0) [4410] |
| 12.5 mm (0.5 in) | 76880 (7.84) [17387] | 10980 (1.12) [2469.5] | 21570 (2.2) [4851] | 21280 (2.1) [4631] | 18630 (1.9) [4190] | 14710 (1.5) [3308] | 43150 (4.4) [9702] | 41190 (4.2) [9261] | 37270 (3.8) [8379] | 29420 (3.0) [6615] |
| 14 mm (0.56 in) | 96400 (9.83) [21675] | 13730 (1.4) [3087] | 27460 (2.8) [6174] | 26480 (2.7) [5954] | 23540 (2.4) [5292] | 18630 (1.9) [4190] | 54920 (5.6) [12348] | 52960 (5.4) [11907] | 47070 (4.8) [10584] | 37270 (3.8) [8379] |

COMPONENTS WEIGHT

| Component | | Weight kg (lb) |
|--|----------------|---------------------|
| Engine | 4Y | 134 (295) |
| | 1DZ-II | 176 (388) |
| Transmission | T/C (1 speed) | 124 (273) |
| | TIC (2 speeds) | 153 (337) |
| Counter weight | Pn15 model | Approx. 750 (1655) |
| | Pn18 model | Approx. 885 (1955) |
| | Pn20 model | Approx. 1215 (2680) |
| | Pn25 model | Approx. 1505 (3320) |
| | Pn30 model | Approx. 1830 (4035) |
| | Pn32 model | Approx. 1935 (4270) |
| | Cu20 model | Approx. 1130 (2495) |
| | Cu25 model | Approx. 1515 (3340) |
| | Cu30 model | Approx. 1925 (4245) |
| | Cu32 model | Approx. 2105 (4645) |
| V mast ASSY Ubackrest and fork (with lift cylinder, max. lifting height: 3300 mm (131 in)) | Pn1 ton series | Approx. 440 (970) |
| | Pn2 ton series | Approx. 550 (1210) |
| | Pn3 ton series | Approx. 630 (1390) |
| | Cu2 ton series | Approx. 510 (1120) |
| | Cu3 ton series | Approx. 630 (1390) |

RECOMMENDED LUBRICANT QUANTITY & TYPES

| Description | | Application | Quantity ℓ (US gal) | Classification | Type |
|------------------------------------|----------|--|---|-------------------|--|
| Engine | Gasoline | 4Y | 4.0 (1.06) | API SH, SJ | Motor oil SAE30 (SAE20 in cold area) SAE20W-40 (SAE10W-30 in cold area) |
| | Diesel | 1DZ-II | 7.9 (2.09) | API CE, CF | Diesel engine oil SAE30 (SAE20 in cold area) SAE10W-30 |
| Transmission | | TIC (1 speed) | 9.0 (2.38) | ATF | GM Dexron® II |
| | | TIC (2 speed) | 10.5 (2.77) | | |
| Differential | | Pn1 ton series | 6.3 (1.66) | API GL-4, GL-5 | Hypoid gear oil SAE85W-90 |
| | | Pn2 ton series Cu2·3 ton series | 7.1 (1.87) | | |
| | | Pn3 ton series | 7.7 (2.03) | | |
| Hydraulic oil | | Attached Table 1 Hydraulic oil volume | | ISO VG32 | Hydraulic oil |
| Fuel tank | | Pn1 ton series Cu2·3 ton series | 45 (11.9) | — | — |
| | | Other series | 65 (17.2) | | |
| Brake line | | All models | Proper quantity Reservoir Tank 0.2 (0.05) | — | SAE J-1703 DOT-3 |
| Chassis parts | | All models | Proper quantity | — | <ul style="list-style-type: none"> • MP grease • Molybdenum disulfide grease |
| Coolant (excluding reservoir tank) | | Attached Table 2 Coolant volume | | LLC | <ul style="list-style-type: none"> • LLC 30-50% mixture (for winter or all-season) • Coolant with rust-inhibitor (for spring, summer and autumn) |
| Coolant (Reservoir Tank) | | All models | 0.6 (0.16) (at Full level) | ↑ | ↑ |

Attached Table 1 Hydraulic oil volume [V mast, max. lifting height 3300 mm (131 in)] Unit: ℓ (US gal)

| Model | Pn1 ton series | Pn2 ton series | Pn3 ton series | Cu2·3 ton series |
|----------------------|----------------|----------------|----------------|------------------|
| 4Y engine models | 29 (7.7) | 36 (9.5) | 38 (10.0) | 30 (7.9) |
| 1DZ-II engine models | 29 (7.7) | 36 (9.5) | 38 (10.0) | |

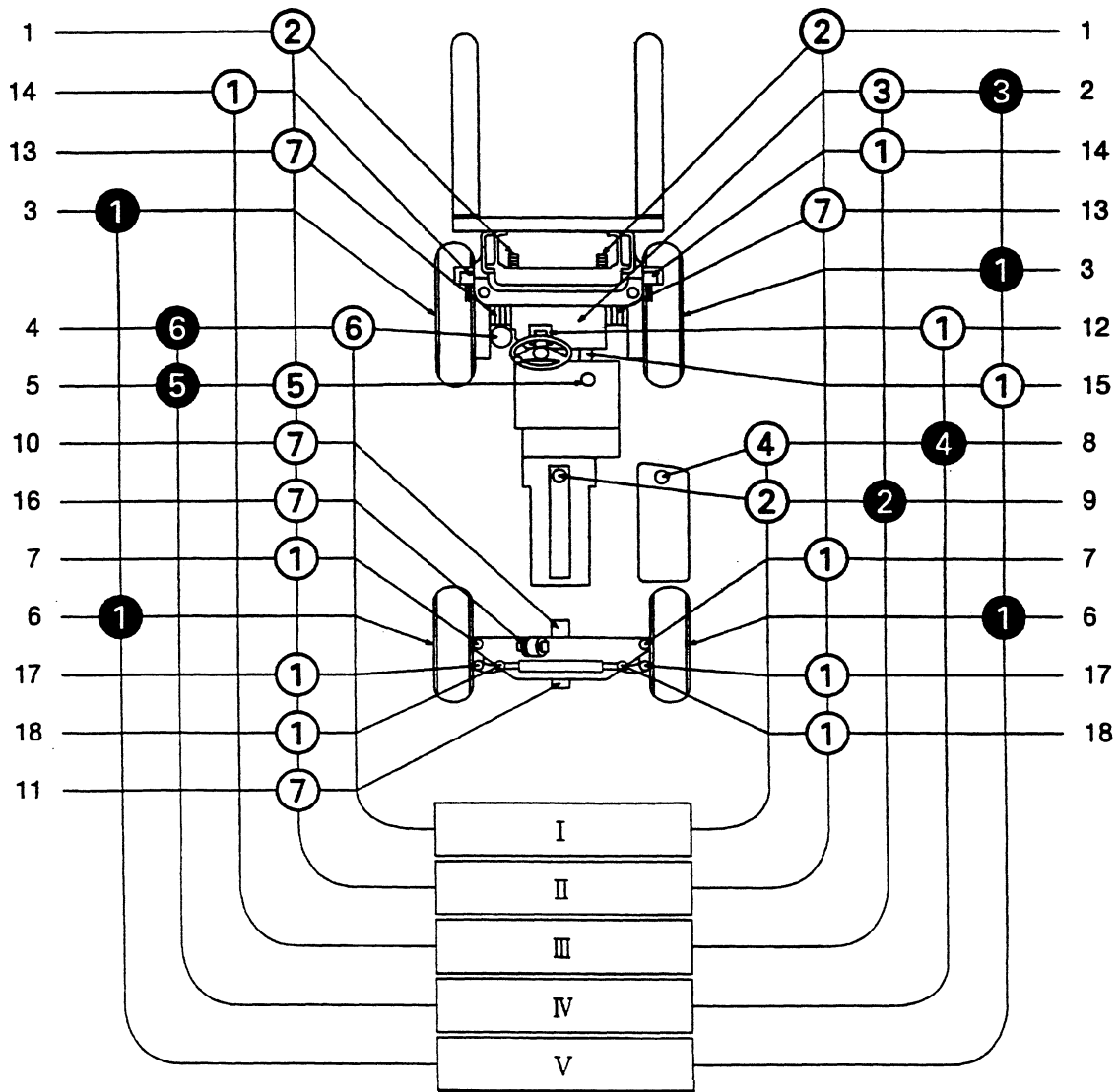
Note:

Since the hydraulic oil volume varies with the mast specification, be sure to check finally with the level gauge.

Attached Table 2 Coolant volume Unit: ℓ (US gal)

| Engine | Pn1 ton series | Pn2 ton series | Pn3 ton series | Cu2·3 ton series |
|--------|----------------|----------------|----------------|------------------|
| 4Y | 8.5 (2.24) | 9.6 (2.53) | 9.6 (2.53) | 8.5 (2.24) |
| 1DZ-II | 8.5 (2.24) | 9.6 (2.53) | 9.6 (2.53) | |

LUBRICATION CHART



- Inspection
- Replacement
- ① MP grease
- ② Engine oil
- ③ Hypoid gear oil
- ④ Hydraulic oil
- ⑤ Automatic transmission fluid
- ⑥ Brake fluid
- ⑦ Molybdenum disulfide grease

- I. Inspect every 8 hours (daily)
- II. Inspect every 40 hours (weekly)
- III. Inspect every 170 hours (monthly)
- IV. Inspect every 1000 hours (6 monthly)
- V. Inspect every 2000 hours (annual)

- | | |
|-----------------------------|------------------------------------|
| 1 Chain | 10 Rear axle beam front pin |
| 2 Differential | 11 Rear axle beam rear pin |
| 3 Front wheel bearing | 12 Tilt steering locking mechanism |
| 4 Brake master cylinder | 13 Mast support bushing |
| 5 Torque converter case | 14 Tilt cylinder front pin |
| 6 Rear wheel bearing | 15 Propeller shaft |
| 7 Steering knuckle king pin | 16 Swing lock cylinder lower pin |
| 8 Oil tank | 17 Tie rod end pin |
| 9 Engine crank case | 18 Rear axle cylinder end pin |

PERIODIC MAINTENANCE

INSPECTION METHOD

I : Inspection. Repair or replacement if required.
 M : Measurement. Repair or adjustment if required.
 T : Retightening C : Cleaning L : Lubrication
 * : For new vehicle *1 : Flaw detector

| Item | | Inspection Period | | | |
|--------------------|--|-------------------|-----------------|------------------|------------------|
| | | Every 1 month | Every 3 months | Every 6 months | Every 12 months |
| | | Every 170 hours | Every 500 hours | Every 1000 hours | Every 2000 hours |
| ENGINE | | | | | |
| Main body | Proper starting and abnormal noise | I | ← | ← | ← |
| | Rotating condition at idling | M | ← | ← | ← |
| | Rotating condition during acceleration | M | ← | ← | ← |
| | Exhaust gas condition | I | ← | ← | ← |
| | Air cleaner element | C | ← | ← | ← |
| | Valve clearance | M* | | | M |
| | Compression | | | | M |
| | Cylinder head bolt loosening | | | | T |
| | Muffler rubber mount | | | | I |
| PCV system | Clogging and damage in PCV valve and piping | I | ← | ← | ← |
| Governor | No-load maximum rpm | M | ← | ← | ← |
| Lubrication system | Oil leak | I | ← | ← | ← |
| | Oil level | I | ← | ← | ← |
| | Clogging and dirt of oil filter | I | ← | ← | ← |
| Fuel system | Fuel leak | I | ← | ← | ← |
| | Operation of carburetor link mechanism | I | ← | ← | ← |
| | Dirt and clogging of fuel filter and element | I | ← | ← | ← |
| | Injection timing | | | M | ← |
| | Injection nozzle injection pressure and spray status | | | | M |
| | Draining of sedimenter | | | I | ← |
| Cooling system | Coolant level in radiator and leak | I | ← | ← | ← |
| | Rubber hose degradation | I | ← | ← | ← |
| | Radiator cap condition | I | ← | ← | ← |
| | Fan belt tension, looseness and damage | I | ← | ← | ← |
| | Radiator rubber mount | | | | I |

| Item | | Inspection Period | | | |
|---|---|-------------------|-----------------|------------------|------------------|
| | | Every 1 month | Every 3 months | Every 6 months | Every 12 months |
| | | Every 170 hours | Every 500 hours | Every 1000 hours | Every 2000 hours |
| POWER TRANSMISSION SYSTEM | | | | | |
| Differential | Leak | I | ← | ← | ← |
| | Oil level | I | ← | ← | ← |
| | Bolt loosening | | | | T |
| Toque converter & transmission | Leak | I | ← | ← | ← |
| | Fluid level | I | ← | ← | ← |
| | Operating mechanism function and looseness | I | ← | ← | ← |
| | Control valve and clutch functions | I | ← | ← | ← |
| | Inching valve function | I | ← | ← | ← |
| | Stall and hydraulic pressure measurement | | | M | ← |
| Propeller shaft and axle shaft | Loose joint | | T | ← | ← |
| | Looseness at spline connections | | | | I |
| | Looseness of universal joint | | | | I |
| | Twisting and cracks of axle shaft | | | | I |
| DRIVE SYSTEM | | | | | |
| Wheels | Tire inflation pressure | M | ← | ← | ← |
| | Tire cuts, damage and uneven wearing | I | ← | ← | ← |
| | Loose rim and hub nuts | T | ← | ← | ← |
| | Tire groove depth | M | ← | ← | ← |
| | Metal chips, pebbles and other foreign matter trapped in tire grooves | I | ← | ← | ← |
| | Rim, side bearing and disc wheel damage | I | ← | ← | ← |
| | Abnormal sound and looseness of front wheel bearing | I | ← | ← | ← |
| | Abnormal sound and looseness of rear wheel bearing | I | ← | ← | ← |

| Item | | Inspection Period | | | |
|------------------------------------|--|-------------------|-----------------|------------------|------------------|
| | | Every 1 month | Every 3 months | Every 6 months | Every 12 months |
| | | Every 170 hours | Every 500 hours | Every 1000 hours | Every 2000 hours |
| Front axle | Cracks, damage and deformation of housing | | | | I |
| Rear axle | Cracks, damage and deformation of beam | | | | I |
| | Looseness of axle beam in vehicle longitudinal direction | M* | | | M |
| STEERING SYSTEM | | | | | |
| Steering wheel | Play and looseness | I | ← | ← | ← |
| | Function | I | ← | ← | ← |
| Steering valve | Oil leak | I | ← | ← | ← |
| | Looseness of mounting | T | ← | ← | ← |
| Power Steering | Oil leak | I | ← | ← | ← |
| | Mounting and linkage looseness | I | ← | ← | ← |
| | Damage of power steering hose | | | | I |
| Knuckle | King pin looseness | I | ← | ← | ← |
| | Cranks and deformation | | | | I |
| BRAKING SYSTEM | | | | | |
| Brake pedal | Play and reserve | M | ← | ← | ← |
| | Braking effect | I | ← | ← | ← |
| Parking brake | Operating force | I | ← | ← | ← |
| | Braking effect | I | ← | ← | ← |
| | Rod and cable looseness and damage | I | ← | ← | ← |
| Brake pipe | Leak, damage and mounting condition | I | ← | ← | ← |
| Reservoir tank | Leak and fluid level | I | ← | ← | ← |
| Master cylinder and wheel cylinder | Function, wear, damage, leak and mounting looseness | | | | I |

| Item | | Inspection Period | | | |
|---------------------------------|--|-------------------|-----------------|------------------|------------------|
| | | Every 1 month | Every 3 months | Every 6 months | Every 12 months |
| | | Every 170 hours | Every 500 hours | Every 1000 hours | Every 2000 hours |
| Brake drum and brake shoe | Clearance between drum and lining | M | ← | ← | ← |
| | Wear of shoe sliding portion and lining | | | | I |
| | Drum wear and damage | | | | I |
| | Shoe operating condition | | | | I |
| | Anchor pin rusting | | | | I |
| | Return spring fatigue | | | | M |
| | Automatic adjuster function | | | | I |
| Backing plate | Defomation, cracks and damage | | | | I |
| | Loose mounting | | | | T |
| MATERIAL HANDLING SYSTEM | | | | | |
| Forks | Abnormality of fork and stopper pin | I | ← | ← | ← |
| | Misalignment between left and right fork fingers | I | ← | ← | ← |
| | Cracks at fork root and welded part | | | | I |
| Mast and lift bracket | Deformation and damage of each part and crack at welded part | I | ← | ← | ← |
| | Mast and lift bracket looseness | I | ← | ← | ← |
| | Wear and damage of mast support bushing | | | | I |
| | Wear, damage and rotating condition of rollers | I | ← | ← | ← |
| | Wear and damage of roller pins | | | | I |
| | Wear and damage of mast trip | I | ← | ← | ← |
| Chain and chain wheel | Tension, deformation and damage of chain | I | ← | ← | ← |
| | Chain lubrication | I | ← | ← | ← |
| | Abnormality of chain anchor bolt | I | ← | ← | ← |
| | Wear, damage and rotating condition of chain wheel | I | ← | ← | ← |
| Various attachments | Abnormality and mounting condition of each part | I | ← | ← | ← |
| HYDRAULIC SYSTEM | | | | | |
| Cylinder | Loosening and damage of cylinder mounting | T | ← | ← | ← |
| | Deformation and damage of rod, rod screw and rod end | I | ← | ← | ← |
| | Cylinder operation | I | ← | ← | ← |
| | Natural drop and natural forward tilt (hydraulic drift) | M | ← | ← | ← |

| Item | | Inspection Period | | | |
|--------------------------|--|-------------------|-----------------|------------------|------------------|
| | | Every 1 month | Every 3 months | Every 6 months | Every 12 months |
| | | Every 170 hours | Every 500 hours | Every 1000 hours | Every 2000 hours |
| Cylinder | Oil leak and damage | I | ← | ← | ← |
| | Wear and damage of pin and cylinder bearing | I | ← | ← | ← |
| | Lifting speed | M | ← | ← | ← |
| | Uneven movement | I | ← | ← | ← |
| Oil pump | Oil leak and abnormal sound | I | ← | ← | ← |
| Hydraulic oil tank | Oil level and contamination | I | ← | ← | ← |
| | Tank and oil strainer | | | C | ← |
| | Oil leak | I | ← | ← | ← |
| Control lever | Loose linkage | I | ← | ← | ← |
| | Operation | I | ← | ← | ← |
| Oil control valve | Oil leak | I | ← | ← | ← |
| | Relief pressure measurement | | | | M |
| | Relief valve and tilt lock valve functions | I | ← | ← | ← |
| Hydraulic piping | Oil leak | I | ← | ← | ← |
| | Deformation and damage | I | ← | ← | ← |
| | Loose joint | T | ← | ← | ← |
| ELECTRICAL SYSTEM | | | | | |
| Ignition timing | Cracks on distributor cap | I | ← | ← | ← |
| | Spark plug burning and gap | I | ← | ← | ← |
| | Distributor side terminal burning | I | ← | ← | ← |
| | Distributor cap center piece wear and damage | I | ← | ← | ← |
| | Plug cord internal discontinuity | | | | I |
| | Ignition timing | | | M | ← |
| Starting motor | Pinion gear meshing status | I | ← | ← | ← |
| Charger | Charging function | I | ← | ← | ← |
| Battery | Battery fluid level | I | ← | ← | ← |
| | Battery fluid specific gravity | | | M | ← |
| Electrical wiring | Damage of wiring harness | I | ← | ← | ← |
| | Fuses | I | ← | ← | ← |

| Item | | Inspection Period | | | |
|-----------------------------|--|-------------------|-----------------|------------------|------------------|
| | | Every 1 month | Every 3 months | Every 6 months | Every 12 months |
| | | Every 170 hours | Every 500 hours | Every 1000 hours | Every 2000 hours |
| Preheater | Open circuit in glow plug | | | I | ← |
| Engine stop- ping system | Diesel engine key stop device function | I | ← | ← | ← |
| SAFETY DEVICES, ETC. | | | | | |
| Head guard | Cracks at welded portion | I | ← | ← | ← |
| | Deformation and damage | I | ← | ← | ← |
| Back-rest | Loosening of mounting | T | ← | ← | ← |
| | Deformation, crack and damage | I | ← | ← | ← |
| Lighting system | Function and mounting condition | I | ← | ← | ← |
| Horn | Function and mounting condition | I | ← | ← | ← |
| Direction indicator | Function and mounting condition | I | ← | ← | ← |
| Instruments | Functions | I | ← | ← | ← |
| Backup buzzer | Function and mounting condition | I | ← | ← | ← |
| Rear-view mirror | Dirt, damage | I | ← | ← | ← |
| | Rear reflection status | I | ← | ← | ← |
| Seat | Loosening and damage of mounting | I | ← | ← | ← |
| | Seatbelt damage and function | I | ← | ← | ← |
| Body | Damage and cracks of frame, cross members, etc. | | | | I |
| | Bolt looseness | | | | T |
| SAS | Functions | I | ← | ← | ← |
| | Loosening and damage at sensor mounting portion | I | ← | ← | ← |
| | Damage, deformation, oil leakage and loosening of the mounting of functional parts | I | ← | ← | ← |
| | Loosening and damage of wire harnesses | I | ← | ← | ← |
| | Lock cylinder accumulator performance | | | | I |
| | Rusting and corrosion of load sensor | | | | I |
| Others | Grease up | L | ← | ← | ← |

PERIODIC REPLACEMENT OF PARTS AND LUBRICANTS

● : Replacement

| Item | Interval | Every 1 month | Every 3 months | Every 6 months | Every 12 months |
|---|----------|-----------------|-----------------|------------------|------------------|
| | | Every 170 hours | Every 500 hours | Every 1000 hours | Every 2000 hours |
| Engine oil | | ● | ← | ← | ← |
| Engine oil filter | | ●*1 | ● | ← | ← |
| Engine coolant (every 2 years for LLC) | | | ● | ← | ← |
| Fuel filter | | | | ● | ← |
| Torque converter oil | | | | ● | ← |
| Torque converter oil filter | | | | ● | ← |
| Differential oil | | | | | ● |
| Hydraulic oil | | | | ● | ← |
| Hydraulic oil filter | | ●*1 | | ● | ← |
| Wheel bearing grease | | | | | ● |
| Spark plugs | | | | ● | ← |
| Air cleaner element | | | | | ● |
| Cups and seals for brake master and wheel cylinders | | | | | ● |
| Brake fluid | | | | ● | ← |
| Power steering hoses | | | | | ●*2 |
| Power steering rubbers parts | | | | | ●*2 |
| Hydraulic hoses | | | | | ●*2 |
| Brake fluid reservoir tank hose | | | | | ●*2 |
| Fuel hoses | | | | | ●*2 |
| Torque converter rubber hoses | | | | | ●*2 |
| Chains | | | | | ●*3 |
| SAS Swing lock cylinder | | | | | ●*5 |

*1: for new vehicle *2: Every 2 years *3: Every 3 years *5: Every 10000 hours

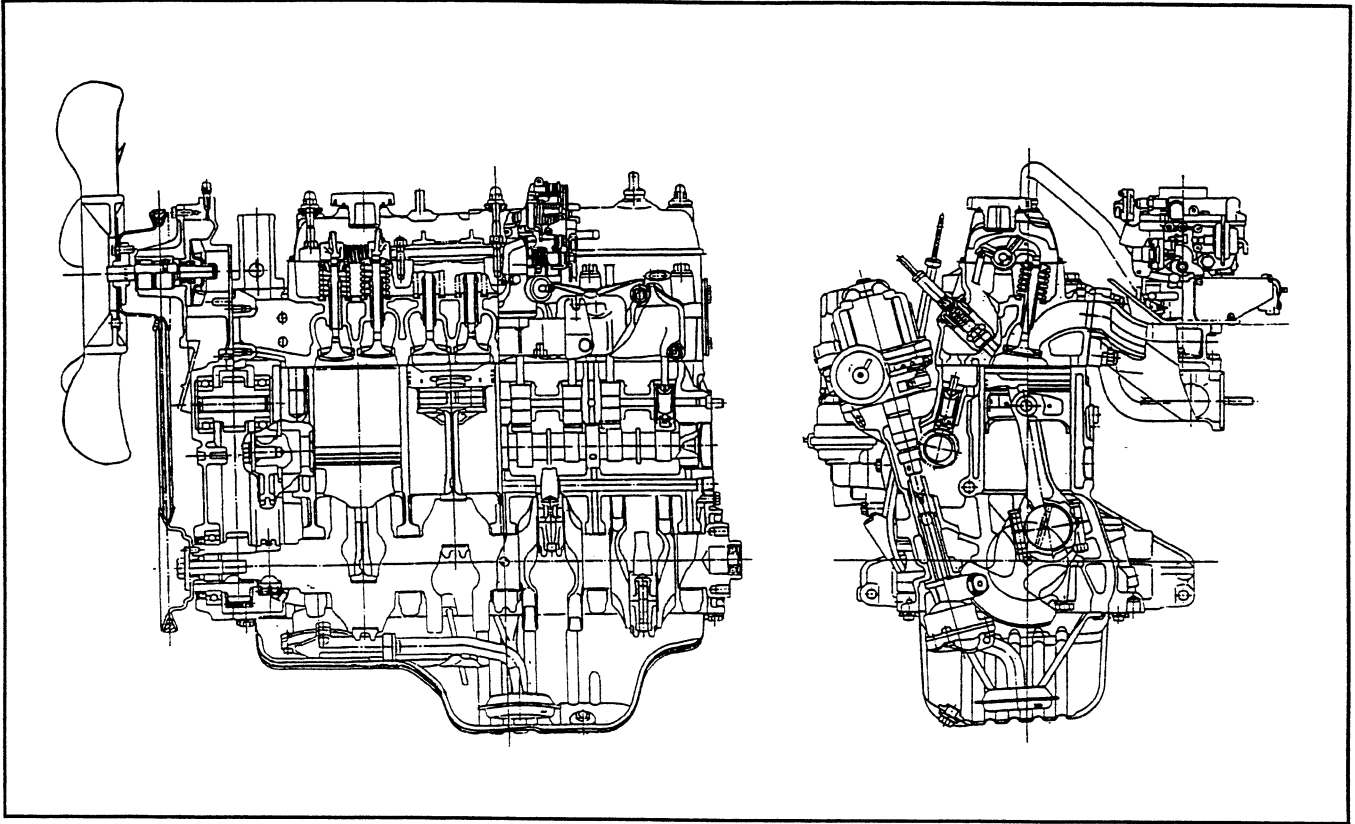
Replacement shall be made upon arrival of the operation hours or months, whichever is **earlier**.

ENGINE

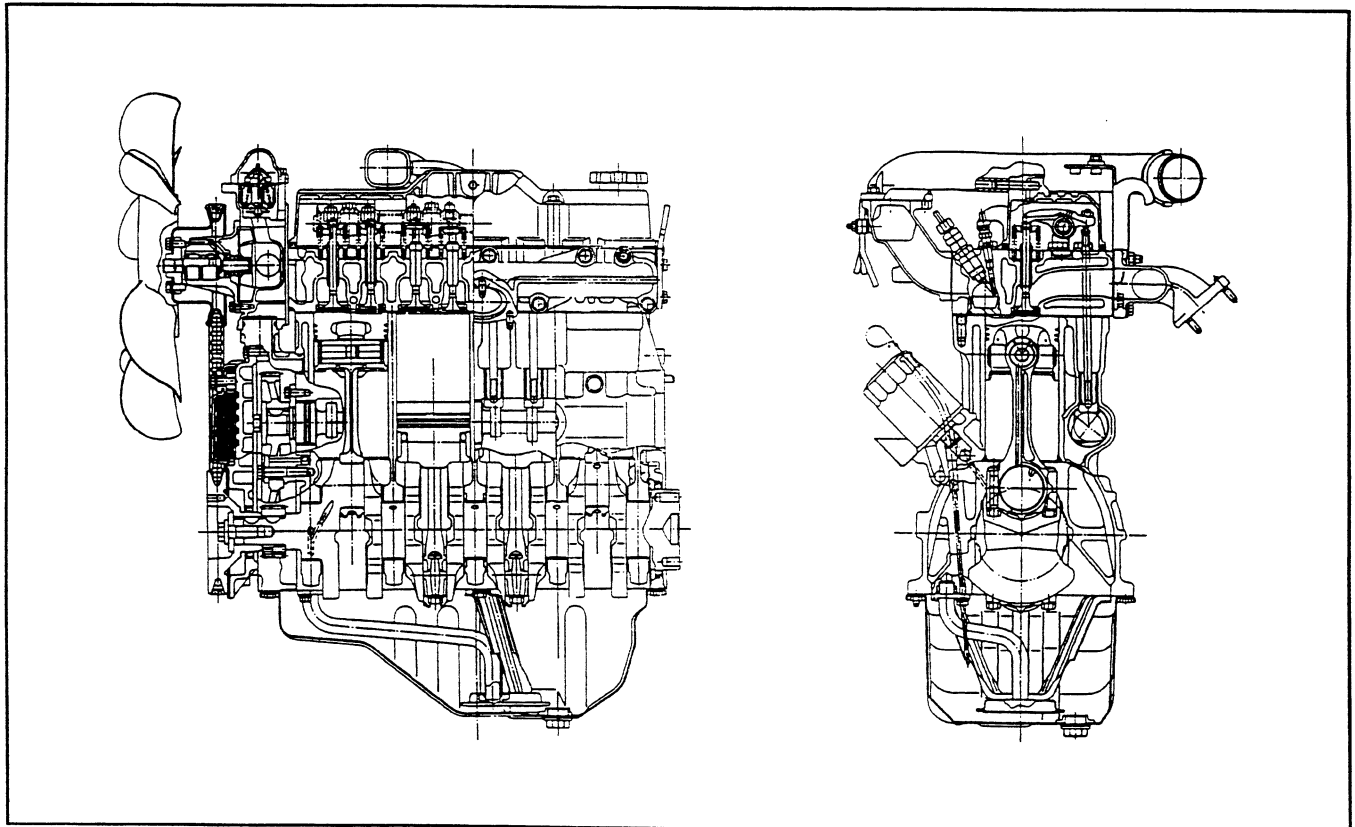
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ENGINE SECTIONAL VIEWS

4Y Engine



1DZ-II Engine



MAJOR SPECIFICATIONS

Gasoline Engines

| Item | Engine | 4Y (Pn1·2 ton series Cu2·3 ton series) | 4Y (Pn3 ton series) |
|-------------------------------------|------------------------------------|--|---|
| Engine type | | Gasoline 4-cycle | ← |
| Number of cylinders and arrangement | | Inline 4 cylinders longitudinal | ← |
| Combustion chamber type | | Wedge type | ← |
| Valve mechanism | | OHV·chain-driven | ← |
| Bore x stroke | mm (in) | 91.0 x 86.0 (3.583 x 3.386) | ← |
| Total displacement | cm ³ (in ³) | 2237 (136.51) | ← |
| Compression ratio | | 8.8 | ← |
| Maximum power | kW (PS)/rpm | Gasoline :40 (54)/2400 Gasoline/LPG :35 (48)/2400 LPG :37 (50)/2400 | Gasoline :43 (58)/2600 Gasoline/LPG :38 (52)/2600 LPG :40 (54)/2600 |
| Maximum torque | N·m (kgf-m)/rpm | Gasoline :162 (16.5)/1800 Gasoline/LPG :147 (15.0)/1600 LPG :157 (16.0)/1800 | ← |
| Minimum specific fuel consumption | g/kW-h (g/PS-h)/rpm | Gasoline :272 (200)/2300 Gasoline/LPG :258 (190)/2400 LPG :252 (185)/2400 | ← |
| Service weight | kg (lb) | 134 (295) | ← |
| No-load maximum rpm | rpm | 2600 | 2800 |

Diesel Engines

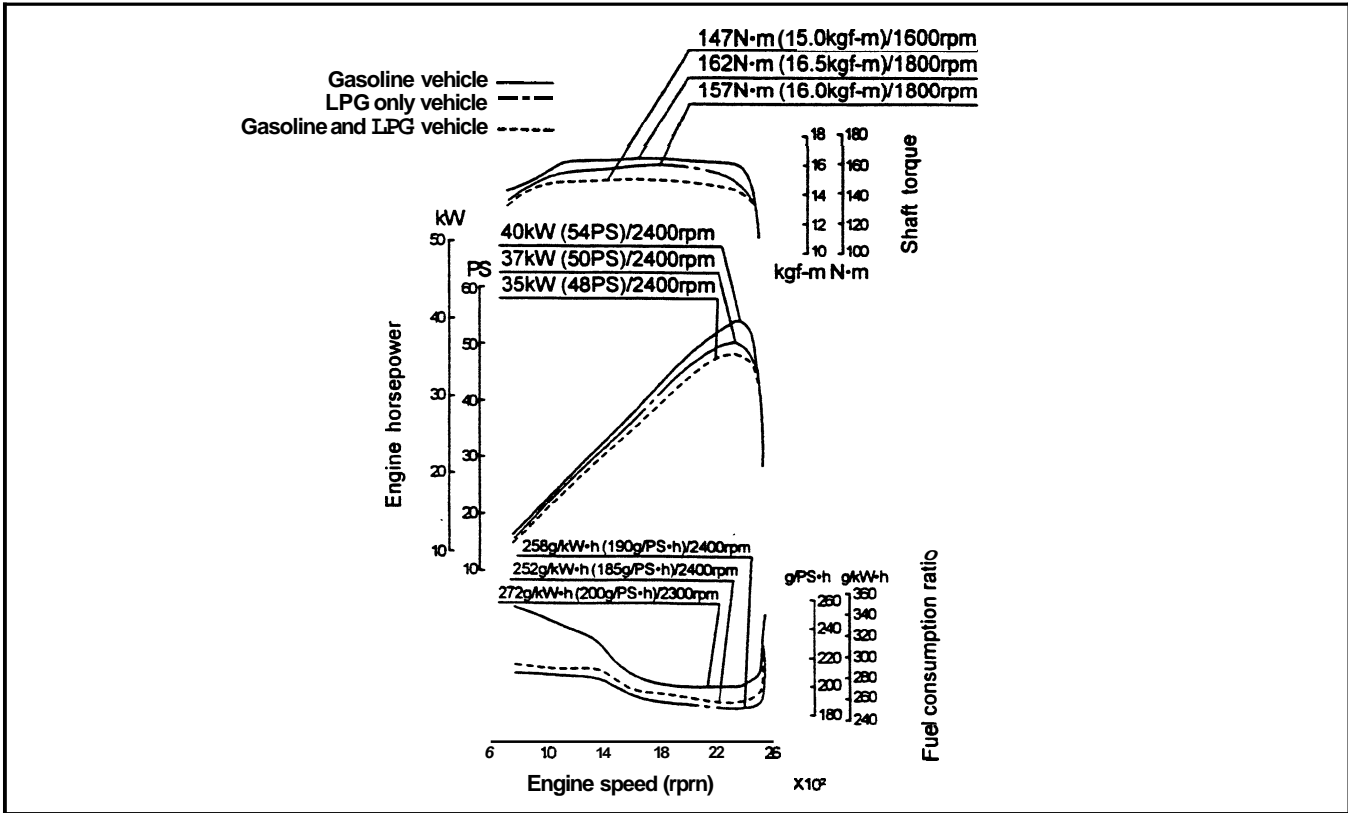
| Item | Engine | 1DZ-11 (Pn1 ton series) | 1DZ-II (Pn2·3 ton series) |
|-------------------------------------|------------------------------------|---------------------------------|---------------------------|
| Engine type | | Diesel 4-cycle | ← |
| Number of cylinders and arrangement | | Inline 4 cylinders longitudinal | ← |
| Combustion chamber type | | Whirl chamber type | ← |
| Valve mechanism | | OHV-geardriven | ← |
| Bore x stroke | mm (in) | 86.0 x 107.0 (3.386 x 4.213) | ← |
| Total displacement | cm ³ (in ³) | 2486 (151.71) | ← |
| Compression ratio | | 21.5 | ← |
| Maximum power | kW (PS)/rpm | 40 (55)/2400 | 44 (60)/2600 |
| Maximum torque | N·m (kgf-m)/rpm | 167 (17.0)/1600 | ← |
| Minimum specific fuel consumption | g/kW-h (g/PS-h)/rpm | 252 (185)/1400 | ← |
| Service weight | kg (lb) | 162 (357) | ← |
| No-load maximum rpm | rpm | 2600 | 2800 |

Note:

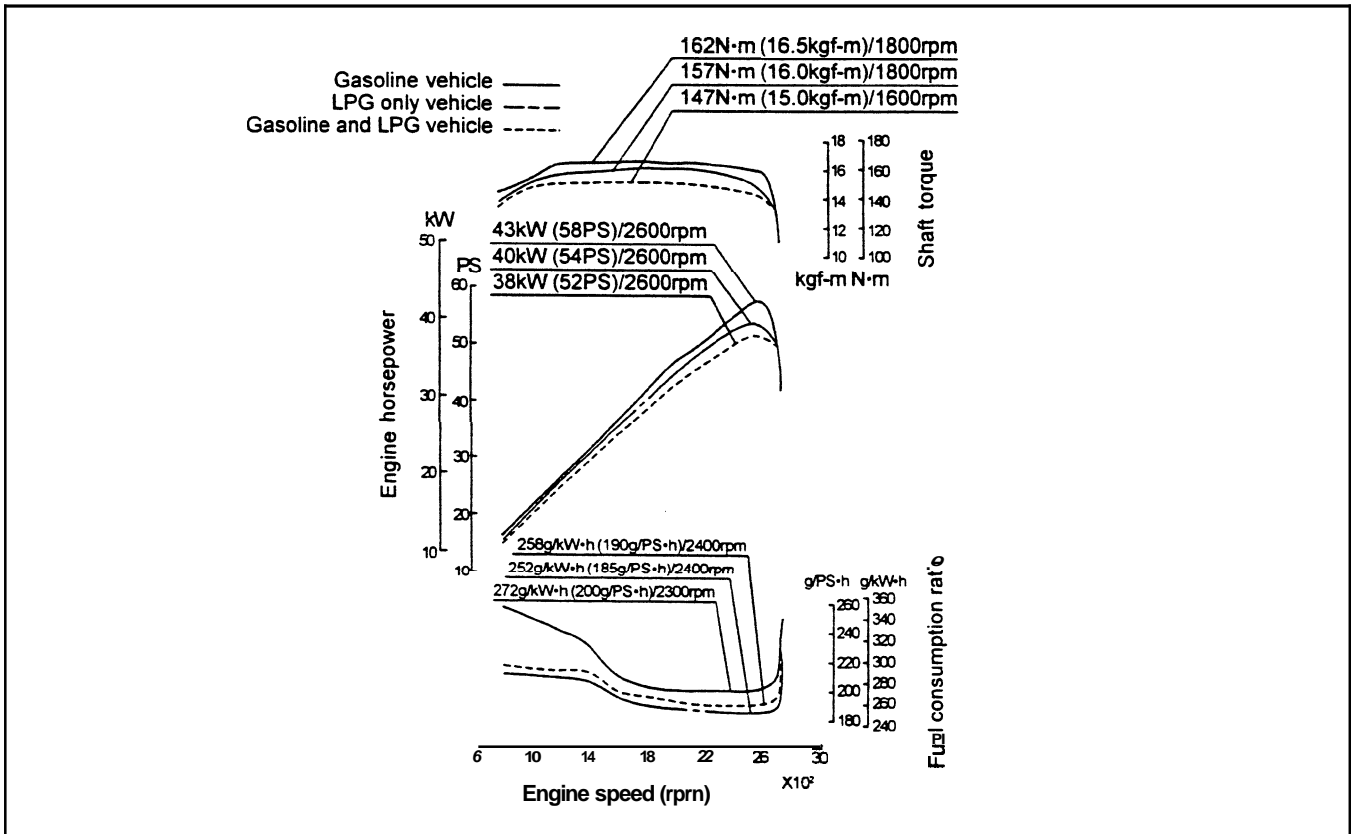
For **2·3** ton series **1DZ-II** models equipped with vehicle speed control system (OPT), the spec. figures and performance curve are same with those of **1** ton series **1DZ-II** models.

ENGINE PERFORMANCE CURVES

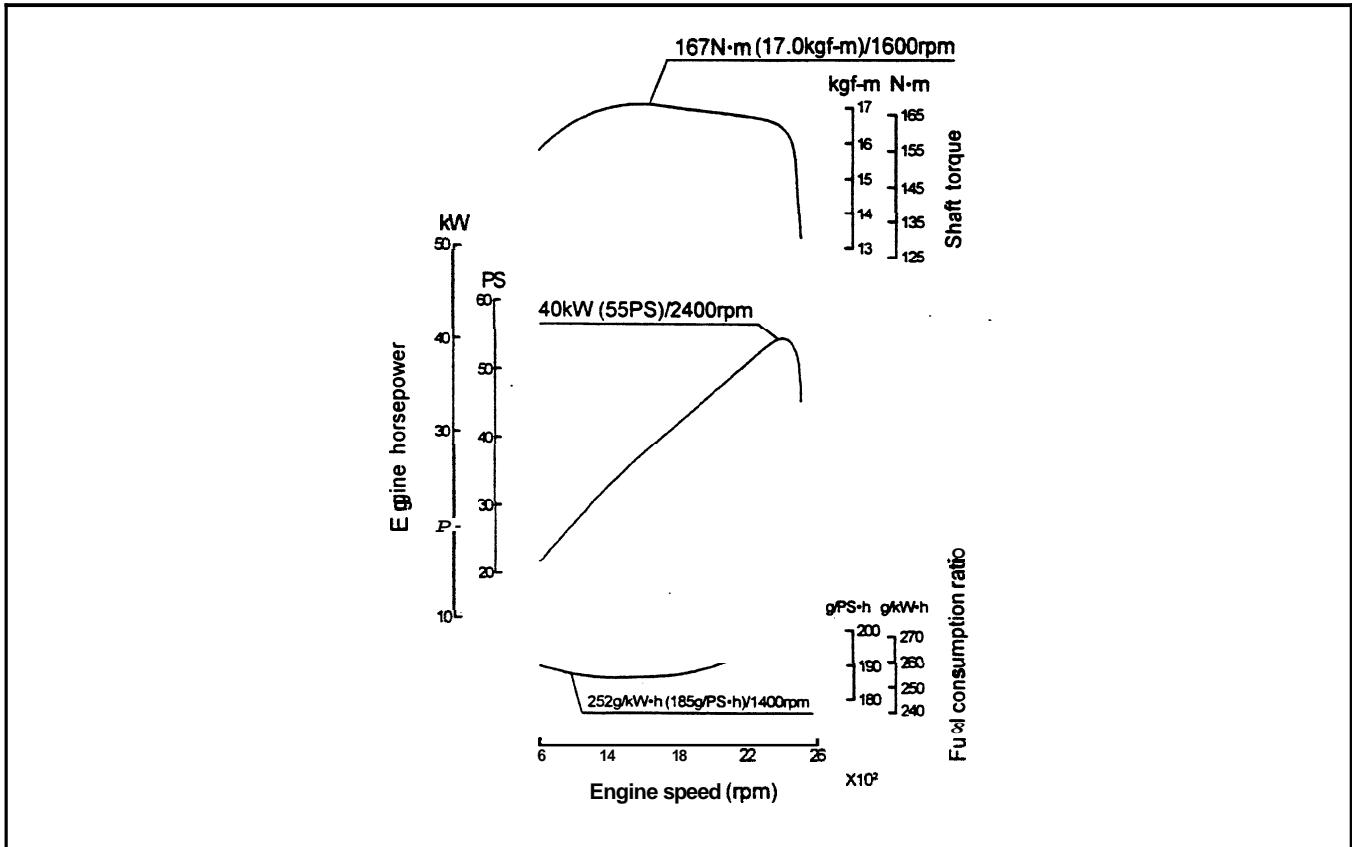
4Y Engine (Pn1·2 ton Series, Cu2·3 ton Series)



4Y Engine (Pn3 ton Series)

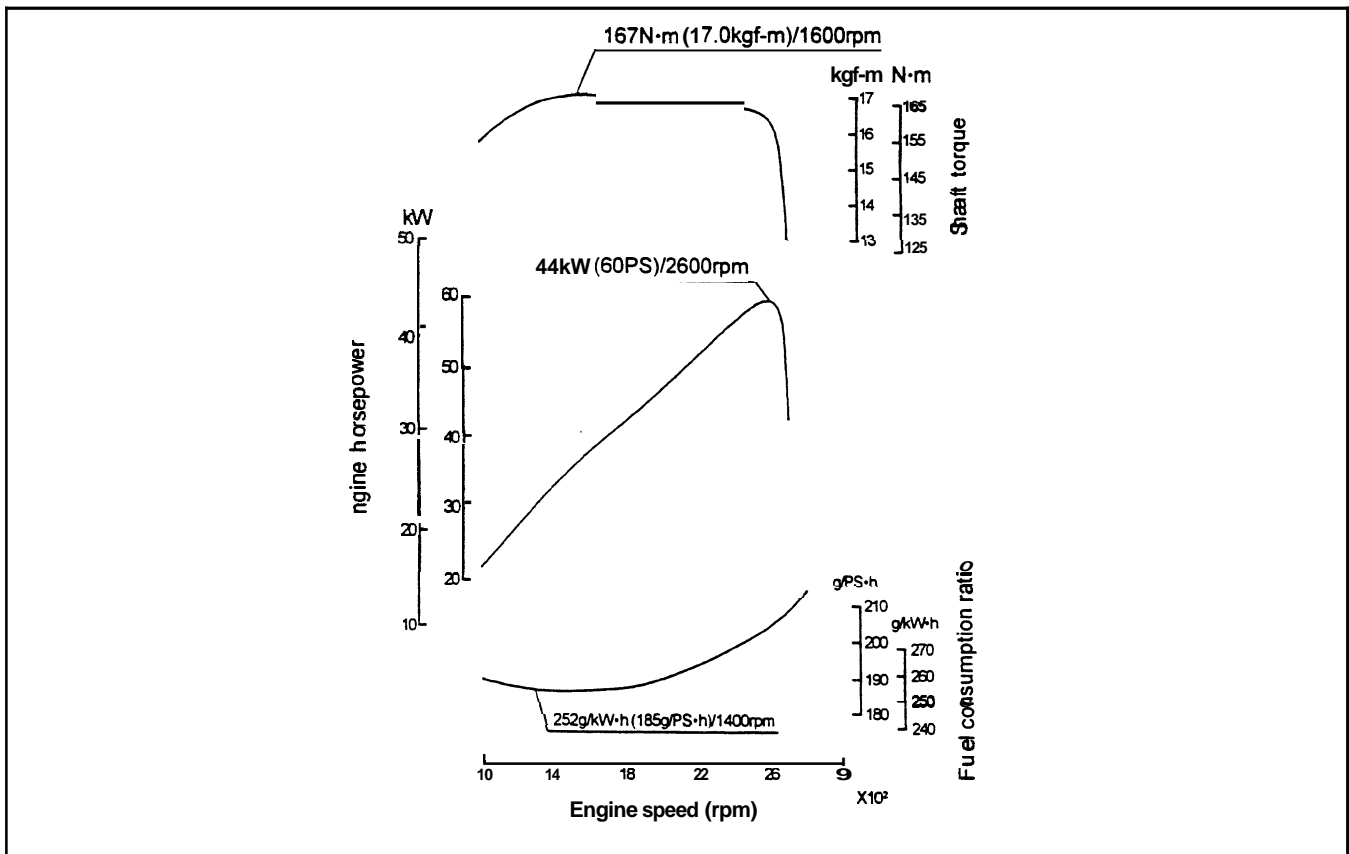


1DZ-II Engine (Pn1 ton Series)



1

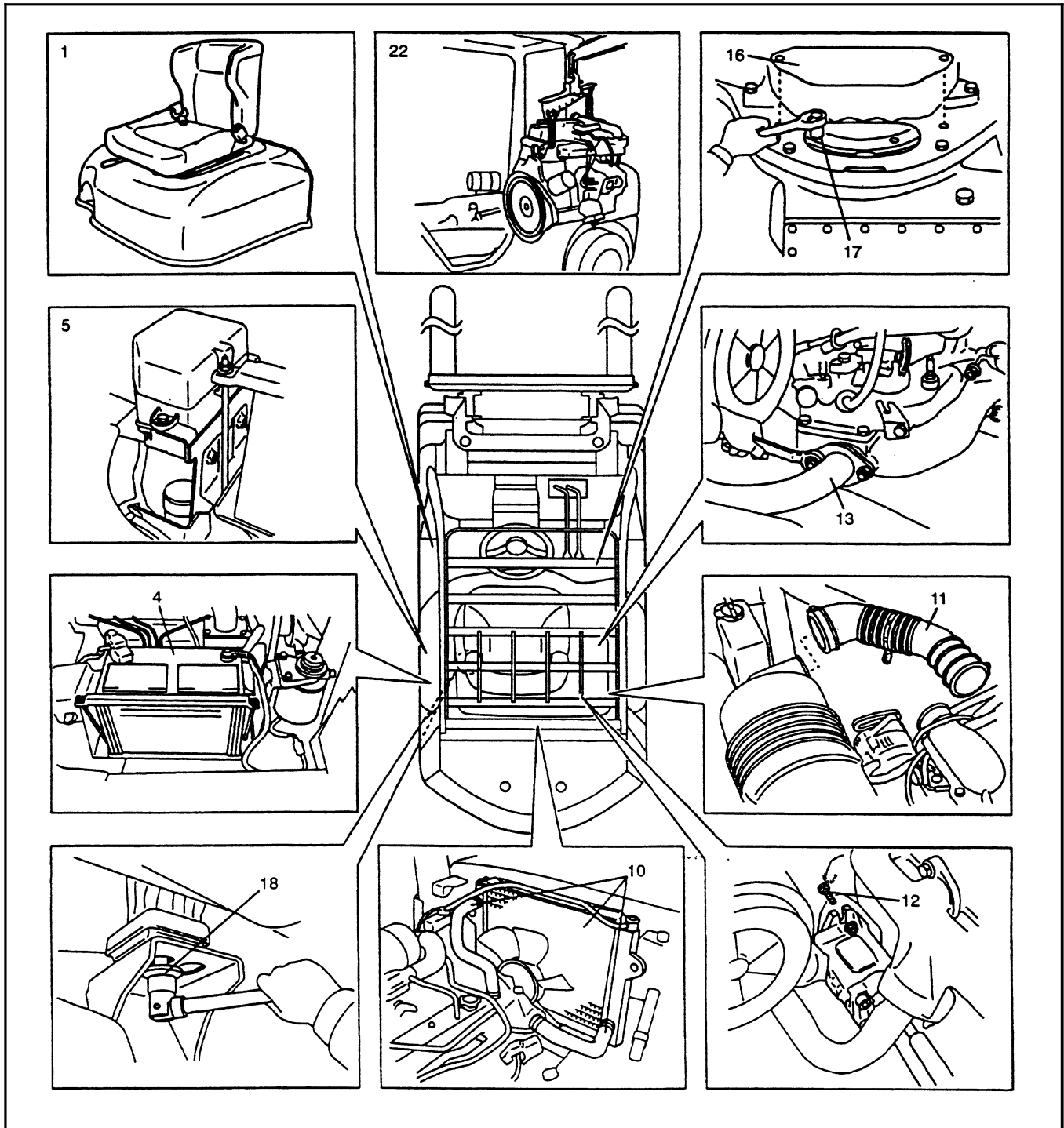
1DZ-II Engine (Pn2·3 ton Series)



ENGINE ASSY

REMOVAL-INSTALLATION

T = N·m (kgf·cm) [ft·lb]



| | |
|---|--|
| Engine mounting nut | T = 53.9 ~ 99.0 (550 ~ 1010) [39.8 ~ 73.11] |
| End plate set bolt | T = 49.0 ~ 78.5 (500 ~ 800) [36.2 ~ 57.91] |
| Drive plate set bolt (for connecting engine crankshaft) | 4Y: T = 56.9 ~ 64.7 (580 ~ 660) [42.0 ~ 47.7] 1DZ-II: T = 76.5 ~ 93.2 (780 ~ 950) [56.4 ~ 68.7] |
| Drive plate set bolt (for connecting torque converter) | T = 14.7 ~ 21.6 (150 ~ 220) [10.9 ~ 15.91] |
| Torque converter housing set bolt | T = 29.4 ~ 44.1 (300 ~ 450) [21.7 ~ 32.61] |

Removal Procedure

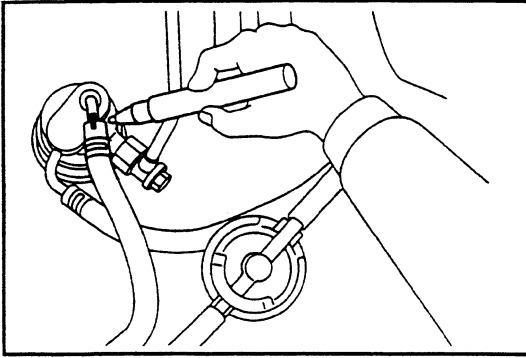
- 1 Remove the engine hood. (See p. **9-6.**)
- 2 Remove the toe board.
- 3 Drain coolant.
- 4 Remove the battery and battery tray.
- 5 Remove the relay block and electrical parts plate set bolts to free them.
- 6 Disconnect the accelerator wire and fuel hose. [Point **1**]
- 7 Diesel Vehicle:
Remove the sedimenter bracket set bolt to free the bracket.
- 8 Disconnect connectors and wiring harness clamps around the engine.
- 9 Disconnect the torque converter cooler hose. [Point **2**]
- 10 Remove the radiator.
- 11 Disconnect the air cleaner hose.
- 12 Remove the oil pump set bolts to free the pump.
- 13 Disconnect the exhaust pipe.
- 14 Disconnect the wiring from the starting motor.
- 15 Remove the under cover.
- 16 Remove the cover plate.
- 17 Remove **6** drive plate set bolts.
- 18 Remove the engine ASSY mounting nuts.
- 19 Slightly hoist the engine. [Point **3**]
- 20 Support the torque converter housing with wooden blocks.
- 21 Separate the torque converter housing and engine. [Point **4**]
- 22 Remove the engine ASSY with drive plate and torque converter end plate.
- 23 Remove the drive plate.
- 24 Remove the torque converter end plate.
- 25 Remove the starting motor.

Installation Procedure

The installation procedure is the reverse of the removal procedure.

Note:

- Apply sealant (**08833-76002-71** (08833-00080)) before tightening the drive plate set bolt (for connecting engine crankshaft).
- Bleed air from the fuel system after installation of the engine **ASSY**. (For diesel vehicle) (See p. **1-9.**)

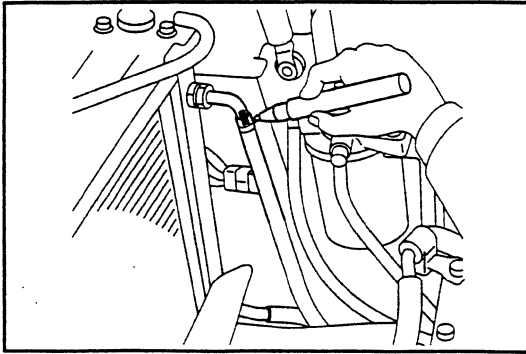


Point Operations

[Point 1]

Removal:

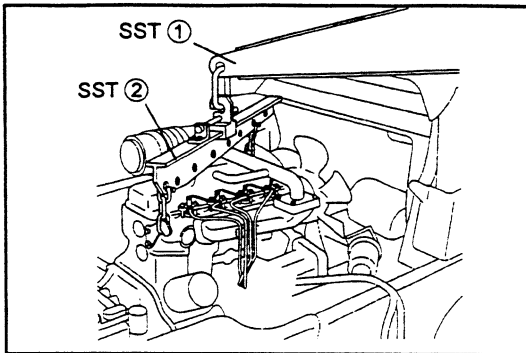
Put a match marks on the fuel hose and the coupler.



[Point 2]

Removal:

Put a match mark on the radiator and torque converter cooler hose.

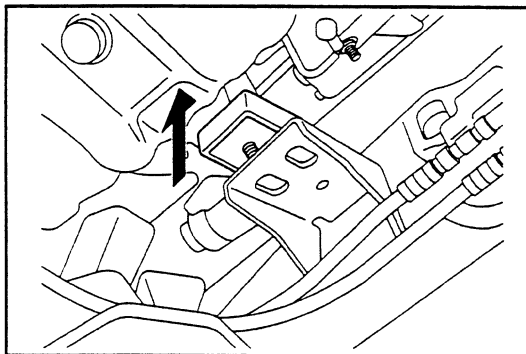


[Point 3]

Removal-Installation:

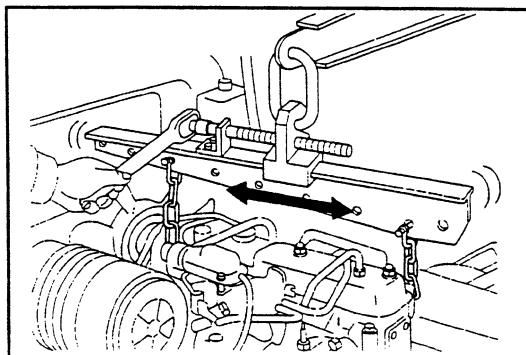
SST 09010-20111-71 — ①

09010-23320-71 --②



Removal:

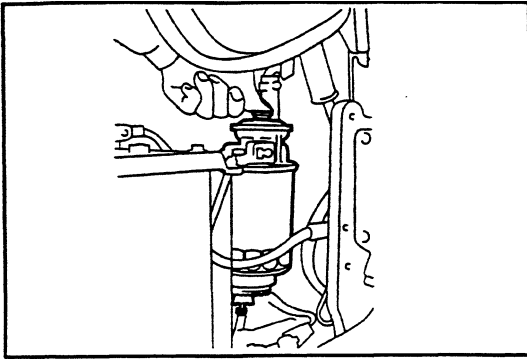
Tentatively hoist up until the mounting bolt completely comes out from the hole in the frame.



[Point 4]

Removal:

Use a straight-edge screwdriver for separation. If the fitting is too tight, change the SST hook position and adjust the engine angle for easier separation.



AIR BLEEDING FROM FUEL SYSTEM (DIESEL VEHICLE)

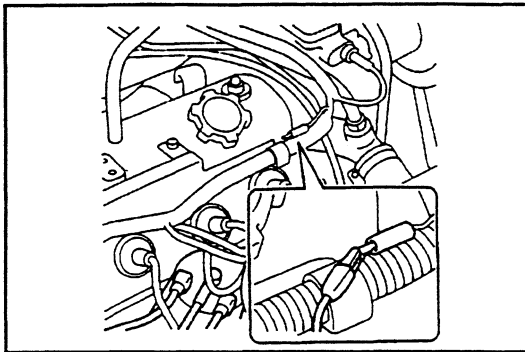
1. Operate the hand pump of the fuel filter until the pump operating force becomes heavy.

ENGINE SPEED INSPECTION AND ADJUSTMENT

Note:

Warm up the engine, set the vehicle to the following conditions, and conduct inspection and adjustment.

Coolant temperature: **80°C (176°F)** or more, engine oil: **70°C (158°F)** or more, operating oil temperature: **50°C (122°F)** or more, auto choke in release state (4Y engine)

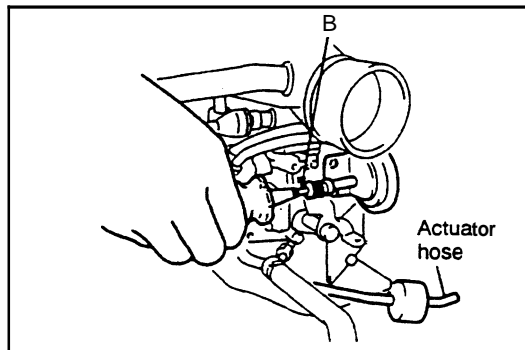


4Y ENGINE

Idling speed and idle up speed inspection and adjustment

<Gasoline Vehicle>

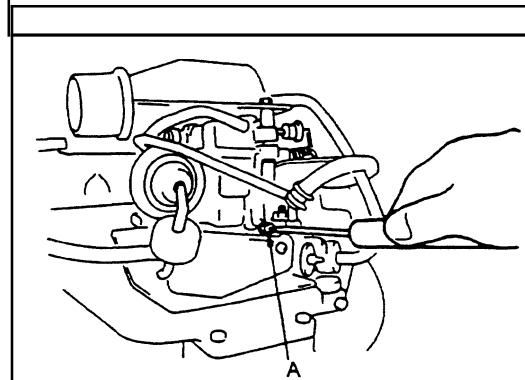
1. Install the engine speedometer.



2. Disconnect the idle up actuator and inspect the idle up speed.

Standard: 1000 a 30 rpm

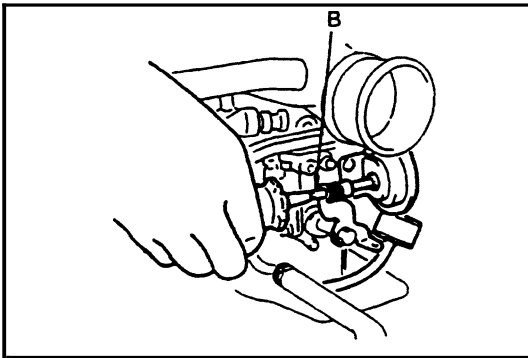
3. If the measured value is out of the specified range, adjust by turning adjusting screw B.
4. Connect the idle up actuator.



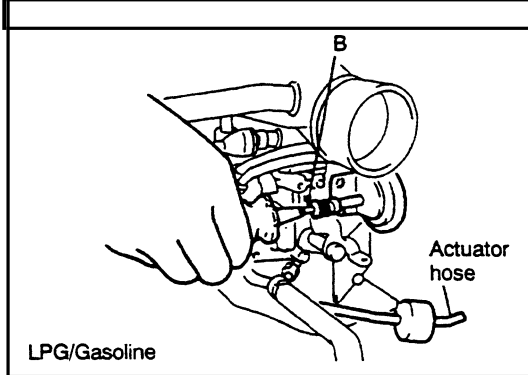
5. Check the idling speed.

Standard: 800 \pm 50 rpm

6. If the measured value is out of the specified range, adjust by adjusting screw A.
7. If the speed is still higher after adjustment in 3 above, adjust using the following procedure:



- (1) If the auto choke **cam** is contacting although the coolant temperature is as specified above, replace the auto choke.
- (2) If the idle up actuator rod and adjusting screw **B** are in contact with each other, turn adjusting screw **B** counterclockwise.



<LPG/Gasoline or LPG>

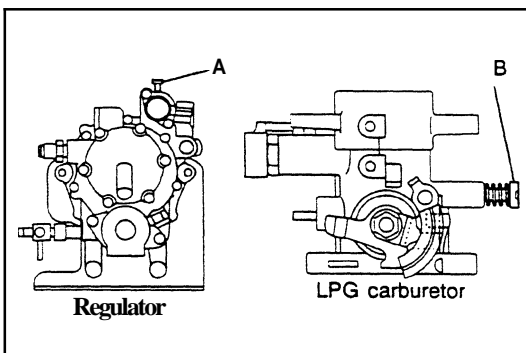
1. Install the engine speedometer.
2. Disconnect the idle up actuator and inspect the idle up speed.
Standard:
LPG/Gasoline: 1000 ± 30 rpm

3. Check the idling speed.

Standard:

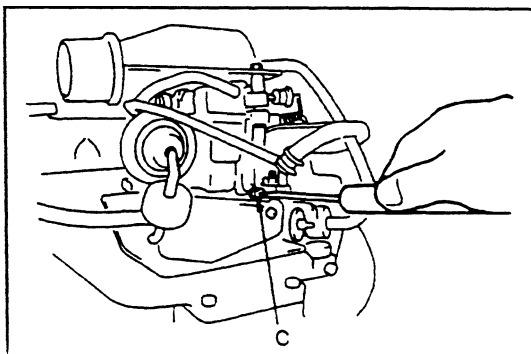
LPG/Gasoline: 800 ±⁵⁰₀ rpm

LPG: 800 ±⁵⁰₀ rpm



4. If the measured value is out of the specified range, make adjustment according to the following procedure:

- (1) Make adjustment by turning adjusting screw **B** (LPG vehicle) or **C** (LPG/gasoline vehicle). (If less than the standard, turn adjusting screw **A** counterclockwise beforehand.)
- (2) Slowly turn adjusting screw **A** clockwise or counterclockwise until the maximum speed is obtained.
- (3) Determine the positions of adjusting screws **B** and **C** by repeating steps (1) and (2) until the value obtained in step (2) satisfies the standard.
- (4) Slowly turn adjusting screw **A** clockwise until the CO concentration becomes 2 to 3%, and then turn it **45** degrees counterclockwise from the position where the speed begins to drop.





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