

# Workshop Manual

**EX20UR - 2**  
**EX30UR - 2**  
**EX40UR - 2**  
**Excavator**

KM-584E-00






W584E-00

**HITACHI**

# WORKSHOP MANUAL

## EX20UR-2·30UR-2·40UR-2

### EXCAVATOR

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*All information, illustrations and specifications in this manual are based on the latest product information available at the time of publication. The right is reserved to make changes at any time without notice.*



# EX20UR-2 · EX30UR-2 · EX40UR-2 EXCAVATOR WORKSHOP MANUAL

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# SECTION 01 GENERAL INFORMATION



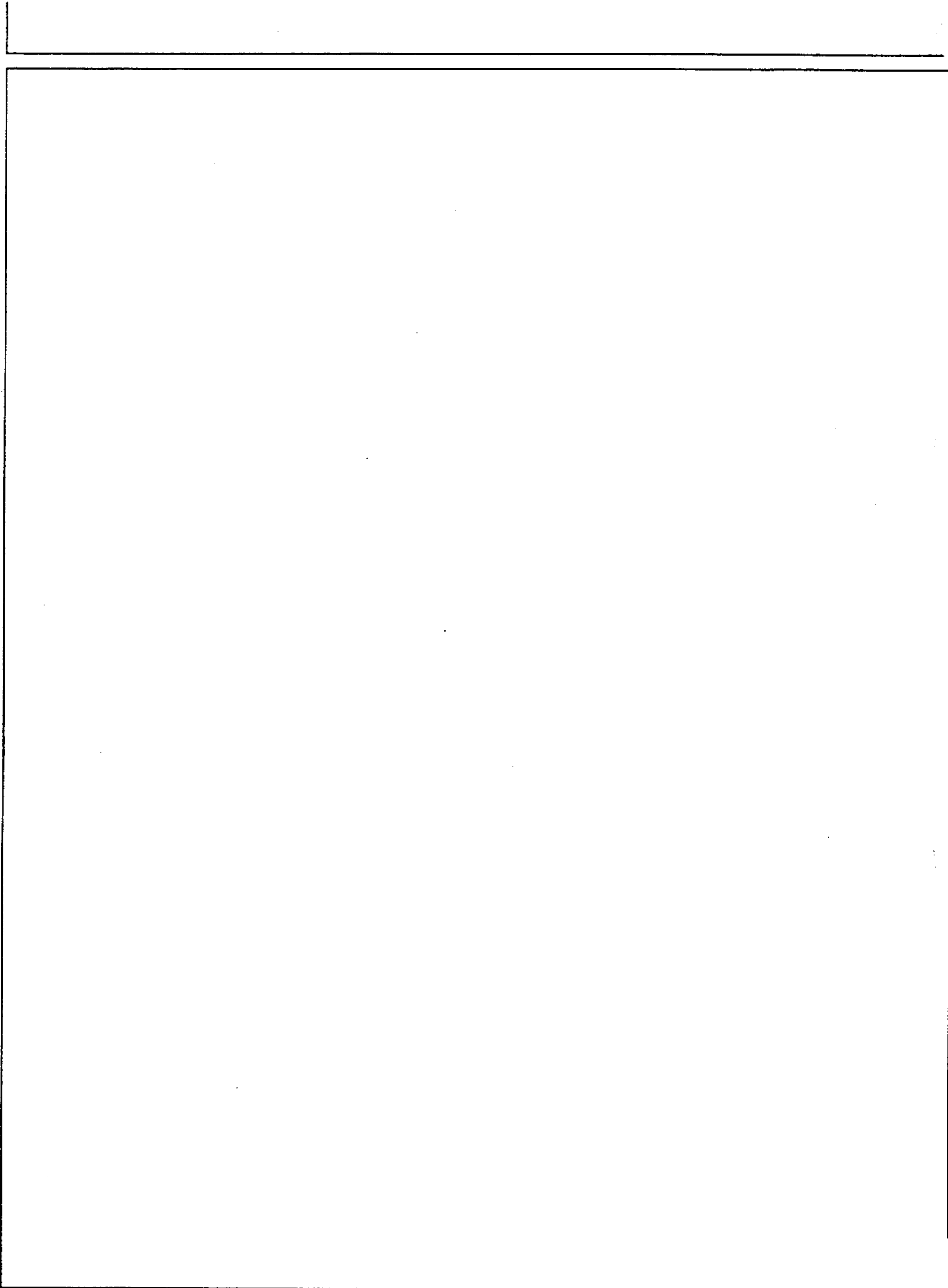
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## GENERAL INFORMATION / Precautions for Disassembling and Assembling

### 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.
- 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.



**GENERAL INFORMATION / Precautions for Disassembling and Assembling**

## GENERAL INFORMATION / Tightening

### TIGHTENING TORQUE SPECIFICATIONS

EX20UR-2

No.	Descriptions	Bolt Dia mm	Qty	Wrench Size mm	Torque		
					N·m	kgf·m	lbf·ft
1	Engine cushion rubber mounting bolt	12	8	19	88	9	65
2	Engine bracket mounting bolt	10	7	17	49	5	36
3	Hydraulic oil tank mounting bolt	10	4	17	49	5	36
4	Hydraulic hoses and Union Joints	PF1/4"		19	29.5	3	22
		PF3/8"		22	39	4	29
		PF1/2"		27	64	6.5	47
		PF3/4"		32	137	14	101
		PF3/4"		36	176.5	18	130
		PT1"		41	206	21	152
5	Pump mounting bolt	10	2	17	49	5	36
	Pump cover mounting bolt	10	6	17	49	5	36
	Pump cover mounting nut	10	2	17	49	5	36
6	Control valve mounting bolt	10	4	17	49	5	36
	Control valve bracket mounting bolt	10	6	17	49	5	36
7	Swing device mounting bolt	12	4	19	88	9	65
8	Swing motor mounting socket bolt	8	6	6	32	3.3	24
9	Battery mounting nut	6	4	10	4.9	0.5	3.6
10	Canopy mounting bolt	10	7	17	49	5	36
11	Swing bearing mounting bolt to upperstructure	12	14	19	109	11	80
	Swing bearing mounting bolt to undercarriage	12	16	19	109	11	80
12	Travel device mounting bolt	12	18	19	109	11	80
13	Sprocket mounting socket bolt	12	18	10 (Hexagon socket head)	109	11	80
14	Lower roller mounting bolt	14	16	22	176.5	18	130
15	Cover mounting bolt	10		17	49	5	36
		12		19	88	9	65
16	Counterweight mounting bolt	16	2	24	206	21	152

- NOTE:** (1) Apply lubricant (i.e. white zinc B dissolved into spindle oil) to bolts and nuts to stabilize their friction coefficients.  
 (2) Make sure bolt and nut threads are clean before installing.  
 (3) Apply Loctite to threads of engine cushion rubber mounting bolts, lower roller mounting bolts, and swing-post vertical-pin mounting bolts before installing them.

## GENERAL INFORMATION / Tightening

EX30UR-2

No.	Descriptions	Bolt Dia mm	Qty	Wrench Size mm	Torque		
					N·m	kgf·m	lbf·ft
1	Engine cushion rubber mounting bolt	12	4	19	88	9	65
2	Engine bracket mounting bolt	10	7	17	49	5	36
	Engine bracket mounting nut	10	1	17	49	5	36
3	Hydraulic oil tank mounting bolt	10	4	17	88	9	65
4	Hydraulic hoses and Union Joints	PF1/4"		19	29.5	3	22
		PF3/8"		22	39	4	29
		PF1/2"		27	64	6.5	47
		PF3/4"		32	137	14	101
		PF3/4"		36	176.5	18	130
		PT1"		41	206	21	152
5	Pump mounting bolt	12	2	19	88	9	65
6	Pump cover mounting bolt	10	6	17	49	5	36
7	Control valve mounting bolt	10	4	17	49	5	36
	Control valve bracket mounting bolt	10	7	17	49	5	36
8	Swing device mounting bolt	12	6	19	88	9	65
9	Swing motor mounting socket bolt	8	4	6	32	3.3	24
10	Battery mounting nut	6	4	10	4.9	0.5	3.6
11	Canopy mounting bolt	16	2	24	206	21	152
		12	4	19	88	9	65
12	Cab mounting bolt	16	4	24	137	14	101
13	Swing bearing mounting bolt to upperstructure	12	14	19	109	11	80
	Swing bearing mounting bolt to undercarriage	12	16	19	109	11	80
14	Travel device mounting bolt	12	18	19	109	11	80
15	Sprocket mounting socket bolt	12	18	10 (Hexagon socket head)	109	11	80
16	Lower roller mounting bolt	14	16	22	176.5	18	130
17	Cover mounting bolt	10		17	49	5	36
		12		19	88	9	65
18	Counterweight mounting bolt	20	2	30	392	40	289

**NOTE:** (1) Apply lubricant (i.e. white zinc B dissolved into spindle oil) to bolts and nuts to stabilize their friction coefficients.

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

(3) Apply Loctite to threads of engine cushion rubber mounting bolts, lower roller mounting bolts, and swing-post vertical-pin mounting bolts before installing them.

## GENERAL INFORMATION / Tightening

EX40UR-2

No.	Descriptions	Bolt Dia mm	Qty	Wrench Size mm	Torque		
					N·m	kgf·m	lbf·ft
1	Engine cushion rubber mounting bolt	12	4	19	88	9	65
2	Engine bracket mounting bolt	10	7	17	49	5	36
	Engine bracket mounting nut	10	1	17	49	5	36
3	Hydraulic oil tank mounting bolt	10	4	17	49	5	36
4	Hydraulic hoses and Union Joints	PF1/4"		19	29.5	3	22
		PF3/8"		22	39	4	29
		PF1/2"		27	64	6.5	47
		PF3/4"		32	137	14	101
		PF3/4"		36	176.5	18	130
		PT1"		41	206	21	152
5	Pump mounting bolt	12	2	19	88	9	65
6	Pump cover mounting bolt	10	4	17	49	5	36
7	Control valve mounting bolt	10	4	17	49	5	36
	Control valve bracket mounting bolt	10	7	17	49	5	36
8	Swing device mounting bolt	12	6	19	88	9	65
9	Swing motor mounting socket bolt	8	4	6	32	3.3	24
10	Battery mounting nut	6	4	10	4.9	0.5	3.6
11	Canopy mounting bolt	16	1	24	206	21	152
		12	3	19	88	9	65
12	Cab mounting bolt	16	4	24	137	14	101
13	Swing bearing mounting bolt to upperstructure	12	18	19	109	11	80
	Swing bearing mounting bolt to undercarriage	12	20	19	109	11	80
14	Travel device mounting bolt	12	18	19	109	11	80
15	Sprocket mounting socket bolt	12	18	19	109	11	80
16	Upper roller mounting bolt	14	2	22	137	14	101
17	Lower roller mounting bolt	14	16	22	176.5	18	130
18	Cover mounting bolt	10		17	49	5	36
		12		19	88	9	65
19	Counterweight mounting bolt	22	3	32	735.5	75	543

**NOTE:** (1) Apply lubricant (i.e. white zinc B dissolved into spindle oil) to bolts and nuts to stabilize their friction coefficients.

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

(3) Apply Loctite to threads of engine cushion rubber mounting bolts, lower roller mounting bolts, and swing-post vertical-pin mounting bolts before installing them.

## GENERAL INFORMATION/Tightening

### TORQUE CHART

**⚠ 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.

SA-040

Hexagon T Bolt



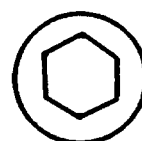
Hexagon H Bolt



Hexagon M Bolt



Socket Bolt



W105-01-01-007

#### 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

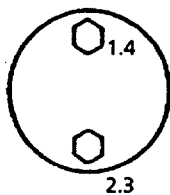
## GENERAL INFORMATION/Tightening

- 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  $\pm 10\%$ .
  - (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.

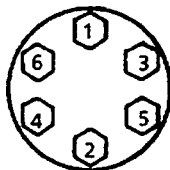
### Bolt Tightening Order

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

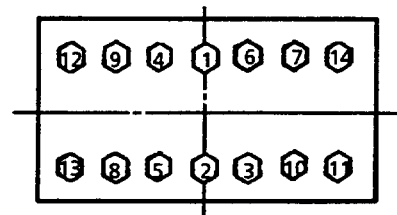
Equally tighten upper and lower alternately



Tighten diagonally



Tighten from center and diagonally



W105-01-01-003

# GENERAL INFORMATION/Tightening

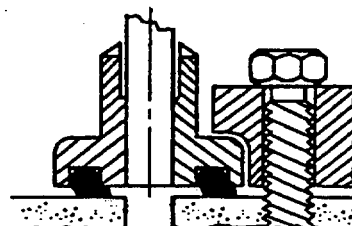
## Service Recommendations for Split Flange

- 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.

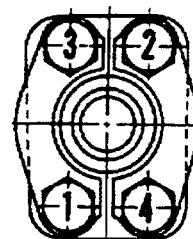


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**WRONG**



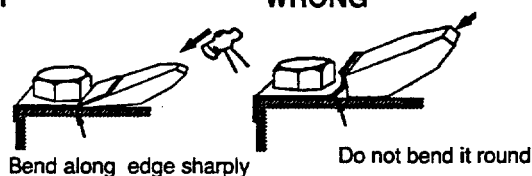
W105-01-01-016



W105-01-01-008

**RIGHT**

**WRONG**



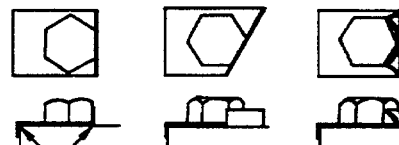
Bend along edge sharply

Do not bend it round

**RIGHT**

**RIGHT**

**WRONG**



Bend along edge sharply

W105-01-01-009

**RIGHT**

**RIGHT**

**WRONG**

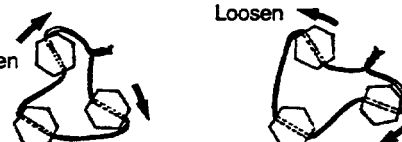


**RIGHT**

**WRONG**

Tighten

Loosen



W105-01-01-010

## 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.

# GENERAL INFORMATION/Tightening

## 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.

#### O-ring Seal Joint

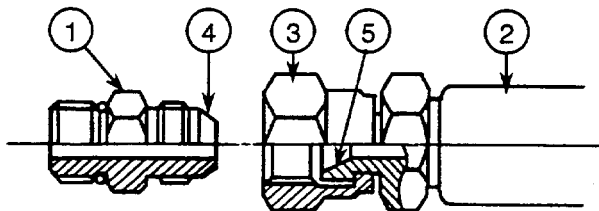
O-ring (6) seats against the end face of adaptor (7) to seal pressure oil.

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

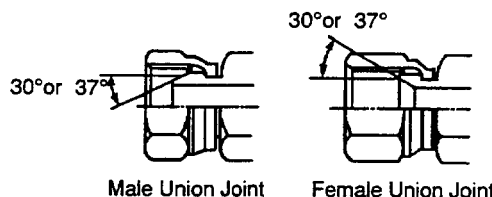
(2) Before tightening nut (9), confirm that O-ring (6) is seated correctly in O-ring groove (8). Tightening nut (9) with O-ring (6) displaced will damage O-ring (6), resulting in oil leakage.

(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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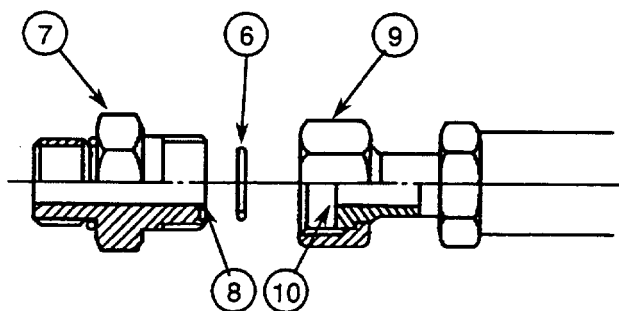


Male Union Joint

Female Union Joint

W105-01-01-017

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 )



M104-07-033

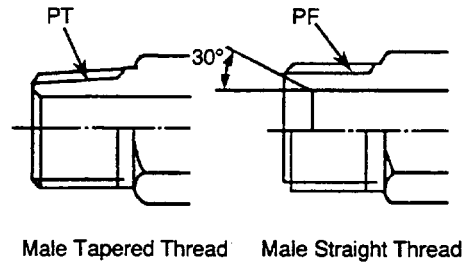
Wrench Size mm	Tightening Torque N·m ( kgf·m, lbf·ft )
27	93 ( 9.5, 69 )
32	137 ( 14, 101 )
36	175 ( 18, 130 )
41, 46	205 ( 21, 152 )



# GENERAL INFORMATION/Tightening

## Screwed-In Connection

**IMPORTANT:** Many types of screwed-in connections are used for hose connections. Be sure to confirm that the thread pitch and thread type (tapered or straight) are the correct type before using any screw-in connection.



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**NOTE:** *Cast Iron:* For tightening screwed-in connection to cast-iron components.  
*Steel :* For tightening screwed-in connection to steel components.

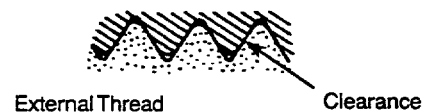
Wrench Size mm	Tightening Torque N·m ( kgf·m, lbf·ft )	
	Cast Iron	Steel
19	14.5 ( 1.5, 10 )	34 ( 3.5, 25 )
22	29.5 ( 3.0, 22 )	49 ( 5.0, 36 )
27	49 ( 5.0, 36 )	93 ( 9.5, 69 )
36	69 ( 7.0, 51 )	157 ( 16, 116 )
41	108 ( 11, 80 )	205 ( 21, 152 )
50	157 ( 16, 116 )	320 ( 33, 240 )
60	195 ( 20, 145 )	410 ( 42, 300 )
70	255 ( 26, 190 )	

## Seal Tape Application

Seal tape is used to seal clearances between male and female threads, so as to prevent any leakage between threads.

Be sure to apply just enough seal tape to fill up thread clearances. Do not overwrap.

Internal Thread



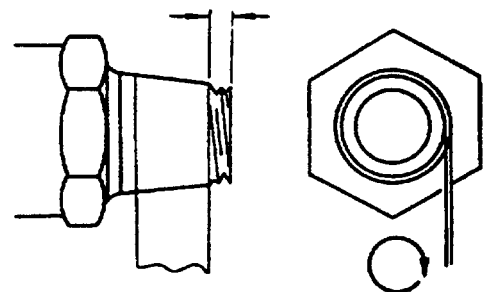
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### Application Procedure

Confirm that the thread surface is clean, free of dirt or damage.

Apply seal tape around threads as shown. Wrap seal tape in the same direction as the threads.

Leave one to two pitch threads uncovered



M114-07-041

## Low-Pressure-Hose Clamp Tightening Torque

Low-pressure-hose clamp tightening torque differs depending on the type of clamp.

See below for correct tightening torque of each type of low-pressure-hose clamp.

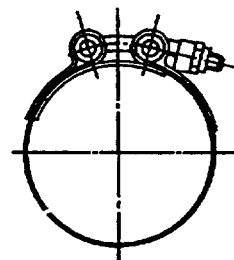
### T-Bolt Type Band Clamp:

4.4 N·m ( 0.45 kgf·m, 3.25 lbf·ft )

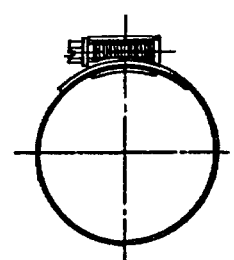
### Worm Gear Type Band Clamp:

5.9 to 6.9 N·m ( 0.6 to 0.7 kgf·m, 4.3 to 5.1 lbf·ft )

T-Bolt Type



Worm Gear Type



M114-07-042

M114-07-043

# GENERAL INFORMATION / Tightening

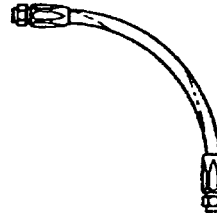
## Connecting Hose



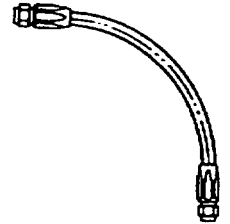
### CAUTION:

- (1) When replacing hoses, be sure to use only genuine Hitachi service parts. Using hoses other than genuine Hitachi hoses may cause oil leakage, hose rupture or separation of fitting, possibly resulting in a fire on the machine.
- (2) Do not install hoses kinked. Application of high oil pressure, vibration, or an impact to a kinked hose may result in oil leakage, hose rupture or separation of fitting. Utilize print marks on hoses when installing hoses to prevent hose from being installed kinked.
- (3) If hoses rub against each other, wear to the hoses will result, leading to hose rupture. Take necessary measures to protect hoses from rubbing against each other.  
Take care that hoses do not come into contact with moving parts or sharp objects.

WRONG

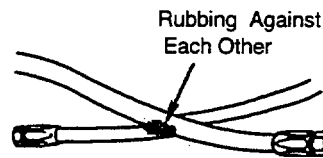


RIGHT

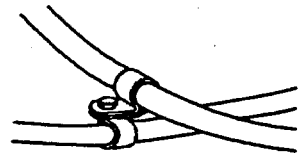


W105-01-01-011

WRONG

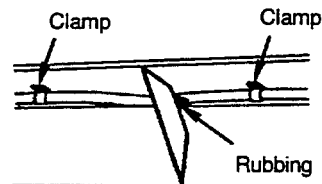


RIGHT

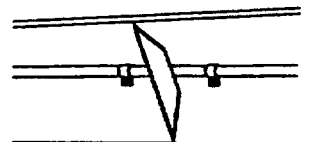


W105-01-01-012

WRONG

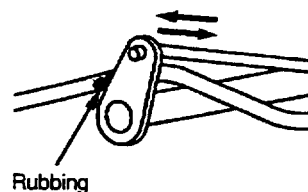


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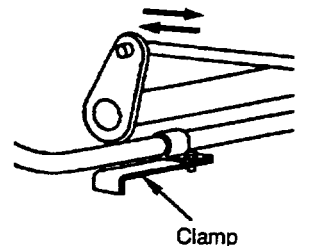


W105-01-01-013

WRONG



RIGHT



W105-01-01-014

**GENERAL INFORMATION / Tightening**

[Empty rectangular box for general information and tightening details]

# SECTION 02 UPPERSTRUCTURE



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