CONTENTS

CHAPTER 1
GENERAL CAUTIONS FOR MAINTENANCE WORK

1-1 Correct Work 1-1
1-2 Safety Precautions 1-1
1-3 Preparations 1-1
1-4 Cautions for Disassembly and Reassembly 1-1
1-5 Cautions for Removal and Installation of Hydraulic Equipment 1-2
1-6 Cautions for Removal and Installation of Hydraulic Piping 1-2
1-7 Cautions for Handling Seals 1-3
1-8 Correct Installation of Hydraulic Hose 1-3
1-9 Specifications of Hydraulic Hose 1-6
1-10 Air Release of Hydraulic Equipment 1-8

CHAPTER 2
TECHNICAL DATA

2-1 Specifications 2-1-1
2-2 Outline Drawing and Working Area 2-2-1
2-3 Weight List of Main Parts 2-3-1
2-4 Lifting Capacity List 2-4-1
2-5 Specifications for Attachment 2-5-1
2-6 Periodic Inspection and Servicing 2-6-1
2-7 Fuel, Lube Oil and Grease Recommended 2-7-1
2-8 Hydraulic Circuit Schematic 2-8-1
2-9 Wiring Diagram 2-9-1

CHAPTER 3
SERVICE STANDARDS

3-1 Machine Performance 3-1-1
3-2 Engine 3-2-1
3-3 Undercarriage 3-3-1
3-3-1 Rubber Track Specifications 3-3-1
3-3-2 Steel Track Specifications 3-3-2
3-3-3 Common Specifications of Steel & Rubber Crawlers 3-3-4
3-4 Controls 3-4-1
3-5 Hydraulic Equipment 3-5-1
3-5-1 Hydraulic Cylinders 3-5-1
3-6 Implement 3-6-1
3-6-1 Front Attachments 3-6-1
3-6-2 Blade Moving Device 3-6-2
3-7 List of Tightening Torque 3-7-1
3-7-1 Machine 3-7-1
3-7-2 Engine 3-7-5
3-7-3 Tightening Torque for General Bolts and Nuts 3-7-6
3-7-4 Hydraulic Fitting 3-7-7
3-8 Pressure Adjustment 3-8-1
3-8-1 Relief Valves 3-8-1
3-8-2 Swing Brake Valve 3-8-4

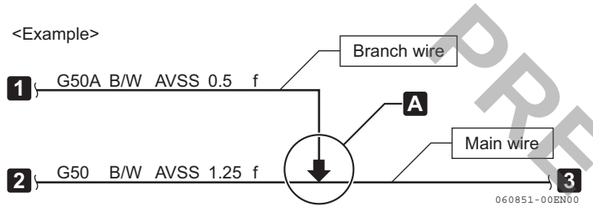
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2-9 Wiring Diagram

■ How to Read Wiring Diagrams

● Intersections and Wire Connections

<Example>

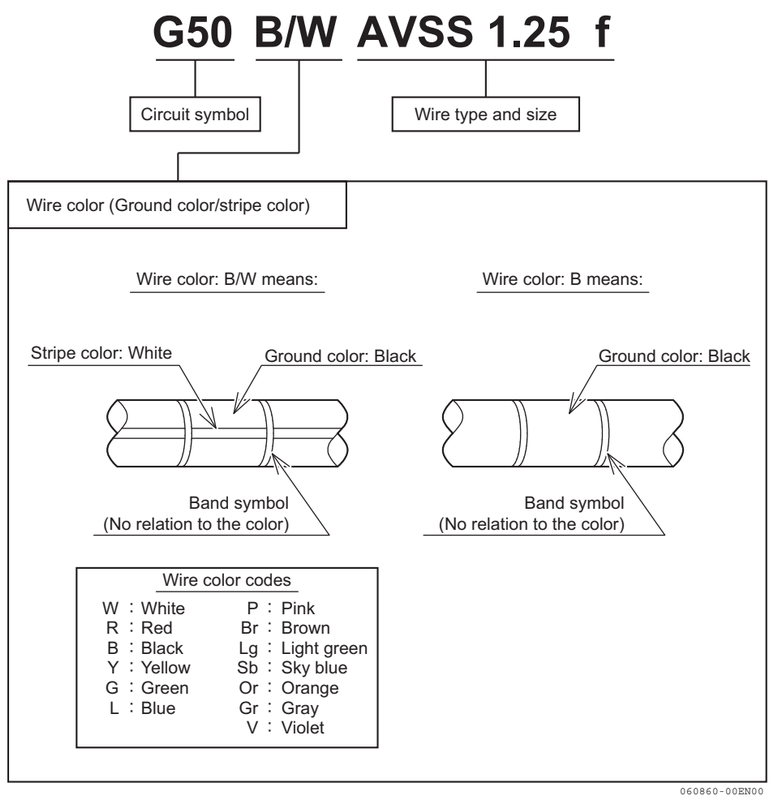


The point of arrow **A** on the main wire shown in the figure above represents an intersection of the branch wire and the main wire.
The direction of the arrow indicates which one is the branch wire (the arrowed line represents the branch wire) and also shows the division between the branch wire and the main wire.

In the example above, the wires are divided as follows.

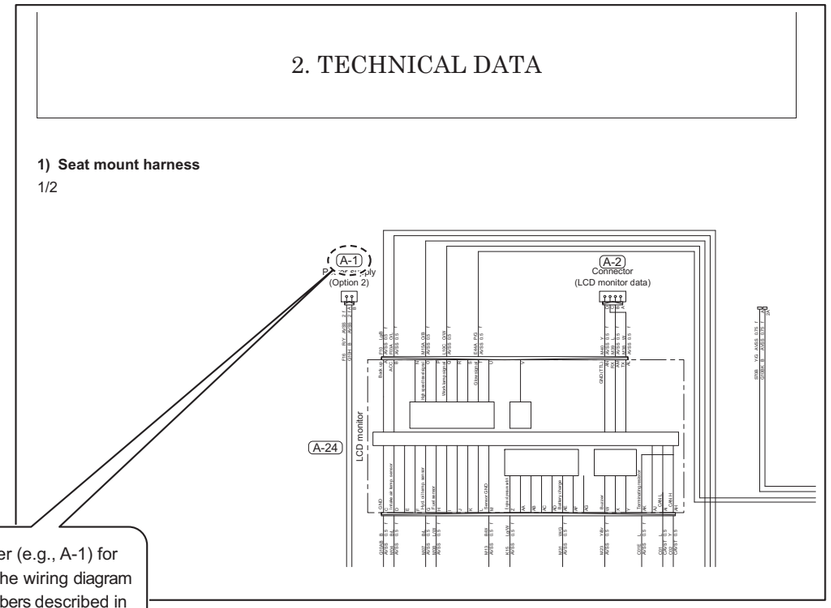
1 to the point of arrow **A** : Branch wire G50A B/W AVSS 0.5 f
2 to **3** : Main wire G50 B/W AVSS 1.25 f

● How to Read Wiring Symbols

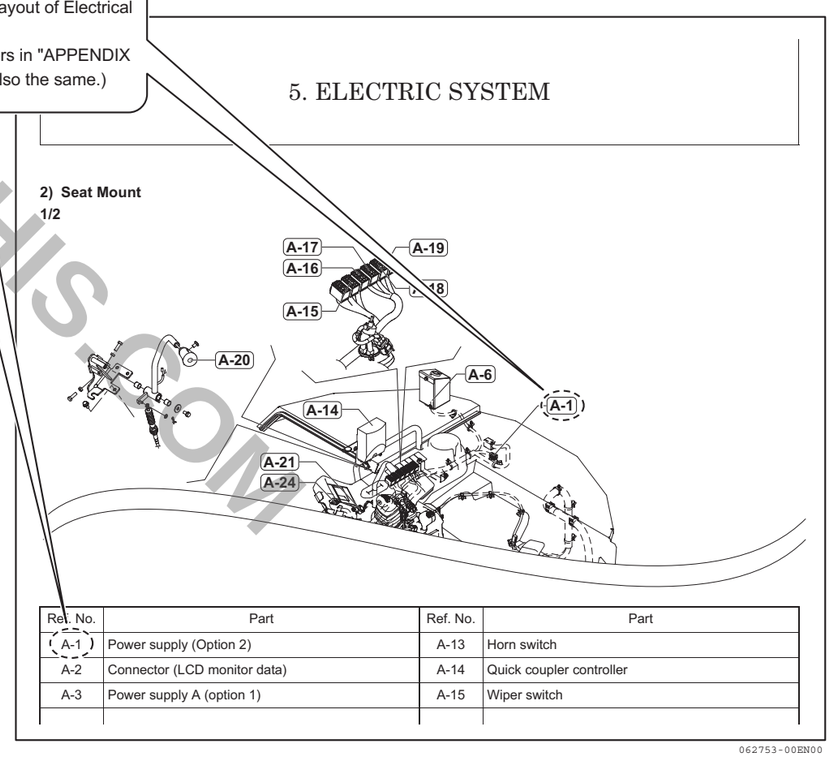


● Reference numbers

<Example>



Each reference number (e.g., A-1) for electric equipment in the wiring diagram corresponds to the numbers described in Section "5-1-1 Parts Layout of Electrical Equipment".
(The reference numbers in "APPENDIX Wiring Diagram" are also the same.)

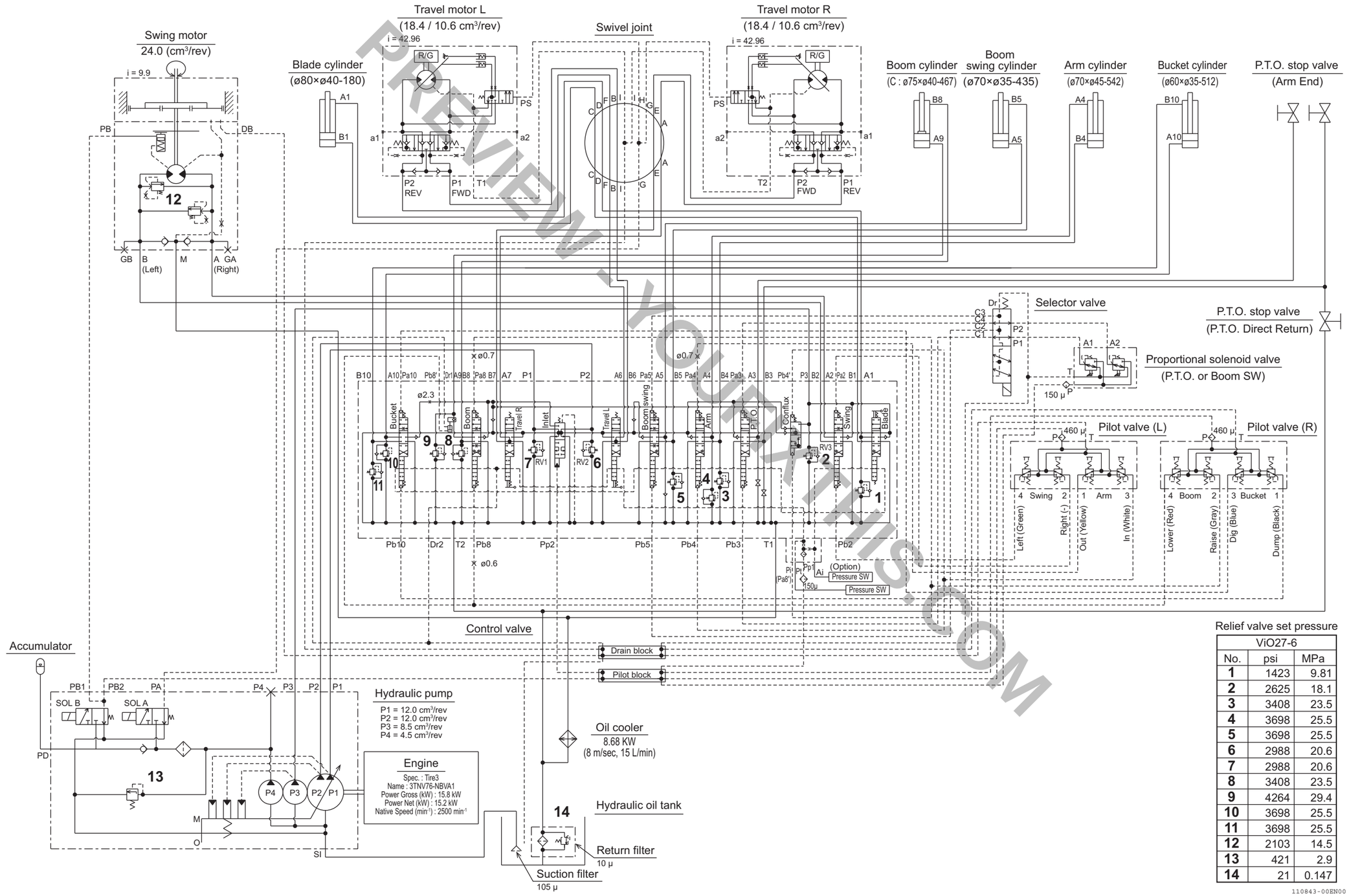


Ref. No.	Part	Ref. No.	Part
A-1	Power supply (Option 2)	A-13	Horn switch
A-2	Connector (LCD monitor data)	A-14	Quick coupler controller
A-3	Power supply A (option 1)	A-15	Wiper switch

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2-8 Hydraulic Circuit Schematic

Applicable model : ViO27-6



Relief valve set pressure

ViO27-6		
No.	psi	MPa
1	1423	9.81
2	2625	18.1
3	3408	23.5
4	3698	25.5
5	3698	25.5
6	2988	20.6
7	2988	20.6
8	3408	23.5
9	4264	29.4
10	3698	25.5
11	3698	25.5
12	2103	14.5
13	421	2.9
14	21	0.147

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4-2-4 Cylinder Head

Cylinder Head Components

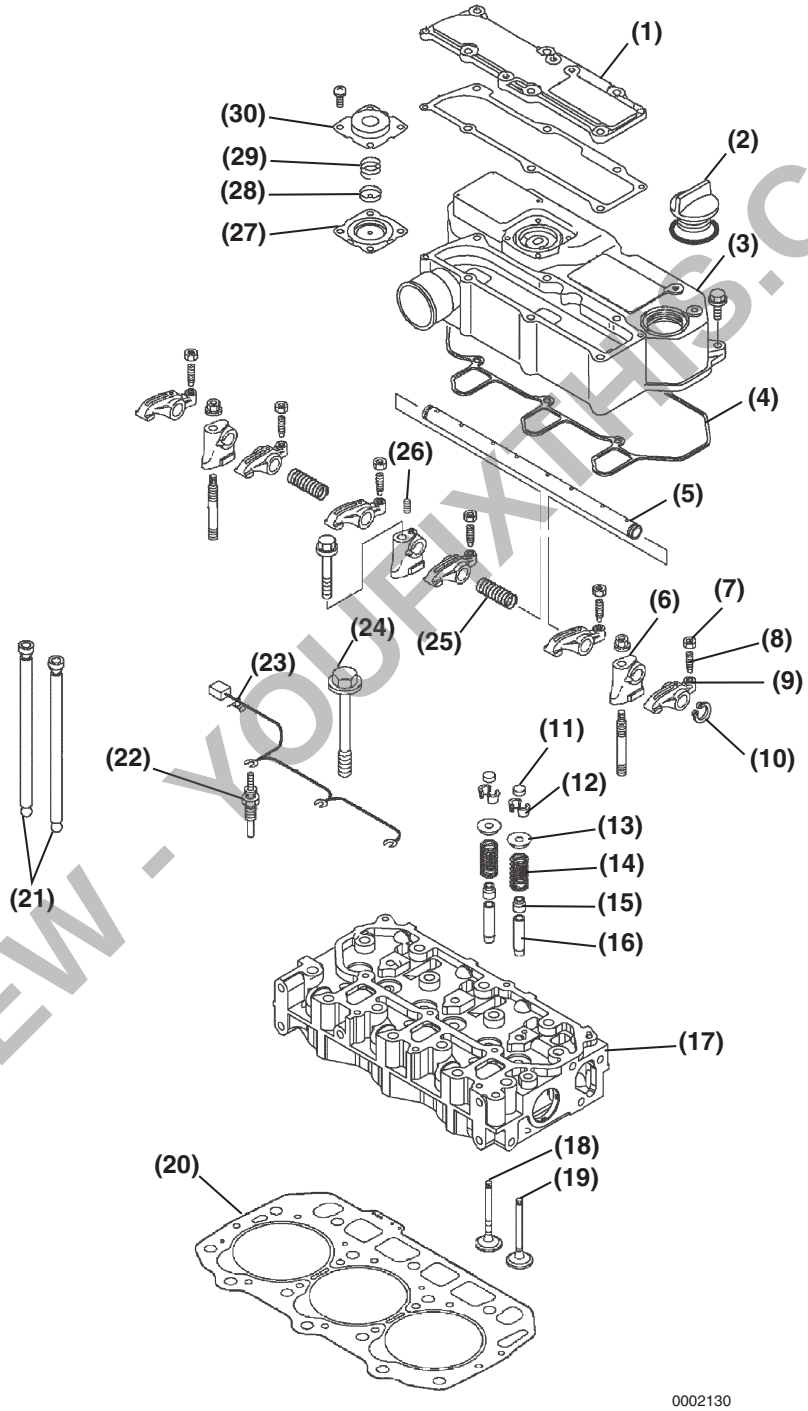


Figure 4-2-1

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3-7 List of Tightening Torque

3-7-1 Machine

Applicable model			ViO27-6		
Equipment No		Tightening part	Thread size	Tightening torque N•m	Adhesive
Engine / Electrical equipment					
	1	Engine mount vibroisolating rubber	Nut 10	24.5 to 32.3	
	2	Engine × Engine mount (Fore Left)	M10×25	44.1 to 58.9	ThreeBond 1324
	3	Engine × Engine mount (Fore Right)	M10×25	44.1 to 58.9	ThreeBond 1324
	4	Engine × Engine mount (Rear Left)	M10×25	44.1 to 58.9	ThreeBond 1324
	5	Engine × Engine mount (Rear Right)	M10×25	44.1 to 58.9	ThreeBond 1324
	6	Engine mount × Stopper (Left)	M10×25	44.1 to 58.9	ThreeBond 1324
	7	Engine mount × Stopper (Fore Right)	M10×25	44.1 to 58.9	ThreeBond 1324
	8	Air cleaner	M8×20	19.6 to 22.6	
	9	Air cleaner intake hose	Hose clip 70	2.16 to 2.45	
	10	Cooling water hose	Hose clip 41	2.45 to 2.94	
	11	Oil cooler hose	Hose clip 22	3.9 to 4.9	
	12	Fuel level gauge unit	M5×12 (Pan head screw)	1.18 to 1.47	
	13	Fuel level gauge hose	Hose band 13	0.98 to 1.47	
	14	Fuel oil tank drain valve	R3/8	19.6 to 29.4	Loctite 577
	15	Fuel oil tank holding band	Nut 10	2.45 to 2.94 <Tank holding side>	24.5 to 32.3 <Lock nut side>
	16	Battery holding rod	Nut 6	1.96 to 2.94 (Lower <holding>)	4.9 to 5.88 (Upper <Locknut>)
	17	Accelerator cable locknut	Nut 6	3.92 to 4.90	
	18	Wire harness × Starter motor terminal	Nut 8	5.88 to 11.77	
	19	LCD monitor × Panel cover	M6×20	1.0 to 1.5	
	20	Panel cover (lower) × Panel cover (upper)	M5×14 (Tapping screw)	2.55 to 3.3	
	21	Safety switch (Travel speed)	Locknut (Fine thread) 20	19.6 to 24.5	
	22	Safety switch (Cut-off lever)	Locknut (Fine thread) 20	19.6 to 24.5	
	23	Accelerator dial (holding nut)	Nut (Fine thread) M9	1.33 to 1.47	

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5-4 Error Code List

Error code	Classification	Error description	Detection condition	Causes	Corrective measures
00 000091.00	Caution	Accelerator sensor malfunction: above normal operating range (SAEJ1843)	Sensor voltage is 4.6 V or more, or 0.2 V or less.	• Connection failure of connectors • Harness wiring failure (engine control dial wiring disconnected or short circuited to GND) • Defective accelerator sensor • Engine ECU internal circuit failure	Check the connectors, harnesses and engine control dial. Turn the starter switch to the “OFF” position and then to the “ON” position to check if the error code is displayed again.
00 000091.01	Caution	Accelerator sensor failure: below normal operating range (SAEJ1843)	Sensor voltage is 4.6 V or more, or 0.2 V or less.	• Connection failure of connectors • Harness wiring failure (engine control dial wiring disconnected or short circuited to GND) • Defective accelerator sensor • Engine ECU internal circuit failure	Check the connectors, harnesses and engine control dial. Turn the starter switch to the “OFF” position and then to the “ON” position to check if the error code is displayed again.
00 000091.02	Caution	Accelerator sensor malfunction: intermittent failure	Sensor voltage is 4.6 V or more, or 0.2 V or less.	• Connection failure of connectors • Harness wiring failure (nearly broken wiring of sensor signal line, sensor 5 V line or sensor GND line) • Defective accelerator sensor • Engine ECU internal circuit failure	Check the connectors, harnesses and accelerator sensor. Turn the starter switch to the “OFF” position and then to the “ON” position to check if the error code is displayed again.
00 000091.03	Caution	Accelerator sensor malfunction: short circuit to high voltage side	Sensor voltage is 4.6 V or more, or 0.2 V or less.	• Connection failure of connectors • Harness wiring failure (sensor GND line disconnected or sensor signal line short circuited to power supply) • Defective accelerator sensor • Engine ECU internal circuit failure	Check the connectors, harnesses and accelerator sensor. Turn the starter switch to the “OFF” position and then to the “ON” position to check if the error code is displayed again.
00 000091.04	Caution	Accelerator sensor malfunction: short circuit to low voltage side	Sensor voltage is 4.6 V or more, or 0.2 V or less.	• Connection failure of connectors • Harness wiring failure (sensor signal line disconnected or short circuited to GND, or sensor 5V line disconnected or short circuited to GND) • Defective accelerator sensor • Engine ECU internal circuit failure	Check the connectors, harnesses and accelerator sensor. Turn the starter switch to the “OFF” position and then to the “ON” position to check if the error code is displayed again.
00 000091.15	Caution	Accelerator sensor malfunction: disabled (SAEJ1843)	Sensor voltage is 4.6 V or more, or 0.2 V or less.	Engine ECU map data setting fault	Turn the starter switch to the “OFF” position and then to the “ON” position to check if the error code is displayed again.
00 000100.01	Warning	Abnormal engine oil pressure	Engine oil pressure switch is on after engine has started.	• Low engine oil pressure • Defective engine oil system • Harness wiring failure (engine oil pressure switch wiring short circuited to GND) • Defective engine oil pressure switch • Engine ECU internal circuit failure	Inspect the engine oil system. Check the harnesses and engine oil pressure switch. Turn the starter switch to the "OFF" position and then to the "ON" position to check if the error code is displayed again.
00 000100.04	Warning	Engine oil pressure switch failure	Engine oil pressure switch is off while engine is stopped with starter switch in the "ON" position.	• Connection failure of connectors • Harness wiring failure (engine oil pressure switch wiring disconnected or short circuited to power supply) • Defective engine oil pressure switch • Engine ECU internal circuit failure	Check the connectors, harnesses and engine oil pressure switch. Turn the starter switch to the "OFF" position and then to the "ON" position to check if the error code is displayed again.
00 000110.00	Warning	Engine coolant temperature sensor malfunction: too high	Sensor voltage is 4.8 V or more.	• Engine overheating • Insufficient amount of engine coolant • Defective engine cooling system • Defective coolant temperature sensor system	Inspect the engine cooling system. Check the connectors, harnesses and coolant temperature sensor. Turn the starter switch to the “OFF” position and then to the “ON” position to check if the error code is displayed again.
00 000110.02	Warning	Engine coolant temperature sensor malfunction: intermittent failure	Error undefined is detected 10 times.	• Connection failure of connectors • Harness wiring failure (nearly broken wiring of sensor signal line, sensor 5 V line or sensor GND line) • Defective coolant temperature sensor • Engine ECU internal circuit failure	Check the connectors, harnesses and coolant temperature sensor. Turn the starter switch to the “OFF” position and then to the “ON” position to check if the error code is displayed again.
00 000110.03	Warning	Engine coolant temperature sensor malfunction: short circuit to high voltage side	Sensor voltage is 4.8 V or more.	• Connection failure of connectors • Harness wiring failure (sensor signal line disconnected or short circuited to power supply, or sensor GND line disconnected) • Defective coolant temperature sensor • Engine ECU internal circuit failure	Check the connectors, harnesses and coolant temperature sensor. Turn the starter switch to the “OFF” position and then to the “ON” position to check if the error code is displayed again.

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1 – Baffle Plate
2 – Oil Fill Cap
3 – Valve Cover / Intake Manifold
4 – Gasket
5 – Rocker Arm Shaft
6 – Rocker Arm Shaft Support
7 – Adjuster Lock Nut
8 – Valve Adjuster Screw
9 – Rocker Arm
10 – Circlip
11 – Valve Cap
12 – Keeper
13 – Valve Spring Retainer
14 – Valve Spring
15 – Valve Stem Seal
16 – Valve Guide
17 – Cylinder Head
18 – Exhaust Valve
19 – Intake Valve
20 – Cylinder Head Gasket
21 – Push Rod (2 per cylinder)
22 – Glow Plug
23 – Glow Plug Wiring Harness
24 – Cylinder Head Bolt

Disassembly of Cylinder Head

Prepare a clean, flat working surface on a workbench large enough to accommodate the cylinder head assembly. Discard all gaskets, O-rings and seals. Use new gaskets, O-rings and seals on reassembly of cylinder head.

IMPORTANT

Mark all valve train components so they can be installed in their original locations.

Note: Record all measurements taken during disassembly.

1. Drain coolant from engine into a suitable container.

NOTICE

Identify all parts and their location using an appropriate method. It is important that all parts are returned to the same position during the reassembly process.

---

2. Remove the coolant pump. *See Disassembly of Engine Coolant Pump on page 4-4-4.*
3. Remove the high-pressure fuel lines and fuel injectors from the cylinder head. *See Removal of Fuel Injectors on page 4-3-18.*

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Reassembly of Crankshaft and Piston Components

Notes:

- Proceed slowly. Make no forced assemblies unless a pressing operation is called for. All parts must be perfectly clean and lightly lubricated when assembled.
- Use new gaskets, seals and O-rings during assembly.
- Liberally apply clean engine oil to all internal parts during assembly.
- All fasteners should be tightened to a given torque. If a special torque is not provided in the *See "3-7-2 Engine Tightening Torque" section for tightening torque*, tighten to standard torque specifications.

Reassembly of Pistons

1. Select the parts needed to assemble the piston and connecting rod for one cylinder.
2. If removed, install a new wrist pin bushing **(Figure 4-2-83, (7))** using a press and the appropriate service tool. Be sure to align the oil holes.

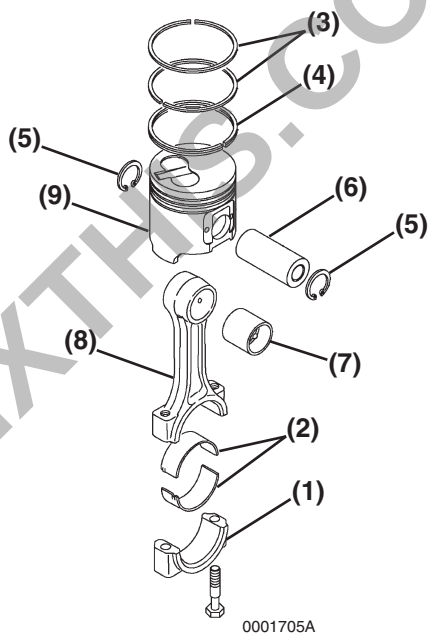


Figure 4-2-83

3. Reinstall one circlip **(Figure 4-2-83, (5))** into the piston. Ensure the circlip is securely seated in the groove.

IMPORTANT

*The piston and connecting rod must be assembled with the correct orientation. When correctly assembled, the piston identification mark **(Figure 4-2-84, (1))** stamped into the top of the piston will be on the opposite side of the connecting rod as the match marks **(Figure 4-2-84, (3))** stamped into the connecting rod and connecting rod cap. When reinstalled in the cylinder, the embossed mark **(Figure 4-2-84, (2))** cast into the beam of connecting rod will face the flywheel end of the engine.*

Note: The actual appearance of the match marks will vary but they will always be in the same locations.

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2. TECHNICAL DATA

2. Technical Data

2-1 Specifications

Item				Unit	ViO27-6
Main specifications of machine					
Dimensions					
Overall length (Transportation position)				mm	4110
				mm	4120
Cabin	Overall height		Transportation position	mm	2530
			Traveling position	mm	2530
	Overall width		Full machine width	mm	1500
Canopy	Overall height		Transportation position	mm	2520
			Traveling position	mm	2520
	Overall width		Full machine width	mm	1500
Tumbler center distance (Steel track / rubber track)				mm	1590
Track gauge				mm	1250
Minimum ground clearance				mm	320
Traveling performance					
Travel speed	Steel track		Low speed (Forward/Reverse)	km/hr	2.8
			High speed (Forward/Reverse)	km/hr	4.5
	Rubber track		Low speed (Forward/Reverse)	km/hr	2.8
			High speed (Forward/Reverse)	km/hr	4.5
Permissible water depth limit				mm	500
Work performance					
Bucket	Width (Standard)			mm	400
	[Standard. JIS heaped capacity]			m^3	0.06
	Number of teeth / Installation method			pcs.	3 / Rubber pin lock type
Work range					
Maximum digging depth	With blade raised			mm	2490
	With blade on the ground			mm	2690
Maximum depth of vertically digging				mm	1150
Maximum dumping height				mm	2830
Minimum front swing radius (with boom in front center)			Cabin	mm	1950
			Canopy	mm	
Minimum front swing radius (with boom in full swing)			Cabin	mm	1650
			Canopy	mm	

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2-6 Periodic Inspection and Servicing

○: Verification and adjustment ●: Replacement □: Cleaning ■: Greasing

Parts & Operations		Daily	Every 50h	Every 250h	Every 500h	Every 1000h / Every year	Every 2000h / Every two years
General	Missing or broken parts	○					
	Tightening of nuts and bolts	○					
	Motor state	○					
	Machine	□					
Transmissions	Oil for travel gears		● 1st time		○	●	
	Rotation reducer		● 1st time		○	●	
Hydraulic circuit	Hydraulic oil	○				●	
	Aspiration filter					□	
	Hydraulic oil return filter		● 1st time		●		
	Operation of the accumulator	○					
Greasing	Greasing points	■					
	Rotation pin and crown		■				
Chassis	Bearing rollers and bearings, idler wheels	○				■	
	Track tension	○					
Electrical equipment	Headlights, horn, travel alarm	○					
	Dashboard and indicators	○					
	System state	○					
Engine	Water separator	○					
	GO filter			●			
	Air filter (dusty atmosphere every 250 h)				●		
	Engine oil	○	● 1st time		●7		
	Oil filter		● 1st time		●7		
	Cooling fluid	○					●
	Belt	○				●	
	Radiator vents	○			□		
	Fuel hose, coolant hose						●
	Intake and exhaust valves					○	
	Injectors and injection pressure						○
Heating						○	

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4. Engine

4-1 Safety

4-1-1 Safety Statements

Yanmar is concerned for your safety and your machine's condition. Safety statements are one of the primary ways to call your attention to the potential hazards associated with Yanmar TNV engine operation. Follow the precautions listed throughout the manual before operation, during operation and during periodic maintenance procedures for your safety, the safety of others and to protect the performance of your engine. Keep the labels from becoming dirty or torn and replace them if they are lost or damaged. Also, if you need to replace a part that has a label attached to it, make sure you order the new part and label at the same time.



This safety alert symbol appears with most safety statements. It means attention, become alert, your safety is involved! Please read and abide by the message that follows the safety alert symbol.

⚠ DANGER

Danger (the word "DANGER" is in white letters with a red rectangle behind it) - indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. Danger is limited to the most extreme situations.

⚠ WARNING

Warning (the word "WARNING" is in black letters with an orange rectangle behind it) – indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION

Caution (the word "CAUTION" is in black letters with a yellow rectangle behind it) – indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

NOTICE

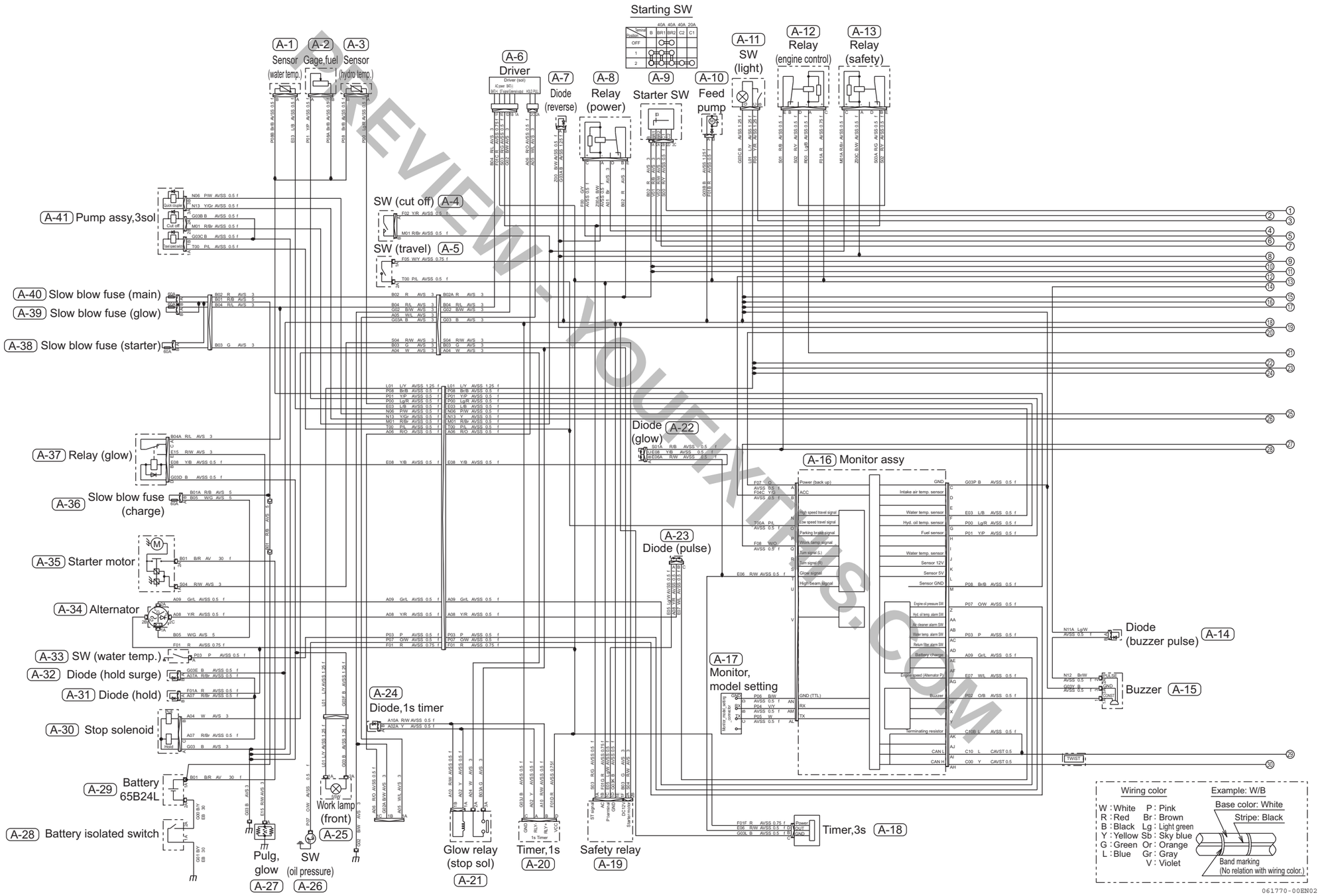
Caution without the safety alert symbol indicates a potentially hazardous situation that can cause damage to the machine, personal property and / or the environment or cause the machine to operate improperly.

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2. TECHNICAL DATA

1) Seat mount harness (standard)

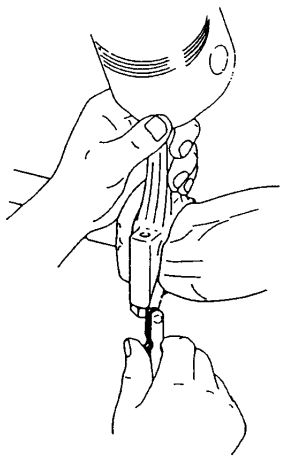
1/2



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1. Using a feeler gauge, measure the connecting rod side clearance **(Figure 4-2-50)**. *See "3-2 Engine Service Standard" section for the service limit.* If the measurement is out of specification, replace the crankshaft, connecting rod, or both.



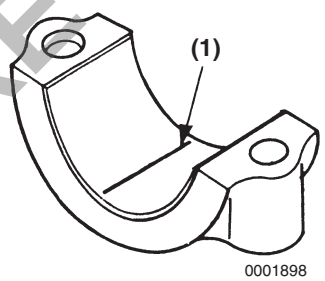
0000219

Figure 4-2-50

IMPORTANT

Mark the connecting rod caps and connecting rods so the caps and connecting rods stay together.

2. Remove the bearing cap. Do not remove the bearing inserts at this time.
3. Wipe oil from the bearing insert and crankshaft journal surfaces.
4. Place a piece of PLASTIGAGE® **(Figure 4-2-51, (1))** along the full width of the bearing insert.



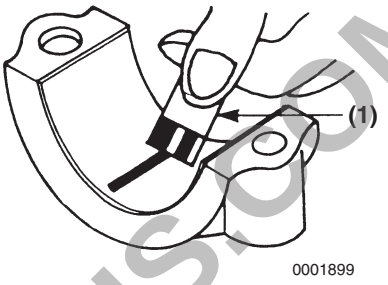
0001898

Figure 4-2-51

IMPORTANT

Do not rotate crankshaft when using PLASTIGAGE. A false reading may result.

5. Reinstall the bearing cap and tighten to specification. *See "3-7-2 Engine Tightening Torque" section for tightening torque.*
6. Remove the bearing cap.



0001899

Figure 4-2-52

7. Compare the width of the flattened PLASTIGAGE **(Figure 4-2-52, (1))** to the graduation marks on the package. The mark that most closely matches the width of the flattened PLASTIGAGE will indicate the bearing oil clearance. Record the measurements. *See "3-2 Engine Service Standard" section for the service limit.*
8. Repeat with the remaining connecting rods.

IMPORTANT

Do not allow the connecting rod to contact the crankshaft journal during piston removal. Damage to the bearing journal may result.

9. Use a wooden dowel against the connecting rod and tap the piston / connecting rod assembly out of the cylinder.
10. Mark the cylinder number on the piston and connecting rod.

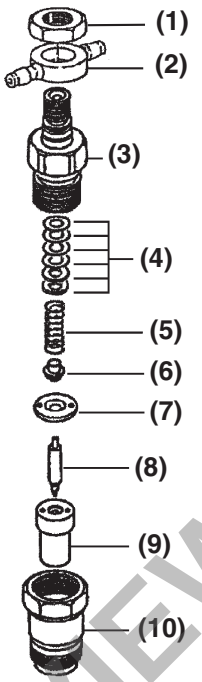
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Disassembly and Inspection of Fuel Injectors

NOTICE

Never use a steel wire brush to clean fuel injectors. Damage to the nozzle and other components is likely to result.

1. Clean carbon from used injectors using clean diesel fuel. Hardened deposits or varnish can be cleaned using a brass wire brush.



1 – Return Fuel Fitting Nut
2 – Return Fuel Fitting
3 – Injector Body
4 – Pressure Adjusting Shims
5 – Spring
6 – Spring Seat
7 – Valve Stop Spacer
8 – Nozzle Valve
9 – Nozzle Body
10 – Nozzle Case Nut

Figure 4-3-32

2. Place the fuel injector in a soft-jawed vise with the nozzle pointing up.
3. Remove the nozzle case nut.
4. Carefully remove the injector from the vise.
5. Turn the injector over and remove the nozzle body, nozzle valve, valve stop spacer, nozzle spring seat, nozzle spring, and shims.
6. Inspect the sealing surfaces **(Figure 4-3-33, (2))** between the valve stop spacer and nozzle body for nicks or scratches. Check the contact area between the valve stop spacer and the nozzle valve **(Figure 4-3-33, (1))** for scoring or pitting. Use a magnifying glass to inspect.

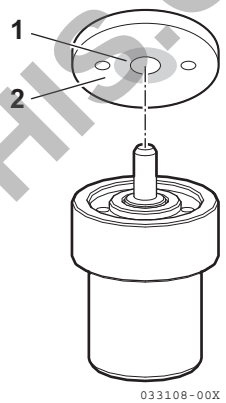


Figure 4-3-33

7. Perform a nozzle valve slide test:
   (a) Wash nozzle body and valve in clean diesel fuel.
   (b) While holding the nozzle body vertical, pull the nozzle valve about 2/3 of the way out **(Figure 4-3-34)**.
   (c) Release the valve. It should fall smoothly to its seat by its own weight.

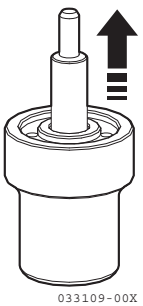


Figure 4-3-34

Replace the fuel injector assembly if it fails any inspection.

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4. Lubricate the shaft of the rotor assembly **(Figure 4-7-14, (1))**. Press the rotor assembly into the front frame housing **(Figure 4-7-14, (2))** and rear frame housing **(Figure 4-7-14, (3))**.

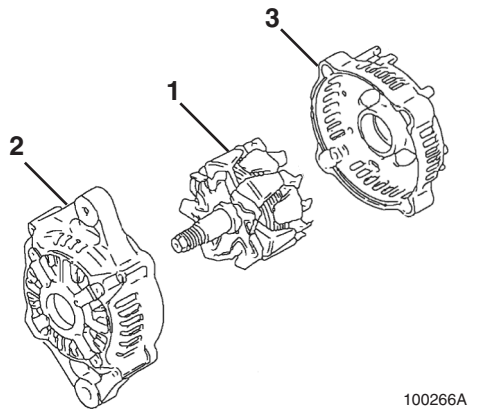


Figure 4-7-14

5. Align the front frame housing with the rear frame housing. Reinstall the two bolts **(Figure 4-7-15, (1))** and two nuts **(Figure 4-7-15, (2))**.

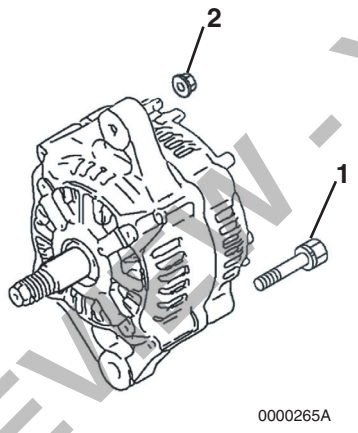


Figure 4-7-15

6. Reinstall the insulation bushing **(Figure 4-7-16, (4))** and nut **(Figure 4-7-16, (3))**.

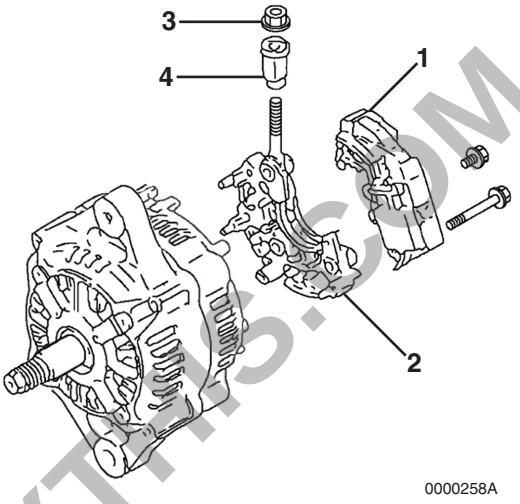


Figure 4-7-16

7. Reassemble the regulator assembly **(Figure 4-7-16, (1))** to the holder **(Figure 4-7-16, (2))**.
8. Reinstall the brush holder **(Figure 4-7-17, (3))**, springs **(Figure 4-7-17, (4))** and brushes **(Figure 4-7-17, (5))**.
9. Reattach the regulator assembly and holder to the rear frame housing.

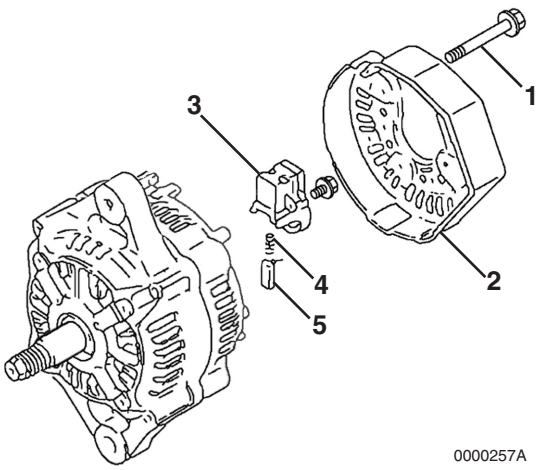
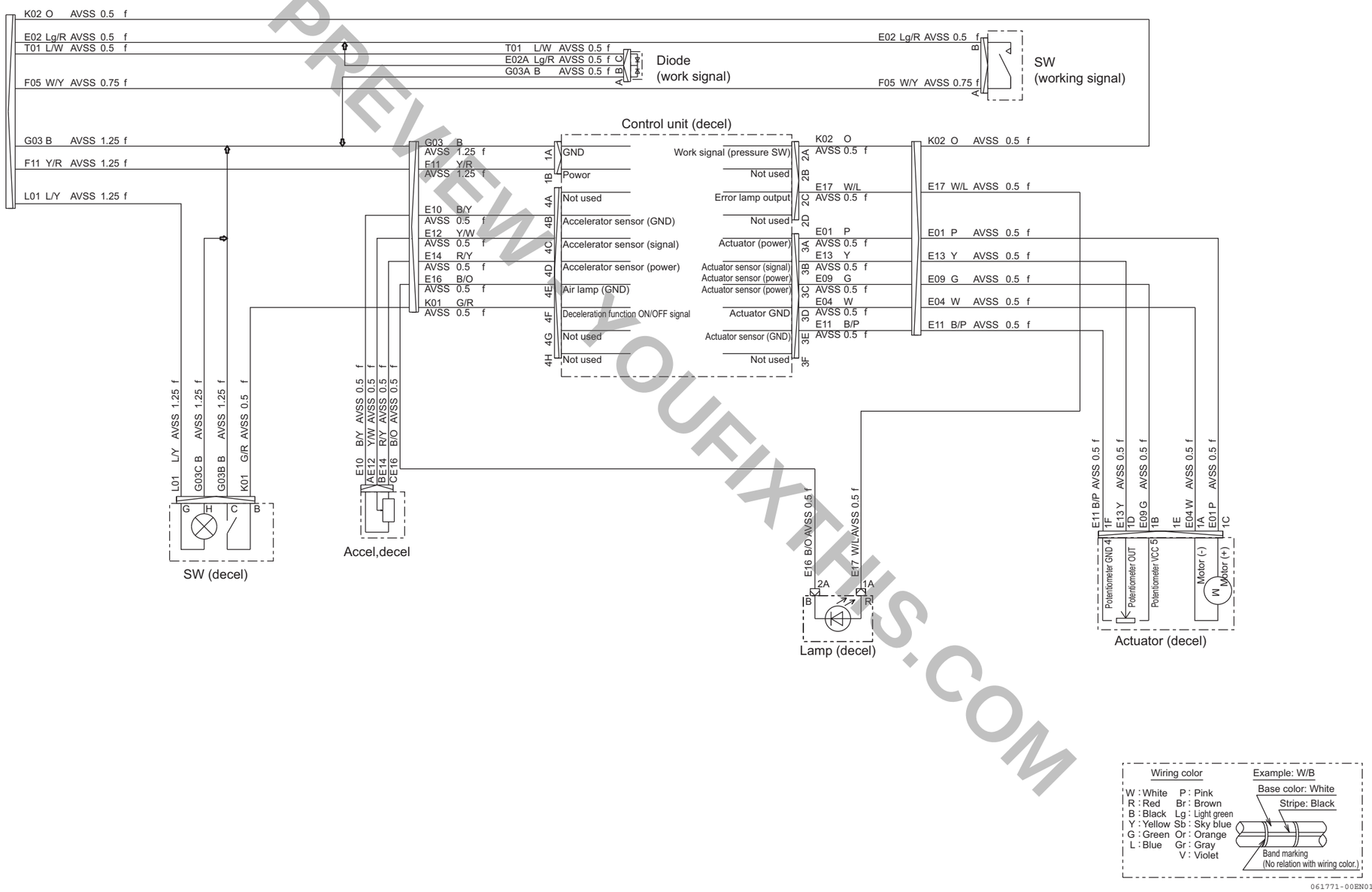


Figure 4-7-17

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Decel harness



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5. Disassembly and Reassembly

1) Precautions for Disassembly and Reassembly

(1) Since the parts of this hydraulic system are precision-made for tight clearances, be sure to perform disassembly and reassembly in a clean area that is free from dust.
(2) Prepare clean tools and cleaning oil and handle the parts carefully.
(3) First clean the external surface of the removed assemblies.
(4) Before beginning disassembly, review the drawings of the internal construction and prepare the required parts according to the purpose and extent of the disassembly.
(5) Never disassemble or readjust the adjust screws unless required. If they are disassembled or readjusted, it may cause the set horsepower to be changed and have a negative influence.
(6) In principle, the removed seals and rings must be replaced with new ones. As some replacement parts are available only in subassemblies, refer to the parts catalog to prepare the necessary subassemblies in advance.
(7) Handling of O-rings
[1] Lubricate the O-rings and the O-ring fitting seats with clean grease or hydraulic oil.
[2] The O-rings may not be damaged in handing or distorted by heat.
[3] Do not permanently deform the O-rings.
[4] Avoid rolling the O-rings when fitting them.
A distorted O-ring may not return to its original shape, and therefore may cause oil leak.
(8) Before beginning reassembly, check the mating surfaces of each section to be sure that there is no cleaning oil or hydraulic oil on the outer surface of the O-ring grooves. If reassembly is performed without cleaning such oil, it may be mistaken for oil leak.
(9) Use a torque wrench to tighten the bolts following the torque specification.

2) Tools for Disassembly and Reassembly

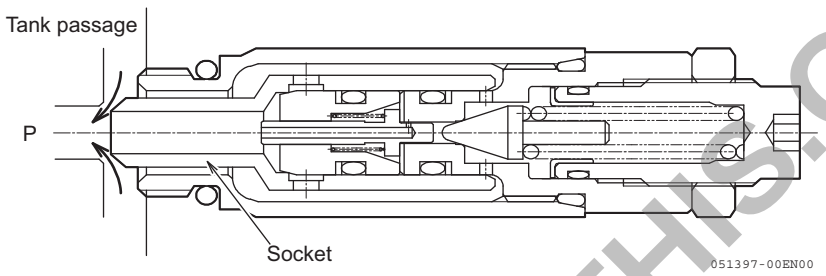
Tools	Q'ty	Nominal size (Unit : mm)
Hexagon bar wrench	1 for each	4, 6 and 8
Offset wrench	1	13
Snap ring pliers	1	For internal snap ring
Plastic hammer	1	
Hexagon socket head bolt	2	M10×65
Grease	Little	

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(2) Suction operation

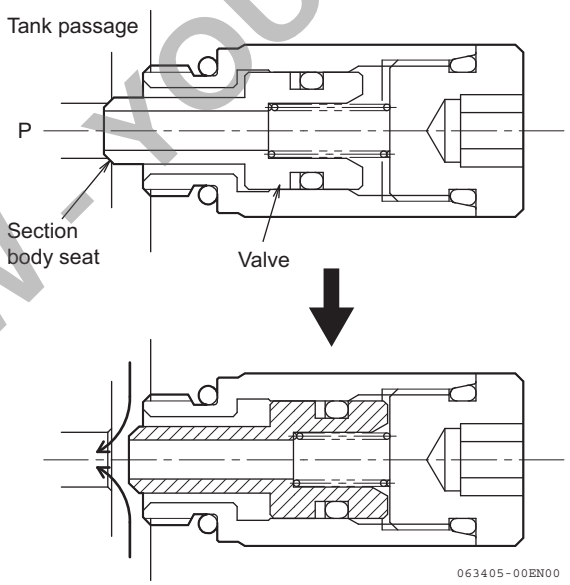
When negative pressure is generated in the port P, the port P is supplied with oil from the tank passage to prevent negative pressure.

When the pressure in the tank passage exceeds that in the port P, upward force is applied to the socket. This creates an opening between the section body seat and the socket, and oil flows from the tank passage to the port P, so that the space in the port P is filled with oil.



(3) Anti-cavitation valve

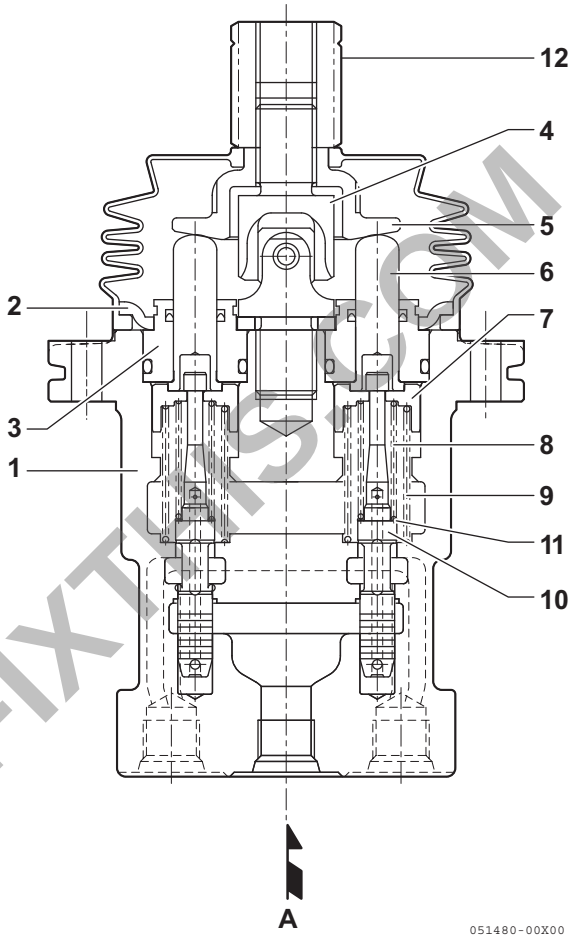
When negative pressure is generated at the port P, oil is fed to the port P through the tank passage. When the pressure in the tank passage exceeds the pressure at the port P, pressing force is applied to the valve. Consequently, the valve is opened and oil flows into the port P through the tank passage, thus filling the space within the port.



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2. Structure

The pilot valve consists of casing **1** with vertical holes and pressure reducing valve assemblies installed therein. The pressure reducing valve assembly comprises spool **10**, spring (secondary pressure) **8**, spring (return) **9**, spring seat **7** and washer 2 **11**. Spring (secondary pressure) **8** has been set so that the specified secondary pressure [0.5 to 1 MPa] is achieved. Spool **10** is pressed against push rod **6** by spring (return) **9**. When the control lever is tilted, push rod **6** is pushed down and in turn spring seat **7** is moved down; accordingly, the setting of spring (secondary pressure) **8** is changed. Casing **1** has six ports: port P (inlet port), port T (outlet port) and four output ports 1, 2, 3 and 4 from which secondary pressure is delivered.



3. Function

The function of spool **10** is to switch between an oil passage through which the pilot pressure fed to port P from the hydraulic pump is led into output ports (1, 2, 3 and/or 4) and an oil passage through which the pilot pressure at output port(s) is led into port T. Spring (secondary pressure) **8** acts on this spool **10** to determine the output pressure. Push rod **6** is slidably installed in plug **3** to change the amount that spring (secondary pressure) **8** is compressed. Spring (return) **9** acts on casing 1 and spring seat **7** to return push rod **6** to the point of zero displacement, regardless of the output pressure, thereby ensuring that spool **10** returns to the neutral position. In addition, it serves as a reaction spring to give an operation feeling to the operator so that an appropriate operating force is applied.

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Trouble	Cause	Measure
2. Motor does not stop or is slow to stop.	(4) Increasing leaking. [1] Increasing inner leaking due to breakage of O-ring seal.	• According to 1-(2), and 1-(3), take measures and remedies.
3. Abnormal sound.	(1) Defective seat of make up valve. [1] Foreign substances caught inside. [2] Broken spring.	• Remove all foreign substances, repair any damaged area, clean parts and reassemble them. If damage is serious and too much oil leaks, replace make-up valve seat. • Replace spring. Remove all foreign substances, repair any damaged area, clean parts and reassemble them. Replace if seriously damaged and too much oil leaks.
	(2) Short supply of pressure and oil amount to make up valve.	Check supply pressure and oil amount of make-up valve, and set specified value if necessary.
	(3) Resonance with other relief valves due to change of relief set pressure.	Readjust set pressure of relief valve.
4. Large shock in stopping swinging.	(1) Malfunction of shock reduction system. [1] Foreign substances caught inside. [2] Pressure oil is not supplied to piston chamber. [3] Increasing leaking due to worn sliding surface of piston.	• Remove all the foreign substances, repair any damaged area, clean parts and reassemble them. Replace if damage is serious and too much oil leaks. • Clean relief assembly to remove foreign substances clogged in orifice. • Repair any damage area, or replace with new one.
	(2) Increasing relief set pressure.	Readjust set pressure of relief valve.
	(1) Malfunction of relief valve. [1] Foreign substances caught in sliding parts.	• Remove all foreign substances, repair any damaged area, clean parts and reassemble them. Replace if damage is serious and too much oil leaks.

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No.	Parts	Inspection item	Standard value (recommended value for replacement	Measure
17	Cylinder barrel **40**	Clearance between it and piston assembly. Sliding surface against valve plate. Surface roughness	0.02 mm (0.04 mm) No excessive flaws (over 0.02 mm), wear or seizure. 0.4 Ra (0.8 Ra)	Replace cylinder barrel and piston assembly together. When sliding surface has roughened, repair it by lapping (#1000). If the damage is beyond repair, replace the cylinder barrel and piston assembly together.
18	Springs **34, 43, 60, 64, 68** and **82**	Breakage or distortion		Replace.
19	Piston assembly **37**	Clearance between it and cylinder barrel. Sliding surface against swash plate and surface roughness. Play between pistons and shoes	Same as No.17 Same as No.16 0.15 mm 0. 4 mm	Same as No.17 Same as No.16 Replace.
20	Piston assembly **35**	Clearance between it and flange holder. Sliding surface against swash plate and surface roughness.	Same as No.17 Same as No.16	Same as No.17 Same as No.16
21	Valve plate **46**	Sliding surface against cylinder barrel and surface roughness. Thickness : 5 mm	Same as No.17 4.8 mm	Same as No.17 Replace.
22	Base plate **53**	Sliding surface against plunger. Sliding surface against spool.	No excessive flaws, wear or seizure. No excessive flaws, wear or seizure.	Replace base plate and plunger together. Replace base plate and spool together.
23	Plunger **58**	Sliding surface against base plate. Sliding surface against check valve.	No excessive flaws, wear or seizure. No excessive flaws, wear or seizure.	Replace base plate and plunger together. Replace plunger and check valve together.
24	Check valve **59**	Sliding surface against plunger. Seat surface against plunger.	No excessive flaws, wear or seizure. The plunger is seated completely.	Replace plunger and check valve together. Replace plunger and check valve together.
25	Spool **67**	Sliding surface against base plate.	No excessive flaws, wear or seizure.	Replace base plate and spool together.
26	Valve body **76**	Sliding surface against check valve.	No excessive flaws, wear or seizure.	Replace check valve and valve body together.
		Seat surface against check valve.	The check valve is seated completely.	
27	Check valve **81**	Sliding surface against valve body.	No excessive flaws, wear or seizure.	Replace check valve and valve body together.
		Seat surface against valve body.	The valve body is seated completely.	

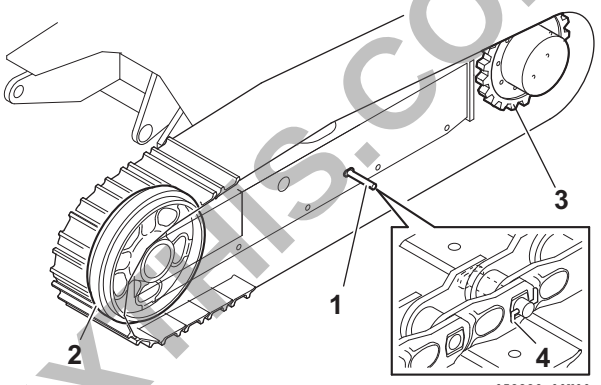
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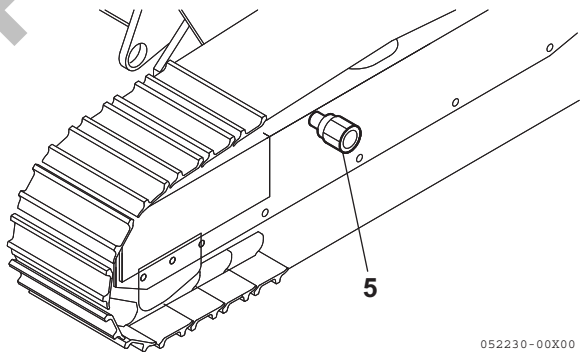
3) Removal of Steel Track

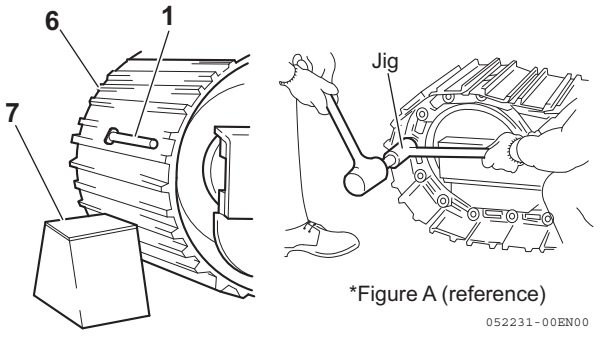
⚠ Do not put your fingers between the shoes.

⚠ Handle the steel tracks with great care, as they are heavy.

165.5 kg/for each track

Procedure	
(1) Stop machine so that master pin **1** should be in lower middle position between idler **2** and sprocket **3**. (2) Remove cotter pin **4**.	

(3) Lower implement to ground, and remove nipple valve **5** to loosen steel track tension. ***Note :*** *Move machine back and forth if grease does not come out smoothly.*	

(4) Turn track shoe **6** until master pin **1** is positioned in front of idler **2**. (5) Set block **7**. (6) Put jig on master pin **1** and remove it by patting with hammer. ***Note :*** *When using hammer to remove master pin, take care not to give permanent set on top of master pin.*	

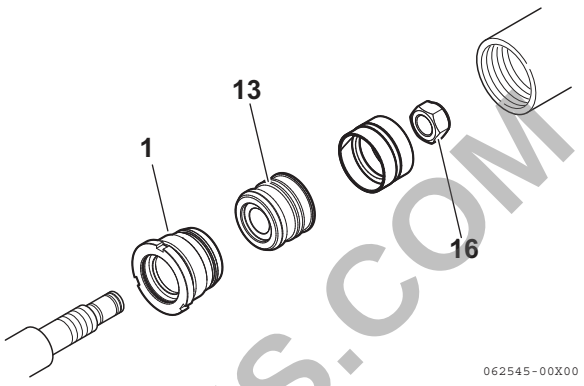
4) Reinstallation of Steel Track

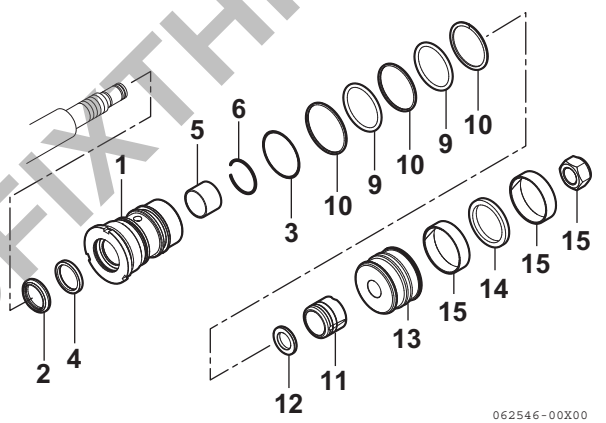
Install the steel track in the reverse order of the removal procedure.

Note :

*For how to bend cotter pin **4**, refer to Section "7-2-4 Points of Reassembly (Steel Track)"*

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Procedure	
(6) Disassembly of arm, bucket, boom swing and blade cylinders Loosen locknut **16** to remove piston **13**, and head **1** from rod in order.	

(7) Remove seal assembly **14** and wear rings **15** from piston **13** and remove all O-rings, back-up rings, retaining ring **6** (or clip **7**), U-seal **4**, lip seal **2**, cushion plunger **11** and seal **12** and head sleeve **5** from head **1**. ***Note :*** *Use a sharp tool to raise each O-ring or piston seal, and then insert a spatula to remove it.*	

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