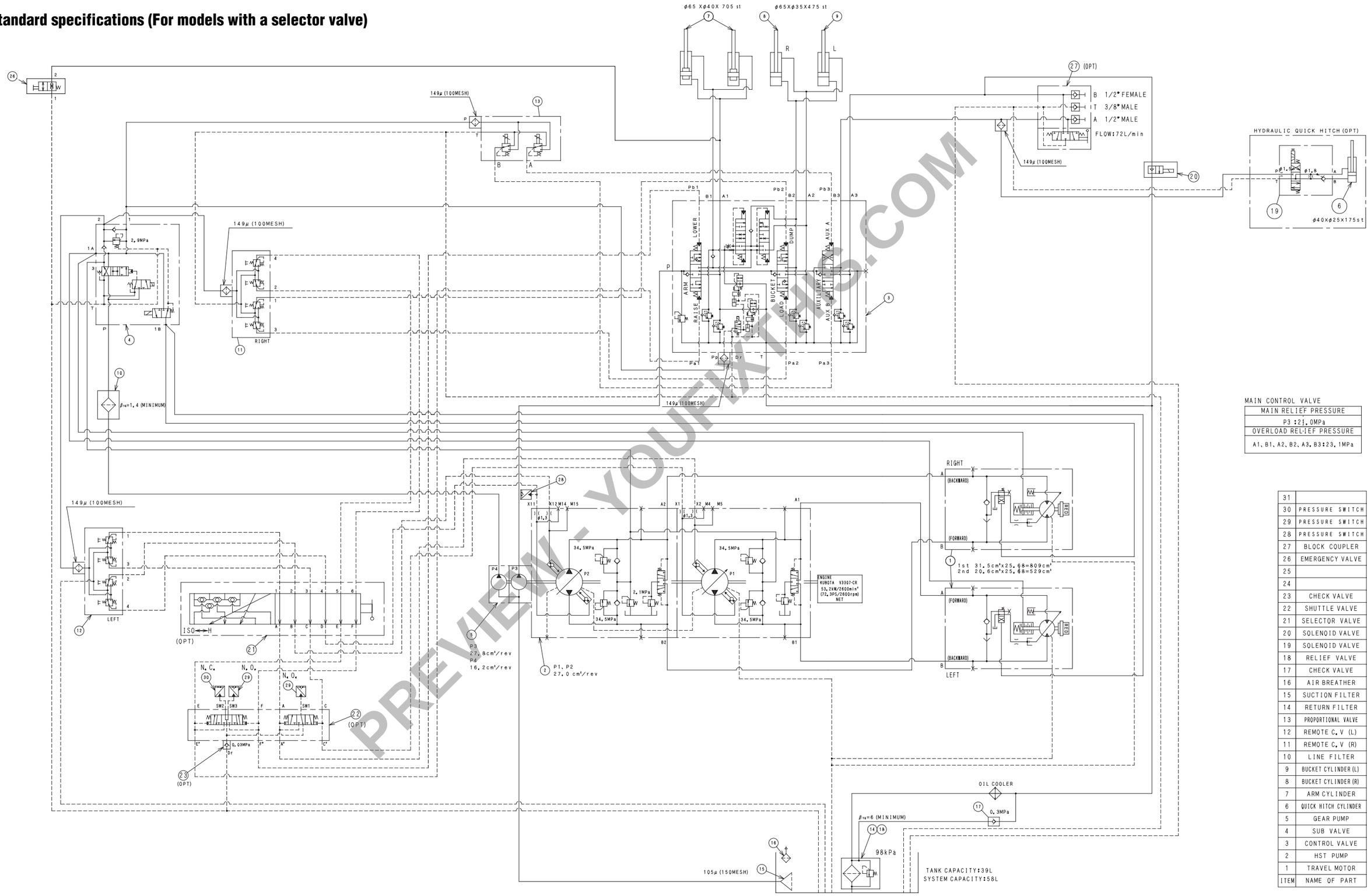
Standard specifications (For models with a selector valve)



MAIN CONTROL VALVE

MAIN RELIEF PRESSURE
P3 :21.0MPa
OVERLOAD RELIEF PRESSURE
A1, B1, A2, B2, A3, B3:23.1MPa

ITEM	NAME OF PART
31	
30	PRESSURE SWITCH
29	PRESSURE SWITCH
28	PRESSURE SWITCH
27	BLOCK COUPLER
26	EMERGENCY VALVE
25	
24	
23	CHECK VALVE
22	SHUTTLE VALVE
21	SELECTOR VALVE
20	SOLENOID VALVE
19	SOLENOID VALVE
18	RELIEF VALVE
17	CHECK VALVE
16	AIR BREATHER
15	SUCTION FILTER
14	RETURN FILTER
13	PROPORTIONAL VALVE
12	REMOTE C.V (L)
11	REMOTE C.V (R)
10	LINE FILTER
9	BUCKET CYLINDER(L)
8	BUCKET CYLINDER(R)
7	ARM CYLINDER
6	QUICK HITCH CYLINDER
5	GEAR PUMP
4	SUB VALVE
3	CONTROL VALVE
2	HST PUMP
1	TRAVEL MOTOR

TL8 HYDRAULIC CIRCUIT DIAGRAM
In Compliance with EC(NRMM) EPA Tier4

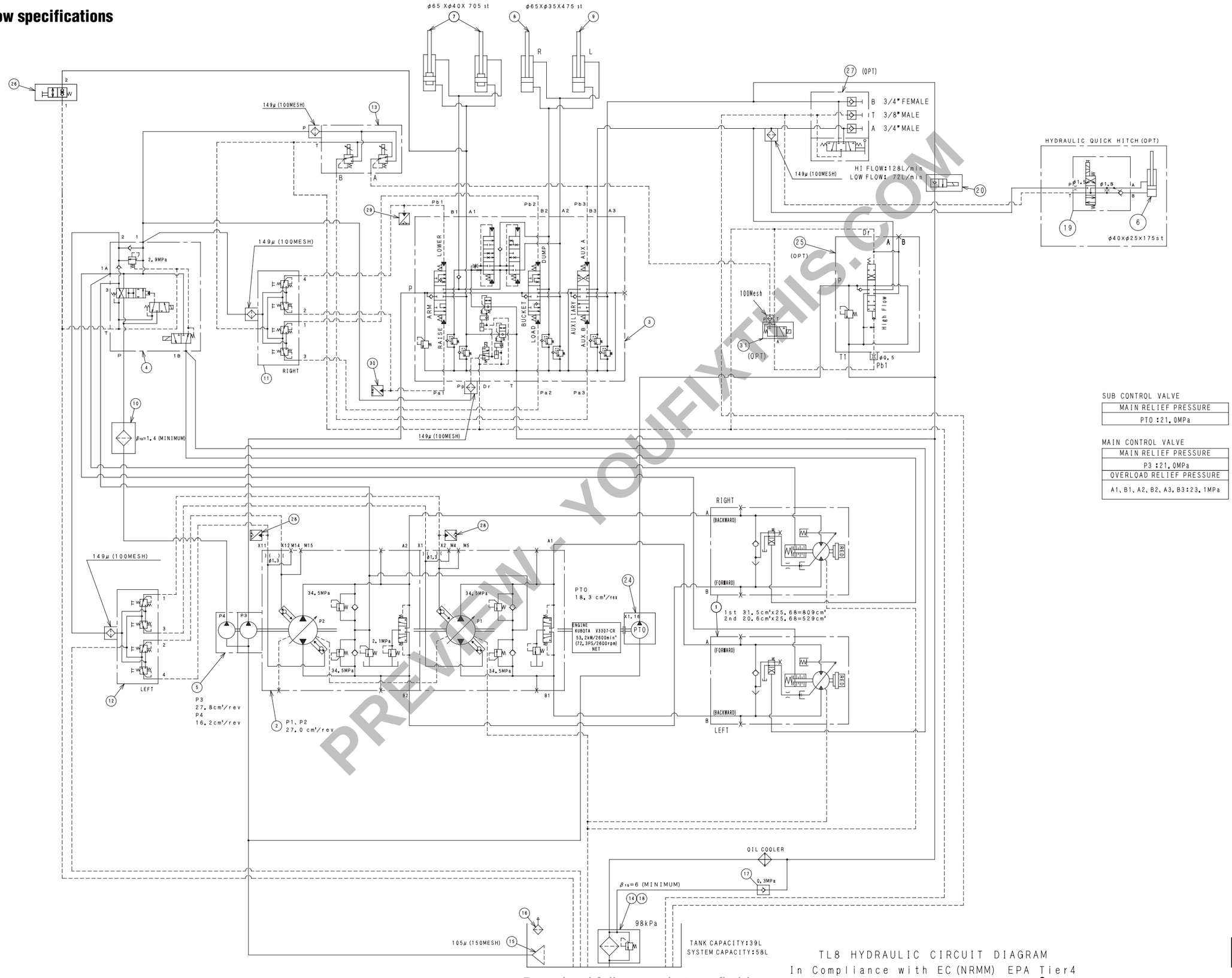
Drawing No.	1/1
06601-00007	

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High-flow specifications



SUB CONTROL VALVE

MAIN RELIEF PRESSURE
PTO :21.0MPa

MAIN CONTROL VALVE

MAIN RELIEF PRESSURE
P3 :21.0MPa
OVERLOAD RELIEF PRESSURE
A1、B1、A2、B2、A3、B3:23.1MPa

ITEM	NAME OF PART
31	SOLENOID VALVE
30	PRESSURE SWITCH
29	PRESSURE SWITCH
28	PRESSURE SWITCH
27	BLOCK COUPLER
26	EMERGENCY VALVE
25	CONTROL VALVE
24	GEAR-PUMP
23	·
22	·
21	·
20	SOLENOID VALVE
19	SOLENOID VALVE
18	RELIEF VALVE
17	CHECK-VALVE
16	AIR BREATHER
15	SUCTION FILTER
14	RETURN-FILTER
13	PROPORTIONAL VALVE
12	REMOTE-C.V (L)
11	REMOTE-C.V (R)
10	LINE FILTER
9	BUCKET CYLINDER (L)
8	BUCKET CYLINDER (R)
7	ARM CYLINDER
6	QUICK HITCH CYLINDER
5	GEAR-PUMP
4	SUB VALVE
3	CONTROL VALVE
2	HST-PUMP
1	TRAVEL MOTOR

Drawing No.	1/1
06601-00008	

2F0BE03

TL8 HYDRAULIC CIRCUIT DIAGRAM
In Compliance with EC(NRMM) EPA Tier4

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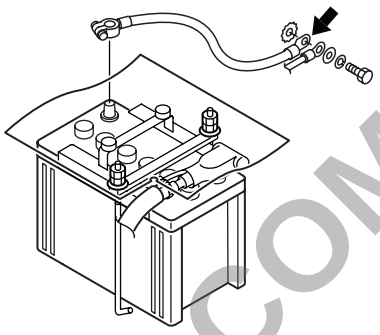
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Removing the engine

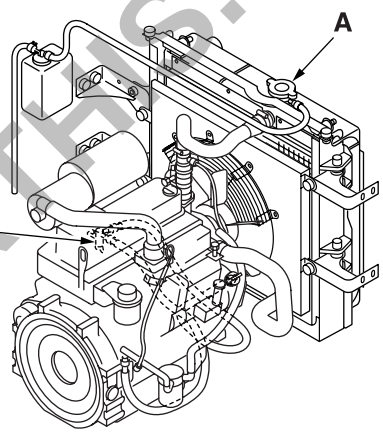
⚠ WARNING

Securely wrap or otherwise isolate the disconnected terminal to ensure that it does not make contact with the body or other parts.

1. Disconnect the ground cable on the battery from the engine body.

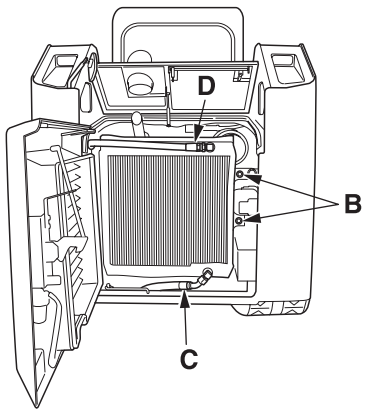

4B0AU02

2. Drain off the engine coolant.
   a. Remove the radiator cap (A).
   b. Loosen the drain valve (32), and let the engine coolant drain out.
      • Engine coolant volume: 14 L (14.8 US qt.)
3. Drain off the hydraulic oil from the hydraulic tank.
   ☞ "Removing the hydraulic tank"
   • Total oil volume: 58 L (15.3 US gal.)
4. Remove the covers.
   ☞ "Removing the covers"
5. Disconnect the hoses on the air conditioner.
   • For air conditioner specifications only
   ☞ "Removing the air conditioner"
6. Remove the canopy.
   ☞ "Removing the canopy"
7. Remove the floor frame.
   ☞ "Removing the floor frame"



4B0AT02

8. Remove the radiator assembly (6).
   a. Remove the bolts (B), and open the radiator assembly.
   b. Disconnect the hoses (C) and (D).
      • Prepare a plate to catch drips of hydraulic oil.
   c. Disconnect the hose (29).
   d. Remove the bands, and disconnect the hoses (16) and (17).
      Band: 5 N·m (3.7 ft.-lb)
   e. Remove the pin (33), and remove the radiator assembly (6).
      Radiator assembly: 52 kg (115 lb)
      • During assembly, the radiator is to be mounted at a right angle to the frame and parallel to the cooling fan.



4B0AU04

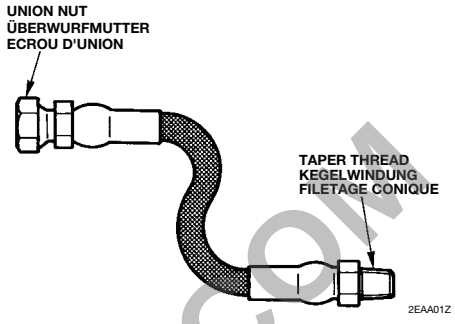
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TIGHTENING TORQUE

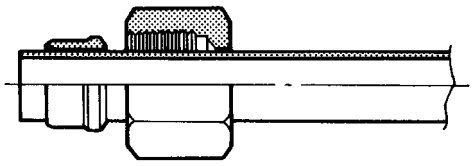
Hydraulic hose

Hose fitting size	Tightening torque			
	Union nut (G)		Taper thread (R)	
	N·m	ft.-lb	N·m	ft.-lb
1/8	$9.8^{+4.9}_{0}$	$7.3^{+3.5}_{0}$	11.8 ± 1.2	8.7 ± 0.8
1/4	$24.5^{+4.9}_{0}$	$18.1^{+3.5}_{0}$	29.4 ± 2.9	21.7 ± 2.1
3/8	$49.0^{+4.9}_{0}$	$36.2^{+3.5}_{0}$	53.9 ± 5.4	39.8 ± 3.9
1/2	$58.8^{+4.9}_{0}$	$43.4^{+3.5}_{0}$	88.3 ± 8.8	65.1 ± 6.4
3/4	$117.7^{+4.9}_{0}$	$86.8^{+3.5}_{0}$	147.1 ± 14.7	108.5 ± 10.7
1	$137.3^{+4.9}_{0}$	$101.3^{+3.5}_{0}$	196.1 ± 19.6	144.7 ± 14.3



Bite-type pipe fitting for steel pipe

Outer diameter of pipe (mm)	Tightening torque	
	N·m	ft.-lb
8	34.3 ± 4.9	23.5 ± 3.5
10	41.7 ± 2.5	30.7 ± 1.7
12	58.8 ± 4.9	43.4 ± 3.5
15	88.3 ± 4.9	65.1 ± 3.5
16	93.2 ± 4.9	68.7 ± 3.5
18	132.4 ± 4.9	97.6 ± 3.5
22	205.9 ± 9.8	151.8 ± 7.2
27.2	245.2 ± 9.8	181.0 ± 7.2
28	313.8 ± 19.6	231.4 ± 14.3
32	313.8 ± 19.6	231.4 ± 14.3
35	411.9 ± 19.6	303.7 ± 14.3

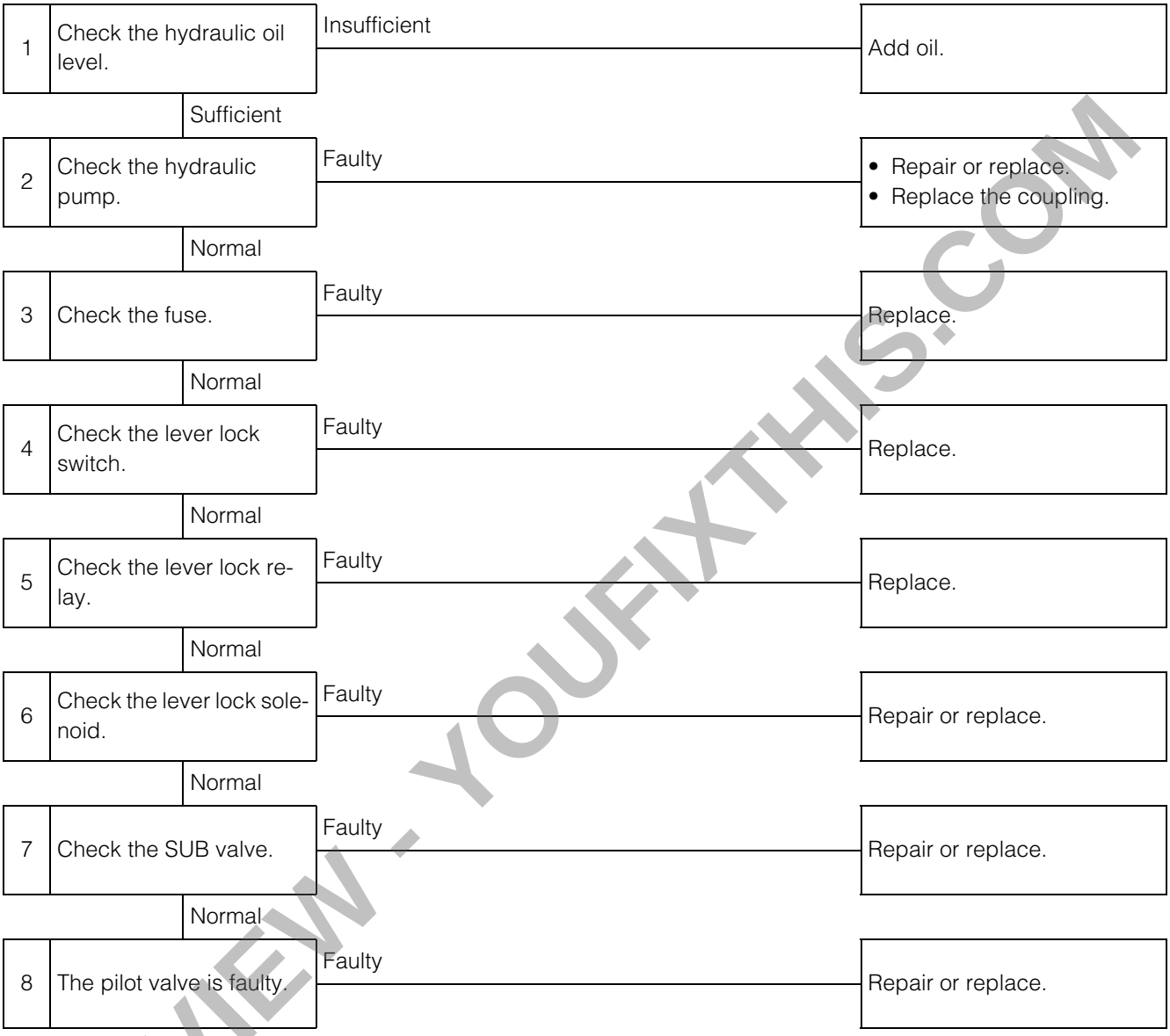


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OVERALL MACHINE

No operation is possible.



1. Check the hydraulic oil level.
   Check the hydraulic oil tank level.
   ☞ "4. Disassembly and assembly, Hydraulic oil tank"
   When adding, use the same brand of oil currently being used.
   ☞ "2. Service data, Fuel and lubricant table"

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SPECIFICATION TABLES

Performance

Bucket type				Standard bucket
Bucket capacity			m^3 ($ft.^3$)	0.351 (12.4)
Tipping load			kg (lb.)	2730 (6020)
Rated loading mass			kg (lb.)	955 (2105)
Breakout force			kN (lbf)	29.9 (6722)
Raising time (with load)			s	4.0
Lowering time			s	2.5
Bucket forward tilting time			s	2.6
Travel speed	Forward	1st	km/h (mph)	7.4 (4.6)
		2nd	km/h (mph)	11.0 (6.8)
	Reverse	1st	km/h (mph)	7.4 (4.6)
		2nd	km/h (mph)	11.0 (6.8)
Maximum tractive force			kN (lbf)	40.6 (9127)
Gradeability			deg.	30
Minimum turning radius	Outermost side of bucket		m (ft.)	2.08 (6.8)

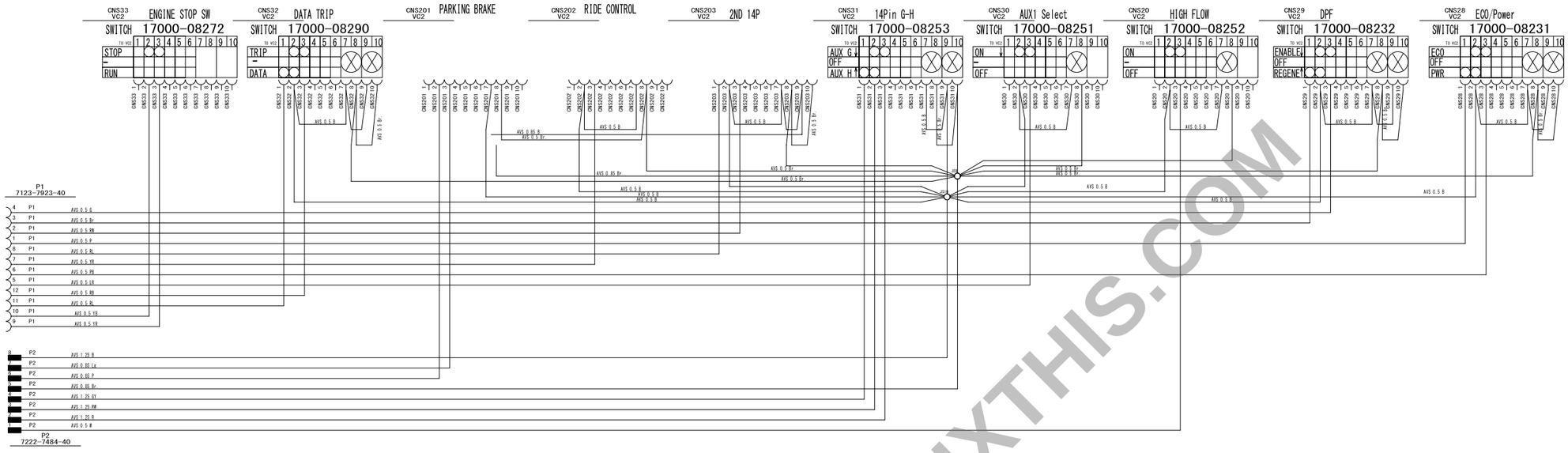
Dimensions

Overall length in transport condition	Without teeth		mm (in.)	3430 (135.1)
	With teeth		mm (in.)	–
Overall width			mm (in.)	1580 (62.2)
Bucket width			mm (in.)	1675 (66.0)
Overall height	Bucket on ground	Canopy	mm (in.)	2130 (83.9)
		Cab	mm (in.)	2235 (88.0)
	Max. raised height of bucket		mm (in.)	3905 (153.8)
Crawler bearing length			mm (in.)	1390 (54.7)
Track gauge			mm (in.)	1260 (49.6)
Shoe width			mm (in.)	320 (12.6)
Crawler bearing area			m^2 ($ft.^2$)	0.890 (9.6)
Ground clearance of undercarriage			mm (in.)	310 (12.1)
Bucket hinge pin height			mm (in.)	3030 (119.3)
Dumping clearance (at 39-degree forward tipping)	Without teeth		mm (in.)	2370 (93.4)
	With teeth		mm (in.)	–
Dumping reach (at 39-degree forward tipping)	Without teeth		mm (in.)	730 (28.8)
	With teeth		mm (in.)	–
Bucket roll back angle	On ground		deg. (°)	30
Bucket dumping angle	Maximum height position		deg. (°)	38.6
Maximum digging depth			mm (in.)	0 (0)

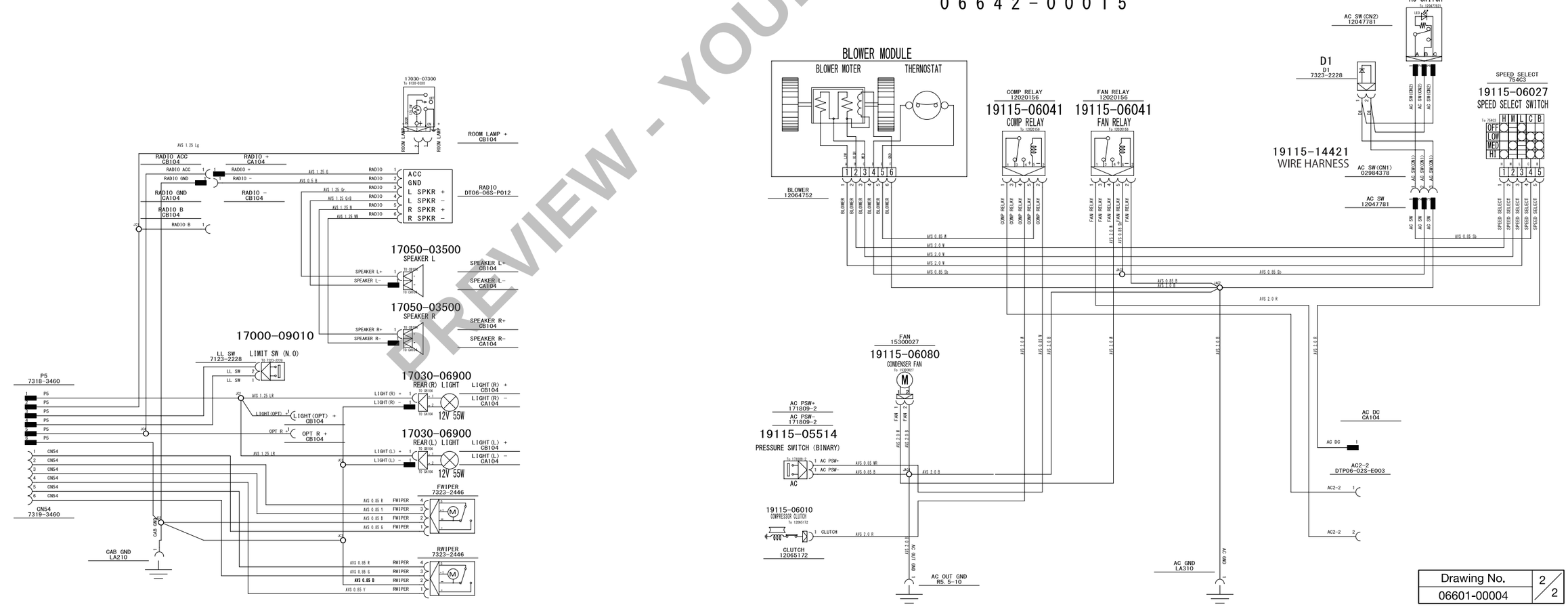
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06642-00049 WIRING HARNESS RH CONSOLE



172651 WIRE HARNESS HVAC 19115-14422
06642-00015



Drawing No.	2/2
06601-00004	

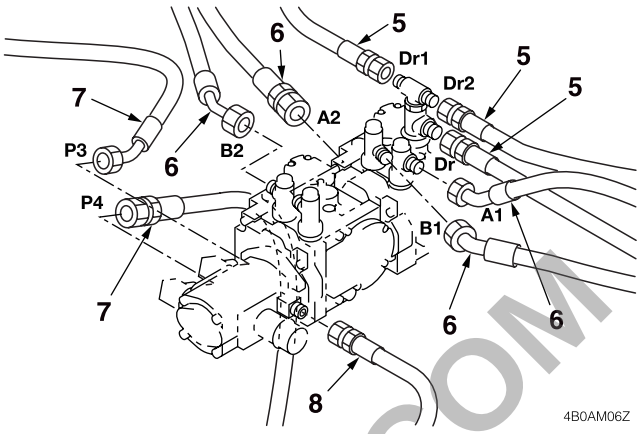
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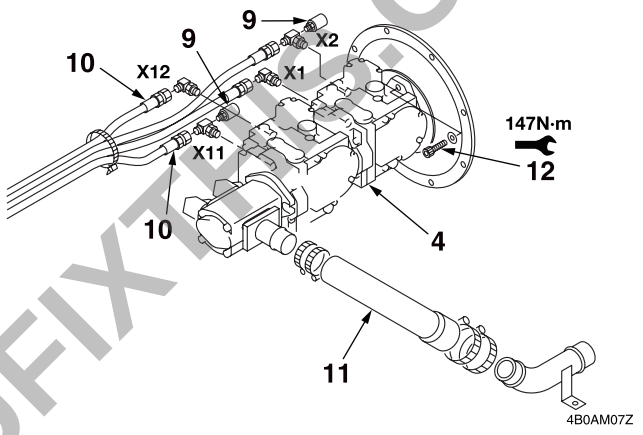
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Removing the hydraulic pump

1. Drain off the hydraulic oil from the hydraulic tank.
   ☞ "Removing the hydraulic tank"
2. Disconnect the drain hoses (5) and the HST hoses (6).
3. Disconnect the discharge hoses (7) and the charge hose (8).
4. Disconnect the electrical wiring from the pressure switches (9).
5. Disconnect the pilot hoses (10).
6. Disconnect the suction hose (11).
7. Take out the cap screws (12), and remove the HST pump (4).
   Apply molybdenum disulfide grease to the spline.
   Cap screw: 147 N·m (108 ft.-lb.)





Installing the hydraulic pump

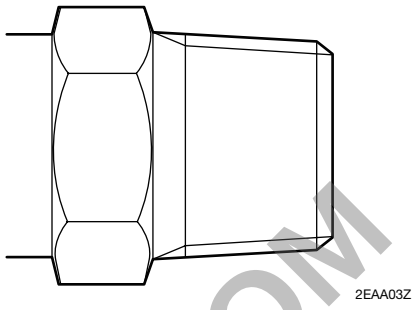
To install, follow the same procedures as for removal but in the reverse order.

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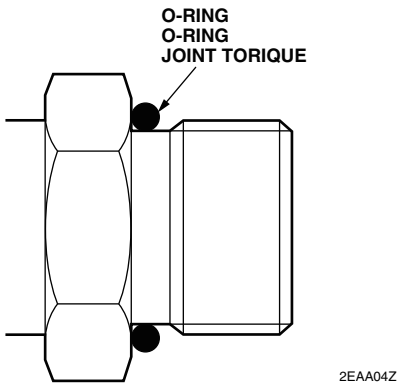
Joint for piping

Nominal thread diameter (R)	Tightening torque			
	Steel		Cast steel	
	N·m	ft.-lb	N·m	ft.-lb
1/8	11.8 ± 1.2	8.7 ± 0.8	10.8 ± 1.1	8.0 ± 0.7
1/4	29.4 ± 2.9	21.7 ± 2.1	24.5 ± 2.5	18.1 ± 1.7
3/8	53.9 ± 5.4	39.8 ± 3.9	49.0 ± 4.9	36.2 ± 3.5
1/2	88.3 ± 8.8	65.1 ± 6.4	73.5 ± 7.4	54.3 ± 5.3
3/4	147.1 ± 14.7	108.5 ± 10.7	127.5 ± 12.7	94.1 ± 9.3
1	196.1 ± 19.2	144.7 ± 14.3	171.6 ± 17.2	126.6 ± 12.5


2EAA03Z

Joint for piping (O-ring seal type)

Nominal thread diameter (G)	Tightening torque	
	N·m	ft.-lb
1/8	19.6 ± 2.0	14.5 ± 1.4
1/4	34.3 ± 4.9	25.3 ± 3.5
3/8	53.9 ± 4.9	39.8 ± 3.5
1/2	63.7 ± 4.9	47.0 ± 3.5
3/4	93.2 ± 4.9	68.7 ± 3.5
1	107.9 ± 9.8	79.5 ± 7.2
1–1/4	117.7 ± 9.8	86.8 ± 7.2
1–1/2	137.3 ± 9.8	101.2 ± 7.2



2EAA04Z

Nominal thread diameter (UNF)	Tightening torque	
	N·m	ft.-lb
7/19–20	16.7 ± 2.0	12.3 ± 1.4
1/2–20	22.6 ± 2.0	16.6 ± 1.4
9/16–18	31.4 ± 2.9	23.1 ± 2.1
3/4–16	59.8 ± 4.9	44.1 ± 3.5
1–1/16–12	102.0 ± 5.9	75.2 ± 4.4
1–5/16–12	135.3 ± 7.8	99.8 ± 5.8
1–5/8–20	181.4 ± 9.8	133.8 ± 7.2

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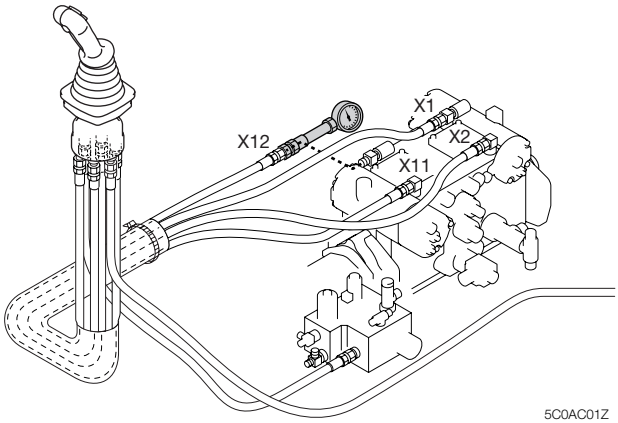
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TRAVELING

Traveling fails.

1	Check the charge pressure.	Pressure too low		Repair or replace.
	Normal			
2	Check the pilot valve.	Faulty		Repair or replace.
	Normal			
3	Check the HST pump discharge pressure.	Normal	The travel motor is faulty.	Repair or replace.
	Pressure too low			
4	Test the high-pressure relief valve using a replacement valve.	Problem solved		Repair or replace.
5	HST pump is faulty.			Repair or replace.

1. Check the charge pressure.
   Measure the charge pressure of the HST pump.
   ☞ "2. Service data, Performance criteria"
   Replace the HST pump if the charge pressure is too low.
   ☞ "4. Disassembly and assembly, HST pump"
2. Check the pilot valve.
   a. Disconnect the hose connecting the pilot valve (left) and the HST pumps (P1 and P2) from the pump side.
   b. Attach a pressure gauge to the hose that was disconnected.
   c. Operate the lever (traveling) and measure the pressure (charge pressure).
      • Replace the pilot valve if the pressure (charge pressure) is not at a normal level.
   ☞ "2. Service data, Performance criteria"
3. Check the HST pump discharge pressure.
   ☞ "2. Service data, Performance criteria"
   If the discharge pressure of the HST pump is not reading at a normal level, repair or replace the travel motor.



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Mass

Gross machine mass	Canopy	kg (lb.)	4395 (9689)
	Cab	kg (lb.)	4475 (9866)
Operating mass	Canopy	kg (lb.)	3835 (8455)
	Cab	kg (lb.)	3915 (8631)
Machine mass	Canopy	kg (lb.)	3760 (8289)
	Cab	kg (lb.)	3840 (8466)
Shipping mass	Canopy	kg (lb.)	3705 (8168)
	Cab	kg (lb.)	3785 (8344)

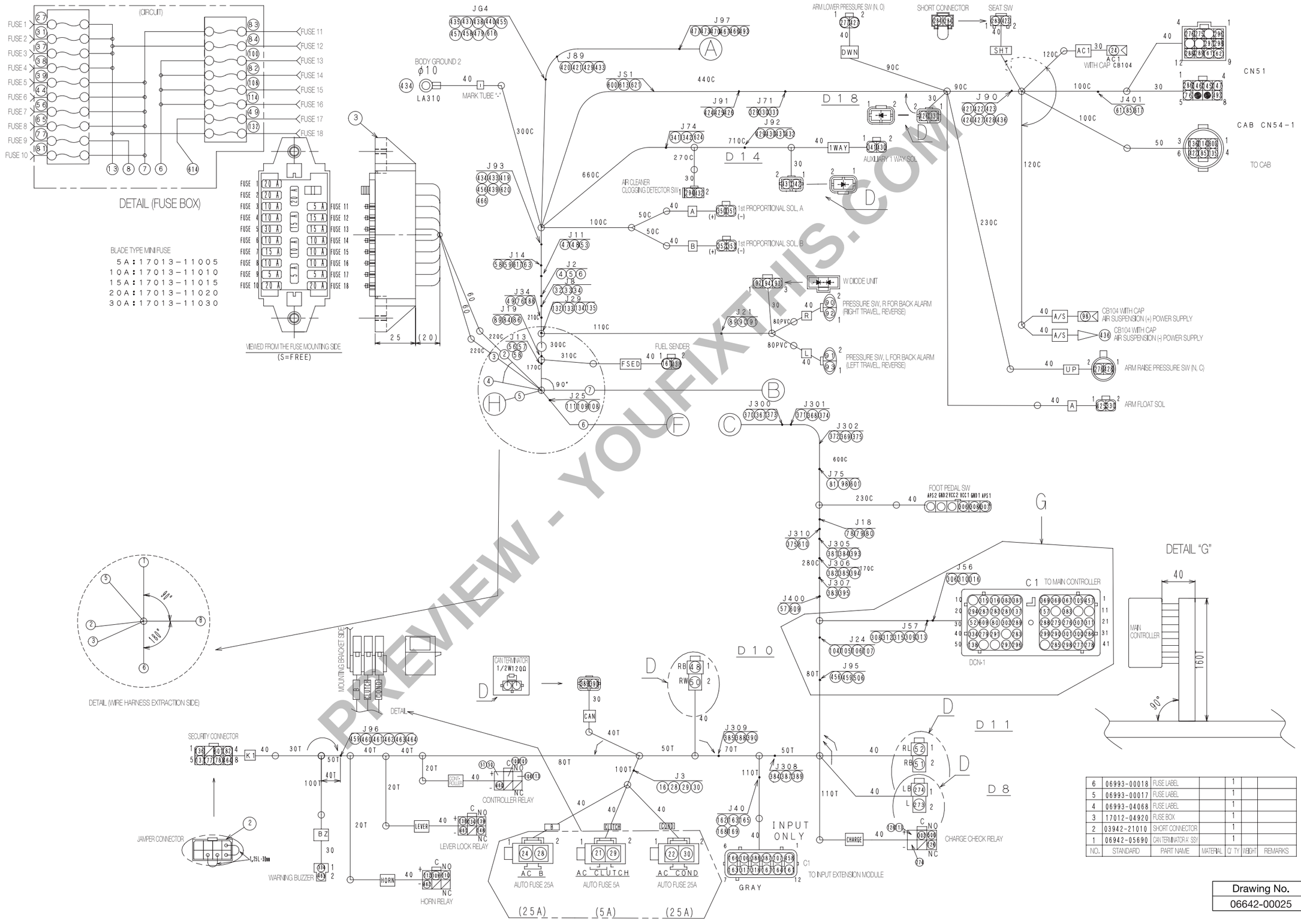
Engine

Model				Kubota V3307-CR-TE4B
Type				4-cycle, vertical, water-cooled, in-line, 4-cylinder, direct-injection
Number of cylinders – Internal diameter × stroke	Number of cylinders		Quantity	4
	Bore		mm (in.)	94 (3.7)
	Stroke		mm (in.)	120 (4.72)
Total displacement			L (cu. in.)	3.331 (203.26)
Performance	Rated output	Gross (SAE J1995)	kW/min^{-1} (hp/rpm)	55.4/2600 (74.3/2600)
		Net (ISO 14396)	kW/min^{-1} (hp/rpm)	54.6/2500 (73.2/2600)
		Net (ISO 9249/ SAEJ 1349)	kW/min^{-1} (hp/rpm)	53.2/2600 (71.3/2600)
	Maximum torque		N·m (ft.-lb.)	259.5 (191.4)/1500 (min^{-1})
	Specific fuel consumption (at rated output)		g/kW·h (lb./hp-hr.)	243 (0.39)
Fuel system	Speed governor			Electronic control
Lubrication system	Lubrication type			Trochoid pump
	Filter system			Filter paper
	Cooling system			Water cooling
Air cleaner				Centrifugal, filter paper
Cooling system	Fan			Spray
	Radiator			Pressurization
Generator	AC/DC			Three-phase, alternating current, self-rectifying
	Voltage		V	12
	Output		kW	0.72
Starter generator	Voltage		V	12
	Output		kW	3
Storage battery	Type			125D31R
	Voltage		V	12
	Capacity		A·h	72
	Quantity			1

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Main harness 06642-00025



NO.	STANDARD	PART NAME	MATERIAL	Q'TY	WEIGHT	REMARKS
6	06993-00018	FUSE LABEL		1		
5	06993-00017	FUSE LABEL		1		
4	06993-04068	FUSE LABEL		1		
3	17012-04920	FUSE BOX		1		
2	03942-21010	SHORT CONNECTOR		1		
1	06942-05690	CAN TERMINATOR A' SSY		1		

Drawing No.	1/5
06642-00025	

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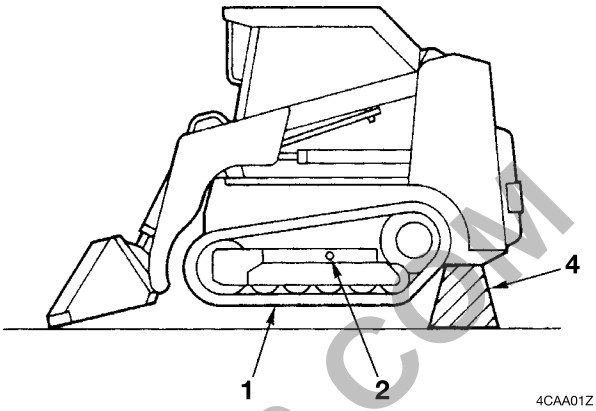
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TRAVEL SYSTEM

Removing the crawler belt

1. Loosen the tension of the crawler (1).
   - When loosening the check valve (2), do it slowly. Stop loosening it once grease starts to come out. If no grease comes out, slightly move the machine forward and backward.

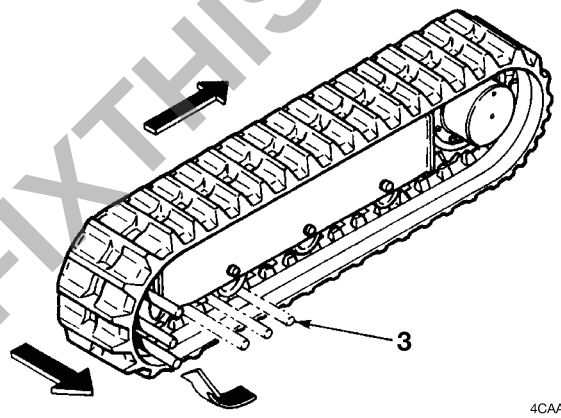
   Check valve: 59 N·m (43.5 ft.-lb)
2. Place the block (4) under the machine to support it, and raise the machine using the arm and bucket.



4CAA01Z

3. Fit the iron pipe (3) into the crawler and then rotate the sprocket in the reverse direction.
4. Once the pipe reaches the side of the idler, stop rotating the sprocket.
5. Slide the crawler to the side, and remove it.

   Crawler belt: 170 kg (375 lb)

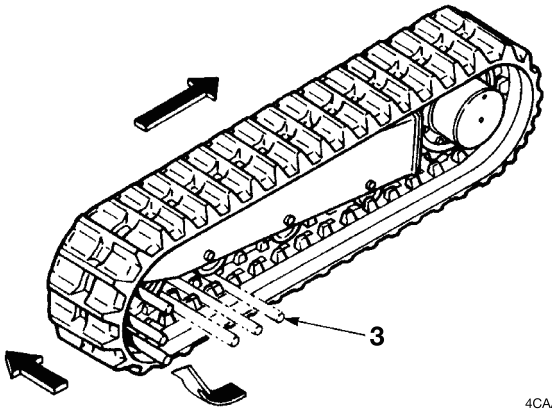


4CAA02Z

Installing the crawler belt

1. Place the block (4) under the machine to support it, and raise the machine using the arm and bucket.
2. Set the crawler (1) on the frame.
   - Set the crawler so that it is engaged with the sprocket.
3. Fit the iron pipe (3) into the crawler and then rotate the sprocket in the reverse direction.
4. Once the pipe (3) reaches the side of the sprocket, stop rotating the sprocket.
5. Slide the crawler to a position where it can be properly fitted with the idler.
6. Make sure that the crawler is firmly engaged with the sprocket and the idler and then adjust the crawler tension.

   “2. Service data, Performance criteria”



4CAA03Z

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Bolts and nuts (JIS strength category 10.9)

Thread	Size × pitch	Tightening torque			
		General tightening points		Special tightening points	
		N·m	ft.-lb	N·m	ft.-lb
Coarse·	M6 × 1.0	9.8 ± 0.5	7.2 ± 0.4	11.8 ± 1.1	8.7± 0.4
	M8 × 1.25	22.6 ± 1.1	16.6 ± 0.8	26.5 ± 2.5	19.5 ± 0.9
	M10 × 1.5	47.1 ± 2.4	34.7 ± 1.7	54.9 ± 4.9	40.5 ± 2.0
	M12 × 1.75	83.4 ± 4.1	61.5 ± 3.0	97.1 ± 7.4	71.6 ± 3.5
	M14 × 2.0	134.4 ± 6.7	99.1 ± 4.9	155.9 ± 12.7	115.0 ± 5.7
	M16 × 2.0	207.9 ± 10.4	153.3 ± 7.7	241.2 ± 17.2	177.9 ± 8.9
	M20 × 2.5	410.9 ± 20.5	303.1 ± 15.1	475.6 ± 23.7	350.8 ± 17.5
Fine	M8 × 1.0	24.5 ± 1.2	18.1 ± 0.9	28.4 ± 1.4	21.0 ± 1.0
	M10 × 1.25	50.0 ± 2.5	36.9 ± 1.8	58.8 ± 2.9	43.4 ± 2.2
	M12 × 1.5	87.3 ± 4.3	64.4 ± 3.2	102.0 ± 5.1	75.2 ± 3.8
	M14 × 1.5	135.3 ± 6.8	99.9 ± 5.0	157.9 ± 7.8	116.5 ± 5.8
	M16 × 1.5	220.6 ± 11.0	162.7 ± 8.1	256.0 ± 12.7	188.8 ± 9.4
	M20 × 1.5	452.1 ± 22.6	333.4 ± 16.6	524.7 ± 26.1	387.0 ± 19.2

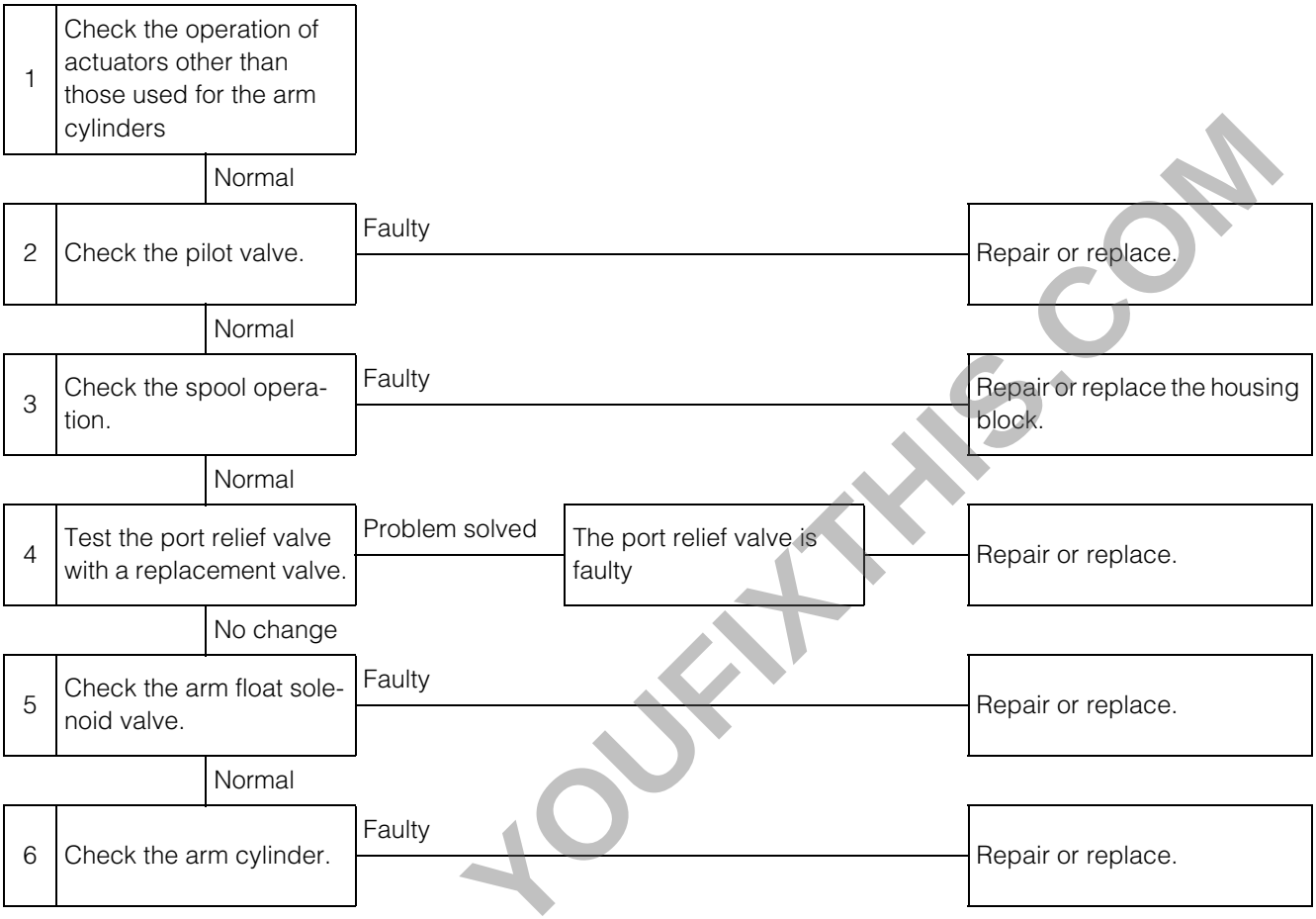
1. General tightening points (non-lubricated)
   All securing points that have no special tightening torque specified in this manual and that are not special tightening points.
2. Special tightening points (grease with molybdenum disulfide applied)
   Points where a specific tightening torque is specified in this manual.
3. Points where thread-locking compound should be applied (ThreeBond #1324).
4. If a tightening torque value is specified in this manual for a point not listed in the table above, follow the specification in the manual.
5. To tighten multiple bolts and nuts evenly, tighten opposite bolts/nuts alternately as a pair.

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LIFT ARM

Arm cylinder does not move.



1. **Check the operation of actuators other than those used for the arm cylinders.**
   Check the operation of the lift arm only as listed in the table below.
   If operation is faulty, check the main relief valve and the hydraulic pump (P3).
   ☞ "2. Service data, Performance criteria"
   ☞ "Overall Machine, No operation is possible"

Lever to operate	Device to check	
Bucket	Relief valve R3	Pump P3

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Hydraulic drive system

Hydraulic pump	Model		Sauer-Danfoss-Daikin PVM2828
	Type		Variable displacement piston
	Displacement	cm^3/rev (cu. in./rev)	0 to 27 (0 to 1.65)
	Quantity		2
Travel motor	Model		Sauer-Danfoss-Daikin BMVT32C
	Type		Variable displacement piston
	Motor displacement	cm^3/rev (cu. in./rev)	20.6/31.5 (1.26/1.92)
	Quantity		2
Set pressure	Effective differential pressure	MPa (psi)	34.5 (5002)
Reduction gears			Epicycle 2-stage reduction gear

Brake device

Parking brake	Spring-loaded, wet-type disc brake

Undercarriage

Suspension system			Rigid type
Roller, idler	Sealing system		Floating seal
	Carrier roller (one side)	Quantity	—
	Track roller (one side)	Quantity	5
Crawler	Track adjustment		Grease adjustment
	Type		Integrated design, single grouser, rubber crawler
	Grouser height	mm (in.)	30 (1.18)
	Number of shoes (one side)	Quantity	52
	Pitch	mm (in.)	86 (3.39)
	Shoe width	mm (in.)	400, 320 (15.7,12.6)

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SAFETY ALERT SYMBOL



This symbol represents the safety alert. The message that follows the symbol contains important information regarding human safety.
Read and understand the message to avoid personal injury or death.

Safety label

Safety labels are used to alert operators or other people exposed to the risks of injury or damage. There are the following three types of labels.
Read the labels carefully as they are important for your safety.

⚠ DANGER

The word "DANGER" indicates an imminently hazardous situation which, if not avoided, is likely to result in serious injury or death.

⚠ WARNING

The word "WARNING" indicates a potentially hazardous situation which, if not avoided, could result in serious injury or death.

⚠ CAUTION

The word "CAUTION" indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

IMPORTANT: The word "IMPORTANT" is used to alert operators and maintenance personnel about situations which could result in damage to the machine and its components.

This manual is intended for trained and qualified personnel only. Warnings or cautions described in this manual do not necessarily cover all safety measures. It is also impossible to cover all hazards and risks which may be associated with the maintenance of the machine in every environment. For maintenance work, each person must take adequate safety precautions against possible hazards in the respective working environment.

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