YANMAR

SERVICE MANUAL

CRAWLER CARRIER

C30R-3

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

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 Power Transmission 2-4-1
2-5 List of periodic inspection and servicing 2-5-1
2-6 Fuel, Lube Oil and Grease Recommended 2-6-1
2-7 Hydraulic Circuit Schematic 2-7-1
2-8 Wiring Diagram 2-8-1

CHAPTER 3
SERVICE STANDARDS

3-1 Machine Performance 3-1-1
3-1-1 Three-side flaps wagon type 3-1-1
3-1-2 Swing wagon type 3-1-4
3-2 Engine 3-2-1
3-2-1 ***Nominal and Allowable Values*** 3-2-1
3-3 Undercarriage 3-3-1
3-4 Controls 3-4-1
3-5 Hydraulic Cylinder 3-5-1
3-6 Work Implement 3-6-1
3-7 List of Tightening Torque 3-7-1
3-7-1 Machine 3-7-1
3-7-2 Engine 3-7-4
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 Measuring the pressure 3-8-1
3-8-2 Measuring the main pressure (effective differential pressure) 3-8-1
3-8-3 Charge pressure measurement 3-8-2
3-8-4 Dump pressure measurement 3-8-3
3-8-5 Pilot pressure measurement 3-8-3
3-8-6 Wagon swing pressure measurement 3-8-4

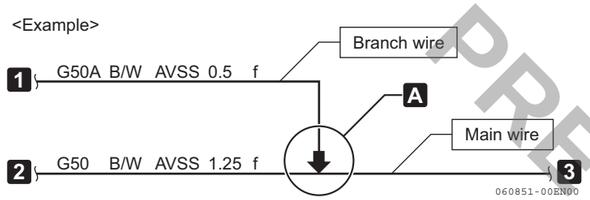
PREVIEW - YOUFIXTHIS.COM

2-8 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

G50 B/W AVSS 1.25 f

- G50: Circuit symbol
- B/W AVSS 1.25 f: Wire type and size

Wire color (Ground color/stripe color)

Wire color: B/W means:
Stripe color: White
Ground color: Black
Band symbol (No relation to the color)

Wire color: B means:
Ground color: Black
Band symbol (No relation to the color)

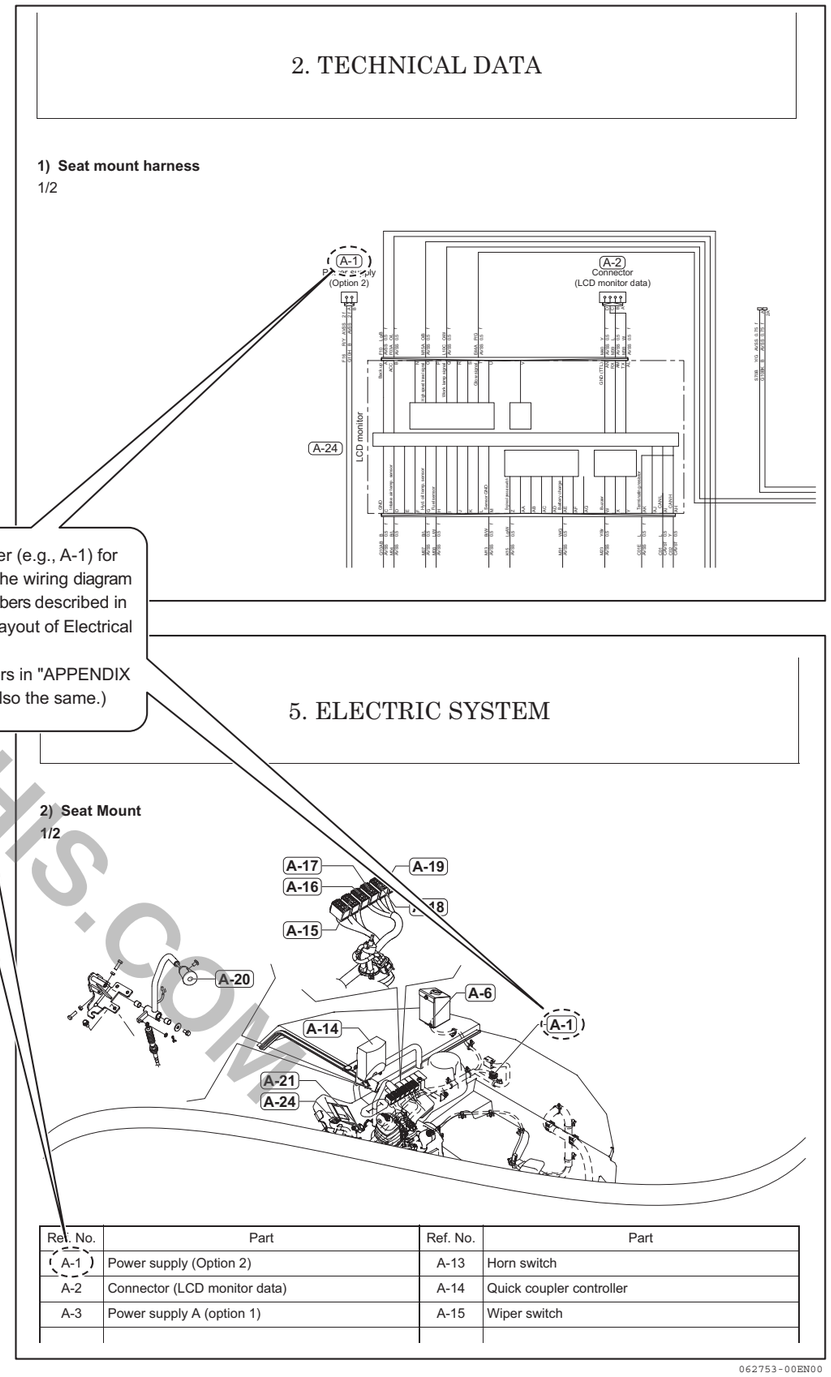
Wire color codes

W	White	P	Pink
R	Red	Br	Brown
B	Black	Lg	Light green
Y	Yellow	Sb	Sky blue
G	Green	Or	Orange
L	Blue	Gr	Gray
		V	Violet

060860-00EN00

● 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.)

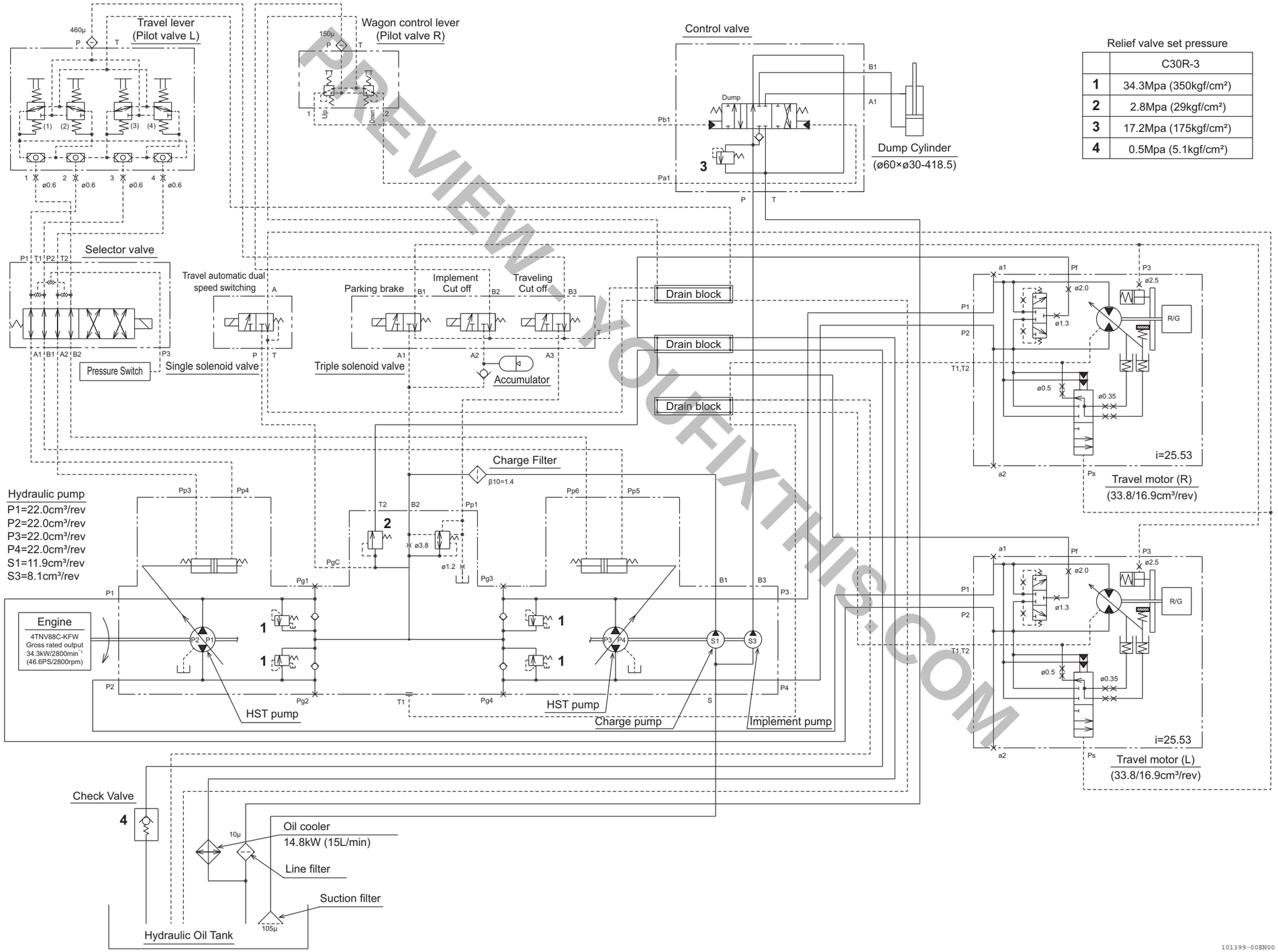
Ref. No.	Part	Ref. No.	Part
A-1	Power supply (Option 2)	A-13	Horn switch
A-2	Connector (LCD monitor data)	A-14	Quick coupler controller
A-3	Power supply A (option 1)	A-15	Wiper switch

062753-00EN00

PREVIEW - YOUFIXTHIS.COM
Download full manual at youfixthis.com

2-7 Hydraulic Circuit Schematic

Three-side flaps wagon type



Relief valve set pressure

	C30R-3
1	34.3Mpa (350kgf/cm²)
2	2.8Mpa (29kgf/cm²)
3	17.2Mpa (175kgf/cm²)
4	0.5Mpa (5.1kgf/cm²)

101399-00EN00

Download full manual at youfixthis.com
PREVIEW - YOUFIXTHIS.COM

4-2-5 Cylinder Head

Cylinder Head Components

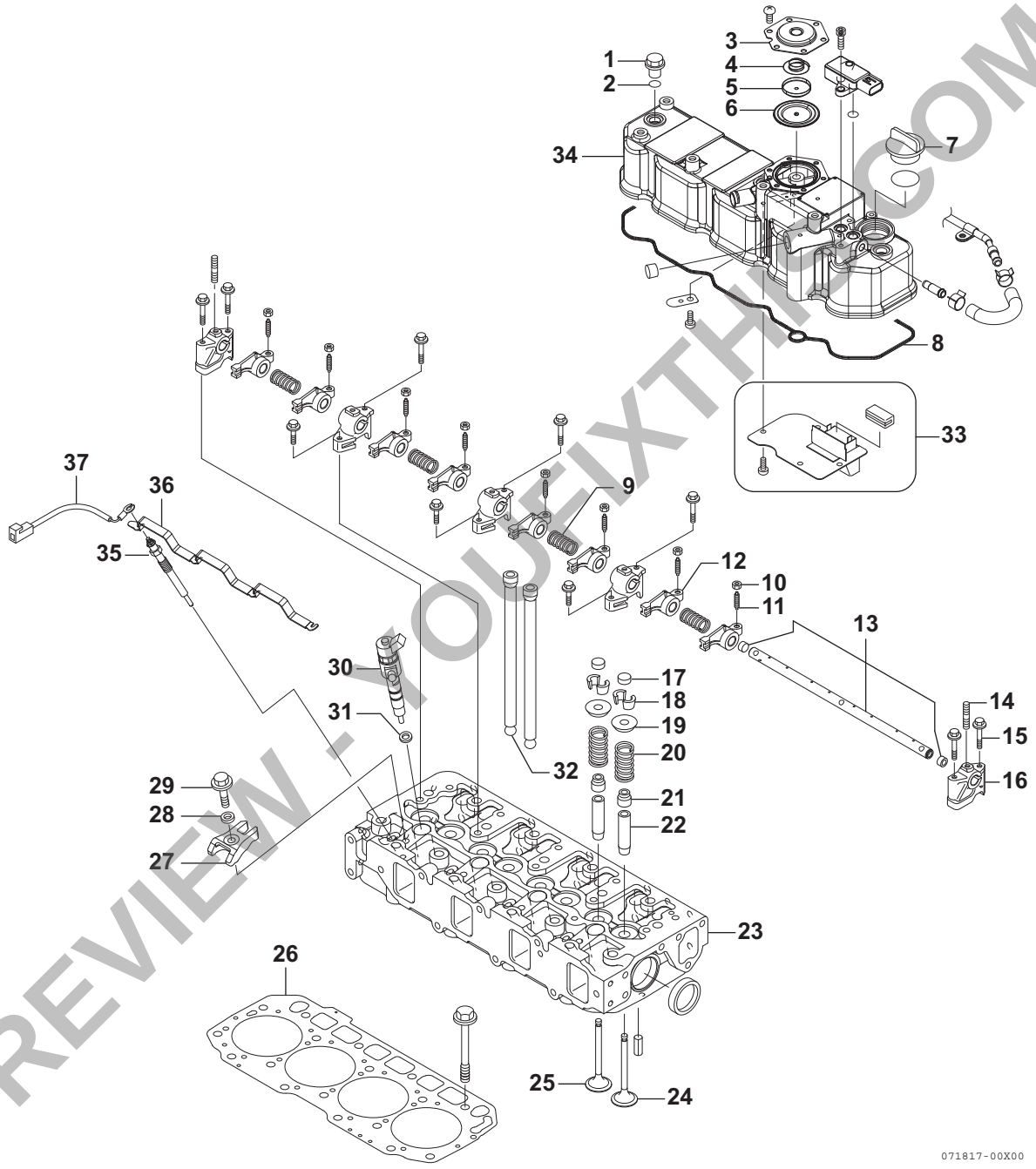


Figure 4-2-1

PREVIEW - YOUFIXTHIS.COM

3-7-2 Engine

1) Tightening torque for major bolts and nuts

Unit: ft•lbf (N•m)

No.	Item	4TNV88C-KFW		
		Thread size X Pitch	Tightening torque	Lubricating oil
1	Cylinder head bolt	M10 X 1.25	63 to 67 (85.3 to 91.1)	Yes
2	Connecting rod bolt	M9 X 1.0	33 to 36 (44.1 to 49.0)	Yes
3	Flywheel bolt	M10 X 1.25	61 to 65 (83.3 to 88.2)	Yes
4	Main bearing cap bolt	M12 X 1.5	70.8 to 73.8 (96.0 to 100)	Yes
5	Crankshaft pulley bolt	M14 X 1.5	Cast metal (FC300): 62 to 69 (83.3 to 93.1) Steel metal (S45C): 83 to 91 (112.7 to 122.7)	Yes
6	Flywheel speed sensor	M6 X 1.0	4.4 to 7.4 (6.0 to 10.0)	No
7	Camshaft speed sensor	M6 X 1.0	5.5 to 6.3 (7.5 to 8.5)	No
8	EGR valve pipe	M8 X 1.25	14.0 to 18.2 (18.9 to 24.7)	No
9	Fresh air temperature sensor	M5 X 0.5	3.0 to 3.7 (4.0 to 5.0)	No
10	Fresh air temperature sensor	M14 X 1.5	8.1 to 12.5 (11.0 to 17.0)	No
11	DPF temperature sensor	M12 X 1.25	18.4 to 29.5 (25.0 to 40.0)	No
12	Differential pressure sensor	M6 X 1.0	4.9 to 6.2 (6.6 to 8.4)	No
13	Differential pressure sensor	M12 X 1.25	33.2 to 40.5 (45.0 to 55.0)	No
14	Valve cover nut	-	-	-
15	Glow plug	M10 X 1.25	11.1 to 14.8 (15 to 20)	No
16	Glow connector nut	M4 X 0.7	0.7 to 1.1 (1 to 1.5)	No

PREVIEW - YOUFIXTHIS.COM

Error Code List

Error code	Classification	Error description	Detection condition	Causes	Corrective measures
00 000051.03	Caution	Intake throttle position sensor malfunction: High voltage	The sensor voltage is higher than 4.8 V when the engine is not cranking.	1. Improper connector engagement, 2. Faulty wire harness, 3. Intake throttle position sensor failure, 4. Engine ECU internal circuit failure	Check the connector, wire harness, intake throttle position sensor and engine ECU. Turn the starter switch to the "OFF" position and then to the "ON" position to check if the error code is displayed again.
00 000051.04	Caution	Intake throttle position sensor malfunction: Low voltage	The sensor voltage is lower than 0.2 V when the engine is not cranking.	1. Improper connector engagement, 2. Faulty wire harness, 3. Intake throttle position sensor failure, 4. Engine ECU internal circuit failure	Check the connector, wire harness, intake throttle position sensor and engine ECU. Turn the starter switch to the "OFF" position and then to the "ON" position to check if the error code is displayed again.
00 000029.03	Caution	Accelerator sensor malfunction: High voltage	The sensor voltage is higher than 4.0 V.	1. Improper connector engagement, 2. Faulty wire harness, 3. Accelerator sensor (pedal) failure, 4. Engine ECU internal circuit failure	Check the connector, wire harness, accelerator sensor and engine ECU. Turn the starter switch to the "OFF" position and then to the "ON" position to check if the error code is displayed again.
00 000029.04	Caution	Accelerator sensor malfunction: Low voltage	The sensor voltage is lower than 0.2 V.	1. Improper connector engagement, 2. Faulty wire harness (Sensor 5V disconnection or short to ground), 3. Accelerator sensor (pedal) failure, 4. Engine ECU internal circuit failure	Check the connector, wire harness, accelerator sensor and engine ECU. 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: High voltage	The sensor voltage is higher than 4.6 V.	1. Improper connector engagement, 2. Faulty wire harness, 3.Accelerator sensor (pedal) failure, 4. Engine ECU internal circuit failure	Check the connector, wire harness, accelerator sensor and engine ECU. 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: Low voltage	The sensor voltage is lower than 0.2 V.	1. Improper connector engagement, 2. Faulty wire harness (Sensor 5V disconnection or short to ground), 3. Accelerator sensor (pedal) failure, 4. Engine ECU internal circuit failure	Check the connector, wire harness, accelerator sensor and engine ECU. 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	Low engine oil pressure alarm	After the engine starts, the engine oil pressure switch stays on for a specific period of time at an engine speed of 600 min^{-1} or more and at a battery voltage of 9V or more.	1. Low engine oil pressure, 2. Engine lubrication system failure, 3. Faulty wire harness (Engine oil pressure switch wire short to ground), 4. Engine oil pressure switch failure (Short to ground on a wire inside the engine oil pressure switch), 5. Engine ECU internal circuit failure	Check the amount of engine oil, engine lubrication system, wire harness, engine oil pressure switch and engine ECU. 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 disconnection	Before the engine starts with the starter switch in the "ON" position, the engine oil pressure switch stays off for one second at a battery voltage of 9 V or more.	1. Improper connector engagement, 2. Faulty wire harness (Engine oil pressure switch wire disconnection or short to power), 3. Engine oil pressure switch failure (Wire disconnection or short to power on a wire inside the engine oil pressure switch), 4. Engine ECU internal circuit failure	Check the connector, wire harness, engine oil pressure switch and engine ECU. Turn the starter switch to the "OFF" position and then to the "ON" position to check if the error code is displayed again.
00 000102.03	Warning	EGR low pressure-side sensor malfunction: High voltage	The sensor voltage is higher than 4.8 V when the engine is not cranking.	1. Improper connector engagement, 2. Faulty wire harness (Sensor signal wire short to ground), 3. EGR pressure sensor failure (Improper sensor output due to short to ground on a wire inside the EGR pressure sensor), 4. Engine ECU internal circuit failure	Check the connector, wire harness, EGR pressure sensor and engine ECU. Turn the starter switch to the "OFF" position and then to the "ON" position to check if the error code is displayed again.
00 000102.04	Warning	EGR low pressure-side sensor malfunction: Low voltage	The sensor voltage is lower than 0.2 V when the engine is not cranking.	1. Improper connector engagement, 2. Faulty wire harness, 3. EGR pressure sensor failure, 4. Engine ECU internal circuit failure	Check the connector, wire harness, EGR pressure sensor and engine ECU. Turn the starter switch to the "OFF" position and then to the "ON" position to check if the error code is displayed again.
00 000102.13	Warning	EGR low pressure-side sensor malfunction: Abnormal learning value	The final offset value for the intake manifold pressure is lower than the threshold value or higher than the threshold value.	1. Improper connector engagement, 2. Faulty wire harness, 3. EGR pressure sensor failure, 4. Engine ECU internal circuit failure	Check the connector, wire harness, EGR pressure sensor and engine ECU. Turn the starter switch to the "OFF" position and then to the "ON" position to check if the error code is displayed again.
00 000105.03	Warning	Intake manifold temperature sensor malfunction: High voltage	The sensor voltage is higher than 4.8 V when the engine is not cranking.	1. Improper connector engagement, 2. Faulty wire harness, 3. Intake manifold temperature sensor failure, 4. Engine ECU internal circuit failure	Check the connector, wire harness, intake manifold temperature sensor and engine ECU. Turn the starter switch to the "OFF" position and then to the "ON" position to check if the error code is displayed again.
00 000105.04	Warning	Intake manifold temperature sensor malfunction: Low voltage	The sensor voltage is lower than 0.2 V when the engine is not cranking.	1. Improper connector engagement, 2. Faulty wire harness, 3. Intake manifold temperature sensor failure, 4. Engine ECU internal circuit failure	Check the connector, wire harness, intake manifold temperature sensor and engine ECU. Turn the starter switch to the "OFF" position and then to the "ON" position to check if the error code is displayed again.

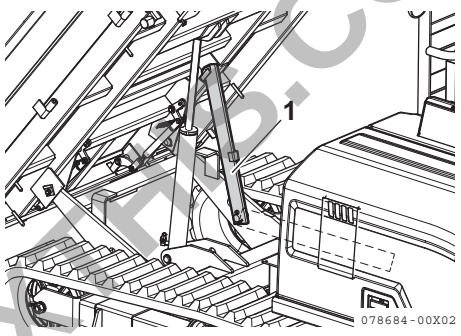
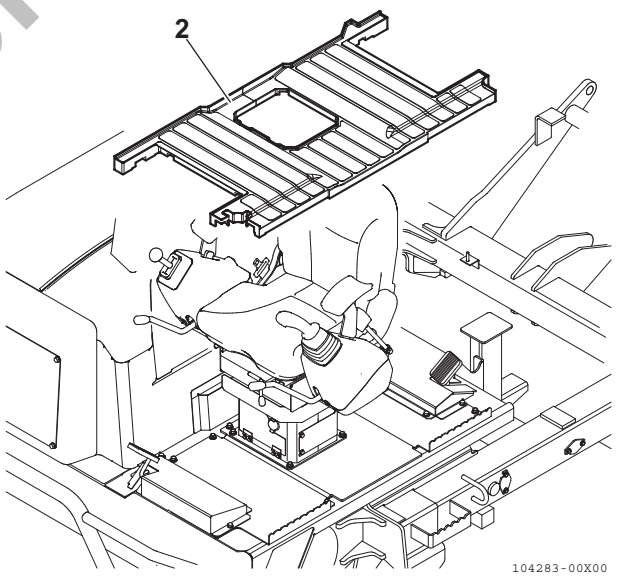
Download full manual at youfixthis.com
PREVIEW - YOUFIXTHIS.COM

7. Adjustment and Repair

7-1 Engine and Electric Equipment

7-1-1 Removal and Reinstallation of Engine

1) Removal

Procedure	
(1) Raise the wagon, and fix it in place using the wagon support stopper **1**.	
(2) Remove the floor mat **2**.	

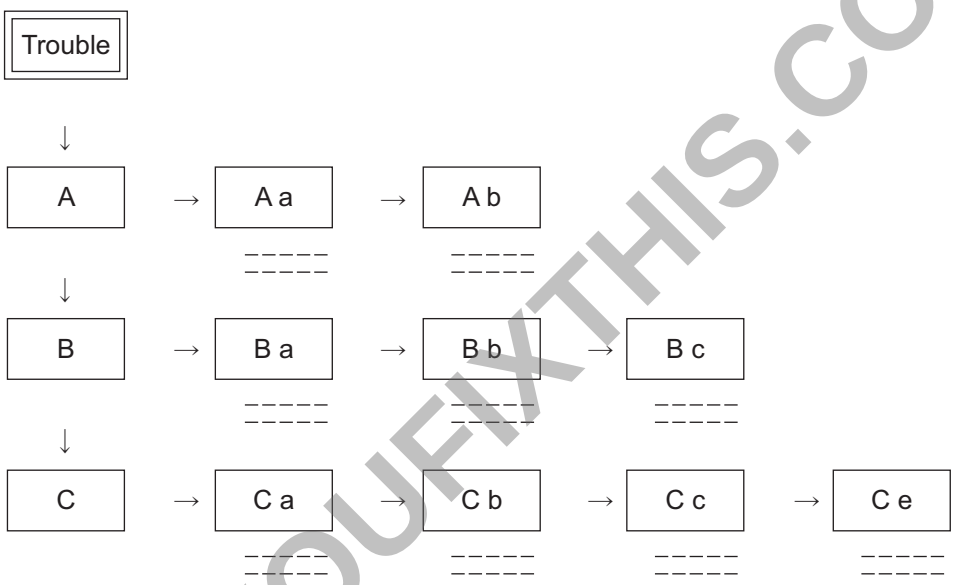
PREVIEW - YOUFIXTHIS.COM

8. Troubleshooting

8-1 Troubleshooting

8-1-1 Machine and Engine

(How to use the charts)



Factors related to the trouble are enumerated in the columns and instructions for corrective procedures are given below. It is recommended that the troubles be inspected and corrected one by one according to the chart.

← Inspection item

← Remedy for failure

000951-00E

PREVIEW: YOUFIXTHIS.COM

2. TECHNICAL DATA

2. Technical Data

2-1 Specifications

Item				Unit	C30R-3	
					Three-side flaps wagon type	Swing wagon type
Main specifications of machine						
Dimensions/Weight						
Overall length				in. (mm)	129.1 (3280)	143.3 (3640)
Overall width				in. (mm)	62.6 (1590)	61.6 (1565)
Overall height				in. (mm)	90.9 (2310)	
Tumbler center distance				in. (mm)	77.2 (1960)	
Crawler center distance				in. (mm)	48.4 (1230)	
Minimum ground clearance				in. (mm)	10.4 (265)	11.0 (280)
Operating mass				lbs. (kg)	5842 (2650)	6316 (2865)
Ground pressure JIS (Empty/Loaded)				PSI (kPa)	4.0 / 7.6 (27.5 / 53.5)	4.3 / 8.1 (29.8 / 55.7)
Traveling performance						
Travel speed		Forward	Low	MPH (km/hr)	0 to 3.5 (0 to 5.7)	
			High	MPH (km/hr)	0 to 6.8 (0 to 11.0)	
		Backward	Low	MPH (km/hr)	0 to 3.5 (0 to 5.7)	
			High	MPH (km/hr)	0 to 6.8 (0 to 11.0)	
Minimum turning radius				in. (mm)	82.7 (2100)	90.6 (2300)
Work performance						
Max. load capacity				lbs. (kg)	5512 (2500)	
Carrier (Length × width × height)				in. (mm)	66.3 × 55.3 × 14.6 (1685 × 1410 × 370)	79.1 × 54.7 × 19.9 (2010 × 1390 × 505)
Carrier capacity		Struck capacity		cu.ft. (cu.m)	31.1 (0.88)	39.9 (1.13)
		Heaped capacity		cu.ft. (cu.m)	43.8 (1.24)	53.0 (1.5)
Floor height above ground				in. (mm)	32.3 (820)	36.2 (920)
Dump angle				degrees	58	85
Dump clearance				in. (mm)	17.9 (455)	28.7 (730)
Maximum dumping capacity				lbs. (kgf)	7275 (32.3)	
Maximum dumping inclination angle				degrees	20	
Height to top of wagon at dumping				in. (mm)	94.7 (2405)	111.0 (2820)
Hydraulic implement						
Hydraulic pump						
Type				-	Variable displacement and swash plate type piston pump + gear pump	
Drive method				-	Engine → CF coupling → Pump (Direct drive)	
Theoretical discharge volume				cu.in. (cc)/rev	1.34 (22.0) × 2	
Maximum number of revolutions				rpm	2830	
Maximum working pressure				PSI (MPa)	4978 (34.3)	
System relief set pressure				PSI (MPa)	4978 (34.3)	
Charge relief set pressure				PSI (MPa)	406 (2.8)	
Charge pump		Type		-	External gear pump	
		Discharge volume		cu.in. (cc)/rev	0.73 (11.9)	
Max. charge pump system pressure				PSI (MPa)	406 (2.8)	
Pilot pump		Type		-	External gear pump	
		Discharge volume		cu.in. (cc)/rev	0.49 (8.1)	

PREVIEW - YOUFIXTHIS.COM

2. TECHNICAL DATA

2-6 Fuel, Lube Oil and Grease Recommended

Item	Recommended type	Capacity	
		Three-side flaps wagon type	Swing wagon type
Fuel oil	Diesel fuel oil (Ultra low sulfur)	15 Gals (58 L)	
Engine oil	Engine oil SAE 10W30, CJ-4 class	7.8 Qts. (7.4 L)	
Hydraulic oil	Hydraulic oil ISO VG46	In the tank: 7.4 Gals (28 L) Other parts: 2.6 Gals (10 L) Total: 10 Gals (38 L)	In the tank: 7.4 Gals (28 L) Other parts: 3.2 Gals (12 L) Total: 10.6 Gals (40 L)
Travel reduction gear oil	Gear oil SAE90 (GL-4)	1.0 Qt (0.9 L)	
Idler	Engine oil SAE 30, CC class	0.137 Qts. (0.13 L)	
Track roller A		0.126 Qts. (0.12 L)	
Track roller B		0.095 Qts. (0.09 L)	
Coolant	Soft water + antirusting & antifreeze long-life coolant (LLC)	Radiator: 5.6 Qts. (5.3 L) Subtank: 0.4 Qts. (0.4 L) Total: 6.0 Qts. (5.7 L)	
Grease	Lithium soap group (extreme pressure type) multi-purpose grease NLGI No.2	-	

■ Mixture ratio of water and antifreeze

Lowest temperature	°F (°C)	23 (-5)	14 (-10)	5 (-15)	-4 (-20)	-13 (-25)	-22 (-30)	-31 (-35)	-40 (-40)
Amount of anti-freeze	Qts. (L)	1.0 (0.9)	1.5 (1.4)	2.35 (2.2)	2.74 (2.6)	3.13 (3)	3.52 (3.3)	3.91 (3.7)	4.3 (4.1)
Amount of water	Qts. (L)	5.0 (4.8)	4.5 (4.3)	5.47 (5.2)	5.08 (4.8)	4.69 (4.4)	4.3 (4.1)	3.91 (3.7)	3.52 (3.3)

Note :

- *Decide the antifreeze mixing ratio for lower temperature by around 18 °F (10 °C) than the lowest temperature at job-site.*
- *At the delivery from the factory, water and antifreeze are mixed at the ratio for -31 °F (-35 °C) temperature above.*

PREVIEW - YOUFIXTHIS.COM

2-5 List of periodic inspection and servicing

◇ : Check ○ : Supply ● : Replace □ : Adjust (clean) ■ : Oil & grease

Check & service items			Daily	Every 50 hrs	Every 100 hrs	Every 250 hrs	Every 500 hrs	Every 1000 hrs	Every 1500 hrs	Every 2000 hrs	Every 3000 hrs
General	Check falling off, breakage of parts		◇								
	Check loosened bolts & nuts, retighten		◇								
	Check engine condition		◇								
	Clean		□								
Fuel oil	Check & supply of oil to the tank		◇(○)								
	Drain the fuel tank			□							
	Water separator	Check, drain	◇								
		Replace					●				
	Replace the fuel filter element						●				
Lube oil	Engine oil	Check, resupply	◇								
		Replace					●				
	Replace the engine oil filter element						●				
	Travel reduction gear oil	Check, resupply				○					
		Replace			● 1st time		●				
Coolant	Check & supply of coolant		◇								
	Check coolant leakage		◇								
	Check & clean radiator fins					□					
	Check & adjust the fan-belt tension		◇(□)								
	Clean & check the coolant system, and replace the coolant									●within two years	
Rubber hose	Check & replace fuel oil pipe, cooling water pipe		◇							●within two years	
Air cleaner	Clean air cleaner					□					
	Replace air cleaner element						●				
Hydraulic system	Hydraulic oil	Check, resupply	◇								
		Replace						●			
	Clean suction filter					□ 1st time		□			
	Replace line filter					● 1st time	●				
	Replace charge filter					● 1st time	●				
	Check for abnormality of hydraulic pump		◇								
	Check function of accumulator									◇	
Grease	Check grease-up positions, grease		■before use								
	Grease the swing bearing (swing wagon type)			■							
Undercarriage	Check, adjust track tension		◇(□)								
	Check for abnormality of upper/lower rollers and idlers		◇								
	Check for wear or damage of rollers		◇								
Control equipment	Check operation of wagon		◇								
	Check the accelerator pedal		◇								
	Check engine control dial function		◇								
	Check travel lever for operation and looseness		◇								
	Check performance and play of dump lever		◇								

PREVIEW - YOUFIXTHIS.COM

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 indicates a hazardous situation which, if not avoided, *will* result in death or serious injury.

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, *could* result in death or serious injury.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, *could* result in minor or moderate injury.

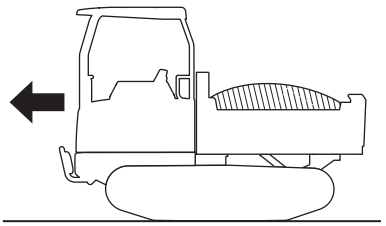
NOTICE

NOTICE indicates a situation which can cause damage to the machine, personal property and/or the environment or cause the equipment to operate improperly.

PREVIEW - YOUFIXTHIS.COM

PREVIEW - YOUFIXTHIS.COM

3. SERVICING STANDARDS

Applicable model		C30R-3		
Item	Measuring condition	Unit	Standard	Allowance
Machine performance				
Breaking distance	Machine position  104762-01JA00 • Engine : Rated speed • Speed : Forward, high-speed • Load : 5513 lbs. (2500 kg) • Run in max. speed on a dry paved ground and measure the distance between the point where the travel lever is moved to the neutral position and the carrier stopping point.	ft. (m)	9.8 (3.0) or less	-

PREVIEW - YOUFIXTHIS.COM

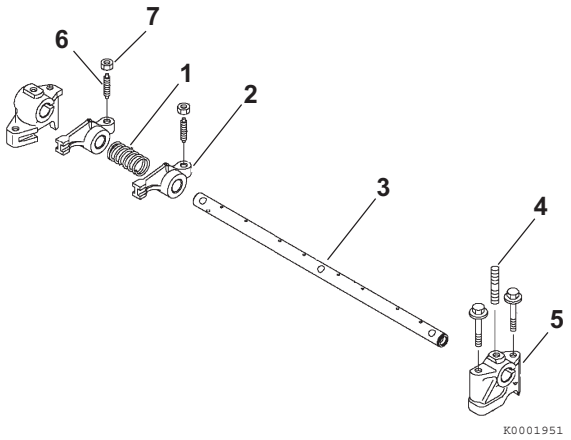


Figure 4-2-38

*Note: **Figure 4-2-38** shows components for one cylinder. Components for all remaining cylinders are assembled in the same order.*

2. Place the rocker arm shaft assembly onto the cylinder head.
3. If removed, reinstall the valve adjusting screws (6, **Figure 4-2-38**) and the lock the nuts (7, **Figure 4-2-38**).
4. Align the push rods with their respective rocker arms.
5. Reinstall and tighten the rocker arm shaft retaining bolts (M10 × 65) to the specified torque.
6. Tighten the rocker arm shaft alignment studs.
7. Adjust the valve clearance. *See Measuring and Adjusting Valve Clearance on page 4-2-24.*

■ Assembling the parts around the cylinder head

1. Attaching the glow plug
   Install the glow plug (1, **Figure 4-2-39**) and tighten with the specified torque.

Glow plug (M10) tightening torque	11.1 - 14.8 ft·lb (15 - 20 N·m; 1.5 - 2.0 kgf·m)

   Attach the glow plug connector (2, **Figure 4-2-39**) and glow plug harness (3, **Figure 4-2-39**) to the glow plug with a specified torque.

M4 nut tightening torque	0.7 - 1.1 ft·lb (1 - 1.5 N·m; 0.1 - 0.2 kgf·m)

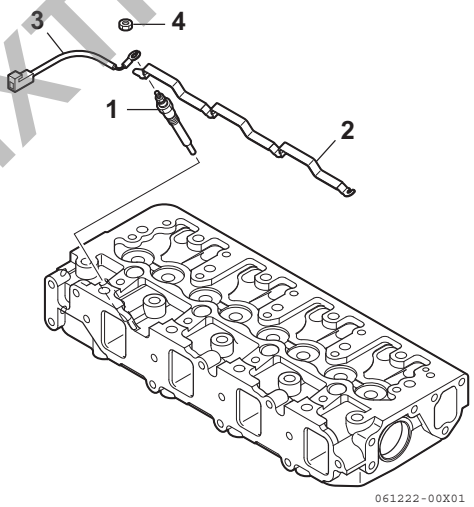


Figure 4-2-39

2. Attaching the injector
   Attach the injector. *See Reassembly of injector on page 4-3-7.*
3. Attaching the exhaust manifold
   Reinstall the exhaust manifold using a new gasket (17, **Figure 4-2-6**). Here, attach the EGR cooler, the EGR cooler outlet vent, a turbocharger (if there is one), and an exhaust throttle (if there is one), as a unit to the cylinder head. Tighten it with specified torque.

Tightening torque for M10 (10.9T) bolts and nuts	59.3 - 60.4 ft·lb (80.3 - 81.8 N·m; 8.2 - 8.3 kgf·m)

   Connect the cooling water pipes (both inlet and outlet) of the EGR cooler.

PREVIEW - YOUFIXTHIS.COM

■ Water temperature sensor

1. Inspect the water temperature sensor to make sure that it is properly operating. As shown in the following figure, connect an electric resistor to the coupler of the water temperature sensor (1, **Figure 4-4-10**).

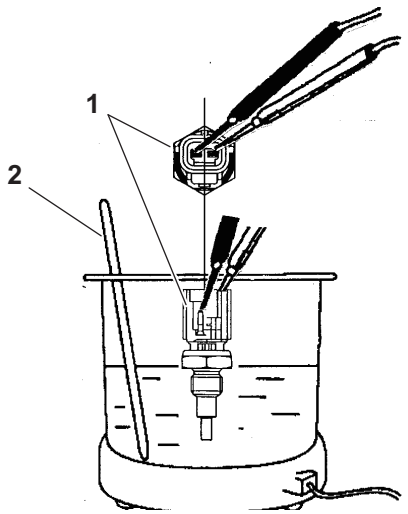


Figure 4-4-10

2. Dip the water temperature sensor and an accurate thermometer (2, **Figure 4-4-10**) into the cooling water.
3. Measure the electric resistance value while slowly raising the cooling water temperature using an external heat source.
4. The resistance value at each of the following temperatures is within the permissible range specified, the water temperature sensor is correctly operating.

Cooling water temperature (°C)	Resistance (kΩ)
20	$2.45^{+0.14}_{-0.13}$
80	0.318 ± 0.008
100	(0.1836)

■ Thermostat

1. Check for proper operation of the thermostat. Place the thermostat (1, **Figure 4-4-11**) and an accurate thermometer (2, **Figure 4-4-11**) in warm water.

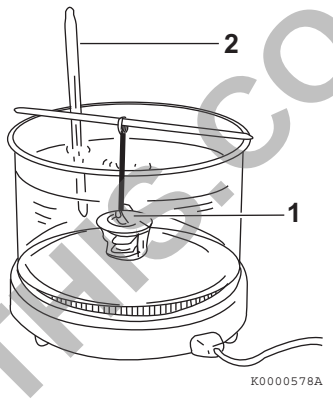


Figure 4-4-11

2. Slowly increase the temperature of the water using an external heat source.
3. The thermostat is operating properly if it starts to open at the temperature value stamped on the flange of the thermostat, and fully opens as the temperature of the water is increased.

■ Radiator cap

1. Check for proper operation of the radiator cap. Install the radiator cap (1, **Figure 4-4-12**) on a cooling system tester.

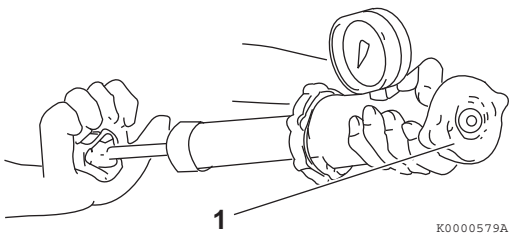


Figure 4-4-12

2. Apply 10.8 - 14.8 psi (75 - 105 kPa; 0.75 - 1.05 kgf/cm²) to the radiator cap. The radiator cap relief valve must open within the specified range.

PREVIEW - YOUFIXTHIS.COM

SMARTASSIST DIRECT (SA-D)

When the ECU or injectors are replaced, you need to rewrite the individual data inside the ECU.

A special treatment is also necessary when replacing DPF or sensors that affects the electronic control system.

A connector is provided at an end of the harness of the driven machine so that the YANMAR genuine SMMARTASSIST DIRECT (SA-D) can be loaded with data from the ECU. See **Figure 4-8-35** and **Figure 4-8-36**.

Contact your authorized YANMAR dealer or distributor that can handle SA-D to repair or replace the electronic control parts.

⚠ WARNING

- **Never use the ECU for purposes that are not intended by YANMAR; such as using unauthorized ECU, writing unauthorized data to ECU, leaving it broken, or removing sensors and actuators. Doing so could result in the violation of emission control regulations and will void the product warranty.**
- **Be sure to use the ECU in conjunction with the engines whose models or serial numbers are specified by YANMAR.**
  Other ECU/engine combinations than specified will void the engine warranty.
- **When replacing the fuel injector, you need to rewrite the fuel injection quantity adjustment data in the ECU. When replacing the ECU, you need to export data from the existing ECU to the new ECU. In order to operate as above, you need to connect the YANMAR genuine SA-D. Be sure to contact your authorized YANMAR dealer. ECU that does not have the proper fuel injection quantity adjustment data written, or ECU that does not have the data transferred correctly will void the engine warranty.**
- **You will also need to connect to SA-D for replacing other CR related products, so be sure to contact your authorized YANMAR dealer.**
- **Improper use or misuse of the ECU may result in death or serious injury due to an abrupt and unexpected increase in engine speed.**

NOTICE

- Do not plug or unplug the ECU for a period of at least 60 seconds after power to the unit has been turned on or off.
- Do not touch connector pins of the ECU with bare hands. Doing so may result in corrosion of the connector pins and/or damage to the internal circuits of the ECU due to static electricity.
- Do not force a measuring probe into the female coupler. Doing so may cause contact failure of the connector pins, resulting in malfunction of the ECU.
- Take care to prevent water from entering the couplers when plugging or unplugging the connector. Water inside the couplers may cause corrosion, resulting in malfunction of the ECU.
- Avoid plugging/unplugging the connector more than approx. 10 times.
  Frequent plugging/unplugging of the connector may cause contact failure of the connector pins, resulting in malfunction of the ECU.
- Do not use the ECU that has ever suffered drop impact.
- Do not disassemble the ECU terminal.

■ About SA-D use

SA-D is a diagnosis tool that automatically transmits the following information to the YANMAR data server (SMARTASSIST CORE (SA-C)) from the ECU equipped in your driven machine via the Internet.

- Injector, exhaust gas post-treatment equipment, parts replacement information for controllers that are necessary for exhaust gas warranty claims.
- Accumulated operation information required for the reuse of exhaust gas post-treatment equipment.
- Operation history of an engine including fault history, operation time, engine speed, and load ratio.

All the obtained data will be used for the following purposes.

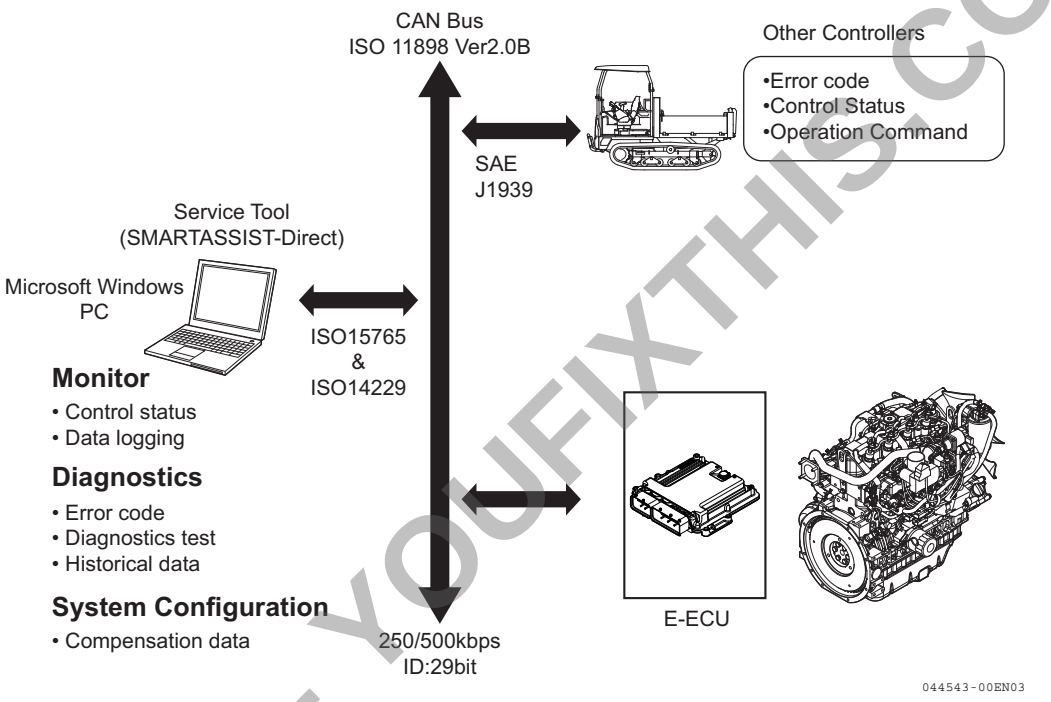
- To prevent improper service in the market
- To provide more accurate and prompt service

PREVIEW - YOUFIXTHIS.COM

(10)CAN Communication Function

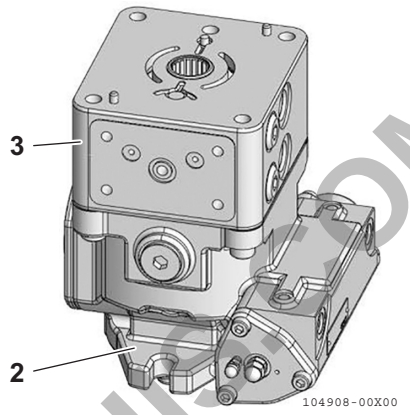
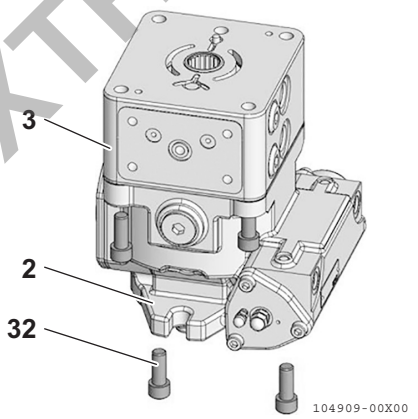
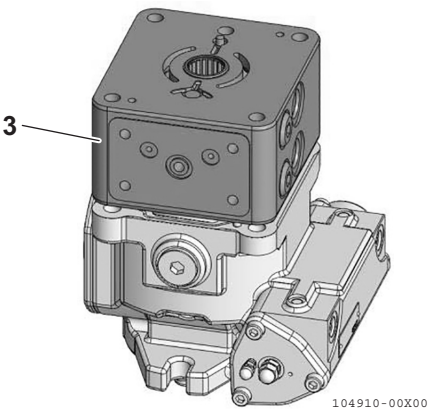
The engine ECU is complete with a single CAN communication port that can be used for either communications with SMARTASSIST-Direct (SA-D) or communications with another controller (inter-ECU communications).

Through inter-ECU communications, the engine ECU can receive various control commands such as target speed instructions from the ECU of the driven machine. In addition, the engine ECU sends control state information such as the actual engine speed as well as information commands such as error codes to the ECU of the driven machine.

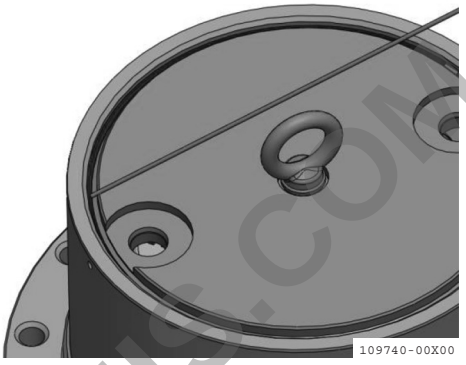
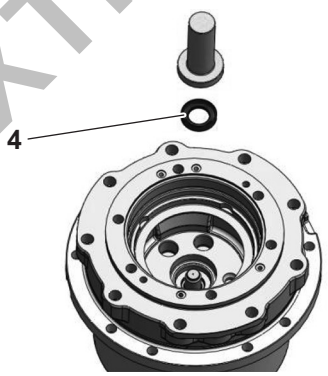
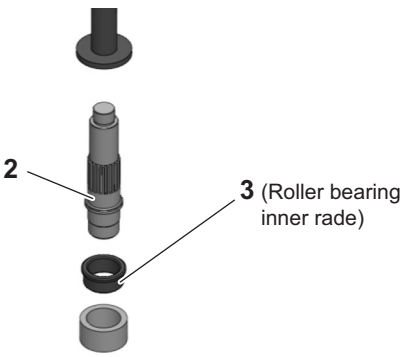


CAN communication overview

PREVIEW - YOUFIXTHIS.COM

Procedure	
(11) Lower rear case **2** and port block **3** lifting by hoist upside down as shown to the right.	
(12) Completely loosen four socket head screws **32** which hold rear case **2** to port block **3** and are slightly loosened at Step **6.**	
(13) Slowly raise port block **3** to remove from rear case **2**. ***Note :*** • *After port block is raised until pins **31** are pulled out and cylinder block **5** is separated from port block **3**, raise port block **3** more to separate it from rear case **2**.* • *Be careful not to lift up cylinder block **5** together. Three pins **19** may come off and further disassembly may not be possible.*	

PREVIEW - YOUFIXTHIS.COM

Procedure	
(16) The use round bar S-3 or a flat-head screwdriver to gently tap the wire securely into the groove.	 109740-00X00
(17) Press fit oil seal **4** into the flange holder. **Tool:** • Oil seal press fitting jig S-12 ***Note:*** *Apply a small amount of low-viscosity oil to the outside surface of the oil seal when it is hard to press fit. Be careful not to apply oil too much.* ***CAUTION*** *Do not reuse the removed oil seal. Replace it with a new one.*	 109741-00X00
(18) As in the figure to the right, press fit the inner race of the roller bearing **3** into shaft **2**, with the flanged part of the inner race facing upwards. **Tool:** • Roller bearing press fitting jig S-13 ***CAUTION*** *Make sure you install the inner race of roller bearing 3 in the correct direction.*	 109742-00EN00

PREVIEW - YOUFIXTHIS.COM

2) Relief valve

Symptoms	Possible causes	Remedies
1. Pressure does not raise at all	(1) Oil escapes because main poppet, sleeve or pilot poppet sticks, otherwise valve seat incompletely blocks circuit due to dust or foreign material	Renew relief valve assembly
2. Relief set pressure is unstable	(1) Pilot poppet seat surface is damaged	
	(2) Piston or main poppet sticks	
3. Relief set pressure is out of specification	(1) Seat surface is worn due to dust or foreign material	
	(2) Locknut and adjuster screw are loosened	Reset pressure and retighten locknut to specified torque
4. Oil leak	(1) Relief valve seat surface is damaged	Renew relief valve assembly
	(2) Related parts stick due to dust or foreign material	
	(3) O-ring is damaged	Renew adjuster or related O-ring

3) All-over hydraulic system

Symptoms	Possible causes	Remedies
1. System malfunctions or does not work at all	(1) Pump damage	Inspect system set pressure or renew pump assembly
	(2) Relief valve malfunction	Renew relief valve assembly
	(3) Cylinder malfunction	Repair or renew cylinder
	(4) Pump load pressure is excessive	Inspect system set pressure
	(5) Valve housing cracks	Renew valve assembly
	(6) Spool does not fully stroke	Inspect spool movement
	(7) Oil level in the oil tank is too low	Replenish hydraulic oil
	(8) Filter clogging	Clean or renew filter
	(9) Oil passage in piping is restricted	Inspect pipings

PREVIEW - YOUFIXTHIS.COM

CHAPTER 7

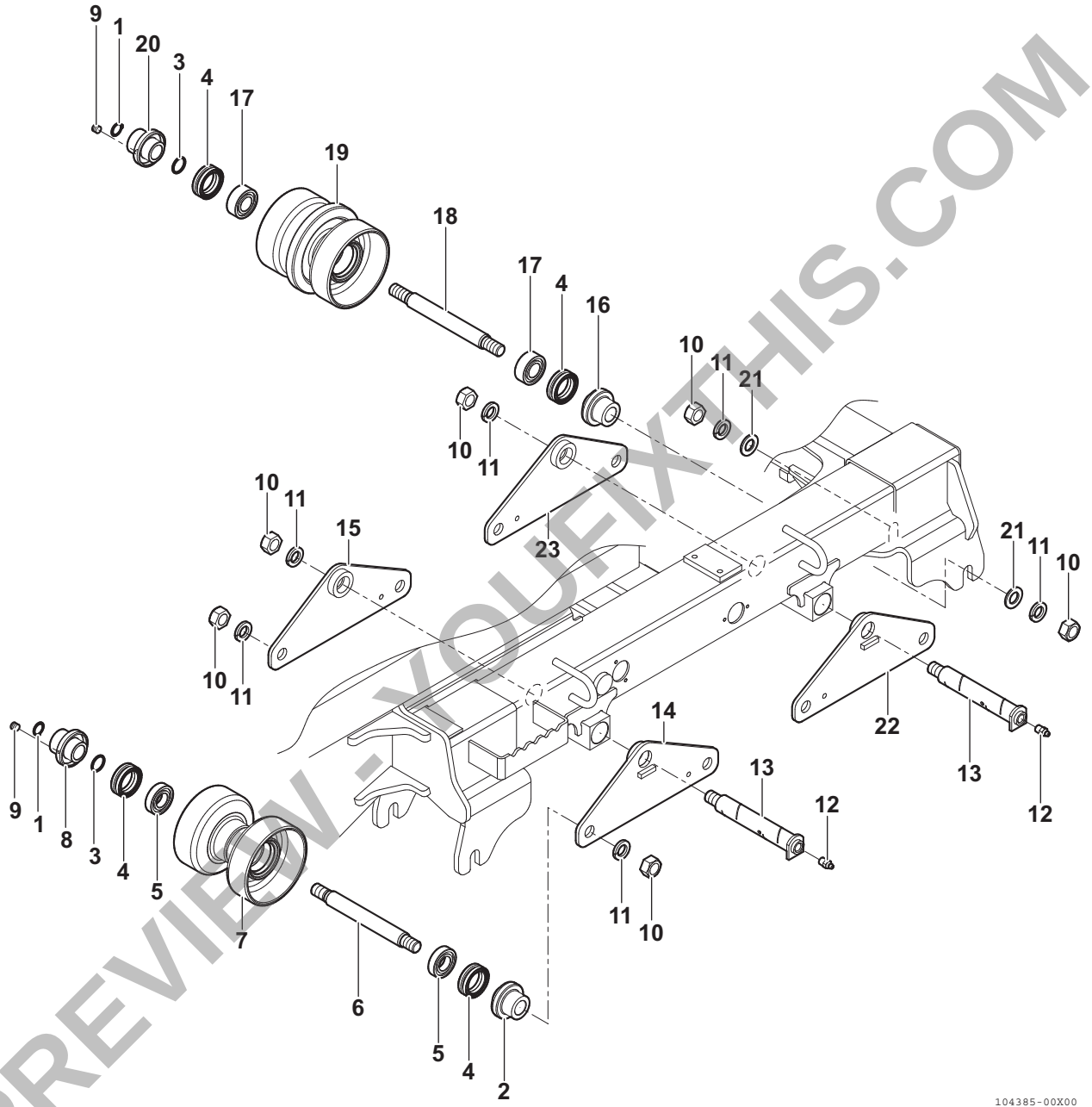
ADJUSTMENT AND REPAIR

7-1 Engine and Electric Equipment 7-1-1
7-1-1 Removal and Reinstallation of Engine 7-1-1
7-1-2 Removal and Reinstallation of Diesel Particulate Filter (DPF) 7-1-12
7-1-3 Removal and Reinstallation of Starter Motor 7-1-18
7-1-4 Removing and reinstalling the fan belt 7-1-20
7-1-5 Removal and Reinstallation of Radiator and Hydraulic Oil Cooler 7-1-22
7-1-6 Removing and installing the fuel cooler 7-1-27
7-1-7 Removing and installing the fuel tank 7-1-29
7-1-8 Removing and installing the LCD monitor 7-1-33
7-1-9 Removal and Reinstallation of Engine ECU ... 7-1-34
7-2 Undercarriage 7-2-1
7-2-1 Removal and Reinstallation of Crawler 7-2-1
7-2-2 Removal and Reinstallation of Travel Motor 7-2-8
7-2-3 Disassembly and Reassembly of Idler and Grease Adjuster 7-2-11
7-2-4 Disassembly and Reassembly of Carrier Roller 7-2-18
7-2-5 Disassembly and Reassembly of Track Roller 7-2-22
7-2-6 Installation of Floating Seal 7-2-31
7-3 Controls 7-3-1
7-3-1 Travel lever, wagon control lever, and lock lever components 7-3-1
7-3-2 Accelerator pedal components 7-3-5
7-3-3 Adjustment of Boom Swing Pedal 7-3-6
7-4 Hydraulic equipment 7-4-1
7-4-1 Removing and Reinstalling the hydraulic pump 7-4-1
7-4-2 Removing and Reinstalling the control valve (Three-side flaps wagon type) 7-4-7
7-4-3 Removing and Reinstalling the control valve (Swing wagon type) 7-4-10
7-4-4 Removal and Reinstallation of Pilot Valves 7-4-13
7-4-5 Removing and installing the solenoid valve (single/triple) 7-4-19
7-4-6 Removing and Reinstalling the selector valve. 7-4-23
7-4-7 Removing and installing the line filter 7-4-26
7-4-8 Removing and installing the charge filter 7-4-28
7-4-9 Removing and Reinstalling the accumulator .. 7-4-31
7-4-10 Removing and Reinstalling the dump cylinder (Three-side flaps wagon type) 7-4-33
7-4-11 Removing and Reinstalling the dump cylinder (Swing wagon type) 7-4-35
7-4-12 Removing and Reinstalling the hydraulic oil tank 7-4-37
7-4-13 Disassembly and Reassembly of wagon swing motor 7-4-40
7-4-14 Removal and Reinstallation of Swivel Joint .. 7-4-42
7-4-15 Disassembly and Reassembly of swing bearing 7-4-45
7-4-16 Piping Layout 7-4-51
7-5 Wagon 7-5-1
7-5-1 Wagon components (Three-side flaps wagon type) 7-5-1
7-5-2 Wagon components (Swing wagon type) 7-5-6
7-5-3 Removing and installing the canopy 7-5-8

PREVIEW - YOUFIXTHIS.COM

7-2-5 Disassembly and Reassembly of Track Roller

1) Track roller components

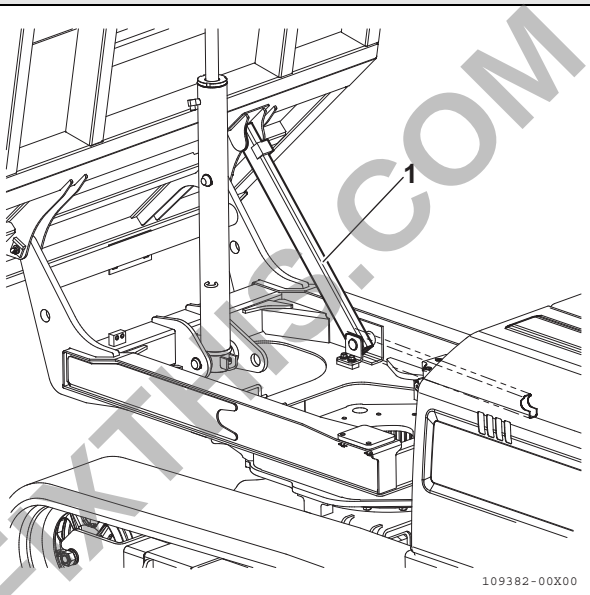
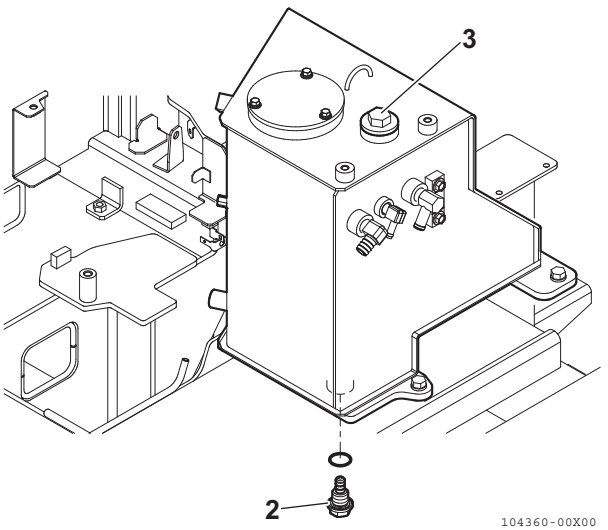
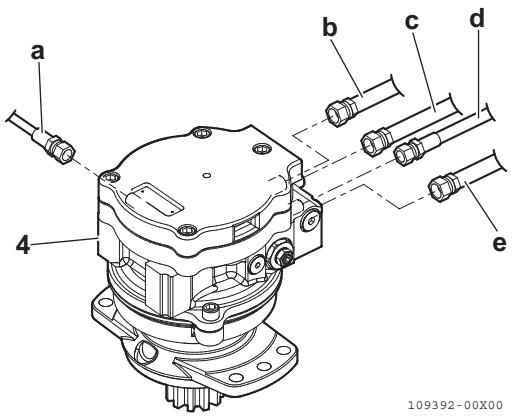


No.	Part	Q'ty	No.	Part	Q'ty	No.	Part	Q'ty
1	Retaining ring C	12	9	Plug	8	17	Ball bearing	8
2	Seal cover	8	10	Nut (M24)	16	18	Track roller shaft	4
3	O-ring	8	11	Spring washer	16	19	Roller	4
4	Seal	16	12	Grease nipple	4	20	Seal cover	4
5	Ball bearing	16	13	Rocking shaft	4	21	Washer	8
6	Shaft	8	14	Rocking plate A (outside)	2	22	Rocking plate B (outside)	2
7	Roller	8	15	Rocking plate A (inside)	2	23	Rocking plate B (inside)	2
8	Seal cover	8	16	Seal cover	4			

PREVIEW - YOUFIXTHIS.COM

7-4-13 Disassembly and Reassembly of wagon swing motor

1) Removal

Procedure	
(1) Raise the wagon, and fix it in place using the wagon support stopper **1**.	
(2) Remove the magnetic plug **2** from the hydraulic oil tank, and drain the hydraulic oil. Or, replace the oil filler port cap **3** with a compression vacuum cap, and then bleed the air. Type: Hydraulic oil ISO VG46 Q'ty: 15.8 Gals (60 L) ***Note:*** *If draining the hydraulic oil, remove the oil filler port cap **3** when draining.* Magnetic plug **2** **Tightening torque: 79.6 to 88.0 ft·lbf (107.9 to 119.3 N·m)**	
(3) Disconnect hydraulic hoses (x5) from wagon swing motor **4**. a. Hose Pb b. Hose A c. Hose M d. Hose Db e. Hose B ***Note:*** *Attach the dust caps/plugs to the ends of the hoses.*	

PREVIEW - YOUFIXTHIS.COM

PREVIEW ONLY

You're viewing 25 of 697 pages

The full manual includes:

- All 697 pages, complete
- Searchable PDF (find any keyword)
- No watermarks
- Instant download
- Print-ready quality

GET FULL MANUAL NOW

Yanmar C30R-3 Service Manual

Scan or click anywhere
youfixthis.com

Click anywhere on this page to get the full manual