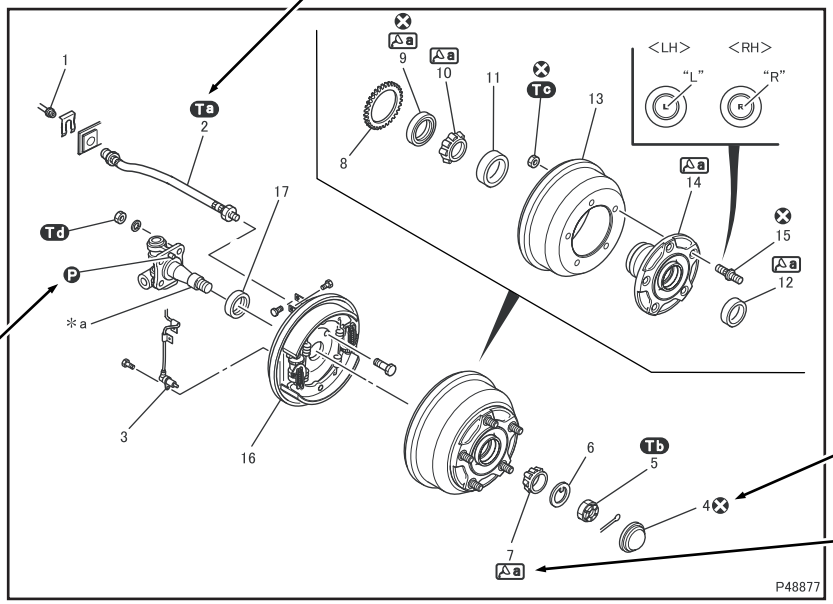
Illustrated Parts Breakdown and Service Procedures

Symbol	Denotation	Application	Remarks
Ta	Tightening torque	Parts not tightened to standard torques (standard torques specified where necessary for servicing)	Specified values shown in table See Table of Standard Tightening Torques for parts for which no tightening torques are specified.
P	Locating pin	Parts to be positioned for installation	
⊗	Non-reusable parts	Parts not to be reused	
a	Lubricant and/or sealant	Parts to be coated with lubricant or sealant for assembly or installation	Necessary lubricant and/or sealant, quantity required, etc. are specified in table.
a	Special tool	Parts for which special tools are required for service operation	Tool name/shape and part number are shown in table.
*a	Associated part	Parts associated with those removed/disassembled for servicing	

Denotes that tightening torque is specified.

WHEEL HUB AND BRAKE DRUM



P48877

Indicates position of locating pin.

Identifies non-reusable parts.

Denotes that coating with lubricant or sealant is required.

● Disassembly sequence

1 Brake pipe
2 Brake hose
3 Wheel speed sensor
4 Hub cap
5 Lock nut
6 Lock washer
7 Outer bearing inner race
8 Anti-lock brake system rotor
9 Oil seal
10 Inner bearing inner race
11 Inner bearing outer race
12 Outer bearing outer race
13 Brake drum
14 Wheel hub
15 Hub bolt
16 Front drum brake (See Gr35A.)
17 Spacer

*a : Knuckle
P : Locating pin
⊗ : Non-reusable parts

● Assembly sequence

Follow the disassembly sequence in reverse.

Service standards (unit : mm)

Location	Maintenance item		Standard value	Limit	Remedy
7, 10, 11, 12	Starting torque of wheel hub bearing (tangential force at hub bolt position with oil seal fitted in)		1 to 3.5 N·m {0.10 to 0.35 kgf·m} (tangential force:8.8 to 28.4 N {0.9 to 2.9 kgf})	–	Adjust or replace
14	Brake drum	Inside diameter	320	322	Repair or replace
		Cylindricality	0.05	0.20	

These location numbers correspond with disassembly sequence numbers.

P58289E

VEHICLE MODEL CODING SYSTEM

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬
F E 7 3 C B □ □ □ □ □ □ □

1	Basic vehicle type	F	Cab-over engine truck
2	Load capacity, drive system	E	2 ton class and over, 4 × 2
		G	2 ton class and over, 4 × 4
3	Cab type	7	Standard-width cab
		8	Wide cab
4	Vehicle variations, Suspension	3	Rigid axle Light duty vehicle (Payload 1500 to 3000 kg)
		4	Rigid axle Light duty vehicle (G.V.M 6000 to 6900 kg)
		5	Rigid axle Light duty vehicle (G.V.M. 7000 kg or more)
5	Engine	C	4D33
		P	4D34T4
6	Wheelbase	B	2500 mm
		C	2750 mm
		E	3350 mm
		G	3850 mm
		H	4710 mm
7	Chassis arrangement for use	None	Standard use
		D	Dump use
		Z	Wide frame
8	Rear tire arrangement, Payload	6	Rear double Payload 3000 kg to 4000 kg
9	Vehicle specification	S	With turbocharger
		W	Crew cab
		None	Standard
10	Steering position	L	Left-hand drive vehicle
11 to 13	Export specification		

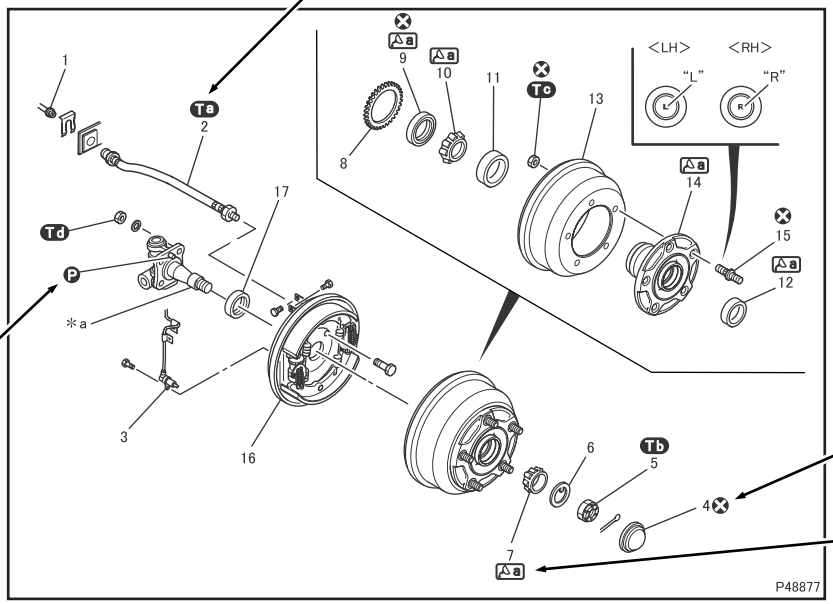
- The information from ① to ⑥ is indicated on vehicles.

Illustrated Parts Breakdown and Service Procedures

Symbol	Denotation	Application	Remarks
Ta	Tightening torque	Parts not tightened to standard torques (standard torques specified where necessary for servicing)	Specified values shown in table See Table of Standard Tightening Torques for parts for which no tightening torques are specified.
P	Locating pin	Parts to be positioned for installation	
⊗	Non-reusable parts	Parts not to be reused	
a	Lubricant and/or sealant	Parts to be coated with lubricant or sealant for assembly or installation	Necessary lubricant and/or sealant, quantity required, etc. are specified in table.
a	Special tool	Parts for which special tools are required for service operation	Tool name/shape and part number are shown in table.
*a	Associated part	Parts associated with those removed/disassembled for servicing	

Denotes that tightening torque is specified.

WHEEL HUB AND BRAKE DRUM



P48877

Indicates position of locating pin.

Identifies non-reusable parts.

Denotes that coating with lubricant or sealant is required.

● Disassembly sequence

1 Brake pipe
2 Brake hose
3 Wheel speed sensor
4 Hub cap
5 Lock nut
6 Lock washer
7 Outer bearing inner race
8 Anti-lock brake system rotor
9 Oil seal
10 Inner bearing inner race
11 Inner bearing outer race
12 Outer bearing outer race
13 Brake drum
14 Wheel hub
15 Hub bolt
16 Front drum brake (See Gr35A.)
17 Spacer

*a : Knuckle
P : Locating pin
⊗ : Non-reusable parts

● Assembly sequence

Follow the disassembly sequence in reverse.

Service standards (unit : mm)

Location	Maintenance item		Standard value	Limit	Remedy
7, 10, 11, 12	Starting torque of wheel hub bearing (tangential force at hub bolt position with oil seal fitted in)		1 to 3.5 N·m {0.10 to 0.35 kgf·m} (tangential force:8.8 to 28.4 N {0.9 to 2.9 kgf})	–	Adjust or replace
14	Brake drum	Inside diameter	320	322	Repair or replace
		Cylindricality	0.05	0.20	

These location numbers correspond with disassembly sequence numbers.

P58289E

1.1 Index number: (100) to (999)

- Index numbers are used as reference numbers for electrical circuits. Each electrical circuit has been assigned its own index number.

1.2 Key number: A01 to Z99

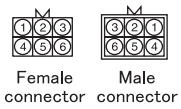
- Key numbers indicate electrical equipment installation locations. The installation location of an electrical equipment can be easily found using its key number shown in a circuit diagram.
  All of the electrical equipment installation locations are listed in Gr54-10.

1.3 Part name

1.4 Connector type (type indication)

- A list of the connectors used is included in Gr54-14.

1.5 Connector terminal number



Female connector Male connector

Connector terminal numbering starts with the upper left corner for female connectors and with the upper right corner for male connectors.

P50678E

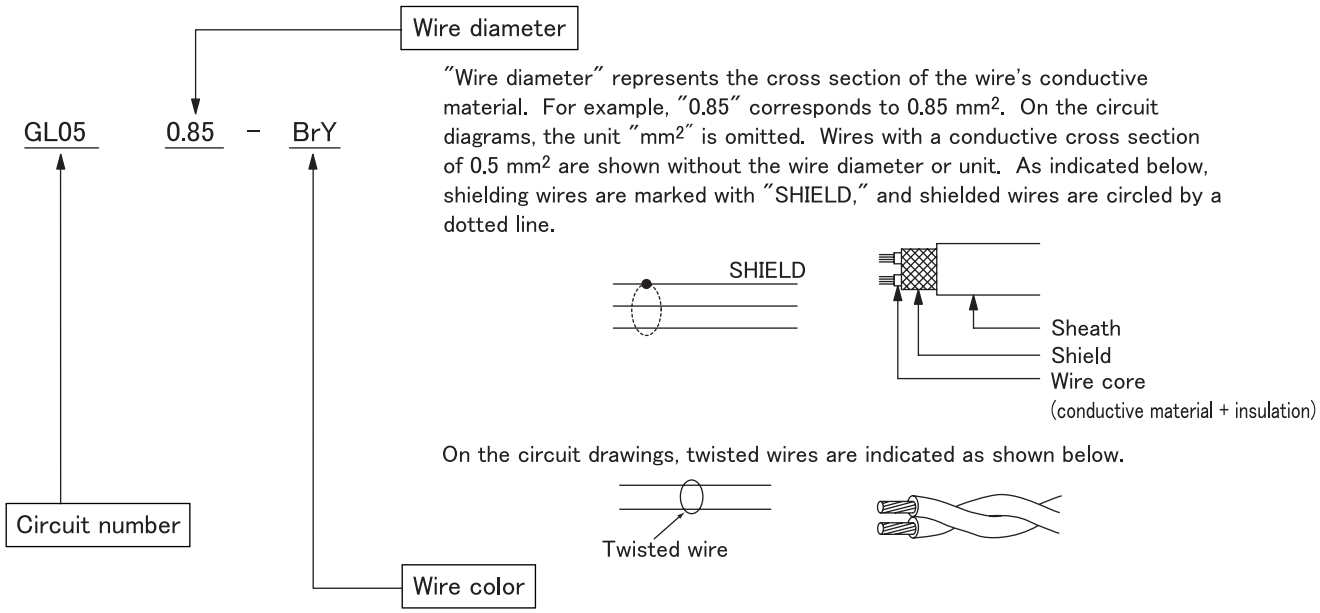
1.6 Major harness division

- Major harness divisions are shown.

1.7 Wiring variations between different specifications

- Variations in wiring/circuit between different vehicle specifications are clearly indicated as shown.

1.8 Circuit number, wire diameter, wire color



"Wire diameter" represents the cross section of the wire's conductive material. For example, "0.85" corresponds to 0.85 mm^2. On the circuit diagrams, the unit "mm^2" is omitted. Wires with a conductive cross section of 0.5 mm^2 are shown without the wire diameter or unit. As indicated below, shielding wires are marked with "SHIELD," and shielded wires are circled by a dotted line.

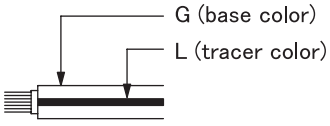
On the circuit drawings, twisted wires are indicated as shown below.

Wire colors are represented by the first letter of the color.
Colors that all start with the letter "B" are indicated as follows.

- BLACK → B
- BLUE → L
- BROWN → Br

Wires that have both base and tracer colors are indicated by two letters.

RY (Yellow tracer on Red base)
GL (Blue tracer on Green base)



P50680E

1.9 Code number: #001 to #999

- Code numbers are reference numbers to find individual electrical equipment inspection procedures. The inspection procedure for an electrical equipment can be found using its code number shown in a circuit diagram.

1.10 Grounding point: [1] to [99]

- Locations where wires are grounded to the vehicle. All of the grounding points are listed in (130).

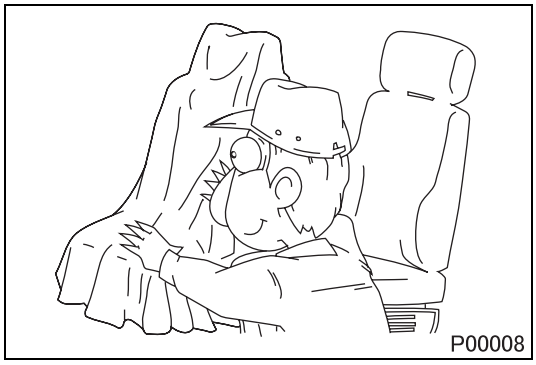
1.11 Harness connection

- The arrow in the wiring diagram indicates where harnesses are connected, and NOT the flow of electricity.

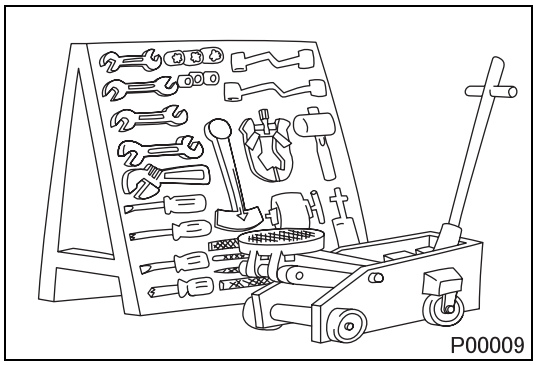
PRECAUTIONS FOR MAINTENANCE OPERATION

1. General Precautions

- Before performing service operations, inquire into the customer's complaints and ascertain the condition by checking the total distance traveled, the conditions under which the vehicle is operated, and other relevant factors on the vehicle. And note the necessary information. This information will help you to service the vehicle efficiently.
  - Check the location of the fault, and identify its cause. Based on your findings, determine whether parts must be removed or disassembled. Then, follow the service procedure given in this manual.


P00008

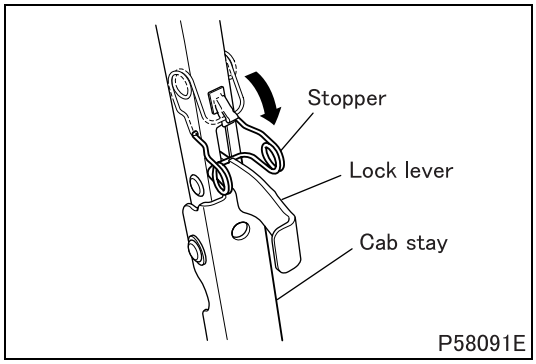
- Perform service operations on a level surface. Before starting, take the following preparatory steps:
  - To prevent soiling and damage, place covers over the seats, trim and floor in the cab and over the paintwork of the body.


P00009

- Prepare all the general and special tools necessary for the job.

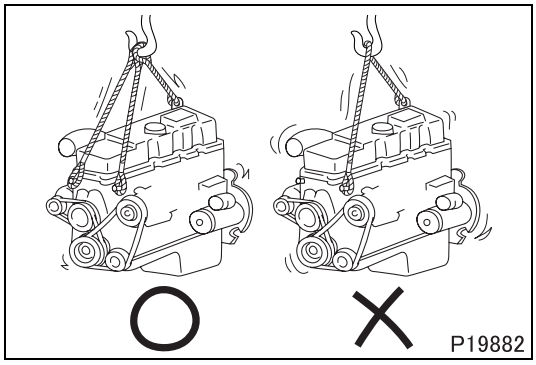
WARNING ⚠

- **Special tools must be used wherever specified in this manual. Do not attempt to use other tools since they could cause injuries and/or vehicle damage.**



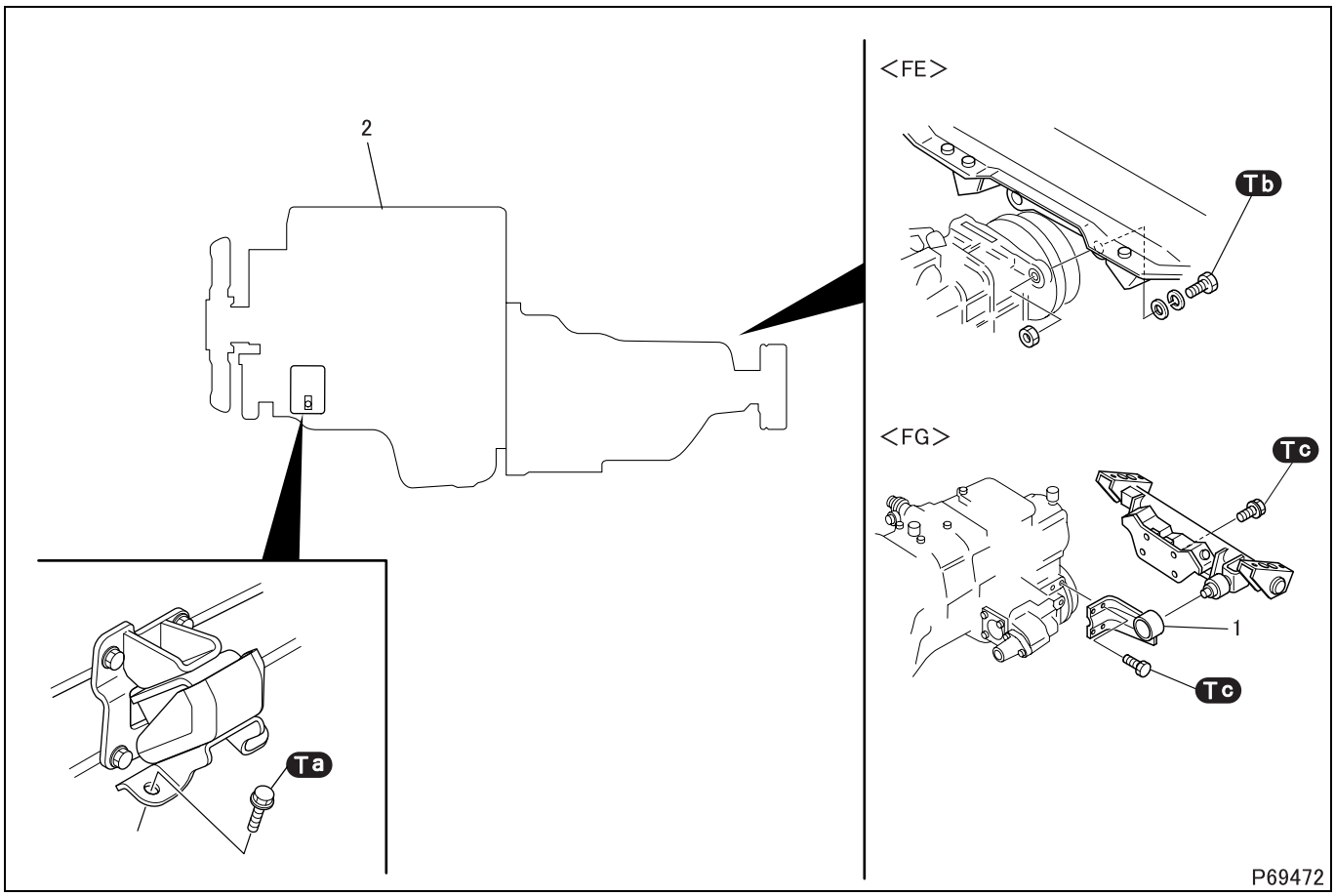
P58091E

- After manually tilting the cab, be sure to engage the stopper with the lock lever to secure the cab stay in a rigid state.


P19882

- Take extreme care when removing/installing heavy items such as engine, transmission and axle. When lifting heavy items using a cable etc., observe the following precautions.
  - Identify the weight of the item being lifted. Use the cable that is strong enough to support the weight.

ENGINE REMOVAL AND INSTALLATION <FIXED CAB>



● **Removal sequence**

1 Roll stopper
2 Engine and transmission

● **Installation sequence**

Follow the removal sequence in reverse.

CAUTION ⚠

- **Before removing each part, support the engine and transmission assembly in place using an engine lifter and a transmission jack.**

Tightening torque (Unit: N·m {kgf·m})

Mark	Parts to be tightened	Tightening torque	Remarks
Ta	Bolt (front mounting installation)	50 to 65 {5.1 to 6.6}	–
Tb	Bolt (rear mounting installation)	130 to 170 {13 to 17}	–
Tc	Bolt (roll stopper bracket mounting)	45 to 65 {4.5 to 6.5}	–
	Bolt (rear mounting installation)		

B: Measuring point on the crankcase (vertical to the crankcase axis).
C: Measuring point on the piston outer diameter (vertical to the piston pin hole).

- If the measured value deviates from the standard value, correct according to one of the following methods, depending on the condition of the parts.

CAUTION ⚠

- **Even if only one cylinder is faulty, correct all the cylinders to oversized ones of the same size.**

  - Replace the piston with an oversized one.
  - Install cylinder sleeve for correction
    (When a cylinder sleeve for correction is not already installed)

- After determining the proper method of correction, correct by following one of the procedures described below.

[Correction]

Piston

<When replacing the pistons with oversized ones>

Amount of oversize: 0.5, 1.0 (4D34) mm

- Measure the outer diameter C of the oversized piston to be used.
- Bore each cylinders so that the clearance between the piston and the cylinder sleeves conform to the standard value.

CAUTION ⚠

- **To prevent deformation as a result of the rise in temperature during boring, bore the cylinders in the following order.**
  No. 2 → No. 4 → No. 1 → No. 3

Dimension after boring finish (tolerance ± 0.005) = oversized piston outer dimension C (measured value) + clearance between piston and cylinder (service standards mean value) - 0.02 mm (honing extent).

- Boring is followed by honing to obtain the proper dimensions (tolerance +0.005 to -0.00).
  Dimension after final finish (tolerance ± 0.005) = oversized piston outer dimension C (measured value) + clearance between piston and cylinder (service standards mean value).
  - Honing finished surface coarseness: 3.2 μm or less.
  - Honing cross-hatching angle: 15 to 25° (half angle).
  - Cylinder bore secureness: 0.05 mm.

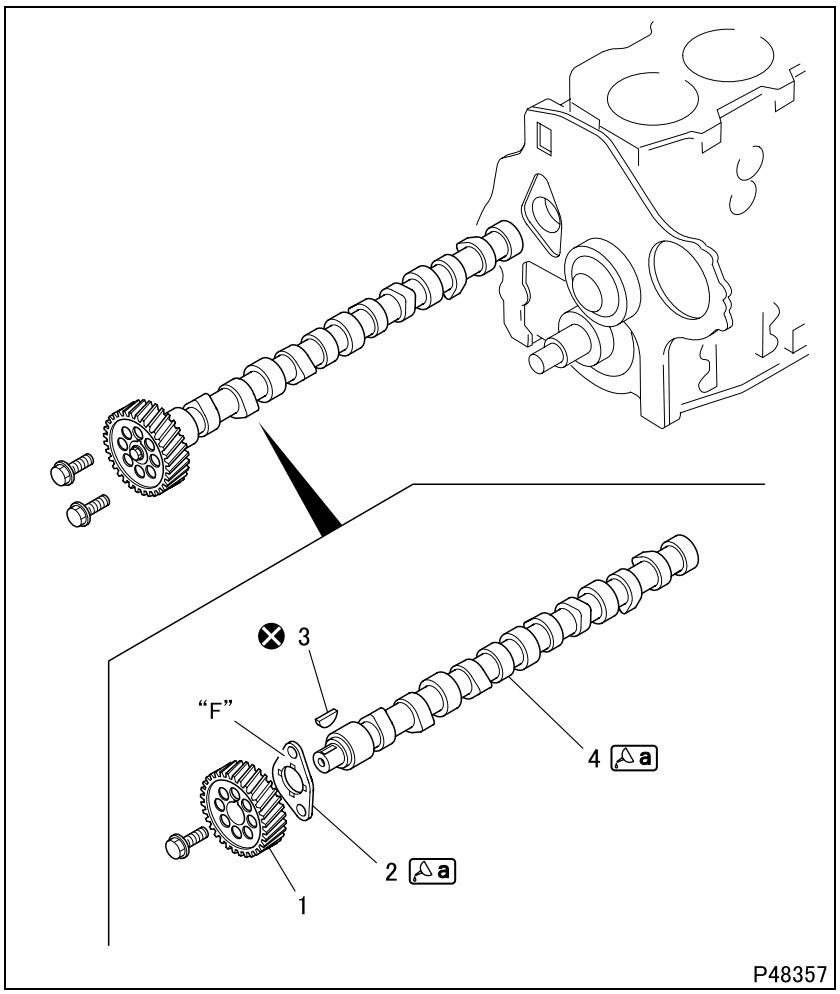
- Check the clearance between the piston and the cylinder.

NOTE

- **Piston rings must be replaced with the corresponding oversized ones.**

Cylinder sleeve

<When replacing the cylinder sleeve>



● **Disassembly sequence**

1 Camshaft gear
2 Thrust plate
3 Key
4 Camshaft

⊗: Non-reusable parts

● **Assembly sequence**

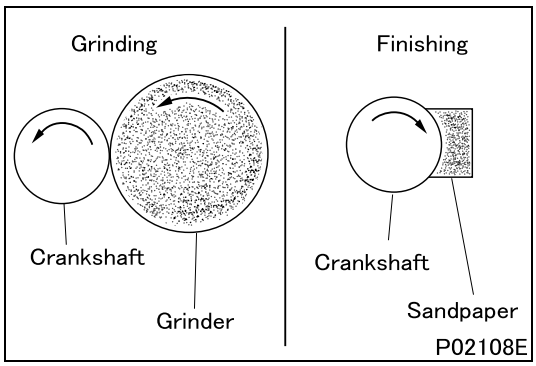
Follow the disassembly sequence in reverse.

Service standards (Unit: mm)

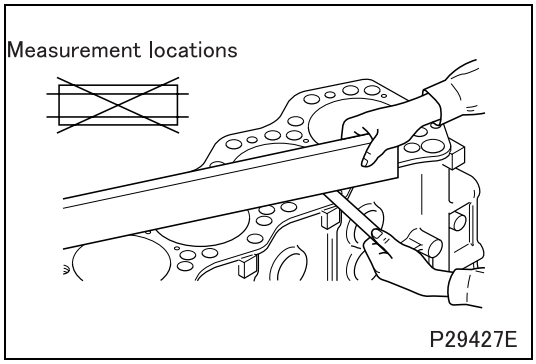
Location	Maintenance item				Standard value	Limit	Remedy
–	Camshaft end play				0.05 to 0.22	0.3	Replace
1, 4	Camshaft gear and camshaft interference				0.03 to 0.07	–	Reassemble Permitted up to three times
4	Camshaft	Cam lift	Intake	Lobe height: 47.105 Base circle diameter: 39.910	7.195 ± 0.05	6.70	Replace
			Exhaust	Lobe height: 46.979 Base circle diameter: 39.658	7.321 ± 0.05	6.82	
		Bend			0.02 or less	0.05	Replace

Lubricant and/or sealant

Mark	Points of application	Specified lubricant and/or sealant	Quantity
a	Thrust plate thrust receiving surface	Engine oil	As required
	Camshaft cams and journals		



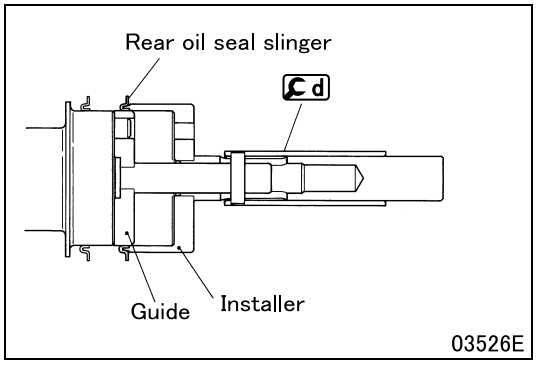
- When grinding, turn both the crankshaft and the grinder counterclockwise as viewed from the crankshaft front end.
- When finishing the crankshaft with whetstone or sandpaper, rotate the crankshaft clockwise.



■ Inspection: Distortion of crankcase top surface

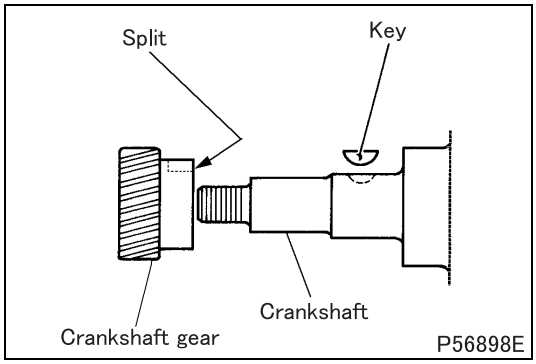
- If the measurement exceeds the specified limit, grind the crankcase top surface with a surface grinder.
- Limit the amount of removed metal to make sure that the amount of piston projection above the crankcase top surface stays within the standard value range.

◆Installation procedure◆



■ Installation: Rear oil seal slinger

- Drive the rear oil seal slinger onto the crankshaft until it touches the guide.



■ Installation: Crankshaft gear

- Heat the crankshaft gear to approximately 100°C with a burner or the like.

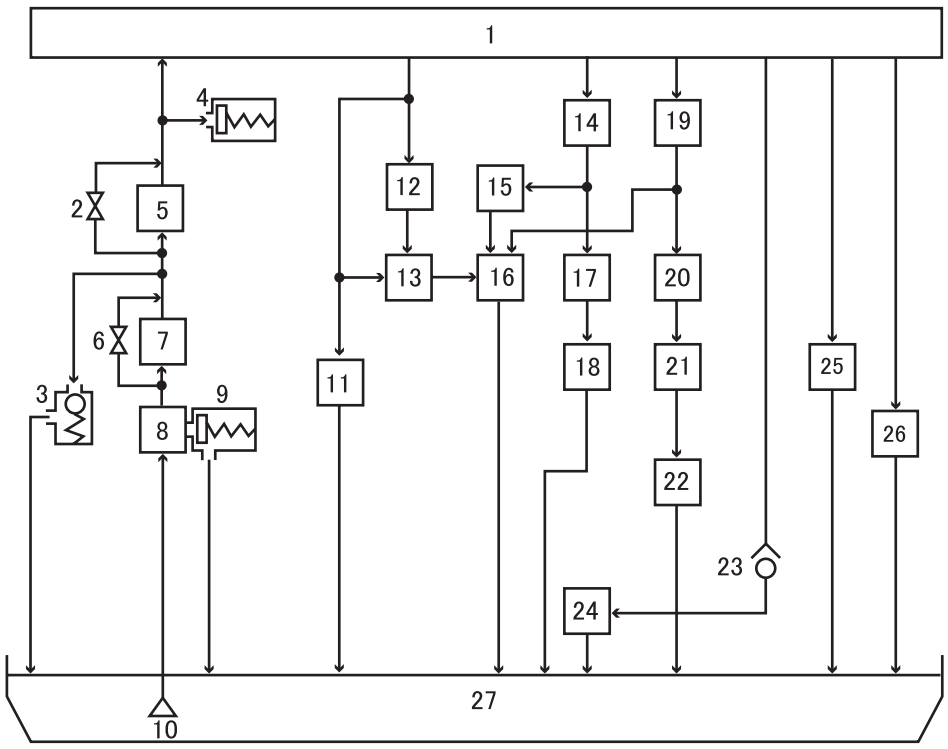
CAUTION ⚠

- **Be careful not to get burned.**

- Align the key fitted in the crankshaft with the slot in the crankshaft gear. Drive the gear into position by lightly striking its end face with a plastic hammer.

1. Lubrication System

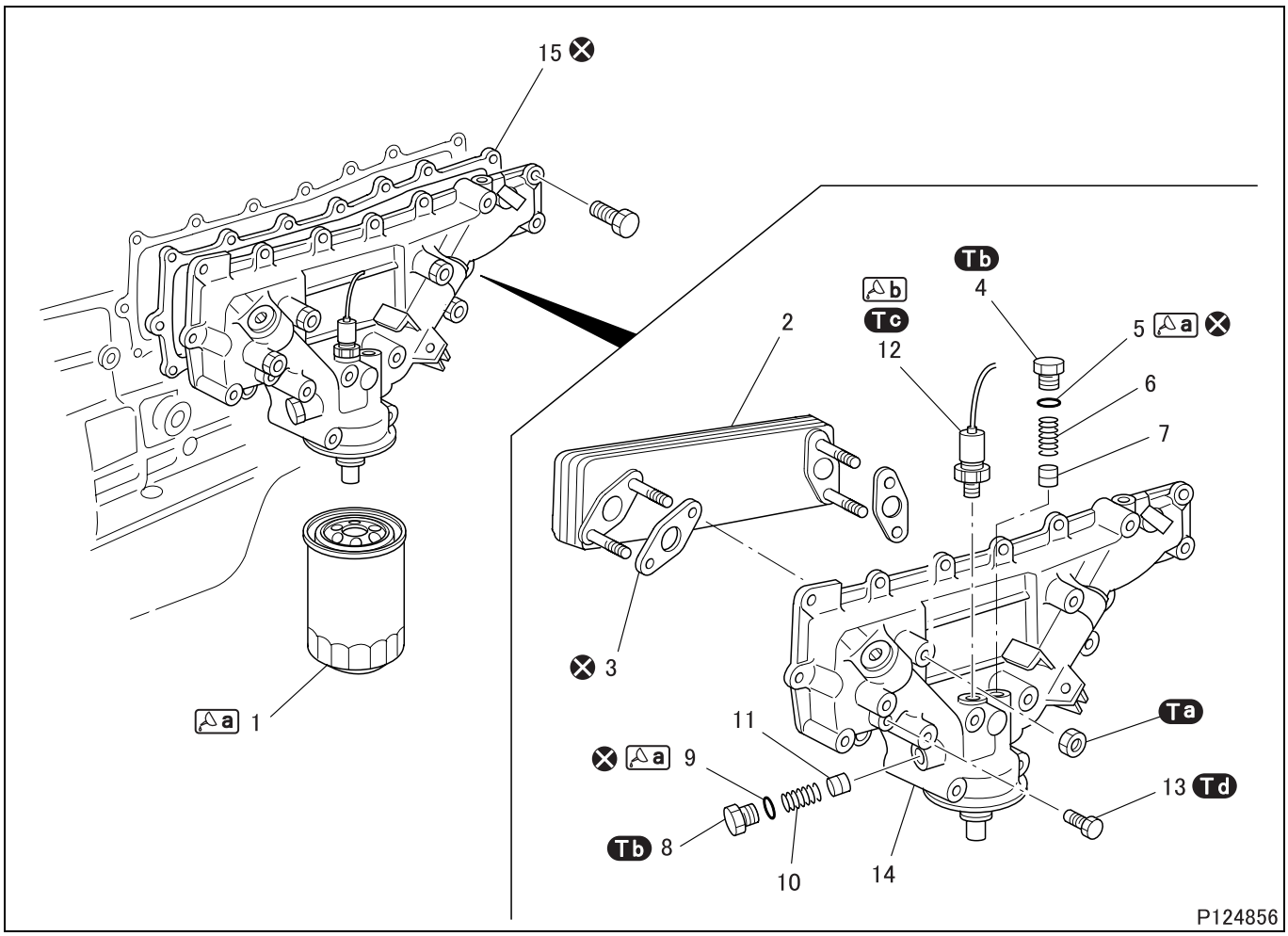
<Spin-on Type>



1 Main oil gallery
2 Bypass valve
3 Regulator valve
4 Engine oil pressure switch
5 Full-flow filter element
6 Bypass valve
7 Oil cooler
8 Oil pump
9 Relief valve
10 Oil strainer
11 Injection pump bearing
12 Injection pump
13 Injection pump gear
14 Crankshaft main bearing
15 Idler gear bushing
16 Timing gear
17 Connecting rod bearing
18 Connecting rod bushing
19 Piston
20 Camshaft bushing
21 Rocker bushing
22 Push rod
23 Tappet
24 Check valve for oil jet
25 Turbocharger <4D34>
26 Vacuum pump
27 Oil pan

Possible causes \ Symptoms		Engine is difficult to start	Overheating	Low oil pressure	Excessive oil consumption (oil leakage)	Reference Gr
Oil cooler	Incorrectly mounted element		O	O	O	
	Defective gasket		O	O	O	
	Defective O-ring		O	O	O	
	Clogged element		O	O		
	Damaged element		O	O	O	
	Weakened bypass valve spring		O			
	Weakened regulator valve spring			O		
Oil pump	Malfunctioning oil pump		O	O		
	Interference between oil pump gear and oil pump case and/or cover	O		O		
	Weakened relief valve spring			O		
Oil filter	Incorrect installation				O	
	Clogged element		O	O		
	Defective gasket			O		
Incorrectly mounted and/or clogged oil strainer			O	O		
Defective crankshaft front oil seal					O	Gr11
Defective crankshaft rear oil seal					O	
Incorrectly mounted timing gear case					O	
Defective piston cooling oil jet(s)			O			
Oil working its way up into combustion chamber(s) through piston rings					O	Gr11
Oil working its way down into combustion chamber(s) through valves					O	
Too high oil viscosity		O				
Poor oil quality			O			
Deterioration of oil			O			
Fuel mixed with oil			O			

OIL COOLER AND OIL FILTER <SPIN-ON TYPE>



WARNING ⚠

- **Wipe up any spilled engine oil, as it can cause fires.**
- **To avoid any risk of burns, take care not to touch the engine oil when the engine is hot.**

CAUTION ⚠

- **Make sure not to put any engine oil on the V-belt when working on the oil cooler and oil filter. V-belts soiled with oil or grease may easily slip, resulting in deteriorated performance of the cooling system.**
- **Do not reuse the oil filter elements by washing.**

● Removal sequence

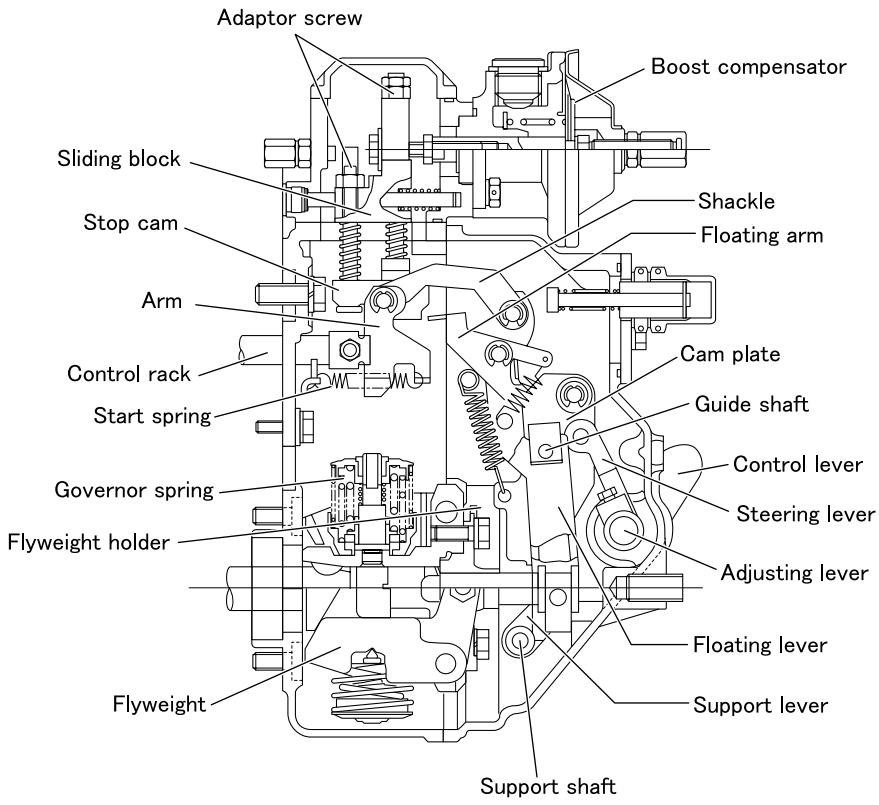
1 Oil filter
2 Oil cooler element
3 Gasket
4 Plug
5 O-ring
6 Regulator valve spring
7 Regulator valve
8 Plug
9 O-ring
10 Bypass valve spring
11 Bypass valve
12 Engine oil pressure switch
13 Drain plug
14 Oil cooler body
15 Gasket

⊗: Non-reusable parts

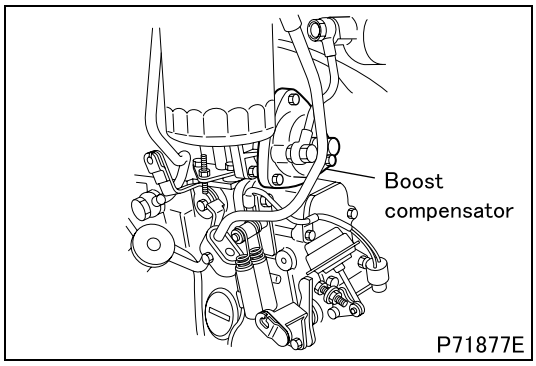
● Installation sequence

Follow the removal sequence in reverse.

6. Governor



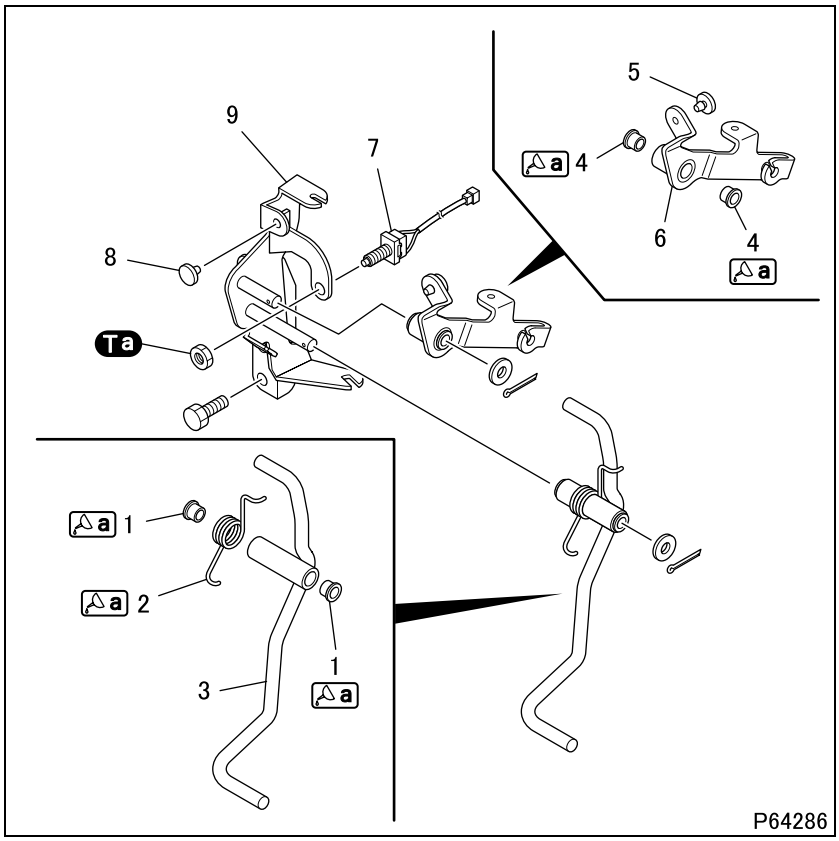
- The governor is a mechanical type that uses centrifugal force generated by flyweights, its characteristics are between those of a minimum/maximum governor and those of an all-speed governor. Since the repercussive force of governor spring does not work directly on control lever when the accelerator pedal is pressed, the repercussive force that is transmitted to the accelerator pedal via the control lever is kept extremely light, making accelerator pedal operation easy.



6.1 Boost compensator <4D34>

- Boost compensator is a device that automatically adjusts injection quantity. When, due to turbo operation, the quantity of sucked air delivered to the engine cylinders increases the boost compensator injects the appropriate amount of fuel.

Accelerator Link



● **Removal sequence**

1. Bushing
2. Spring
3. Accelerator arm
4. Bushing
5. Rubber stopper
6. Upper lever
7. Accelerator switch (with exhaust brake)
8. Rubber stopper
9. Accelerator link bracket

● **Installation sequence**

Follow the removal sequence in reverse.

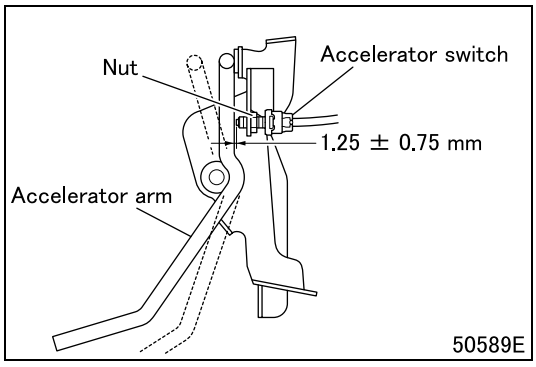
Tightening torque (Unit: N m {kgf·m})

Mark	Parts to be tightened	Tightening torque	Remarks
Ta	Nut (accelerator switch mounting)	9 to 14 {0.9 to 1.4}	–

Lubricant and/or sealant

Mark	Points of application	Specified lubricant and/or sealant	Quantity
a	Inner surface of bushing	Chassis grease [NLGI No.1 (Li soap)]	As required

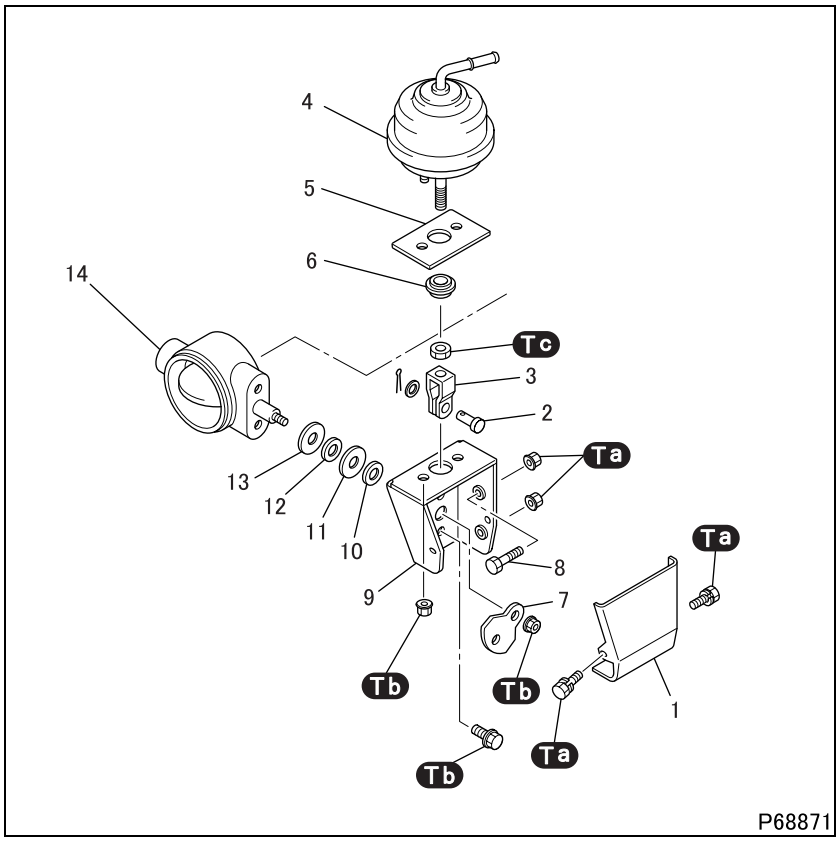
◆Installation procedure◆



■ **Installation: Accelerator switch**

- Screw in and secure the accelerator switch with the nut. Be sure that the clearance between the tip of the threaded part of the switch and the accelerator arm is as shown in the illustration.

Exhaust Brake Unit



● Disassembly sequence

1 Cover
2 Clevis pin
3 Clevis
4 Power chamber
5 Gasket
6 Bearing
7 Lever
8 Adjust bolt
9 Bracket
10 Seal ring A
11 Seal ring B
12 Seal ring A
13 Seal ring B
14 Valve

CAUTION ⚠

- **Do not attempt to disassemble the power chamber.**

NOTE

- **For removal and installation procedures of the exhaust brake unit, see Gr15.**

● Assembly sequence

Follow the disassembly sequence in reverse.

Service standards (Unit: mm)

Location	Maintenance item	Standard value	Limit	Remedy
–	Average of top and bottom clearances between butterfly valve and body with valve fully closed (With power chamber vacuum of 87 to 93 kPa {650 to 700 mmHg} or above)	0.10 to 0.25	–	Replace
4	Air-tightness of power chamber (At 15 sec. after vacuum of 67 kPa {500 mmHg} is achieved in chamber)	63 kPa {475 mmHg} or above	–	Replace

Tightening torque (Unit: N·m {kgf·m})

Mark	Parts to be tightened	Tightening torque	Remarks
Ta	Bolt (cover mounting)	4.9 to 6.9 {0.5 to 0.7}	–
	Nut (bracket mounting)		
Tb	Nut (power chamber mounting)	10.8 to 16.7 {1.1 to 1.7}	–
	Bolt (bracket mounting)		
	Nut (lever mounting)		
Tc	Lock nut (Clevis retention)	9.8 to 15.7 {1.0 to 1.6}	–