YANMAR

TECHNICAL MANUAL

DIESEL TRACTOR

EF-312T
EF-352T

Read this manual thoroughly before attempting repair or maintenance work on this machine. Failure to understand the information contained in this manual could result in an accident or a decline in the performance or condition of the machine.

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I

Rough disassembly of components **1**
1. Periodic inspection items **2**
1-1. Check and change of oils 2
1-2. Replacement of elements 4
1-3. Check and change of coolant 5
1-4. Check and supply of fuel 6
1-5. Air bleeding of fuel 6
1-6. Cleaning and replacement of radiator screen and air cleaner element 7
1-7. Check and replacement of battery 7
1-8. Check of pipes 9
1-9. Check of electrical wiring 9
1-10. Greasing points 10
1-11. Check and adjustment of brake 11
1-12. Check and adjustment of clutch 11
1-13. Check and adjustment of steering wheel 12
1-14. Check and adjustment of fan belt 12
1-15. Check and adjustment of toe-in 12
1-16. Check and replacement of fuse and slow blow fuse 13
1-17. Check of tire 13
2. Exterior **15**
2-1. Opening and closing hood 15
2-2. Opening and closing engine side cover 15
3. Clutch housing **16**
3-1. Disassembly and assembly of engine and clutch housing 16
4. Disassembly of floor **19**
5. Front axle assembly **21**
6. Rear axle assembly **22**
7. Hydraulic cylinder case **23**

II

Engine **25**
1. Structure and functions **26**
1-1. Outline 26
1-2. Fuel system 27
1-3. Fuel system (Injection pump) 30
1-4. Lubricant system 32
1-5. Coolant system 33
1-6. Service standards 35
2. Removal of the fuel injection pump **40**

III

Clutch **43**
1. Structure and functions **44**
1-1. Outline 44
2. Disassembly and assembly **45**
2-1. Disassembly 45
2-2. Service standards 46
2-3. Assembly of clutch 46
3. Check and adjustment **47**
3-1. Check and adjustment of clutch 47
3-2. Precautions for storage for long period 47

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SAFETY

(1) This is the safety-alert symbol. When you see this symbol on your machine or in this manual, be alert to the possibility of personal injury and read carefully the messages that follow.



(2) This machine is of metric design. All hardware is metric (ISO). Make sure you use the specified metric hardware when service becomes necessary.



SAFETY-ALERT SYMBOL

The signal words "DANGER" "WARNING" "CAUTION" are used with the safety-alert symbol.

(1) "DANGER" denotes the extreme hazard which would result in high probability of irreparable injury if proper precautions are not taken.



(2) "WARNING" denotes the hazard which would result in injury if proper precautions are not taken.



(3) "CAUTION" denotes the general precautions.

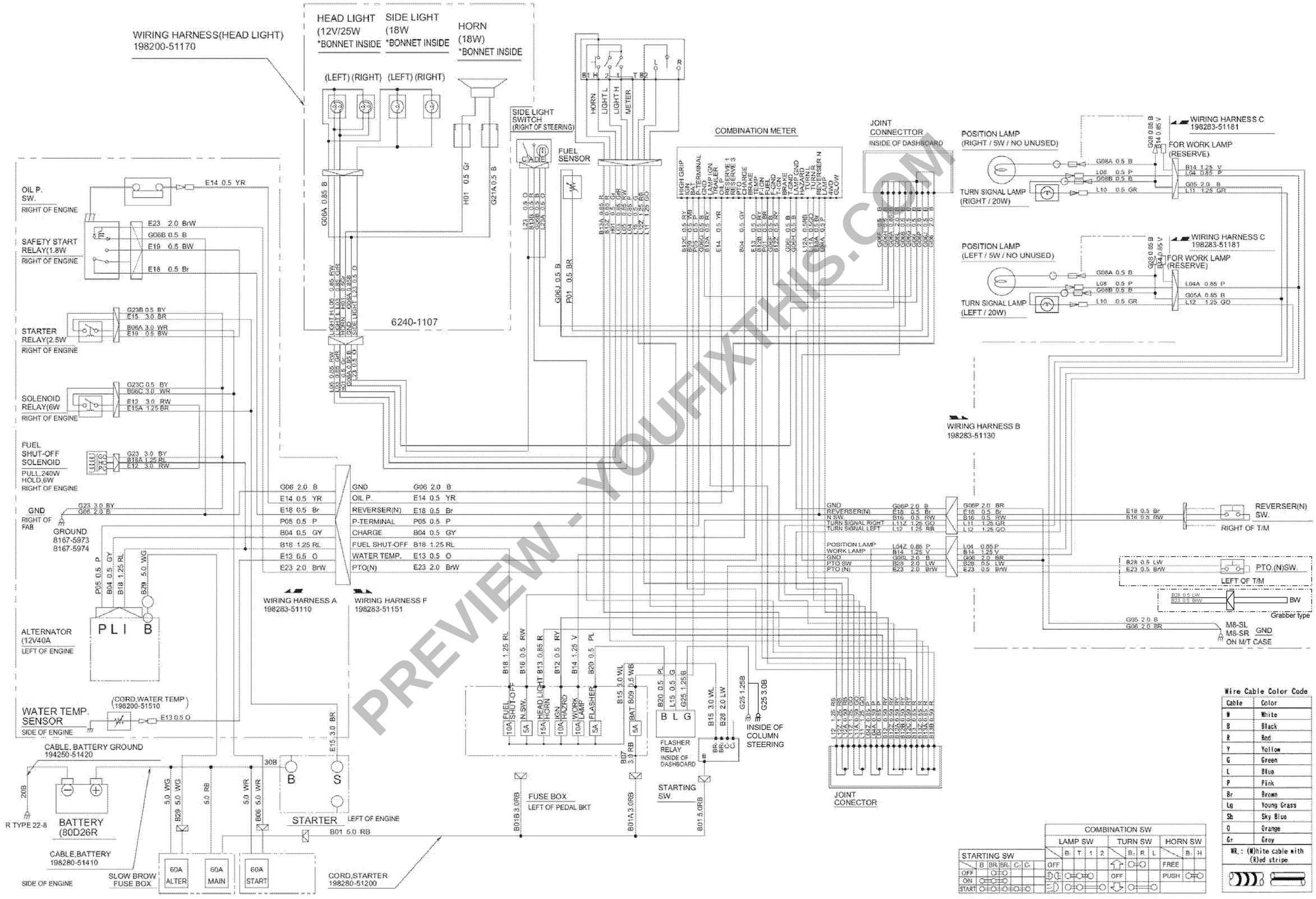


IMPROVEMENTS

To improve or upgrade the feature of the machine or for some other reason, parts are sometimes changed. In this case, parts of this manual may not apply to the machine.
The company has the right to improve or change when it becomes possible and practical to do so without incurring any obligations to make changes or additions to the equipment sold previously.

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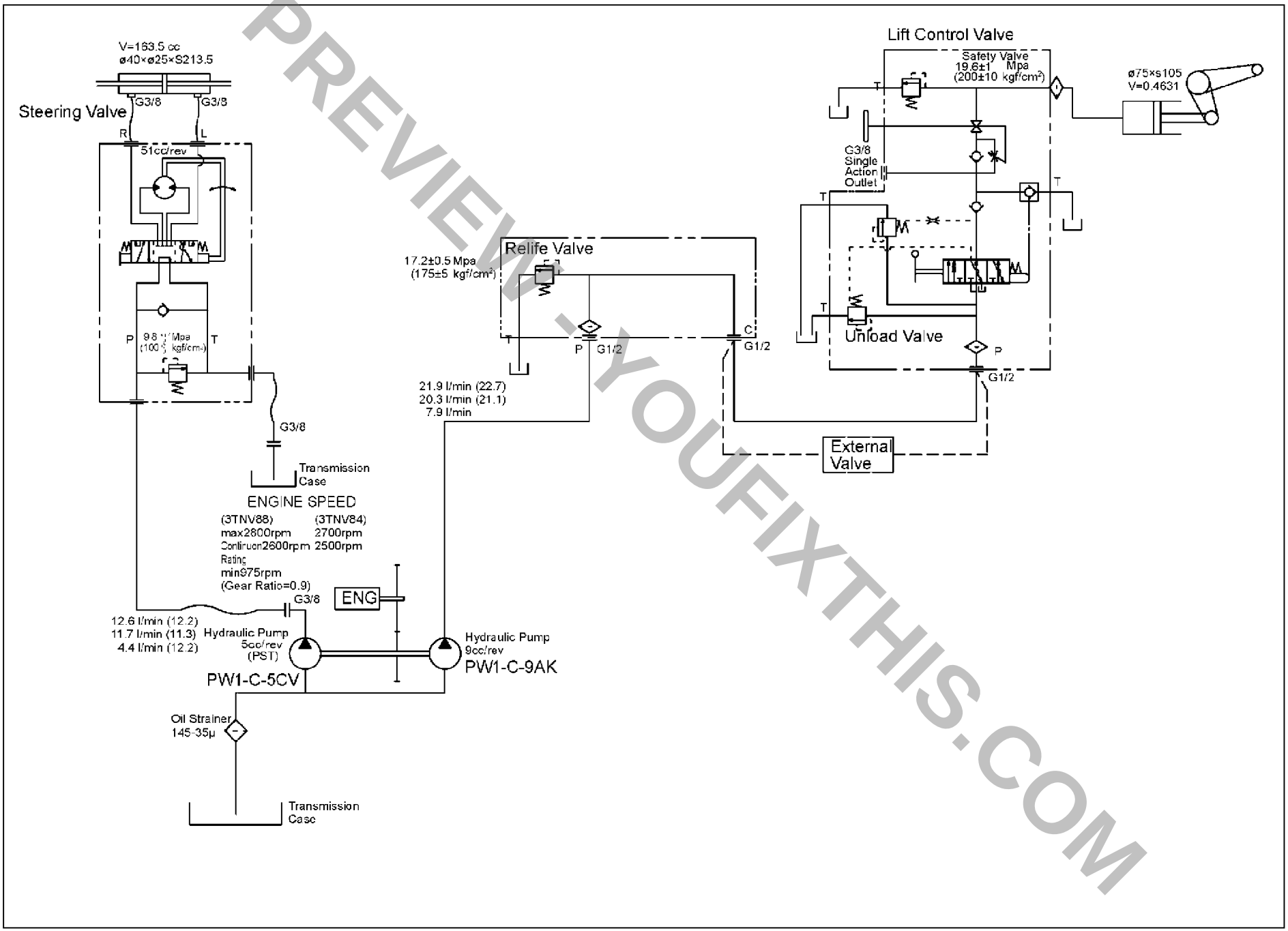
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1. Hydraulic Circuit Diagram



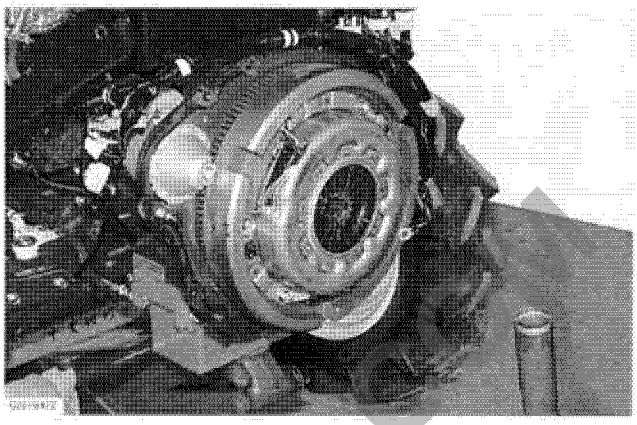
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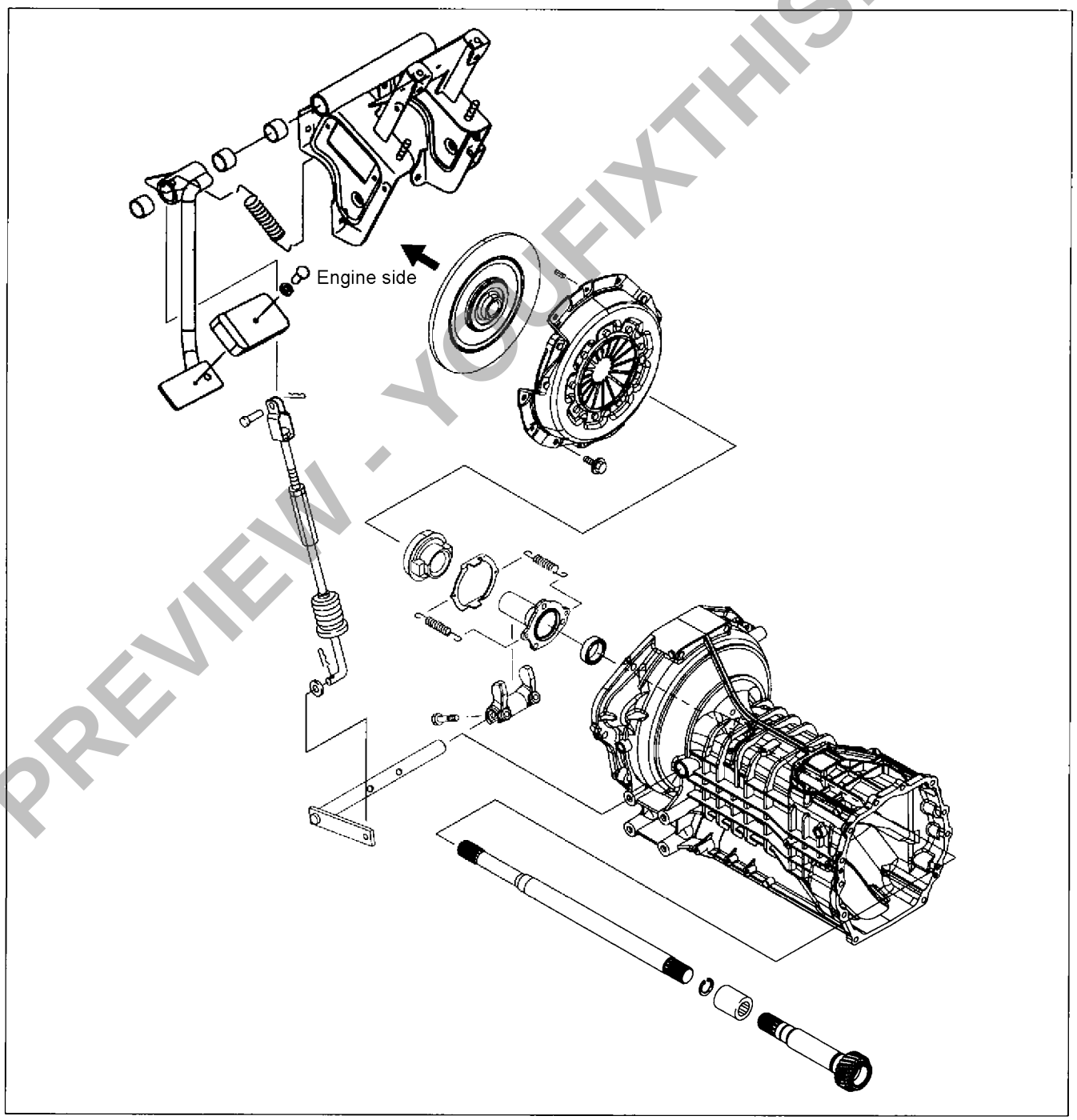
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2. Disassembly and assembly

2-1. Disassembly

As for disassembly and assembly of the clutch housing, refer to the part catalog page 23, 24.





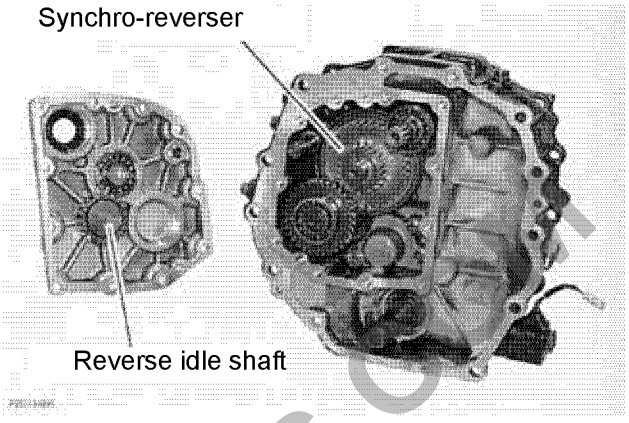
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1-4. Disassembly in transmission

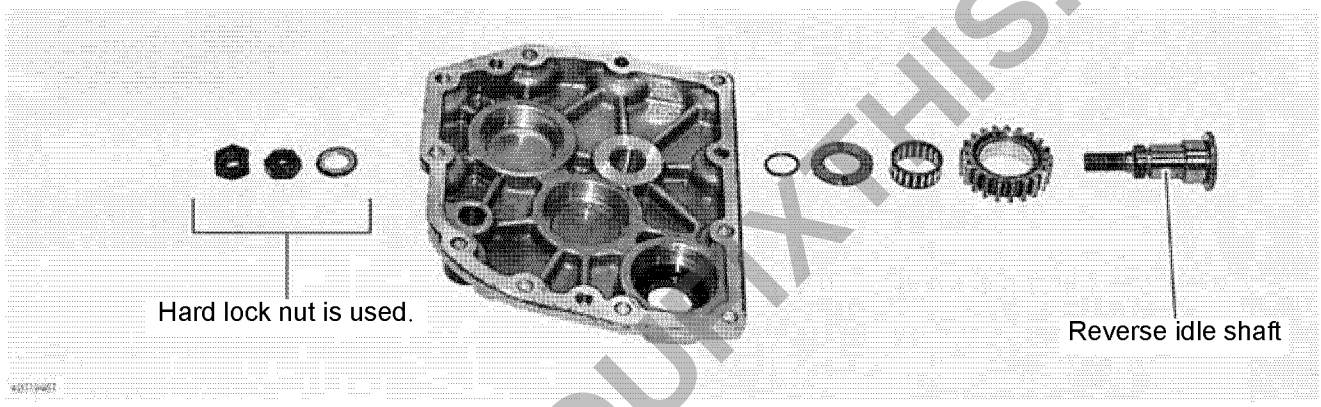
(1) Center plate

1. Remove the reverser case cover.
2. Remove the reverser gear and the synchro-reverser.



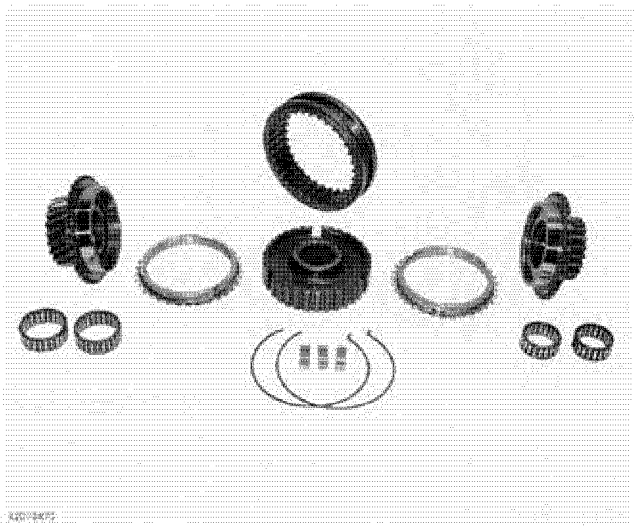
● Reverse idle shaft
Tightening torque: 29 - 38 N·m (3.0 - 3.9 kg·m)

Hard lock nut is used for fixing of the reverse idle shaft.



● Synchro-reverser

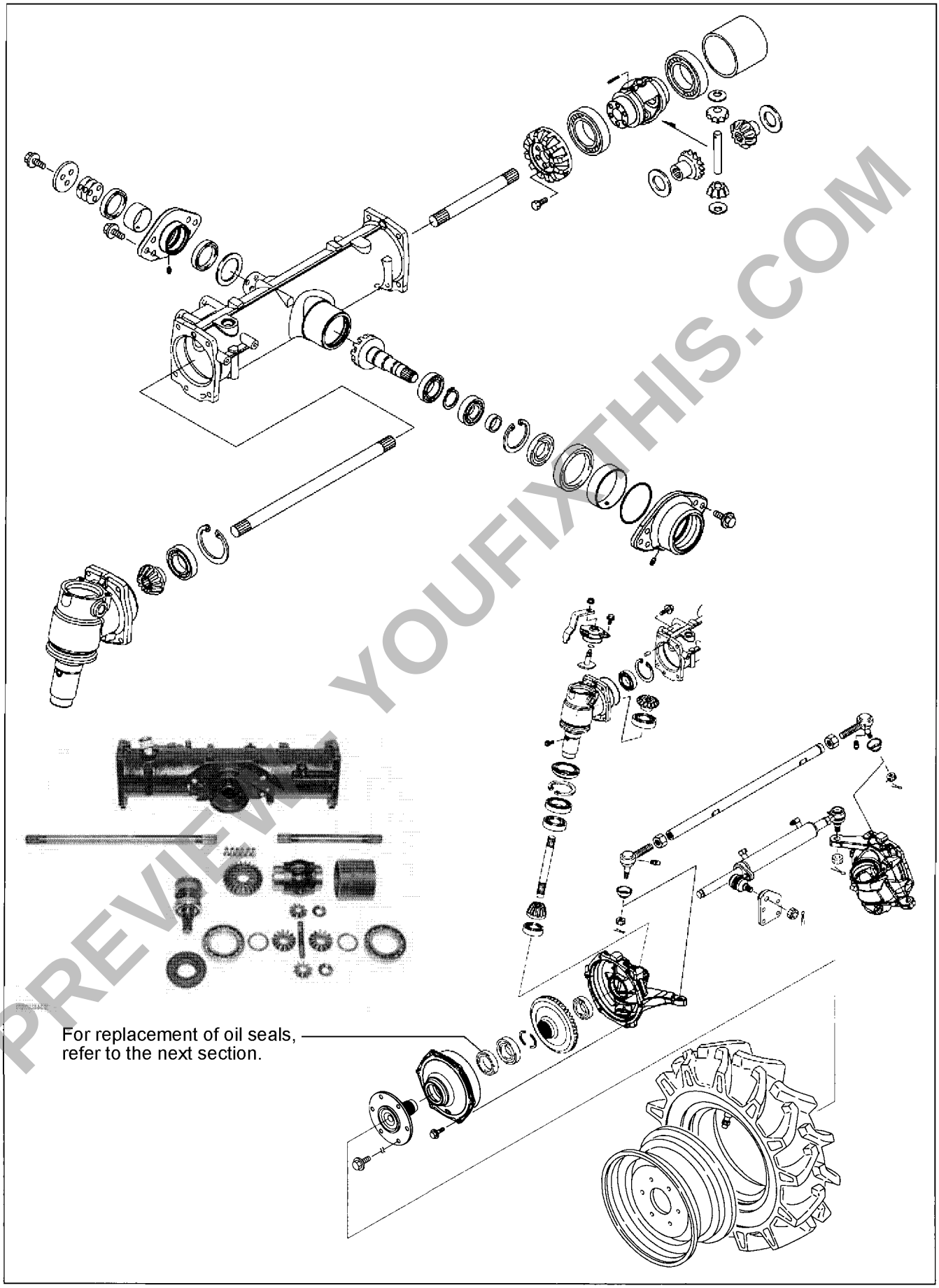




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2-2. Development



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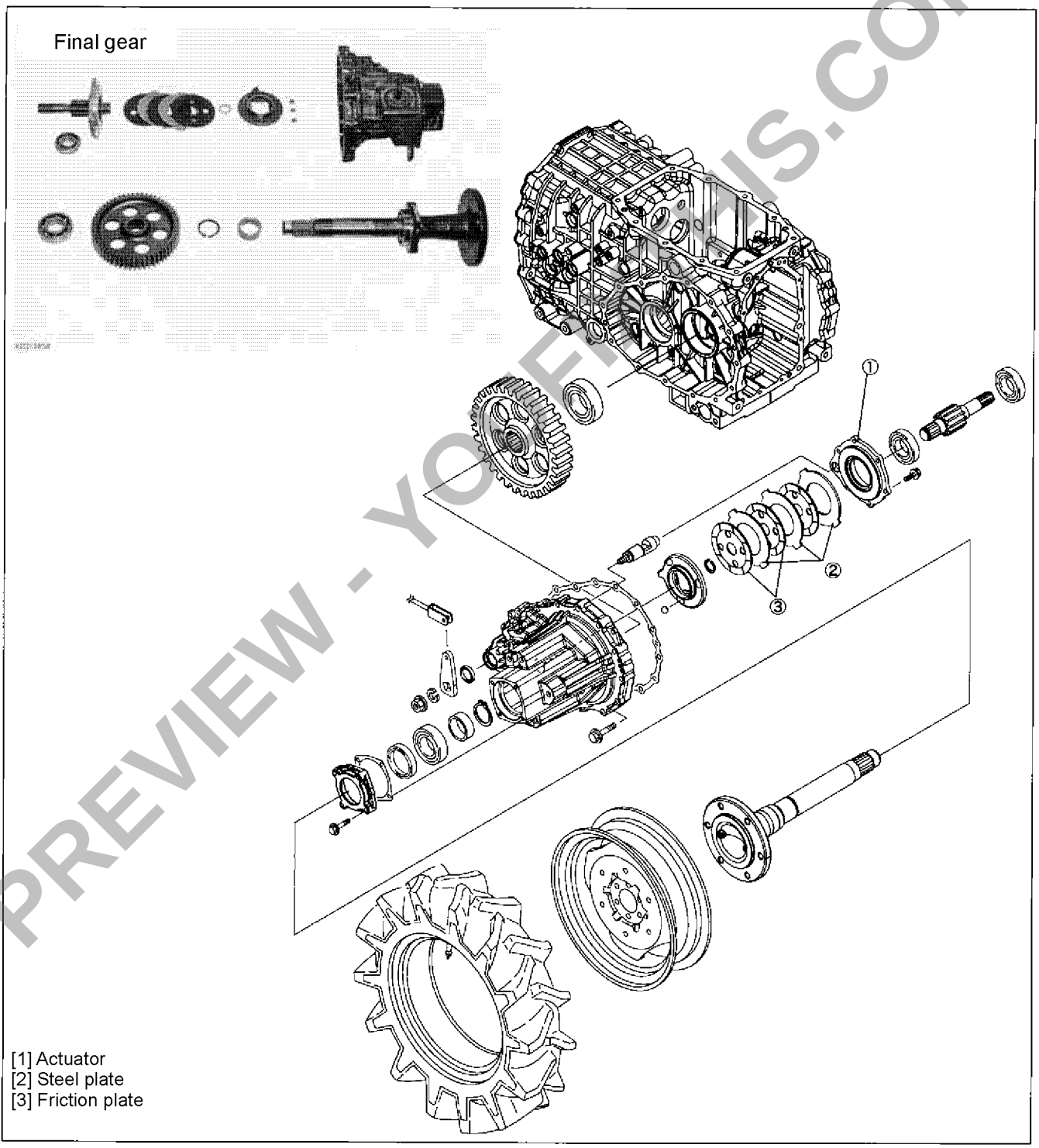
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2. Disassembly and assembly

2-1. Service standards

Item	Standard (mm)	Remarks
Spiral bevel gear backlash	0.13 - 0.18	Perform shim adjustment before assembling the differential lock shaft fork
Thickness of brake friction plate	3.3 - 3.5	Replace if the thickness is 3.1 mm or less

2-2. Development



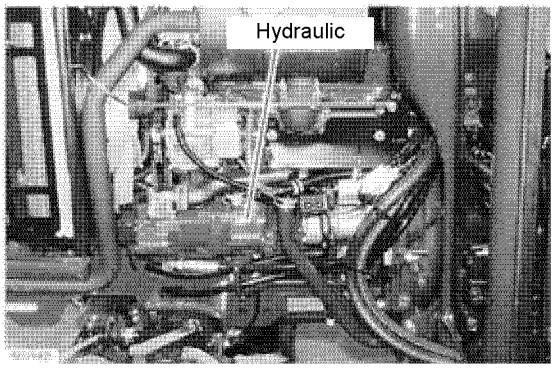
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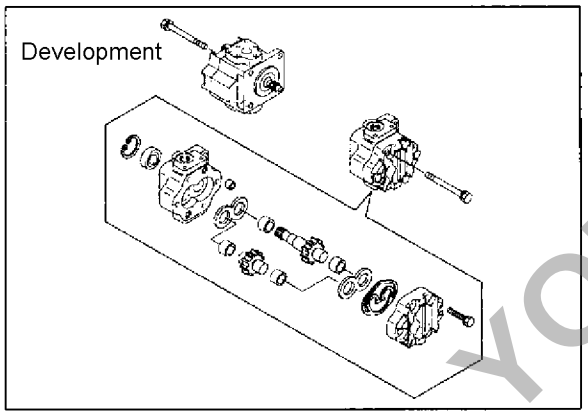
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1-3. Components

(1) Hydraulic pump

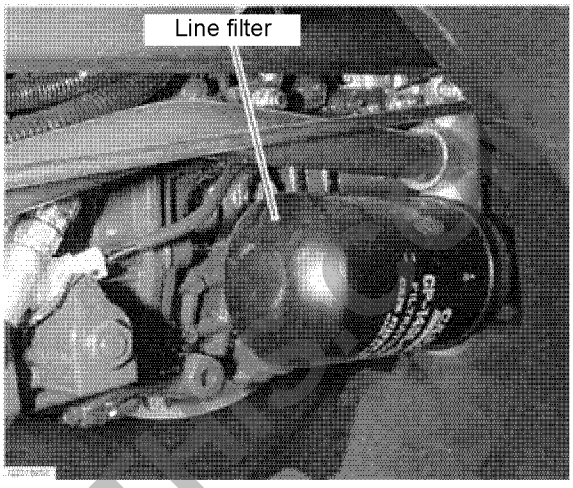
The hydraulic pump draws oil from the transmission case through the oil filter. The oil is fed from the SCV (Sub control valve) or the relief valve case (Non-SCV type) to the lift valve (hydraulic lift unit).
Gear pump (PW1-C-9C1) is used as the hydraulic pump.





(2) Oil Filter

Line filter is used as the oil filter.
● Line filter (from 145 to 35 μ)

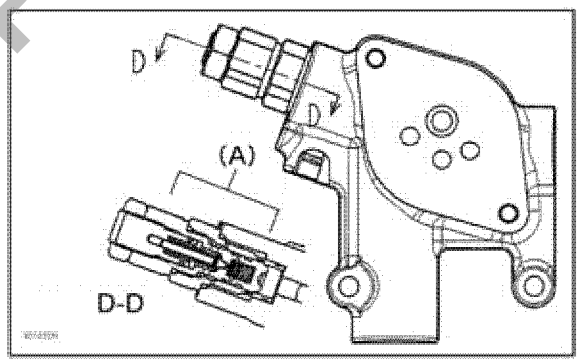


(3) Relief valve

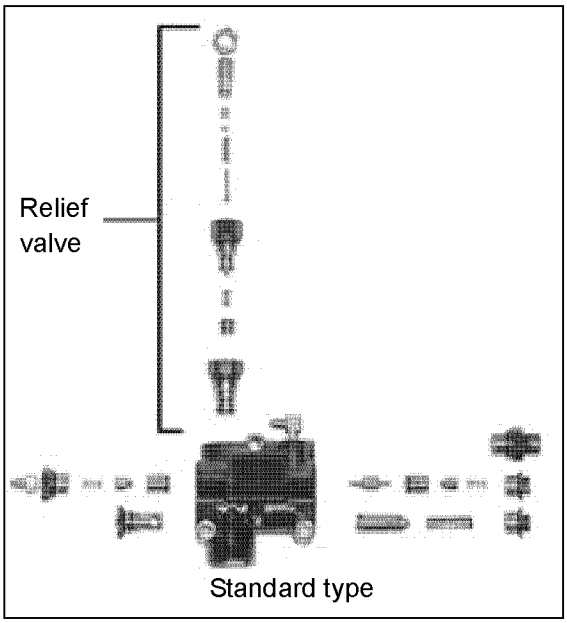
The relief valve protects the hydraulic circuit by regulating the maximum pressure in the hydraulic circuit. If the pressure in the circuit exceeds the specified relief pressure, it overcomes the spring force, causing the valve to return oil into the transmission case.

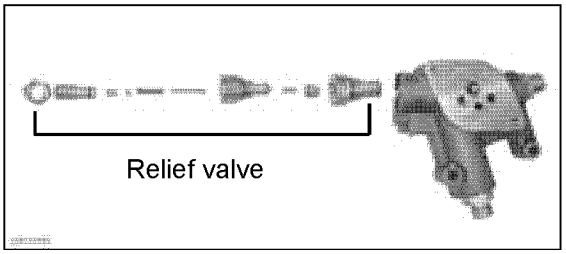
Relief pressure	17.2±0.5MPa(175±5kgf/cm^2)

* Setting at relief valve case



SCV type





SCV type

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SCREW TIGHTENING TORQUE TABLE

Tighten screws, bolts and nuts according to the table below. If the tightening torque is specified, follow the specification.

General tightening torque Unit: N-m (kgf-m)

Items	Thread diameter	Tightening torque
PT plug	1/8	9.8 (1.0)
	1/4	19.6 (2.0)
	3/8	29.4 (3.0)
	1/2	58.8 (6.0)
Pipe joint bolt	M8	13.0 - 16.4 (1.3 - 1.7)
	M12	24.5 - 34.3 (2.5 - 3.5)
	M14	39.2 - 49.0 (4.0 - 5.0)
	M16	49.0 - 58.8 (5.0 - 6.0)

General tightening torque of bolts N-m (kgf-m)

	Standard thread screw		
Nominal size	4T	7T	10, 9T
M6	4.90 - 6.86 (0.5 - 0.7)	8 - 12 (0.8 - 1.2)	–
M8	12.74 - 16.66 (1.3 - 1.7)	23 - 29 (2.3 - 3.0)	30-34 (3.0-3.5)
M10	24.50 - 34.36 (2.5 - 3.5)	44 - 59 (4.5 - 6.0)	61-71 (6.2-7.2)
M12	44.10 - 58.80 (4.5 - 6.0)	78 - 98 (8.0 - 10.0)	101-116 (10.3-11.8)
M14	68.80 - 83.30 (7.0 - 8.5)	118 - 147 (12.0 - 15.0)	167-196 (17.0-20.0)
M16	107.80 - 137.20 (11.0 - 14.0)	167 - 206 (17.0 - 21.0)	260-304 (26.5-31.0)
M18	156.80 - 186.20 (16.0 - 19.0)	235 - 284 (24.0 - 29.0)	343-402 (35.0-41.0)
M20	215.60 - 264.60 (22.0 - 27.0)	324 - 402 (33.0 - 41.0)	490-568 (50.0-58.0)

* The tightening torque of fine thread screws shall be 80% of that of the standard thread screws.
Recently, all the bolts may be standardized to 7T bolts under the plant line management of Yanmar.
When 7T bolt is used with rubber, rubber packing or aluminum parts, tighten the bolt following the values in the 4T-bolt table.

Bolt standard

		4T	7T
Tensile Strength (kgf/sq.mm)	Minimum	40	70
Brinell Hardness (Hb)	Minimum	105	201
	Maximum	229	277
Yield Point (kgf/sq.mm)	Minimum	23	50

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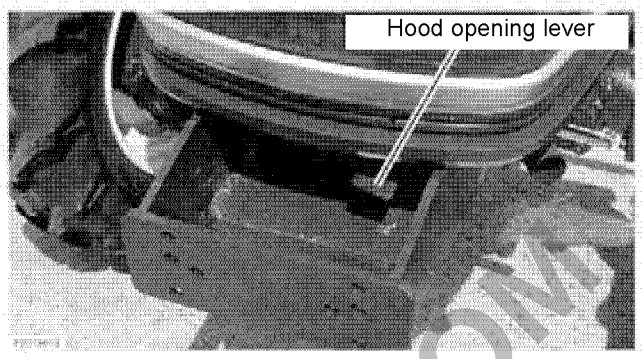
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2. Exterior

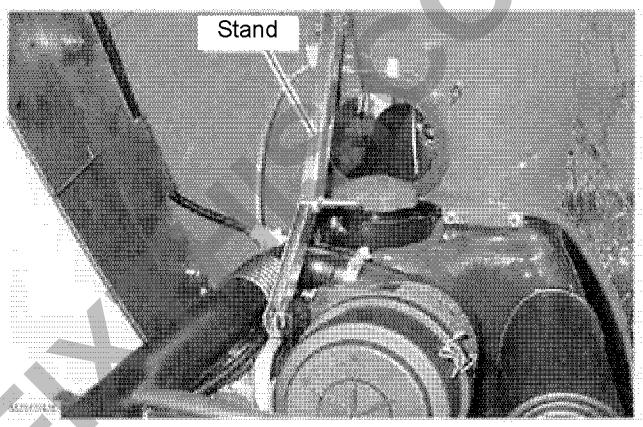
2-1. Opening and closing hood

(1) Opening hood

1. When the hood opening lever is raised, the hood is unlocked.



2. When the hood is lifted with your hands, the stand is automatically locked.

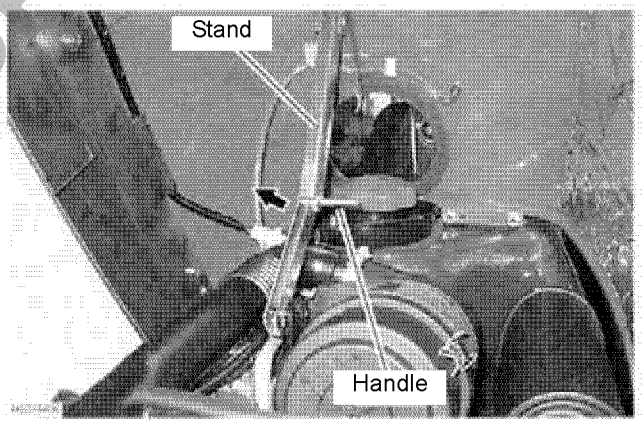


⚠ CAUTION

- When the hood is opened for check, the hood and the front mask are opened simultaneously. Pay close attention not to bump your head on them.

(2) Closing hood

1. Slightly lift the hood, hold the handle in the center of the stand, and pull it in the arrow direction shown in the figure on the right side. Then, it can be unlocked.
2. Lower the hood, and fully press the top face of the front of the hood with your hands until a click sound is heard.
3. After closing the hood, try lifting it to make sure that it is securely locked.

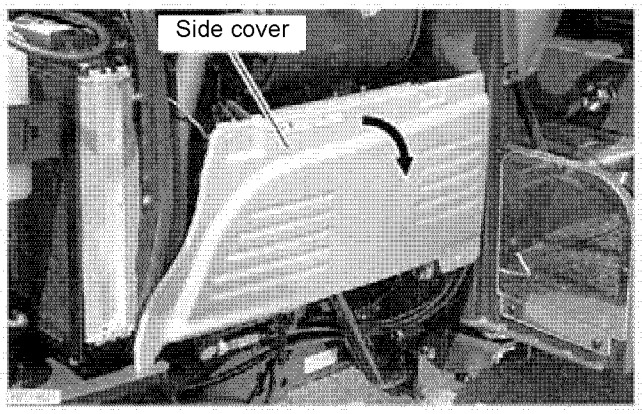


⚠ CAUTION

- When closing the hood, pay close attention not to pinch your fingers in the hood or stand.

2-2. Opening and closing engine side cover

Pull the top of the side cover to your side, and pull it up.



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