YANMAR

SERVICE MANUAL

EXCAVATOR

B7-6 (YCEE)

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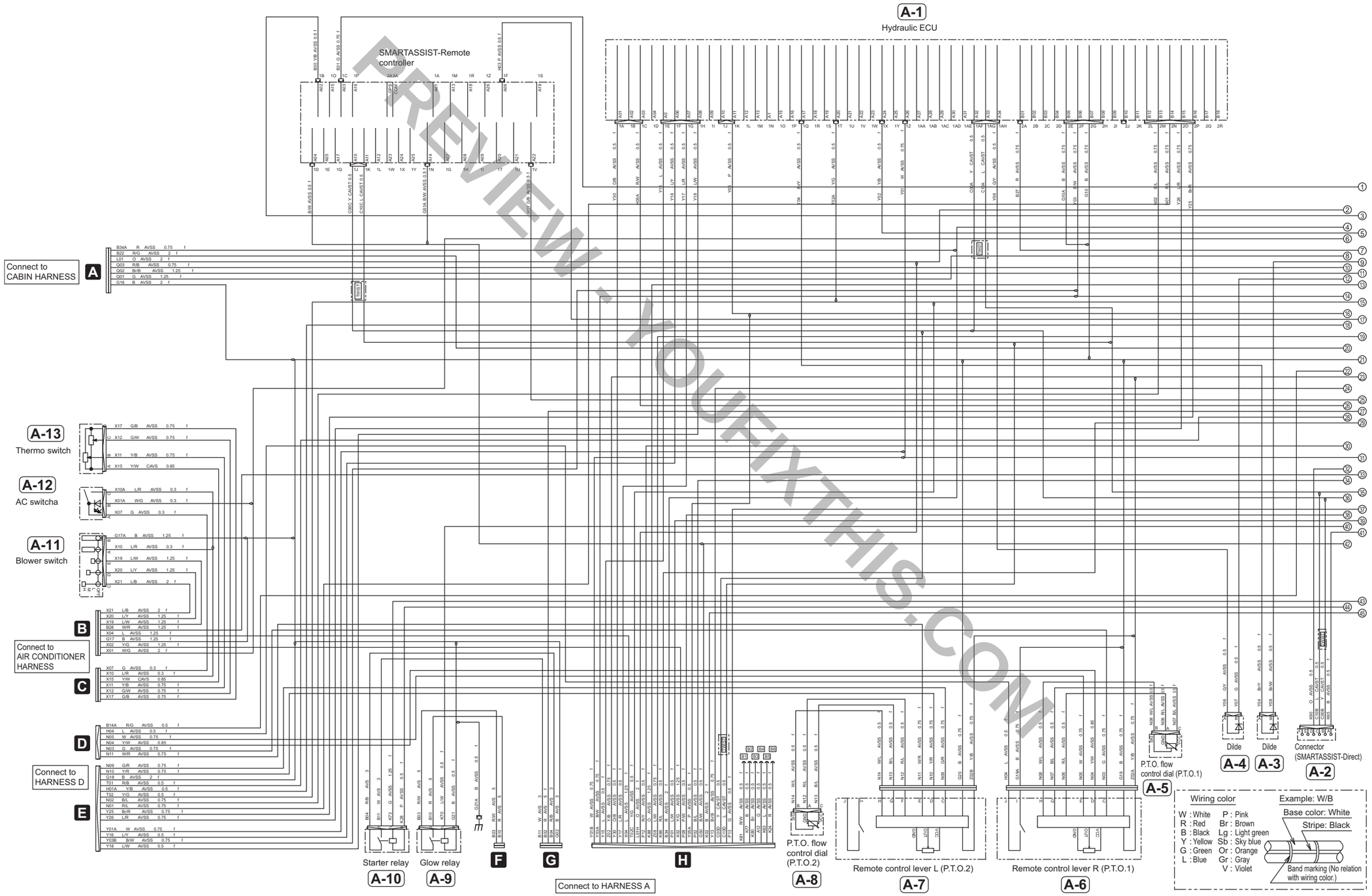
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1) Harness B

1/3

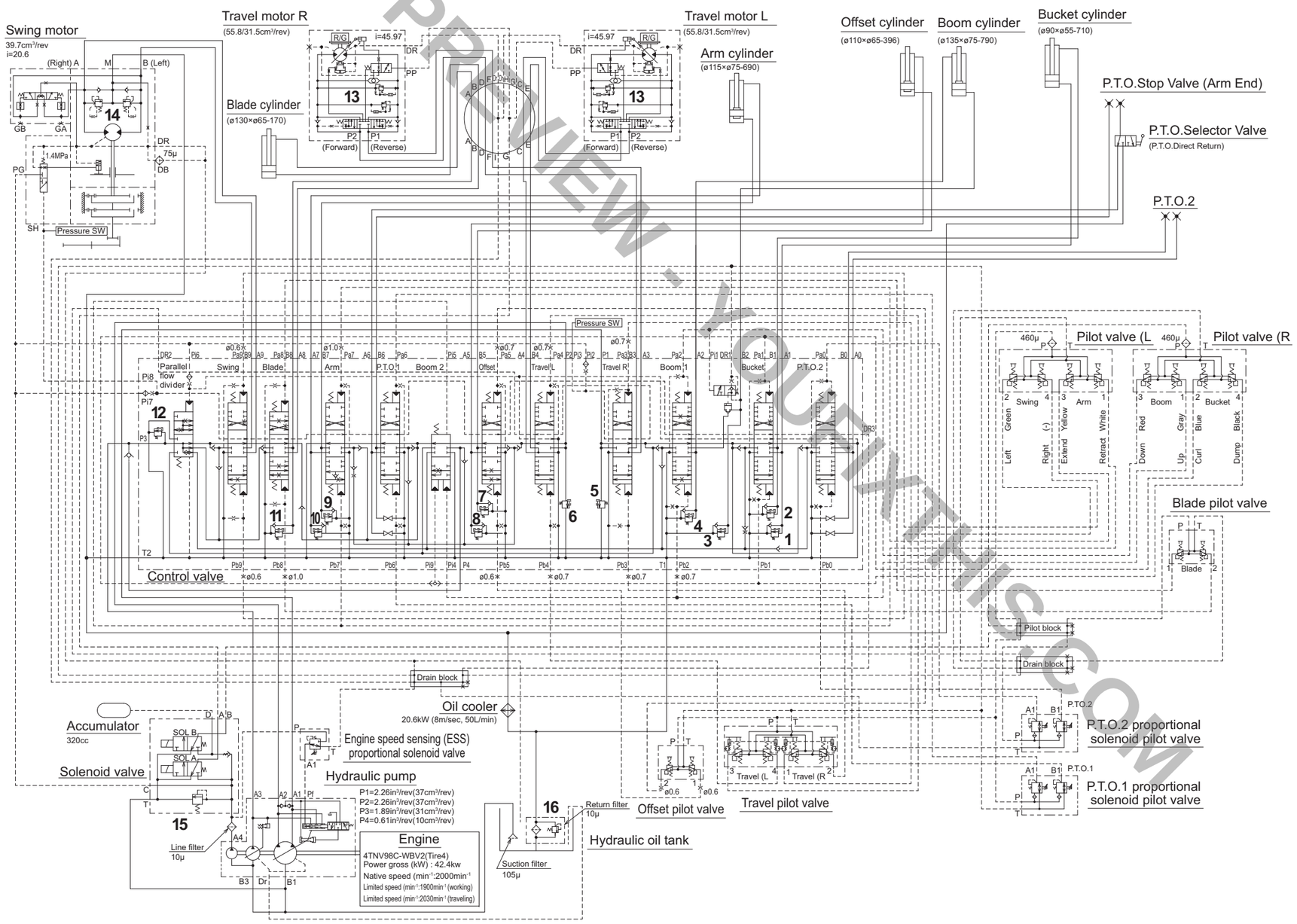


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2. TECHNICAL DATA

2-8 Hydraulic Circuit Schematic



Relief valve set pressure

	B7-6
1	4134psi (28.5Mpa)
2	4134psi (28.5Mpa)
3	4279psi (29.5Mpa)
4	4134psi (28.5Mpa)
5	3698psi (25.5Mpa)
6	3698psi (25.5Mpa)
7	4134psi (28.5Mpa)
8	4134psi (28.5Mpa)
9	4134psi (28.5Mpa)
10	4134psi (28.5Mpa)
11	2176psi (15.0Mpa)
12	3481psi (24.0Mpa)
13	3698psi (25.5Mpa)
14	3481psi (24.0Mpa)
15	421psi (2.9Mpa)
16	21.3psi (0.147Mpa)

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4-2-6 Crankshaft and Camshaft Components

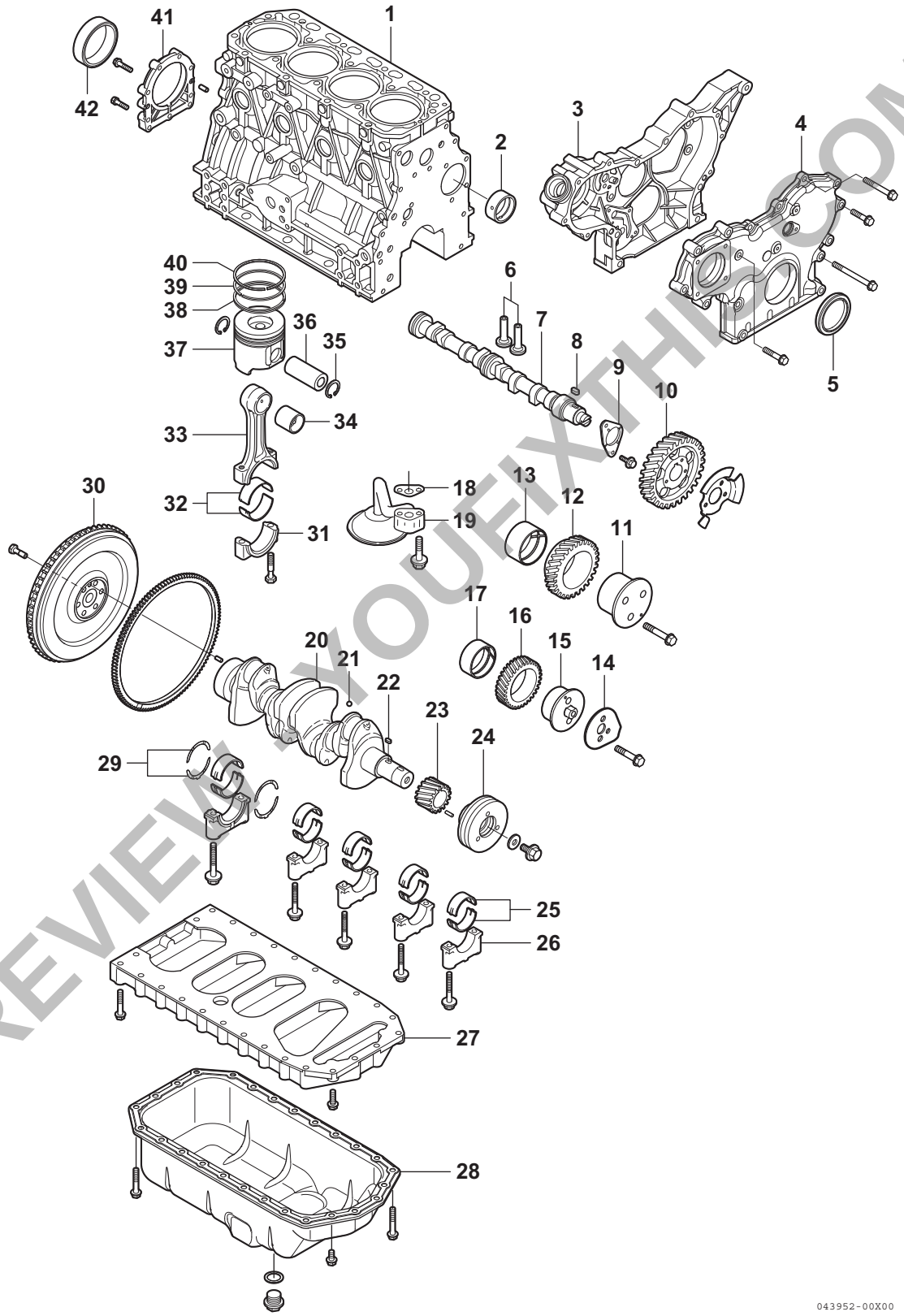


Figure 4-2-41

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3-7 List of Tightening Torque

3-7-1 Machine

Applicable model			B7-6		
Equipment			Thread size	Tightening torque ft•lbf (N•m)	Adhesive
	No	Tightening part			
Engine / Electrical equipment					
	1	Engine mount vibroisolating rubber	M16 × 130	195.3 to 224.2 (264.8 to 304)	Three Bond 1324
	2	Engine × Engine mount F (Radiator side)	M10 × 35 (11T)	61.4 (83.3)	Three Bond 1324
	3	Engine × Engine mount R (Flywheel side)	M12 × 30 (10.9)	79.7 to 94.4 (108 to 128)	Three Bond 1324
	4	Air cleaner	M8 × 20	14.5 to 16.7 (19.6 to 22.6)	-
	5	Air cleaner intake hose (Engine and Air cleaner side)	Hose clip 80	1.8 to 2.5 (2.5 to 3.4)	-
	6	Air cleaner intake hose (Air cleaner intake side)	Hose clip 80	0.9 to 1.1 (1.2 to 1.5)	-
	7	Cooling water hose	Hose clip 48	1.8 to 2.5 (2.5 to 3.4)	-
	8	Fuel gauge unit	M5×12 (Pan-head machine screw)	0.87 to 1.08 (1.18 to 1.47)	-
	9	Fuel tank × Bracket (SWP × Clamp)	M8 × 16	9.4 to 12.3 (12.8 to 16.7)	-
	10	Fuel drain valve	R3/8	14.5 to 21.7 (19.6 to 29.4)	Sealing tape Loctite 577
	11	Fuel tank holding band (Tank holding (upper) side)	Nut 10	1.8 to 2.1 (2.5 to 2.9)	-
	12	Fuel tank holding band (Lock nut (lower) side)	Nut 10	18.1 to 23.9 (24.5 to 32.4)	-
	13	Battery holding rod (Battery holding side)	Nut 8	2.2 (2.94)	
	14	LCD monitor × Panel	M5 × 20	0.6 to 0.9 (0.8 to 1.2)	-
	15	Air conditioner hose joint	M6 × 20	5.9 to 8.9 (8 to 12)	
	16	Air conditioner hose × Receiver dryer	M6 × 25	5.9 to 8.9 (8 to 12)	-
	17	Air conditioner hose × Condenser (Condenser upper side)	M22 × 1.5 (Hose joint)	14.8 to 18.4 (20 to 25)	-
	18	Air conditioner hose × Condenser (Condenser lower side)	M16 × 1.5 (Hose joint)	8.9 to 11.1 (12 to 15)	-
	19	Air conditioner hose × Compressor	M8 × 25	14.8 to 18.4 (20 to 25)	-
	20	Safety switch (Cut-off lever)	Nut 18 (Fine thread)	21.7 to 25.3 (29.4 to 34.3)	-
	21	Engine control dial	Nut 9 (Fine thread)	1.08 or less (1.47 or less)	-
	22	Mount × Air conditioner bracket	Nut 8	9.37 to 12.3 (12.7 to 16.7)	-
	23	Exhaust pipe × Clamp	M10 × 65	32.5 (44.1)	-

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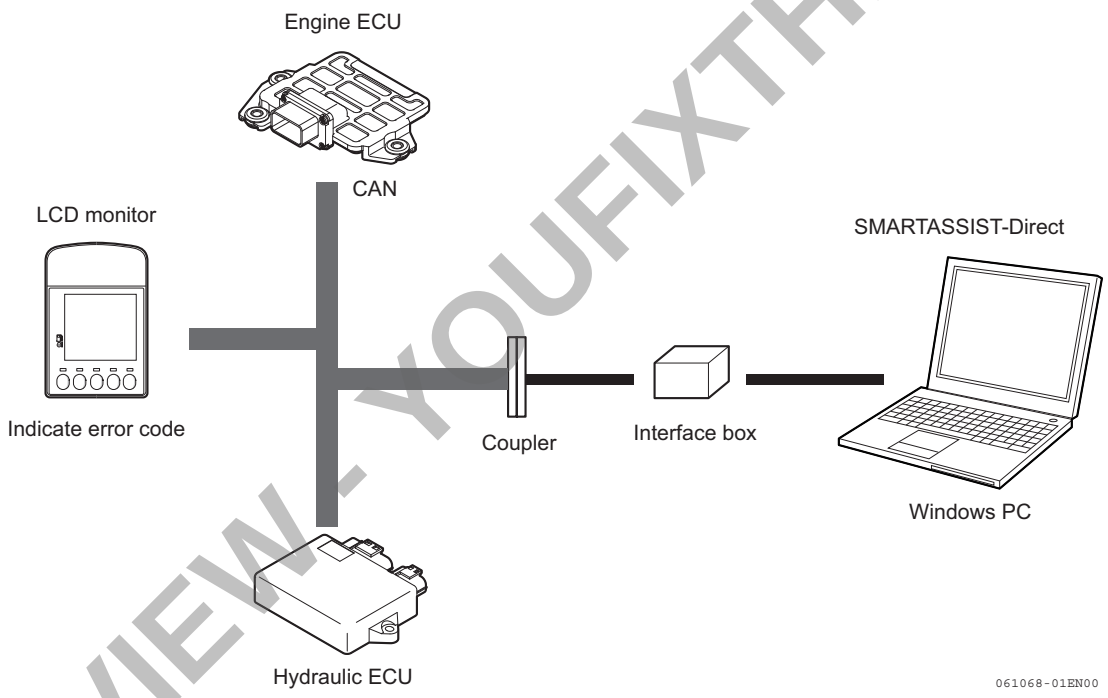
5-5 Error Code

The LCD monitor and the controllers including the engine ECU and hydraulic ECU are connected via CAN.
If the LCD monitor or any of the controllers detects an abnormality, an error code corresponding to the abnormality is displayed on the LCD monitor. For detailed description of error codes, refer to the error code list.

Connecting SMARTASSIST-Direct (SA-D), a controller failure diagnosis tool, to the controllers allows checking of detailed failure information and history for the engine ECU and hydraulic ECU as well as implementation of status monitoring and diagnostic tests.
For detailed information and operation of SA-D, refer to the SMARTASSIST-Direct operation manual and the engine troubleshooting manual.

Note:

Information on the LCD monitor cannot be checked by SA-D.



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1. GENERAL CAUTIONS FOR MAINTENANCE WORK

1. General Cautions for Maintenance Work

1-1 Correct Work

Correct work means the quickest possible completion of according to the correct procedures and the specified standards.

It is important when conducting certain operations always to bear in mind the equipment, tools, gauges, materials, oil and grease, etc. that you must have ready, as well as items to be checked, adjusted, or disassembled, and cautions to watch out for.

1-2 Safety Precautions

(1) Never attempt servicing while engine is running or immediately after stopping operation.
(2) Wear work cloths, safety shoes and helmet.
(3) Check the equipment and tools before use. Especially, be sure to check the crane, lifting equipment and tools.
(4) When working together with other persons, allocate everyone's share of job, arrange the signals and act in concert with the other persons.
(5) The operation of the crane and slinging work must be performed by qualified persons.
(6) Do not enter or pass under the raised load.
(7) Lift and support the massive parts by crane before removing the installation bolts.
(8) Disconnect cables from battery before repairing the electric system.
(9) Remove the battery when welding the machine.

1-3 Preparations

(1) Check the service record of the machine. (That is, check how many months or hours the machine has been used since the preceding overhaul, what was the trouble then and what parts were replaced.)
(2) Have all servicing tools ready, i.e., tools, measuring devices (which have received periodic maintenance), containers, oil & grease, etc.
(3) Have the service literature (operation manual, parts catalog, etc.) ready.

1-4 Cautions for Disassembly and Reassembly

(1) Clean the machine before disassembly.
(2) Check and record the condition of the machine before disassembly :
  • Model, machine number, operation hours
  • Reasons for repair, history of repair
  • Contamination of filters
  • Fuel and oil condition
  • Damage to parts, etc.
(3) Place alignment marks on the necessary parts to facilitate reassembly.
(4) Clean all the removed parts and new replacement parts and put them in order.
(5) Use new seals, split pins, etc. for reassembly.

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8. TROUBLESHOOTING

Troubleshooting table

Symptoms and conditions of failures		Implement																			
		Implement does not move at all										Implement's force is weak or its speed is slow									
Cause		All implements	Boom	Arm	Bucket	Boom offset	Swing	Blade	Travel R	Travel L	P.T.O.	All implements	Boom	Arm	Bucket	Boom offset	Swing	Blade	Travel R	Travel L	P.T.O.
1. Hydraulic pump	Hydraulic pump ASSY	O										O									
	Piston pump P1		O		O				O				O		O				O		
	Piston pump P2		O	O	O	O				O	O		O	O	O	O				O	O
	Piston pump P3			O			O	O			O			O			O	O			O
	Pilot pump P4	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
2. Control valve	Sections related to P1 flow																				
	Sections related to P2 flow																				
	Sections related to P3 flow																				
	Boom section		O										O								
	Arm section			O										O							
	Bucket section				O										O						
	Boom offset section					O										O					
	Blade section							O										O			
	Swing section						O										O				
	Travel R section								O										O		
	Travel L section									O										O	
	P.T.O. section										O										O
	Inlet section																				
	Boom2 section		O	O							O		O	O							O
	Parallel flow divider section													O			O	O			O
3. System relief valve	Relief valve P1		O		O				O				O		O				O		
	Relief valve P2		O	O	O	O				O	O		O	O		O				O	O
	Relief valve P3			O			O	O			O			O			O	O			O
	Relief valve P4		O	O	O	O	O	O	O	O	O		O	O	O	O	O	O	O	O	O
4. Circuit relief valve	Relief valve (Boom)		O										O								
	Relief valve (Arm)			O										O							
	Relief valve (Bucket)				O										O						
	Relief valve (Boom offset)					O										O					
	Relief valve (Blade)							O										O			
	Relief valve (Swing motor)						O										O				
5. Pilot valve	Right		O		O								O		O						
	Left			O			O							O			O				
	Boom offset					O										O					
	Travel								O	O									O	O	
	Blade							O										O			
	P.T.O.										O										O

Symptoms and conditions of failures		Implement																		
		Implement does not move smoothly									Implement drifts									Unintended movement of implement
Cause		Boom	Arm	Bucket	Boom offset	Swing	Blade	Travel R	Travel L	P.T.O.	Boom	Arm	Bucket	Boom offset	Swing	Blade	Travel R	Travel L	P.T.O.	
1. Hydraulic pump	Hydraulic pump ASSY																			
	Piston pump P1	O		O				O												
	Piston pump P2	O	O	O	O				O	O										
	Piston pump P3		O			O	O			O										
	Pilot pump P4	O	O	O	O	O	O	O	O	O										
2. Control valve	Sections related to P1 flow	O		O				O												
	Sections related to P2 flow	O	O	O	O				O	O										
	Sections related to P3 flow		O			O	O													
	Boom section	O									O									O
	Arm section		O									O								O
	Bucket section			O									O							O
	Boom offset section				O									O						O
	Blade section						O									O				O
	Swing section					O									O					O
	Travel R section							O									O			O
	Travel L section								O									O		O
	P.T.O. section									O									O	O
	Inlet section																			
	Boom2 section	O	O							O										
	Parallel flow divider section		O			O	O			O										
3. System relief valve	Relief valve P1	O		O				O												
	Relief valve P2	O	O		O				O	O										
	Relief valve P3		O			O	O			O										
	Relief valve P4	O	O	O	O	O	O	O	O	O										
4. Circuit relief valve	Relief valve (Boom)	O									O									
	Relief valve (Arm)		O									O								
	Relief valve (Bucket)			O									O							
	Relief valve (Boom offset)				O									O						
	Relief valve (Blade)						O									O				
	Relief valve (Swing motor)					O									O					
5. Pilot valve	Right	O		O																O
	Left		O			O														O
	Boom offset				O															O
	Travel							O	O											O
	Blade						O													O
	P.T.O.									O										O

Symptoms and conditions of failures		Travel				Engine and electrical equipment												
Cause		Cannot change the travel speed to high	Cannot return the travel speed to low	Crawler tension loosens	Jumping of crawler link	Engine does not start	Engine speed does not increase	Engine overheating	Battery dies or battery cannot be charged	Electrical equipment does not work	Fuel meter does not work	Engine water temp. meter does not work	Engine oil pressure lamp lights up	Battery charge lamp lights up	Hour meter does not work	LCD monitor does not work (starter switch is turned on)	Auto deceleration function does not work	Eco mode function does not work
1. Hydraulic pump	Hydraulic pump ASSY						O	O										
	Piston pump P1																	
	Piston pump P2																	
	Piston pump P3																	
	Pilot pump P4	O															O	
2. Control valve	Sections related to P1 flow																	
	Sections related to P2 flow																	
	Sections related to P3 flow																	
	Boom section																	
	Arm section																	
	Bucket section																	
	Boom offset section																	
	Blade section																	
	Swing section																	
	Travel R section																	
	Travel L section																	
	P.T.O. section																	
	Inlet section																	
	Boom2 section																	
	Parallel flow divider section																	
3. System relief valve	Relief valve P1																	
	Relief valve P2																	
	Relief valve P3																	
	Relief valve P4	O															O	
4. Circuit relief valve	Relief valve (Boom)																	
	Relief valve (Arm)																	
	Relief valve (Bucket)																	
	Relief valve (Boom offset)																	
	Relief valve (Blade)																	
	Relief valve (Swing motor)																	
5. Pilot valve	Right																	
	Left																	
	Boom offset																	
	Travel																	
	Blade																	
	P.T.O.																	

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2. TECHNICAL DATA

2. Technical Data

2-1 Specifications

Item			Unit	B7-6	
				Steel track	Rubber track
Main specifications of machine					
Dimensions					
Overall length (Transportation position)			in. (mm)	229.9 (5840)	230.3 (5850)
Cabin	Overall height	Transportation position	in. (mm)	105.5 (2680)	
		Traveling position	in. (mm)	110.6 (2810)	110.2 (2800)
	Overall width	Full machine width	in. (mm)	89.4 (2270)	
Canopy	Overall height	Transportation position	in. (mm)	-	
		Traveling position	in. (mm)	-	
	Overall width	Full machine width	in. (mm)	-	
Tumbler center distance			in. (mm)	89.6 (2277)	90.1 (2288)
Track gauge			in. (mm)	73.6 (1870)	
Minimum ground clearance (height of track frame center bottom)			in. (mm)	14.2 (360)	15.4 (390)
Traveling performance					
Travel speed		Low speed (Forward/Reverse)	MPH (km/hr)	1.6 (2.5)	1.7 (2.7)
		High speed (Forward/Reverse)	MPH (km/hr)	2.8 (4.5)	3.0 (4.8)
Permissible water depth limit			in. (mm)	19.7 (500)	
Work performance					
Bucket	Width (Standard) *including side cutter		in. (mm)	29.53 (750)	
	[Standard. JIS heaped capacity]		cu.ft. (cu.m)	9.89 (0.28)	
	Number of teeth / Installation method		pcs.	4 / rubber pin lock type	
Maximum digging depth	With blade raised		in. (mm)	167.7 (4260)	166.5 (4230)
	With blade on the ground		in. (mm)	176.4 (4480)	175.2 (4450)
Maximum depth of vertically digging			in. (mm)	148.0 (3760)	147.2 (3740)
Maximum dumping height			in. (mm)	214.2 (5440)	215.4 (5470)
Minimum front swing radius (with boom in front center)		Cabin	in. (mm)	52.0 (1320)	
		Canopy	in. (mm)	-	
Minimum front swing radius (with boom full offset <left / right>)		Cabin	in. (mm)	69.3 (1760) / 73.2 (1860)	
		Canopy	in. (mm)	-	
Rear end swing radius			in. (mm)	44.7 (1135)	
Boom offset movement	Cabin	Left	in (mm)	41.7 (1060)	
		Right	in (mm)	34.3 (870)	
	Canopy	Left	degrees	-	
		Right	degrees	-	
Maximum digging force		Bucket	lbs. (k•N)	9554 (42.5)	
		Arm	lbs. (k•N)	5305 (23.6)	
Maximum traction force			lbs. (k•N)	17692 (78.7)	16321 (72.6)
Maximum slope angle to start swinging (in maximum reach position with standard bucket and JIS heaped load <992 lbs (450kg)>)			degrees	15	

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2-6 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	◇								
		Clean		□							
	Replace the fuel filter element						●				
Lube oil	Engine oil	Check, resupply	◇								
		Replace		● 1st time		●					
	Replace the engine oil filter element			● 1st time		●					
	Travel reduction gear oil	Check, resupply				○					
		Replace			● 1st time			●			
Cooling water	Check & supply of cooling water		◇								
	Check cooling water leakage		◇								
	Check & clean radiator fins					□					
	Check & adjust the fan-belt tension		◇(□)								
	Clean & check the cooling water system, and replace the cooling water							● within one year			
Rubber hose	Check & replace fuel oil pipe, cooling water pipe		◇							●	
Air cleaner	Clean air cleaner					□					
	Replace air cleaner element						●				
Hydraulic system	Hydraulic oil	Check, resupply	◇								
		Replace						●			
	Clean suction filter					□ 1st time		□			
	Replace return filter					● 1st time	●				
	Replace line filter							●			
	Check for abnormality of hydraulic pump		◇								
	Check function of accumulator									◇	
Grease	Check grease-up positions, grease		■								
	Greasing the swing gears and the swing bearings			■							
Undercar-riage	Check, adjust track tension		◇								

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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 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

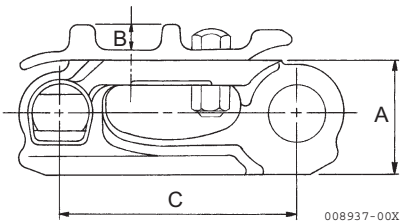
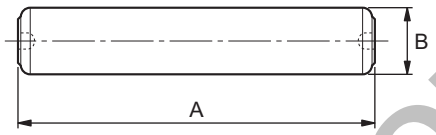
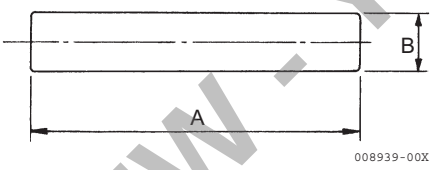
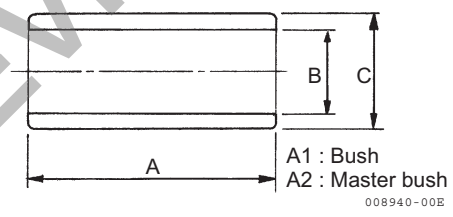
NOTICE indicates a situation which can cause damage to the machine, personal property and/or the environment or cause the equipment to operate improperly.

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3-3-2 Steel Crawler Specifications

[Unit : in. (mm)]

Applicable model		B7-6		
Part		Measuring position	Standard	Wear limit
Steel crawler specifications				
(1) Crawler link (Triple grouser)  ***Note :*** *For the link pitch, measure 5 links at three places and obtain the average value.*		A	2.91 (74)	2.76 (70)
		B	0.79 (20)	0.47 (12)
		C	6.06 (154)	6.18 (157)
(2) Master pin  		A	5.16 (131)	-
		B	Ø0.94 (Ø24.00)	Ø0.87 (Ø22)
(3) Pin  		A	5.16 (131)	-
		B	Ø0.95 (Ø24.075)	Ø0.87 (Ø22)
(4) Bush & master bush  	A	A1	3.18 (80.8)	-
		A2	2.93 (74.5)	-
	B		Ø0.97 (Ø24.6)	Ø1.02 (Ø26)
	C		Ø1.62 (Ø41.26)	Ø1.47 (Ø37.3)

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■ Removal of oil pan

1. Invert the engine (oil pan up) on the engine stand.
2. Remove the oil pan **(Figure 4-2-47, (1))**.

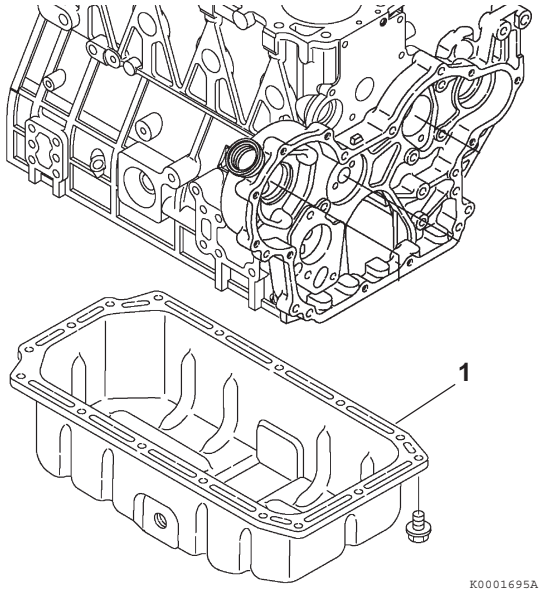


Figure 4-2-47

3. Remove the oil pickup tube **(Figure 4-2-48, (1))** and O-ring **(Figure 4-2-48, (2))**.

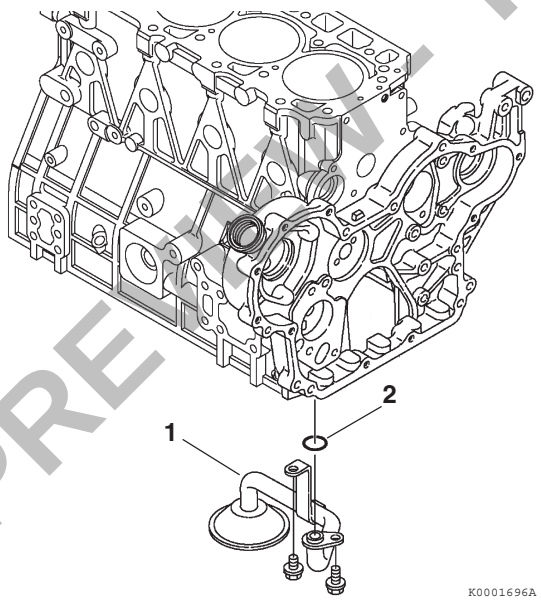


Figure 4-2-48

■ Removal of camshaft

1. Before removing the camshaft, check the camshaft end play.
   - **Method A:** Install a dial indicator **(Figure 4-2-49, (1))** on the cylinder block. Move the camshaft **(Figure 4-2-49, (2))** back and forth to measure the end play. Record the measurement. *See "3-2 Engine Service Standard" section for the service limit.*

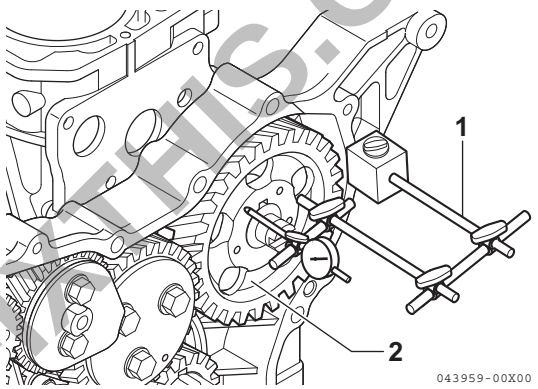


Figure 4-2-49

   - **Method B:** Use a feeler gauge to measure the clearance between the thrust plate **(Figure 4-2-50, (1))** and front camshaft bearing **(Figure 4-2-50, (2))**. *See "3-2 Engine Service Standard" section for the service limit.*

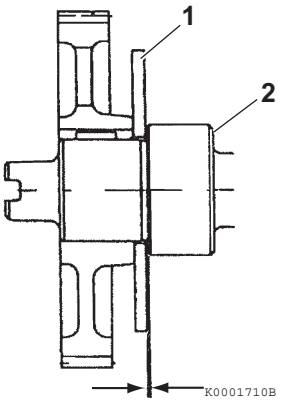


Figure 4-2-50

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4-6-3 Starter Motor Specifications

Yanmar Part Number			129940-77011
Mfg. Part Number			S14-102 (HITACHI)
Nominal Output			4.0 HP (3.0 kW)
Weight			14.3 lbs (6.5 kg)
Revolution Direction (As Viewed From Pinion)			Clockwise
Engagement System			Magnetic Shift
No-load	Terminal Voltage / Current		12 V / 160 A or less
	Revolution		3600 rpm (min^{-1}) and over
Loaded	Terminal Voltage / Current		3.0 V / 1300 A or less
	Torque		19.5 ft·lbf (26.5 N·m) and over
Clutch System			Overrunning
Pinion Projection Voltage at 212°F (100°C)			8 V or less
Pinion DP or Module / Number of Teeth			DP 3 / 9
Brush	Spring Force		7.9 lbf (35 N)
	Height	Standard	0.75 in. (19 mm)
		Limit	0.35 in. (9 mm)
Magnetic Switch	Series Coil Resistance		0.37 Ω at 68°F (20°C)
	Shunt Coil Resistance		0.62 Ω at 68°F (20°C)
Commutator	Outside Diameter	Standard	1.44 in. (36.5 mm)
		Limit	1.40 in. (35.5 mm)
	Run-Out	Standard	0.001 in. (0.03 mm)
		Limit	0.008 in. (0.2 mm)
	Insulation Depth	Standard	0.020 to 0.031 in. (0.5 to 0.8 mm)
		Limit	0.008 in. (0.2 mm)
Armature	Run-Out	Standard	0.001 in. (0.03 mm)
		Limit	0.008 in. (0.2 mm)
Bearing Type	Armature Front	Nominal Number	6004DD
	Armature Rear		608ZZ
	Pinion Front		–
	Pinion Rear		–
Pinion Projection Length (L)			0.012 to 0.059 in. (0.3 to 1.5 mm)

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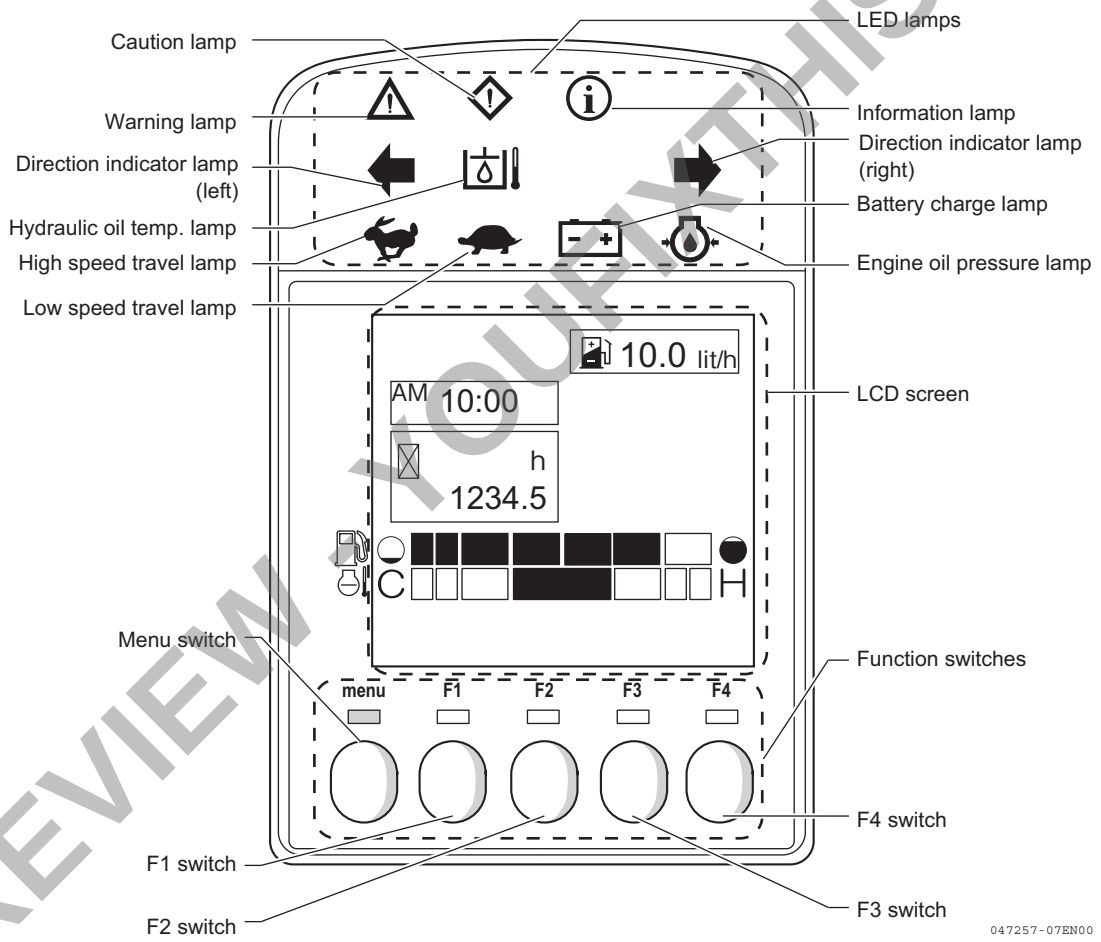
5-1-2 LCD Monitor and Alarm Systems

For safer machine operation, the operator needs to have a clear understanding of the machine's condition. However, it is difficult for the operator to keep an eye on every aspect of the machine he/she is operating.
Therefore, gauges and alarms are installed to warn the operator of any trouble of the machine at the early stage.

Note:

The monitors do not give a full assurance of the machine's condition. The indications shown on them should be used as a guide for daily check and periodic maintenance according to the operation and maintenance manual.

1) Part Name



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6-2-3 Bucket

1) Bucket “Curl”

(1) Pilot oil flow

When the bucket control lever is moved to the left to curl the bucket, the oil from the pilot pump P4 flows through the port B of the cut-off valve, pilot block and the port 2 of the pilot valve (RH) to the port Pa1 of the bucket section and the port Pi9 of the boom 2 section through the shuttle valve to move their spools.

(2) Oil flow from hydraulic pump

The oil from the piston pump P1 flows through the port P1 of the inlet section to the bucket section, while the oil discharged from the piston pump P2 flows to the bucket section through the port P2 of the inlet section, the boom 2 section and parallel passage, and combined oil flows through the port A1 of the bucket section to the bottom end of the bucket cylinder to extend its cylinder rod. The return oil from the rod end of the bucket cylinder flows back to the hydraulic oil tank through the port B1 of the bucket section, the ports T1 and T2 of the control valve. The return oil from the port T2 flows through the oil cooler.

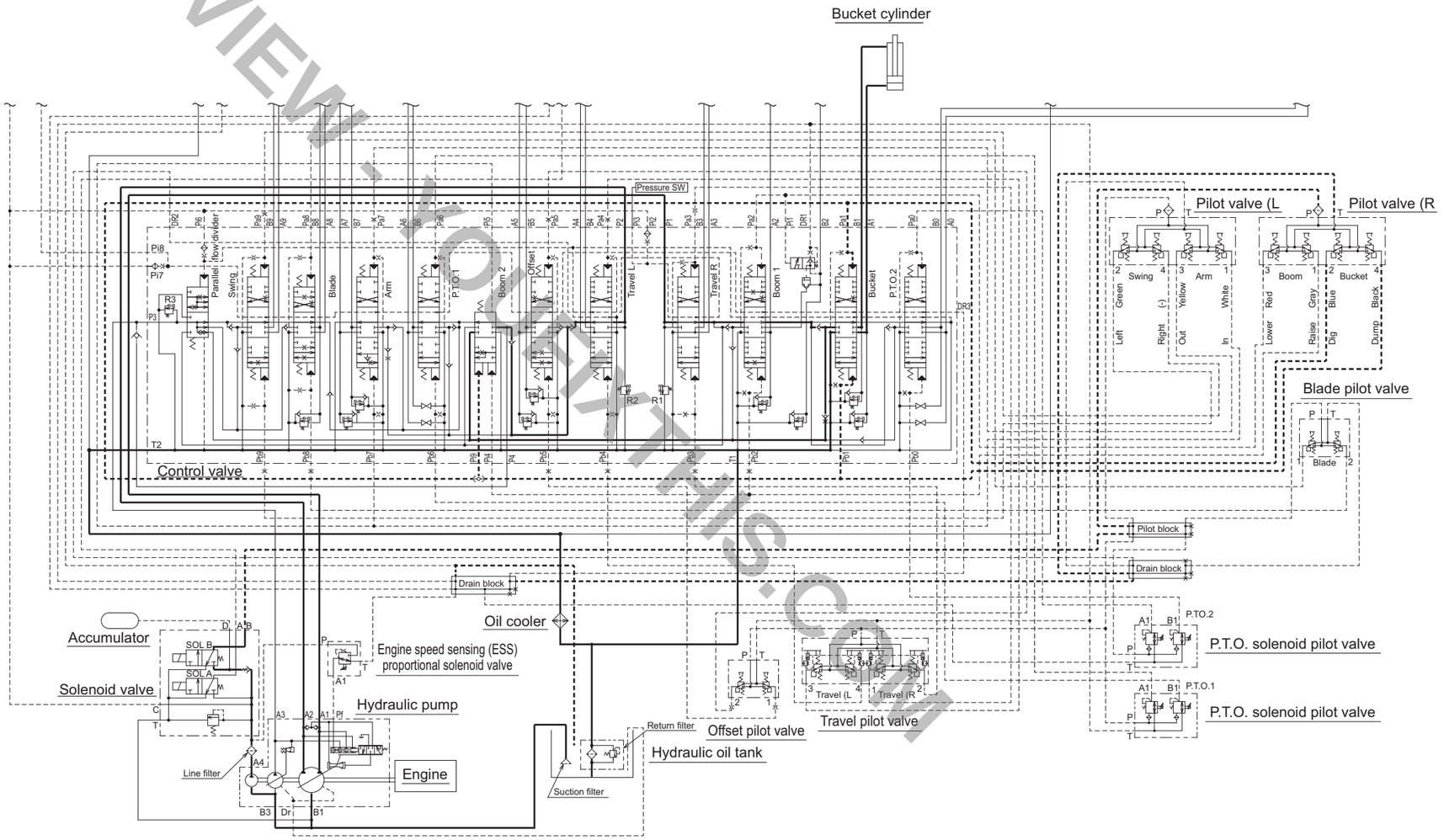
2) Bucket “Dump”

(1) Pilot oil flow

When the bucket control lever is moved to the right to dump the bucket, the oil from the pilot pump P4 flows through the port B of the cut-off valve, pilot block and the port 4 of the pilot valve (RH) to the port Pb1 of the bucket section and the port Pi9 of the boom 2 section through the shuttle valve to move their spools.

(2) Oil flow from hydraulic pump

The oil flows in the opposite direction to the oil flow in the Bucket Curl operation with regard to the bucket cylinder.



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6) Disassembly of travel left section

Loosen the socket head bolt (hexagon diameter 0.2 in (5 mm)) **10** to remove the cap **3** in Fig. 2-8. Then, remove the spring seat **4**, spring **6**, spring seat **5** and O-ring **9**. After that, pull out the spool **2** from the valve housing **1**.

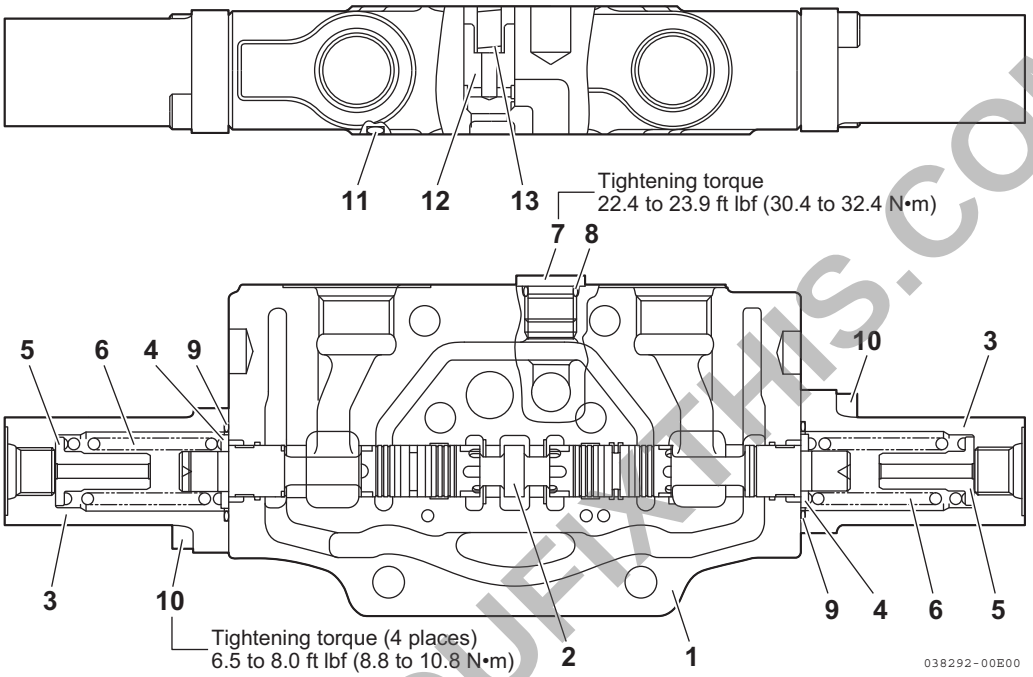


Fig. 2-8

7) Disassembly of boom offset section

Loosen the socket head bolt (hexagon diameter 0.2 in (5 mm)) **13** to remove the cap **3** in Fig. 2-9. Then, remove the spring seat **4**, spring **6**, spring seat **5** and O-ring **12**. After that, pull out the spool **2** from the valve housing **1**.

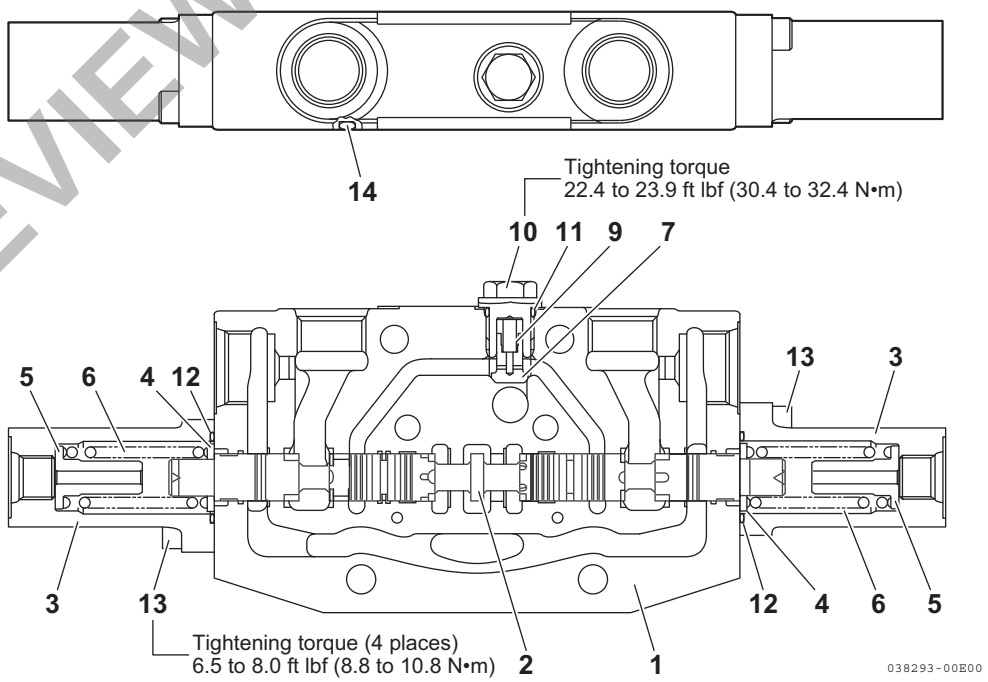
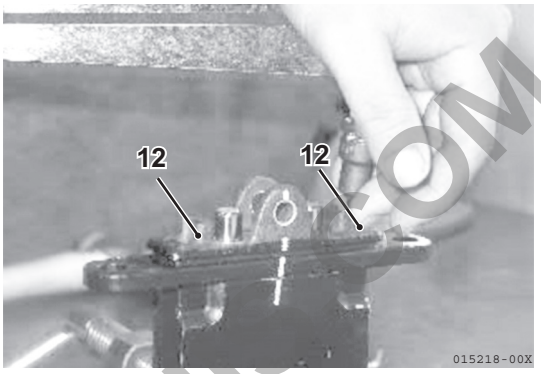
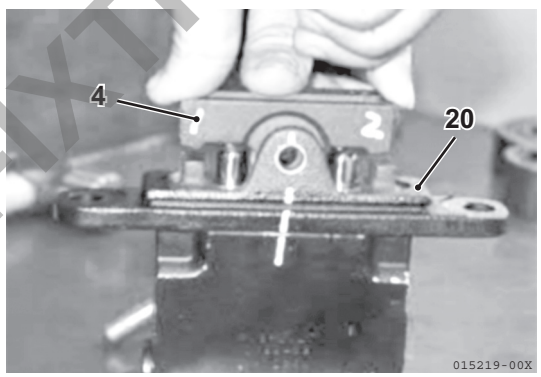
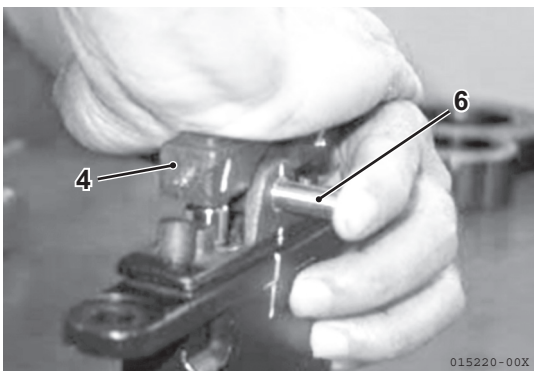
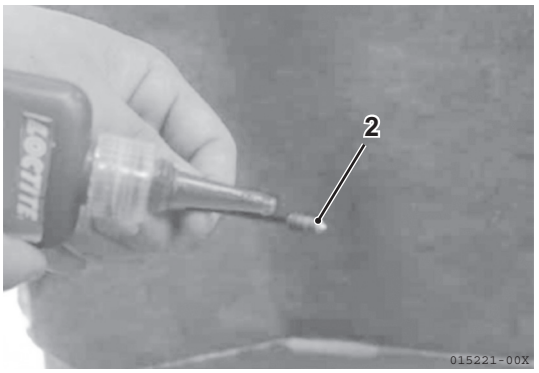


Fig. 2-9

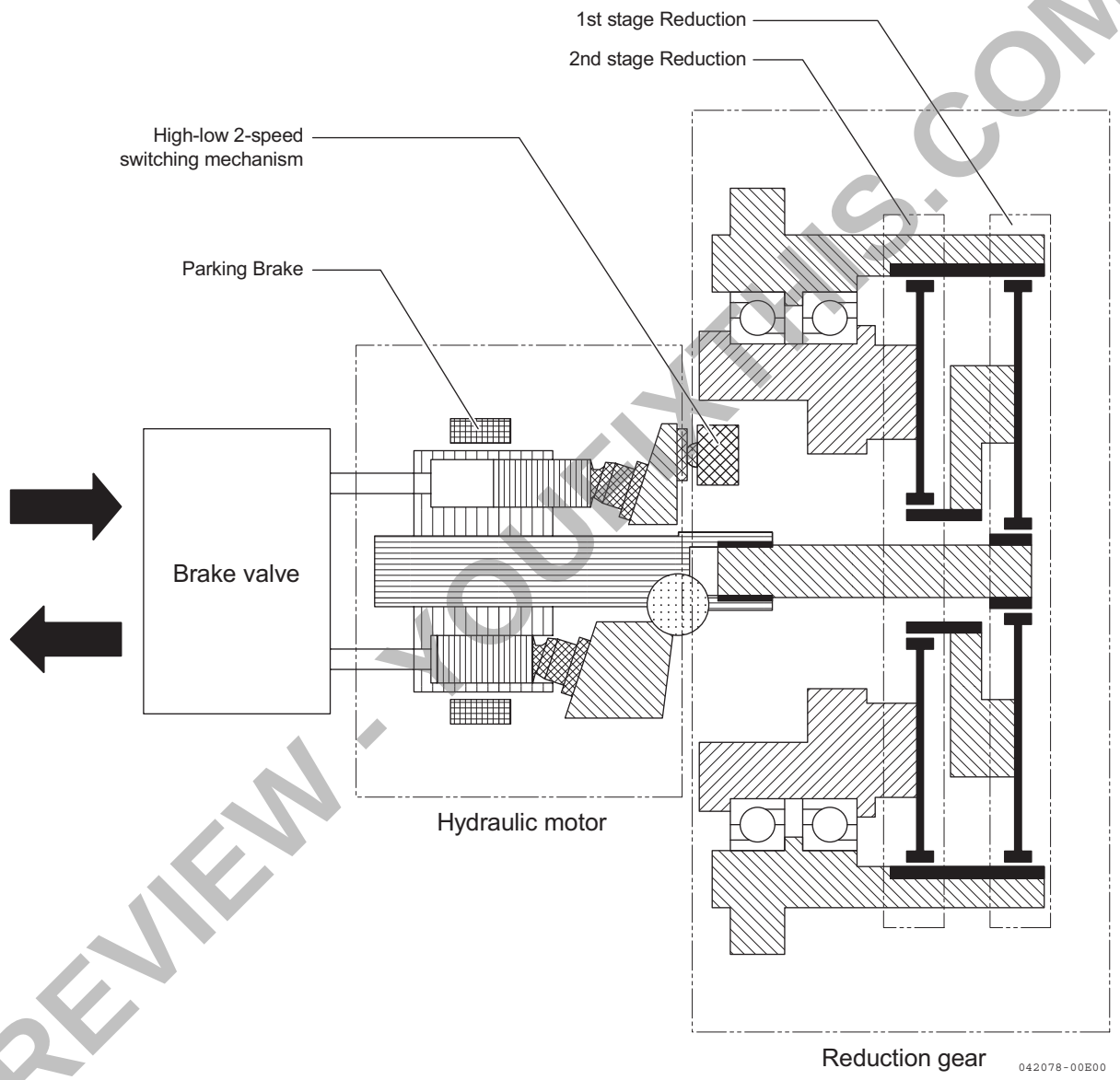
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Procedure	
(11) Tighten two allen head cap screws **12** to 6.42 to 6.56 ft•lb (8.7 to 8.9 N•m).	
(12) Install cam **4** on cover **20**. ***Note :*** *Reinstall the part to the original position before disassembling.*	
(13) Install cam shaft **6** with pressing cam **4** down. ***Note :*** *Coat grease on cam shaft **6** before installing it.*	
(14) Apply Loctite **241** or equivalent of it on allen head screw **2**.	

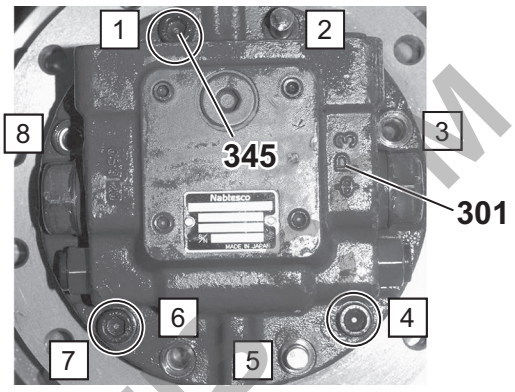
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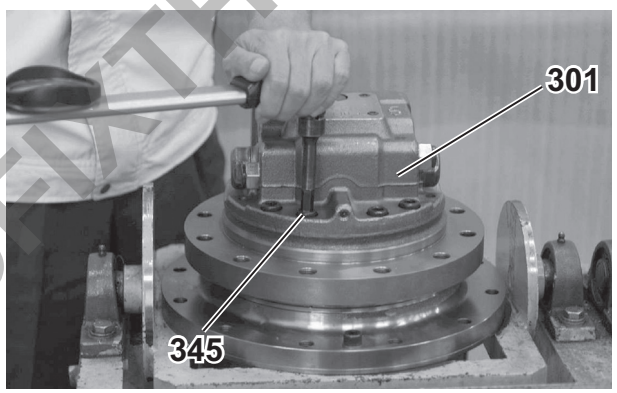
6-7-3 Basic Configuration and Drawing

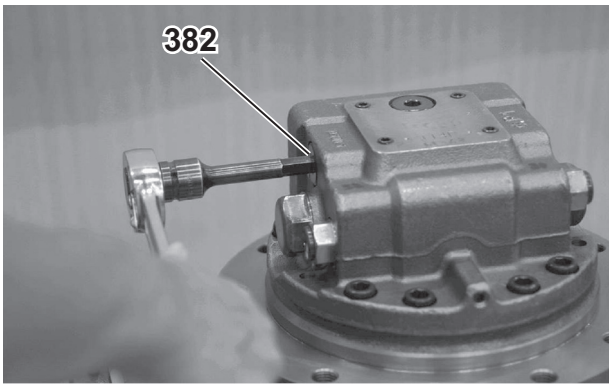
1. Motor Basic Configuration

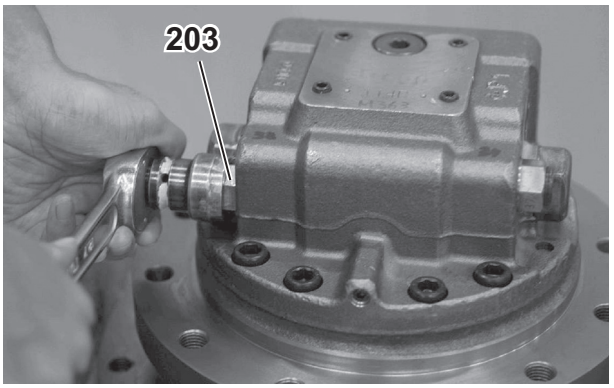


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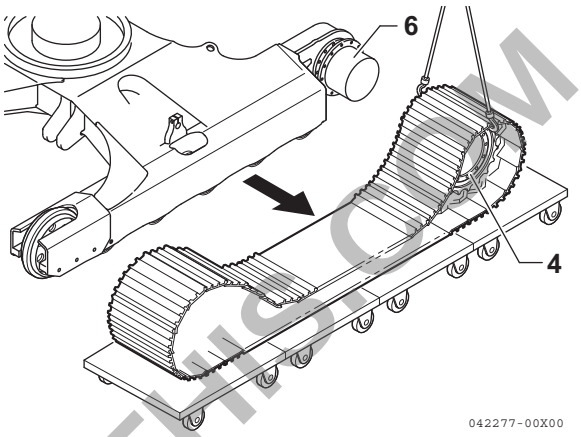
Procedure	
(6) Insert three hexagon socket head cap screws **345** (No.1, 4, 7). Temporarily tighten them **345** slowly and evenly with a hexagon wrench so as to keep the gap between the rear flange **301** and spindle **2** even. ***Note:*** *If you feel that something is wrong even a little while temporarily tightening, disassemble again and check that no part has any abnormality. After that, continue the assembling.*	

(7) Insert the remaining five hexagon socket head cap screws **345** and tighten them. (8) Tighten the eight hexagon socket bolts **345** equally and evenly with the specified torque. **Tightening torque: 63.7 to 86.8 ft•lbf (86.3 to 117.7 N•m)**	

(9) Tighten the plug **382** with the specified torque. **Tightening torque: 57.9 to 86.8 ft•lbf (78.5 to 117.7 N•m)**	

(10) Tighten the sleeve **203** with the specified torque. **Tightening torque: 90.2 to 111.9 ft•lbf (122.3 to 151.7 N•m)**	

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Procedure	
(7) Lift up the crawler on sprocket side slightly, and pull out the sprocket **4** with the crawler from the travel motor **6**.	

6) Reinstallation of Steel Crawler

Reinstall the steel crawler in the reverse order of the removal procedure.

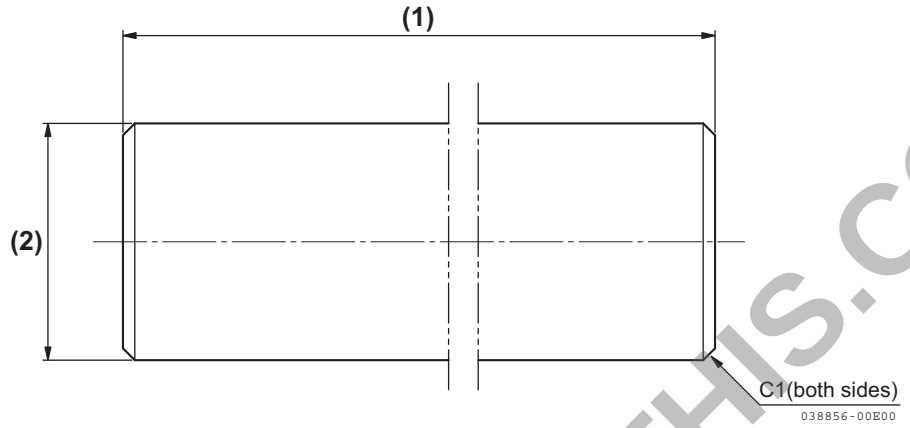
- When installing the sprocket, lift up the crawler and the sprocket and install the sprocket to the travel motor. If leaving the sprocket in the crawler is difficult to install, install them separately after removing the sprocket from the crawler.
- Apply the adhesive to installation bolts **5** for sprocket and tighten them by specified tightening torque.

Adhesive	Loctite 262 or its equivalent
Tightening torque	137.2 to 151.9 ft•lbf (186 to 206 N•m)

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[4-5] Lever

Material: S25C or equivalent



Unit: mm

Cylinder	Arm
Rod diameter	Ø65
(1)	200
(2)	Ø13

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