EX550-3, EX550-3C Workshop Manual

SECTION 01
GENERAL INFORMATION

CONTENTS

PRECAUTIONS FOR DISASSEMBLING AND ASSEMBLING

Preparations for Disassembling

- Clean the Machine

  Thoroughly wash the machine before bringing it into the shop. Bringing a dirty machine into the shop may cause machine components to be contaminated during disassembling/assembling, resulting in damage to machine components, as well as decreased efficiency in service work.

- Inspect the Machine

  Be sure to thoroughly understand disassembling procedures beforehand, to help avoid incorrect disassembling of components as well as the purchase of unnecessary service parts.
  Check and record the items listed below to help prevent problems from occurring in the future.

  · The machine model, machine serial number, and hour meter reading,
  · Reason for disassembly (symptoms, failed parts, and causes).
  · Clogging of filters and oil or air leakages, if any,
  · Capacities and dirtiness of lubricants,
  · Loose or damaged parts.

- Prepare and Clean Tools and Disassembly Area

  Prepare tools to be used and areas for disassembling as well as for disassembled parts. Clean the tools and areas.

Precautions for Disassembling and Assembling

- Precautions for Disassembling

  · Be sure to provide appropriate containers for draining fluids.
  · Plug all disconnected ends of hoses, lines and ports.
  · Use matching marks for easier reassembling.
  · Be sure to use specified special tools, when so instructed.
  · If a part or component cannot be removed after removing its securing nuts and bolts, do not attempt to remove it forcibly. Find the cause(s), then take appropriate measures to remove it.
  · Orderly arrange disassembled parts. Put marks and tags on them as necessary.
  · Store common parts, such as nuts and bolts with reference to where they are to be used and in a manner that will prevent loss.
  · Inspect contact or sliding surfaces of disassembled parts for abnormal wear, sticking, or other damage.
  · Measure and record degrees of wear and clearances.

- Precautions for Assembling

  · Be sure to clean all parts and inspect them for any damage. If any damage is found on a part, repair or replace it with a new one.
  · Dirt or debris on contact or sliding surfaces may shorten the service life of the machine. Take care not to contaminate any contact or sliding surfaces of the parts to be assembled.
  · Be sure that liquid-gasket-applied surfaces are clean and dry.
  · If an anti-corrosive agent has been used on a new part, be sure to thoroughly clean the part so as to remove the agent.
  · Utilize matching marks when assembling.
  · Be sure to use designated tools to assemble bearings, bushings and oil seals.
  · Keep a record of the number of tools used for disassembling/assembling. After assembling is complete, count the number of tools, so as to make sure that no tools are left in the assembled components.

TORQUE SPECIFICATIONS

No.	Descriptions			Bolt Dia mm	Q'ty	Wrench Size (mm)	Torque N·m	Torque kgf·m	Torque lbf·ft
1	Engine cushion rubber mounting bolt	Front	Engine Cushion rubber	16	2	24	205	21	152
			Cushion Rubber-Machine	16	2	24	205	21	152
		Rear	Engine Cushion rubber	22	2	32	540	55	400
			Cushion Rubber-Machine	16	4	24	205	21	152
2	Radiator mounting bolt			16	4	24	205	21	152
3	Hydraulic oil tank mounting bolt			16	8	24	205	21	152
4	Fuel tank mounting bolt			16	8	24	205	21	152
5	ORS fittings for hydraulic hoses and piping			1−3/16−12UNF 1−7/16−12UNF		36 41	175 205	18 21	130 152
6	Pump transmission mounting bolt			U 7/16−14	14	16	69	7	51
7	Pump device mounting bolt			20	8	30	390	40	290
8	Control valve mounting bolt			20	4	30	390	40	290
9	Swing device mounting bolt Ring gear housing mounting bolt (hexagonal wrench)			22 18	26 24	32 14	740 295	75 30	540 215
10	Swing motor mounting bolt (hexagonal wrench)			12	16	10	88	9	65
11	Battery mounting nut			12	2	19	34	3.5	25.5
12	Cab mounting bolt		STD, LC	16	4	24	205	21	152
			H, LCH	16	6	24	205	21	152
13	Swing bearing mounting bolt to upperstructure Swing bearing mounting bolt to undercarriage			30 30	36 36	46 46	1 910 1 720	195 175	1 410 1 270

Continued on next page

Torque Specifications (continued)

No.	Descriptions		Bolt Dia mm	Q'ty	Wrench Size mm	Torque N·m	Torque kgf·m	Torque lbf·ft
14	Travel device mounting bolt		22	40	32	740	75	540
	Travel motor mounting bolt		18	8	27	295	30	215
	Sprocket mounting bolt		22	48	32	740	75	540
15	Upper roller mounting		20	24	30	540	55	400
16	Lower roller mounting bolt	STD, H	24	64	36	930	95	690
		LC, LCH	24	72	36	930	95	690
17	Track shoe bolt	STD, H	24	392	32	1 370	140	1 010
		LC, LCH	24	416	32	1 370	140	1 010
18	Track guard mounting bolt	STD, H	24	16	36	930	95	690
		LC, LCH	24	24	36	930	95	690
19	Track mounting bolt		33	36	50	2 160	225	1 590
20	Coupling and clamp of low pressure piping	Coupling	8		13	10.5 to 12.5	1.05 to 1.26	7.6 to 9.1
		Clamp	U 1/4		11	5.9	0.6	4.3
21	Counterweight mounting bolt		45	2	65	2 750	280	2 030
	Counterweight retaining bolt		24	4	36	440	45	330
22	Front Pin-Retaining bolt		20		30	390	40	290
	Front Pin-Retaining Nut		20		30	390	40	290

NOTE: (1) Apply lubricant (e.g. white zinc B solved into spindle oil) to bolts and nuts to stabilize friction coefficient of them.

(2) Make sure bolt and nut threads are clean before installing.

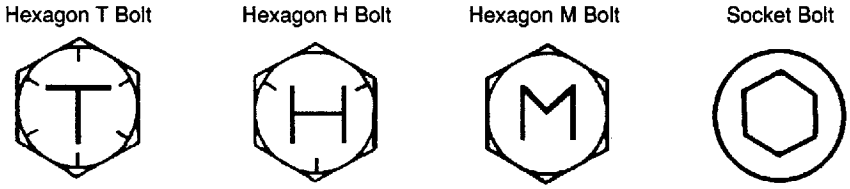
STANDARD TORQUE SPECIFICATIONS

SA-040

CAUTION: Use tools appropriate for the work to be done. Makeshift tools and procedures can create safety hazards. For loosening and tightening nuts and bolts, use correct size tools. Otherwise, tightening tools may slip, potentially causing personal injury.

Bolt Types

Tighten nuts or bolts correctly to torque specifications. Four different types and grades of bolt are employed. Make sure to employ correct bolts and tighten them correctly when assembling the machine or components.



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Specified Tightening Torque Chart

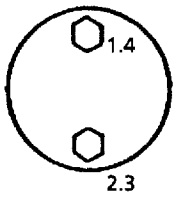
Bolt Dia.	Wrench Size	Hexagon Wrench Size	T Bolt, Socket-Head bolt			H Bolt			M Bolt		
			N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft
M 8	13	6	29.5	3	22	19.5	2	14.5	9.8	1	7.2
M 10	17	8	64	6.5	47	49	5	36	19.5	2	14.5
M 12	19	10	108	11	80	88	9	65	34	3.5	25.5
M 14	22	12	175	18	130	137	14	101	54	5.5	40
M 16	24	14	265	27	195	205	21	152	78	8	58
M 18	27	14	390	40	290	295	30	220	118	12	87
M 20	30	17	540	55	400	390	40	290	167	17	123
M 22	32	17	740	75	540	540	55	400	215	22	159
M 24	36	19	930	95	690	690	70	505	275	28	205
M 27	41	19	1 370	140	1 010	1 030	105	760	390	40	290
M 30	46	22	1 910	195	1 410	1 420	145	1 050	540	55	400
M 33	50	24	2 550	260	1 880	1 910	195	1 410	740	75	540
M 36	55	27	3 140	320	2 310	2 400	245	1 770	930	95	690

IMPORTANT:
(1) Apply lubricant (i. e. white zinc B dissolved into spindle oil) to nuts and bolts to stabilize their friction coefficients.
(2) Torque tolerance is ±10 %.
(3) Be sure to use bolts of correct length. Bolts that are too long cannot be tightened, as the bolt tip comes into contact with the bottom of the bolt hole. Bolts that are too short cannot develop sufficient tightening force.
(4) The torques given in the chart are for general use only.
Do not use these torques if a different torque is given for a specific application.
(5) Make sure that nut and bolt threads are clean before installing. Remove dirt or corrosion, if any.

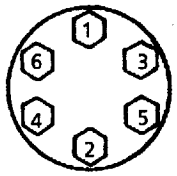
Bolt Tightening Order

When tightening two or more bolts, tighten them alternately, as shown, to ensure even tightening.

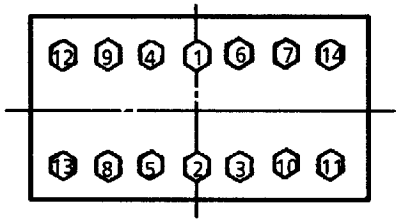
Equally tighten upper and lower alternately



Tighten diagonally



Tighten from center and diagonally



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Service Recommendations for Split Flange

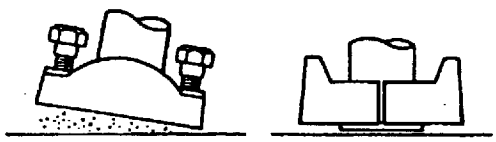
IMPORTANT: (1) Be sure to clean and inspect sealing surfaces. Scratches / roughness cause leaks and seal wear. Unevenness causes seal extrusion. If defects cannot be polished out, replace the component.

(2) Be sure to use only specified O-rings. Inspect O-rings for any damage. Take care not to file O-ring surfaces. When installing an O-ring into a groove, use grease to hold it in place.

(3) Loosely assemble split flange halves. Make sure that split is centrally located and perpendicular to the port. Hand-tighten bolts to hold parts in place. Take care not to pinch the O-ring.

(4) Tighten bolts alternately and diagonally, as shown, to ensure even tightening.

(5) Do not use air wrenches. Using an air wrench often causes tightening of one bolt fully before tightening of the others, resulting in damage to O-rings or uneven tightening of bolts.



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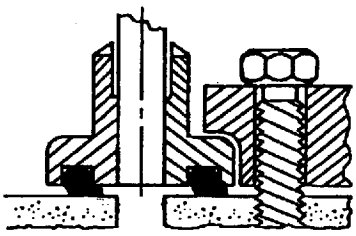
WRONG



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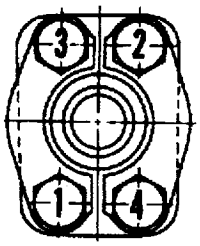

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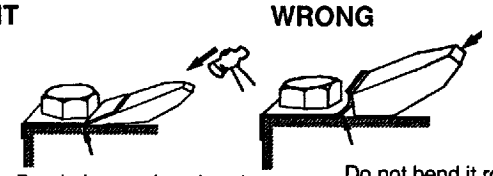
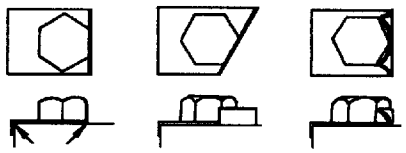
RIGHT **WRONG**



Bend along edge sharply

Do not bend it round

RIGHT **RIGHT** **WRONG**



Bend along edge sharply

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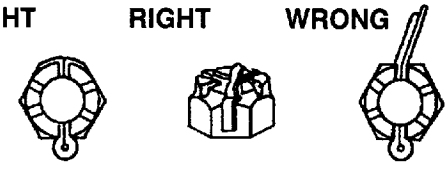
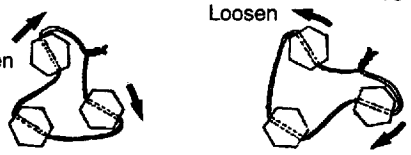
RIGHT **RIGHT** **WRONG**



RIGHT **WRONG**

Tighten

Loosen



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Nut and Bolt Lockings

- Lock Plate

IMPORTANT: Do not reuse lock plates. Do not try to bend the same point twice.

- Split Pin

IMPORTANT: Do not reuse split pins. Match the holes in the bolt and nut while tightening, not while loosening.

- Lock Wire

IMPORTANT: Apply wire to bolts in the bolt-tightening direction, not in the bolt-loosening direction.

PIPING JOINT

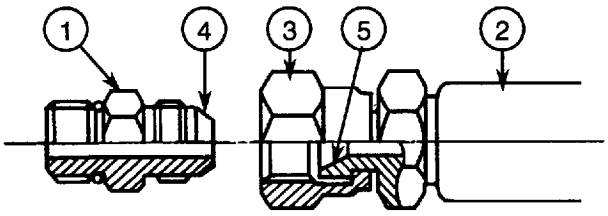
Pipe Thread Connection / Union Joint Tightening Torque Specifications

Union Joint

Metal sealing faces (4) and (5) of adaptor (1) and hose (2) fit together to seal pressure oil. Union joints are used to join small-diameter lines.

IMPORTANT: (1) Do not over-tighten nut (3). Excessive force will be applied to metal sealing surfaces (4) and (5), possibly cracking adaptor (1). Be sure to tighten nut (3) to specifications.

(2) Scratches or other damage to sealing surfaces (4) or (5) will cause oil leakage at the joint. Take care not to damage them when connecting /disconnecting.



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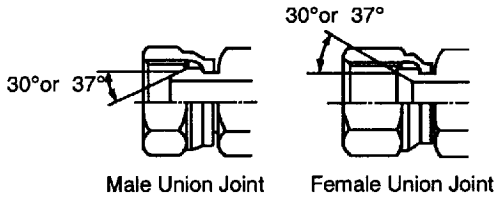

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Wrench Size mm	Tightening Torque N·m (kgf·m, lbf·ft)
19	29 (3.0, 22)
22	39 (4.0, 29)
27	93 (9.5, 69)
32	137 (14, 101)
36	175 (18, 130)
41	205 (21, 152)
50	255 (26, 188)

O-ring Seal Joint

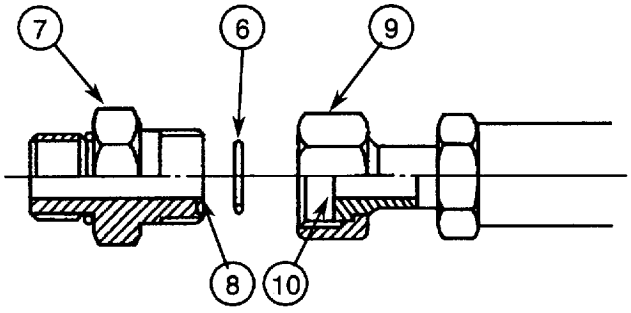
O-ring (6) seats against the end face of adaptor (7) to seal pressure oil.

IMPORTANT: (1) Be sure to replace O-ring (6) with a new one when reconnecting.

(2) Before tightening nut (9), confirm that O-ring (6) is seated correctly in O-ring groove (8). Tightening nut (9) with O-ring (6) displaced will damage O-ring (6), resulting in oil leakage.

(3) Take care not to damage O-ring groove (8) or sealing face (10). Damage to O-ring (6) will cause oil leakage.

(4) If loose nut (9) is found to be loose, causing oil leakage, do not tighten it to stop leakage. Instead, replace O-ring (6) with a new one, then tighten nut (9) after confirming that O-ring (6) is securely seated in place.



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Wrench Size mm	Tightening Torque N·m (kgf·m, lbf·ft)
27	93 (9.5, 69)
32	137 (14, 101)
36	175 (18, 130)
41, 46	205 (21, 152)