

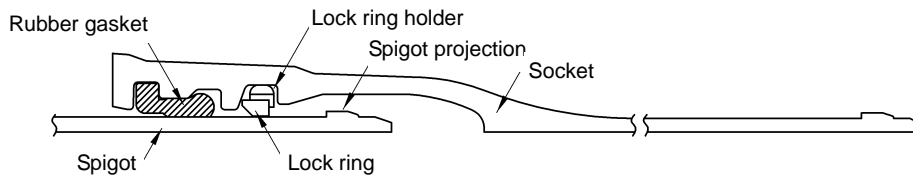
I. General

1. GX Pipe and Fittings

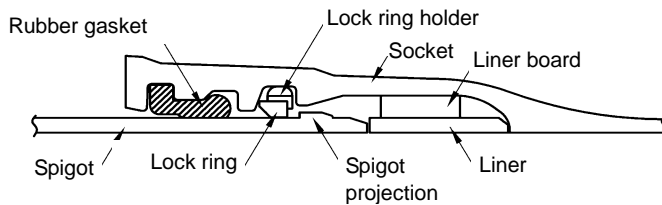
Nominal diameter (Pipe size)	6, 8, and 12 in.	
Pipes	Wall thickness class	T52, T54, C350
	Nominal length	Size 6" and 8": 16.40 feet (16' 4-7/8") Size 12": 19.69 feet (19' 8-1/4")
Fittings	Double Socket bend (90°, 45°, 22-1/2°, 11-1/4°) All Socket Cross All Socket tee Double Socket Tee with Flanged Branch Double Socket Reducer Collar (Mechanical-joint sleeves) Flanged Socket adapter Flanged Spigot adapter Flanged Spigot adapter for GX- Collar Connection Nipple	
Connecting piece for cut pipe	G-Link (for fittings) (Size 6" to 12")	

2. GX Joint

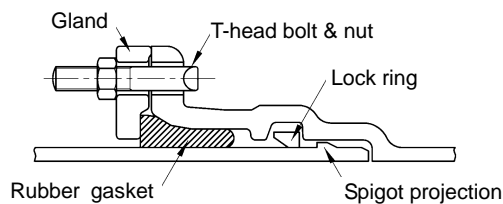
(1) Pipe



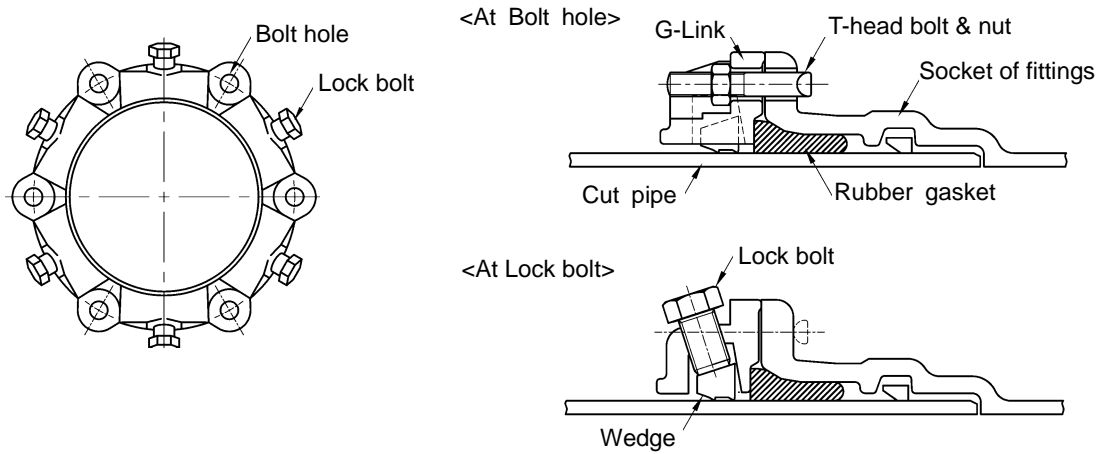
(2) Pipe with Liner



(3) Fittings



(4) G-Link



3. Symbol of GX Joint

Pipe	G-Link	Pipe with Liner	Bend

All socket cross	All socket tee	Double Socket Tee with Flanged Branch

Double Socket Reducer	Collars (Sleeves)	Flanged Socket	Flanged Spigot

4. Materials of Accessories

Description	Material
Rubber gasket	SBR
Lock ring	Ductile cast iron
Lock ring holder	Polypropylene
Liner	Ductile cast iron
Liner board	Polyamide resin
Gland for fittings	Ductile cast iron
T-bolts & nuts for fittings	Stainless steel
G-Link	Ductile cast iron
Lock bolts for G-Link	Stainless steel
Wedges for G-Link	Ductile cast iron
Stopper for Lock ring of fittings	ABS resin

II. Jointing Procedure

Assemble GX joint strictly in accordance with this manual. To ensure the assembled joint, it is recommended to check the joint conditions with “Joint check sheet”.

1. Assembling of Pipe Joint (factory spigot)

1.1 Cleaning of socket inside and spigot outside

Remove all foreign materials such as sand, mud, gravel, and deposited paint.

1.2 Confirmation of Lock ring

When pipe is delivered, Lock ring and Lock ring holder are attached in the socket.

Confirm that they are in the correct position by both visual check and hand (Fig.-1).

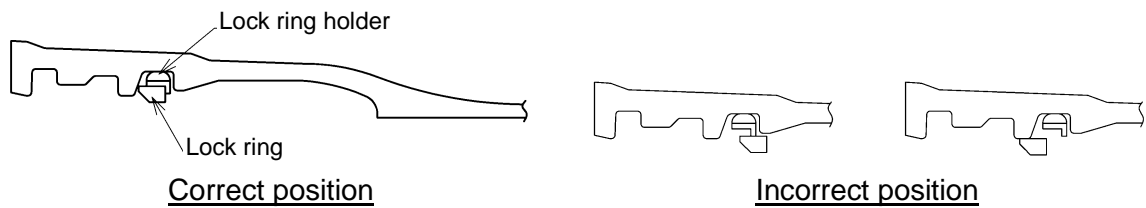


Fig.-1 Position of Lock ring

If Lock ring is not in the correct position, reposition it with special pliers (refer to Annex (1)) and install it again (Fig.-2).

⚠ Caution: Do not put fingers between the socket and Lock ring. Fingers may be pinched.

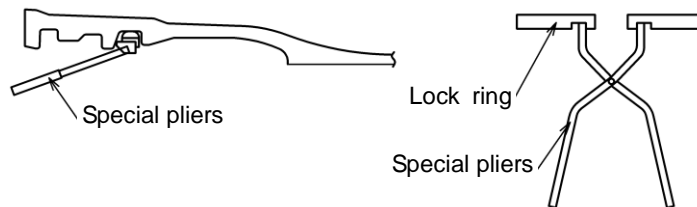


Fig.-2 Repositioning of Lock ring

1.3 Installation of rubber gasket

Confirm that the rubber gasket to be used is for GX pipe (not for fittings or others). Nominal diameter and the letter “GX” are marked on the heel portion of the rubber gasket (Fig.-3).



Fig.-3 Marking position of rubber gasket

(Reference) Rubber gasket for fittings

Clean the rubber gasket, then form it in a heart shape and place in the groove of socket inside ((a) of Fig.-4) so that the heel portion faces the socket end. Press the rubber gasket upward ((b) of Fig.-4), then push the lower portion of the rubber gasket into the groove of

socket inside ((c) of Fig.-4).

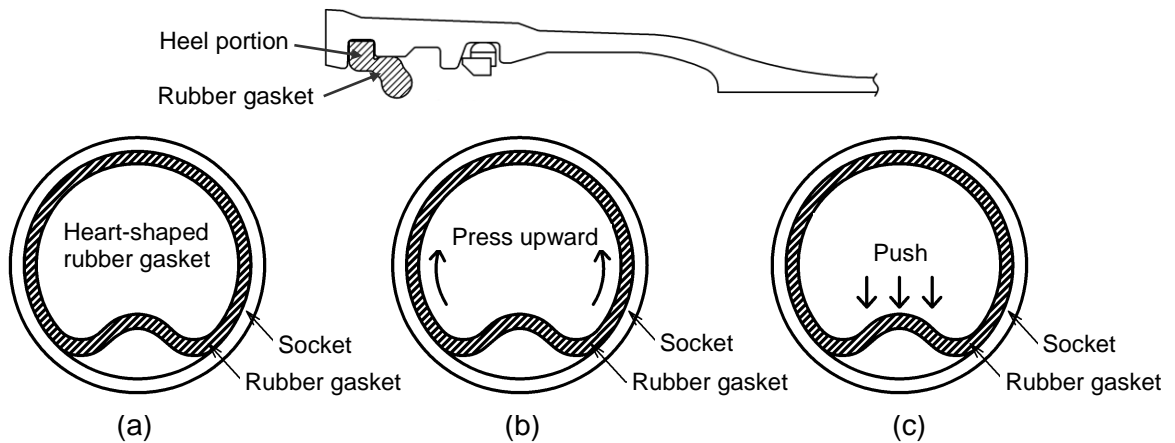


Fig.-4 Installation of rubber gasket

Tamp the rubber gasket lightly with a plastic hammer all around the socket, then confirm by hand that the rubber gasket is seated correctly (Fig.-5).

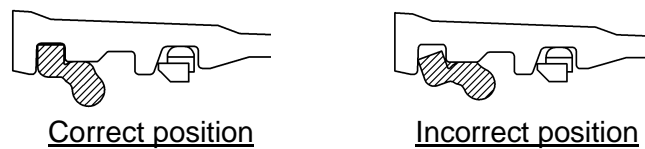


Fig.-5 Position of rubber gasket

1.4 Lubrication

Apply lubricant to the spigot from the spigot end to the white line and also to the rubber gasket (Fig.-6).

Do not apply the lubricant to the socket inside and whole surface of the rubber gasket. This may cause the rubber gasket displacement at pipe jointing work.

Note. Use the lubricant for ductile iron pipe. Never use oil or grease.

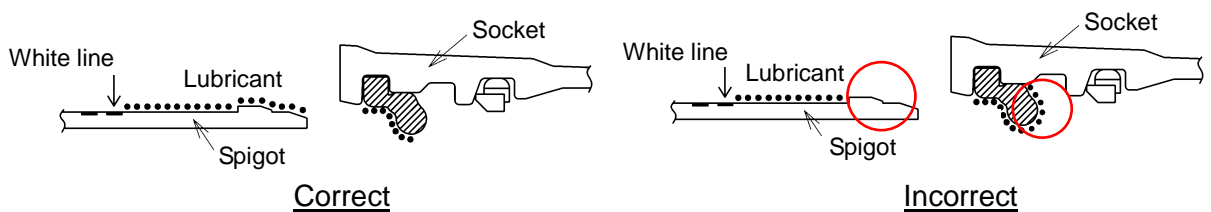


Fig.-6 Application of lubricant

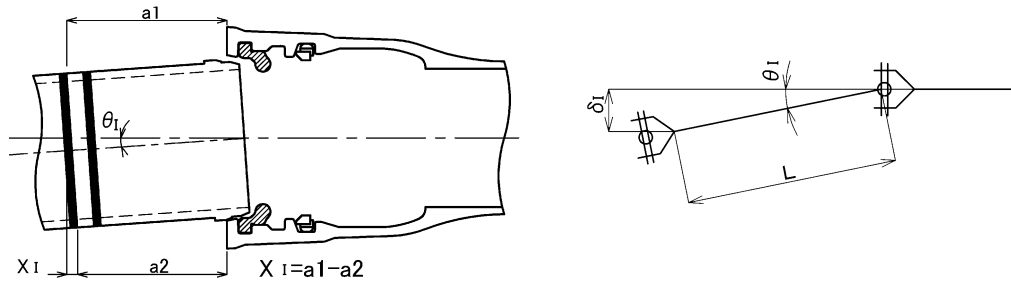
1.5 Pipe jointing

1.5.1 Alignment of socket and spigot

Lift the pipe, and then align the spigot and socket. Make sure that deflection of the spigot pipe to the socket pipe does not exceed 2° (see Table-1). Deflection of jointing which exceeds 2°, may cause displacement of the rubber gasket and lock ring.

In the case of pipe with Liner, align the pipes in straight with no deflection.

Table-1 Jointing of pipes with maximum joint deflection



Size	Maximum allowable deflection θ_1 (°)	Maximum difference X_1 (=a1 - a2) (in.)	Pipe length L (feet)	Maximum allowable offset δ_1 (in.)
6"	2	0.24	16.40	6.9
8"	2	0.31	16.40	6.9
12"	2	0.43	19.68	8.3

1.5.2 Jointing tools

Place lever hoist and sling belt (refer to Annex (2) and (3)) on the pipes (Photo-1). Never use the bucket of an excavator to push on the pipe. This may cause displacement of rubber gasket.

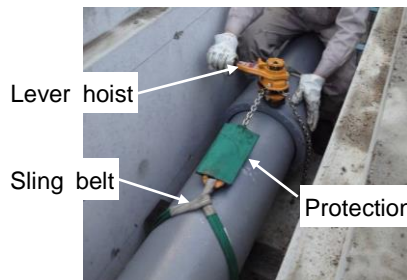


Photo-1 Jointing tools for pipe

To facilitate jointing of short cut pipes or fittings to the socket of pipe, use two lever hoists for the better stability of jointing work.

To protect the external coating of the pipe from getting damaged by the tools, use any protective materials under the lever hoist and sling belt (see Photo-1).

1.5.3 Jointing

Pull on the lever hoist until the first white line of the two marked around the spigot comes to the socket end (Fig.-7).

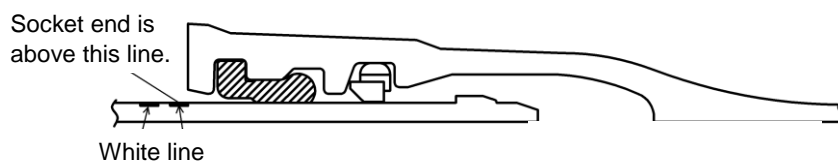


Fig.-7 Completion of pipe jointing

1.6 Check of rubber gasket position

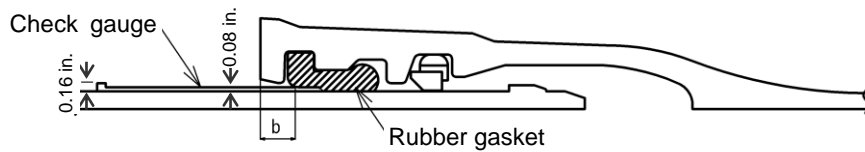
Confirm the proper position of the rubber gasket all around the socket by inserting a check

gauge (see Annex (4)) to the gap between the socket and spigot.

Measure the insertion depth (b in Table-2) with the 0.08 in. thickness gauge. The value of the insertion depth shall conform to Table-2 to judge that the joint is acceptable.

Use the opposite side of the check gauge (thickness 0.16 in.) if any measurement is out of the allowable value. (This is only applicable for size 6" and 8", not 12".) The joint is acceptable if the measurement of the 0.16 in. thickness gauge conforms to Table-2. If not, disassemble the joint and re-assemble the jointing.

Table-2 Allowable insertion depth of check gauge



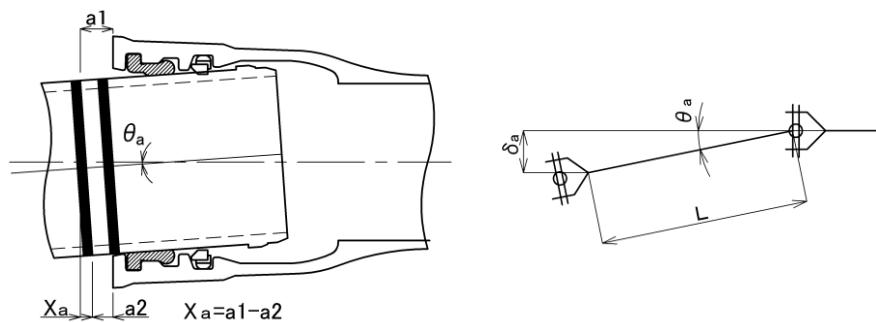
Size	Allowable insertion depth b (mm)
6", 8"	11 to 21
12"	14 to 24

When the joint is deflected, the check gauge may not go into the gap. In this case, check the position of the rubber gasket close to the position where the check gauge did not go into the gap.

1.7 Installation with joint deflection

The joint can be deflected to the maximum allowable angle (see Table-3) after checking. The deflected angle of the joint can be checked by measuring the distances between the socket end and the white line marked on the spigot at two opposite sides of the pipe or by measuring the offset at the end of the pipe as shown in Table-3.

Table-3 Check of deflection angle



Size	Maximum allowable deflection θ_a (°)	Maximum difference $X_a (= a1 - a2)$ (in.)	Pipe length L (feet)	Maximum allowable offset δ_a (in.)
6"	4	0.47	16.40	13.8
8"	4	0.59	16.40	13.8
12"	4	0.90	19.68	16.5

2. Assembling of Fitting Joint

2.1 Cleaning of socket inside and spigot outside

Remove all foreign materials such as sand, mud, gravel and deposited paint.

2.2 Confirmation of Lock ring

When fittings are delivered, Stopper and Lock ring are pre-installed in the socket.

Confirm that they are in the correct position (Fig.-8).

⚠ Caution: Do not attempt to pull Stopper unless it is necessary. Lock ring gets released from tension and it may pinch fingers.



Fig.-8 Stopper and Lock ring

If Stopper is dislocated, fix it by expanding Lock ring with Expander (refer to Annex (5)).

⚠ Caution: Do not put fingers between the socket and Lock ring. Fingers may be pinched.

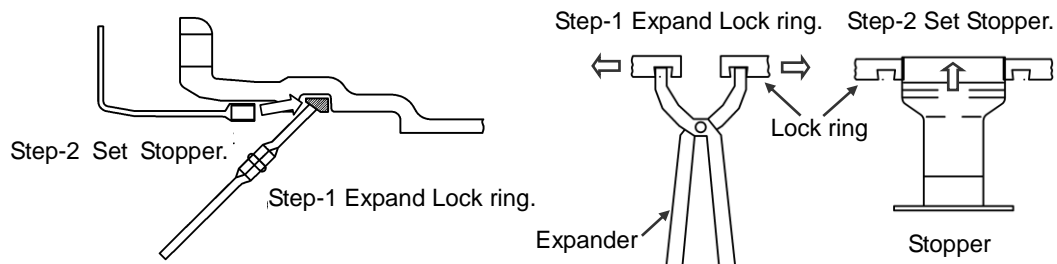


Fig.-9 Reposition of Stopper

2.3 Confirmation of socket depth

Measure the socket depth. Copy the measured length on the spigot from its end and mark a circumferential white line or several short lines around the spigot at this length (Fig.-10).

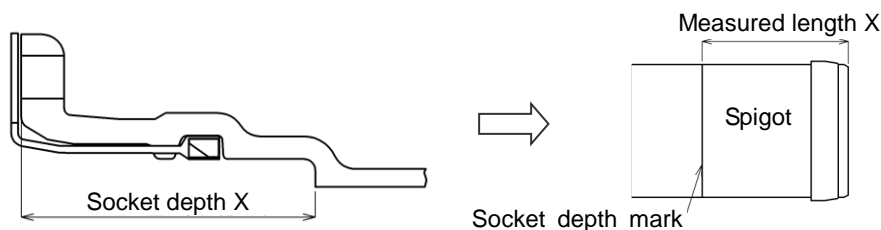


Fig.-10 Marking of socket depth on the spigot

2.4 Installation of joint accessories on the spigot

Confirm that the gland and rubber gasket to be used are for GX joint fittings. Nominal diameter and the letter "GX" are marked on the heel of the rubber gasket (Fig.-11).

Note. The shape of the rubber gasket for fittings is different from the gasket for pipe.



Fig.-11 Marking position of rubber gasket (Reference) Rubber gasket for pipe

Clean the gland and rubber gasket then install the gland first and the rubber gasket secondly on the spigot (Fig-12). In this case, confirm that they face correct direction. Application of lubricant to the inside of the rubber gasket will make its installation easier.

⚠ Caution: Handle the gland carefully not to drop on the foot.

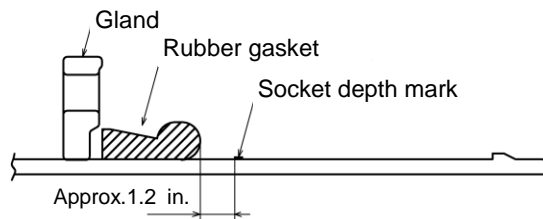


Fig.-12 Installation of gland and rubber gasket

2.5 Lubrication

Apply lubricant to the spigot, rubber gasket and socket inside (Fig.-13).

Note. Use the lubricant for ductile iron pipe. Never use oil or grease.

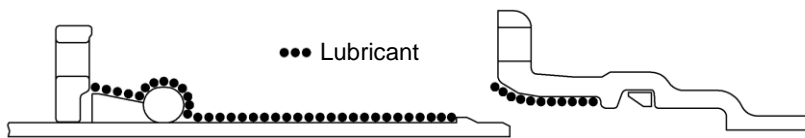


Fig.-13 Application of lubricant

2.6 Jointing

2.6.1 Alignment of socket and spigot

Lift the pipe or fitting then align the spigot and socket. Insert the spigot into the socket until the spigot end comes to contact with the socket bottom.

After confirmed that the socket end is at the socket depth indication mark ((a) of Fig.-14), pull out Stopper so that Lock ring holds the spigot ((b) of Fig.-14).

If Stopper is displaced before the insertion, reposition Stopper in accordance with 2.2.

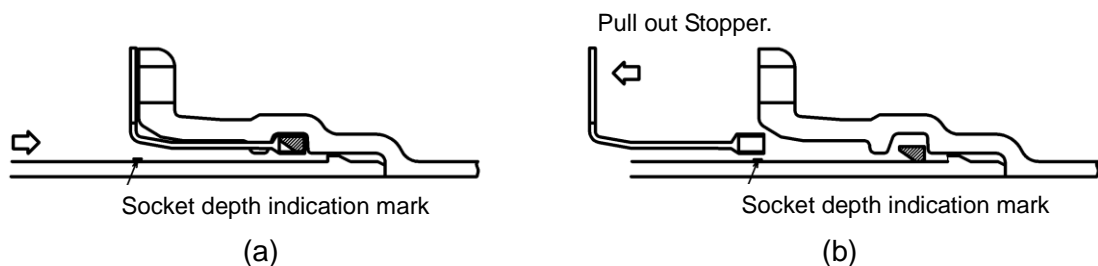


Fig.-14 Insertion of spigot to socket

2.6.2 Confirmation of locked joint

Rock the pipe or fitting vertically and laterally (Fig.-15) while lifting. If the spigot does not come out, the joint is properly locked. If it comes out, reassemble the joint.

⚠ Caution: Be careful when rocking the pipe or fitting because it will come out if not locked.

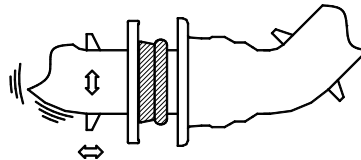


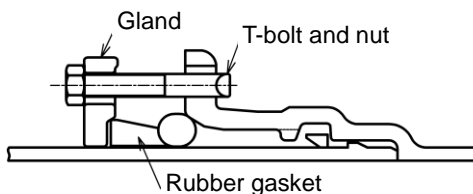
Fig.-15 Confirmation of locked joint

2.6.3 Installation of joint accessories

Push the rubber gasket into the socket. Apply lubricant again if it is dried up. Pull the gland to the socket then align the bolt holes of the gland and socket flange.

Install T-head bolts and nuts to the bolt holes on the gland and socket flange (Fig.-16).

Note. The number of bolt holes on the gland is half of the bolt holes on the socket flange.



Size	Number of bolt holes		Bolt size (mm)
	Gland	Socket flange	
6" and 8"	3	6	M20
12"	4	8	

Fig.-16 Installation of T- bolt and nut

2.6.4 Bolt tightening

Tighten the bolts and nuts evenly alternating from one side to the other side to make the distance between the gland and socket flange equivalent around the socket.

When the gland comes to contact with the socket flange, the jointing is finished.

Note. As for recommended electric wrench for bolt tightening, refer to Annex (6).

2.6.5 Check of assembled joint

Confirm the contact of gland and socket flange at the bolt holes with a 0.02 in. thick gauge (Fig.-17). When checked, the gauge shall not go into the gap between the gland and socket flange.

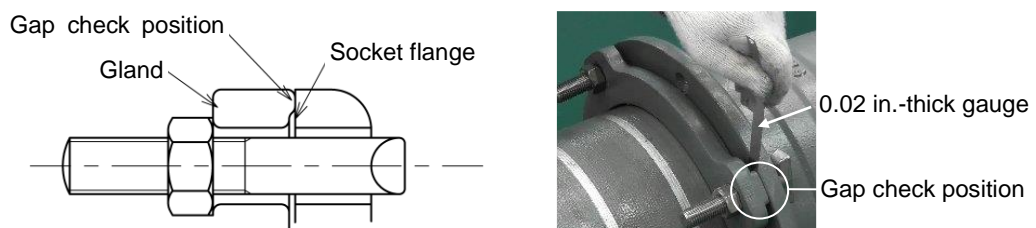


Fig.-17 Check of gap between gland and socket flange

3. Assembling of Pipe Joint with Liner

3.1 Installation of Liner board

Install Liner board in the socket so that marked end faces the socket entrance (Fig.-18).

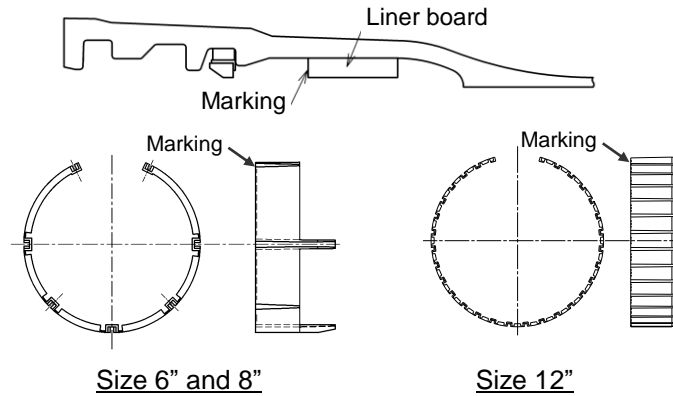


Fig.-18 Liner board

3.2 Installation of Liner

Face the tapered end of Liner and insert Liner until it reaches the socket bottom.

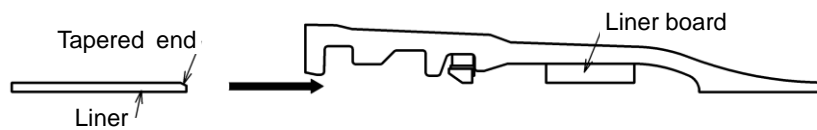


Fig.-19 Installation of Liner

Confirm by hand that Liner surely touches the socket bottom (Fig.-20).

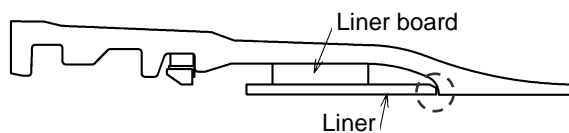


Fig.-20 Correct position of Liner

3.3 Confirmation of Lock ring

Confirm by hand that Lock ring and Lock ring holder are in correct position (see 1.2).

3.4 Confirmation of socket depth

Measure the socket depth (i.e., distance between the socket end and Liner). Copy the measured length on the spigot from its end and mark a circumferential white line or several short lines around the spigot at this length (Fig.-21).

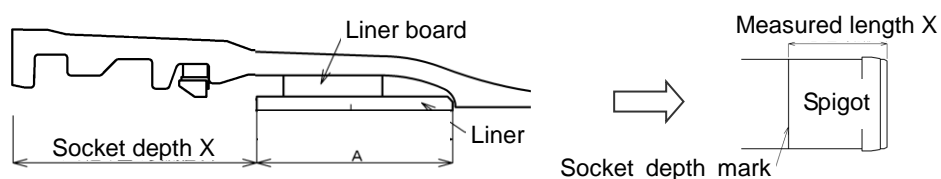


Fig.-21 Marking of socket depth on the spigot

3.5 Installation of rubber gasket

Install the rubber gasket in the groove of socket inside then confirm by hand that the rubber gasket is seated correctly (see 1.3).

3.6 Lubrication

Apply lubricant to the spigot and rubber gasket (see 1.4).

3.7 Pipe jointing

3.7.1 Alignment of socket and spigot

Lift the pipe then align the spigot and socket. Set up the jointing tools to assemble the pipes (see 1.5). In this case, socket and spigot shall be straight with no deflection.

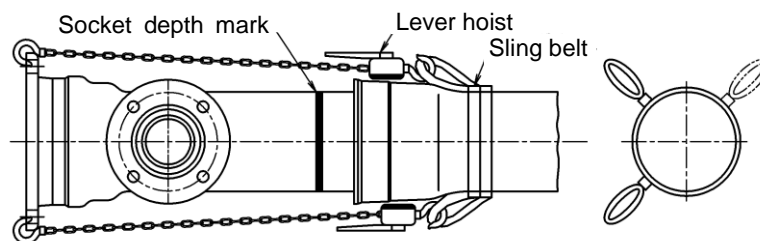
3.7.2 Jointing

Joint the pipes by pulling on the lever hoist. When socket depth mark on the spigot (see Fig.-21) comes to the socket end, the jointing is finished.

3.7.3 Connecting of fittings spigot to pipe socket with Liner

When connecting the spigot of fittings to the socket with Liner, use two lever hoists. In this case, there are two ways to hook the sling belts on the fittings depending on the type of fittings (Fig.-22).

(a) Hook directly on the socket of fittings (Except for bends and offset)



(b) Sling belts around the hooks of fittings (Bends and offset)

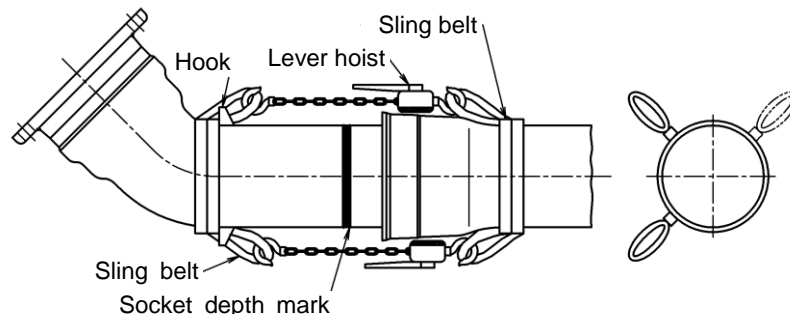


Fig.-22 Position of sling belts for fittings

3.8 Check of rubber gasket position

Confirm the proper position of the rubber gasket by check gauge (see 1.6).

4. Assembling of Pipe Joint with Collar

4.1 Connecting two pipes successively with collar

4.1.1 Cleaning of socket inside and spigot outside

Remove all foreign materials such as sand, mud, gravel and deposited paint from the socket inside and spigot outside in about 12 in. from the spigot end.

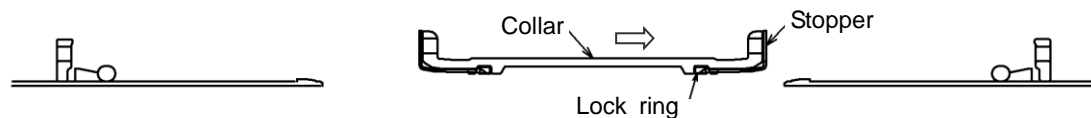
4.1.2 Installation of gland and rubber gasket

Install the glands and rubber gaskets on the pipes to be connected to the collar.



4.1.3 Confirmation of Lock ring and stopper

Confirm that Lock ring and stopper are in correct position.



4.1.4 Installation of collar

Install the collar on the previous pipe then pull-out Stopper so that Lock ring holds spigot.



4.1.5 Connection of pipe to collar

Insert the pipe to the collar then pull out Stopper so that Lock ring holds the spigot. Adjust the distance (L' in Table-4) between the socket end and white line on the spigot.

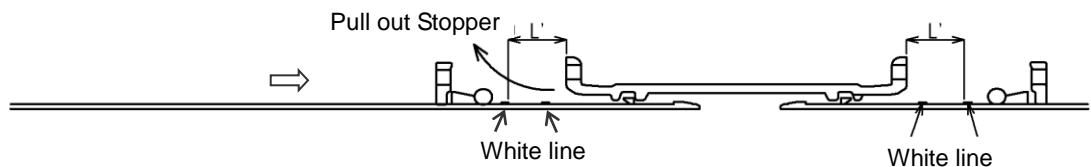


Table-4

Size	L' (in.)
6"	4.3
8"	4.7
12"	5.3

4.1.6 Jointing of collar

Assemble the joints of the collar with the same procedure as for fittings. After T-bolts are tightened, confirm that gland touches the socket (Fig.-17).

4.2 Connecting two pipes to tie in with collar

4.2.1 Confirmation of pipe alignment

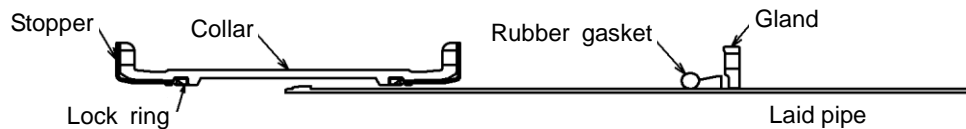
Confirm that two pipelines are aligned. If not, connect them with two or more collars.

4.2.2 Cleaning of socket inside and spigot outside

Remove all foreign materials such as sand, mud, gravel and deposited paint from the socket inside and spigot outside in about 24 in. from the spigot end.

4.2.3 Installation of gland and rubber gasket

Install the gland and rubber gasket on the spigot of the laid pipe.



4.2.4 Installation of collar

Install the collar on the laid pipe then pull-out Stopper.



4.2.5 Installation of the opposite side pipe

Install the gland and rubber gasket on the spigot of the opposite side pipe then align the two pipes so that the distance between these pipes is kept in y1 in Table-5.

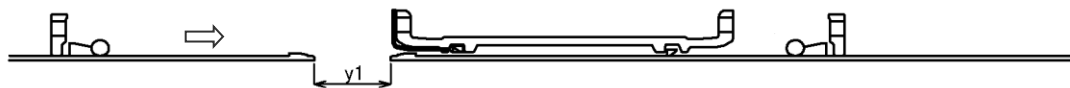


Table-5

Size	y1 (in.)
6"	9-3/8
8"	9-13/16
12"	11-13/16


4.2.6 Shifting of collar

Place the collar in the center of the two pipes then pull-out Stopper.



4.2.7 Jointing of collar

Assemble the joint with the same procedure as fittings. After T-bolts are tightened, confirm that gland touches the socket (Fig.-17).

ASSEMBLING PROCEDURE OF GX JOINT (Inch ver.)				
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Remark (1) Joint deflection angle of collar is same as that of pipe.

Remark (2) The spigot of fittings must NOT be connected to collar.

Remark (3) Pull out Stopper after the spigot projection passed Lock ring.

Remark (4) When collar is positioned within the required restrained length of pipes for thrust protection of fittings, use G-Link instead of the gland.

5. Assembling of Pipe Joint (field cut)

There are two methods to connect the plain spigot of cut pipe to GX socket:

- (1) Using G-Link for the socket of fittings
- (2) Using spigot projection formed by Spigot ring for the socket of pipe and fittings

5.1 Connecting cut pipe to socket of fittings with G-Link

5.1.1 Pipe cutting

- (1) Cut the pipe with suitable equipment.

The length of the cut pipe is as shown in Fig.-23.

⚠ Caution: When using the cutting machine, follow the manufacturer's instruction.

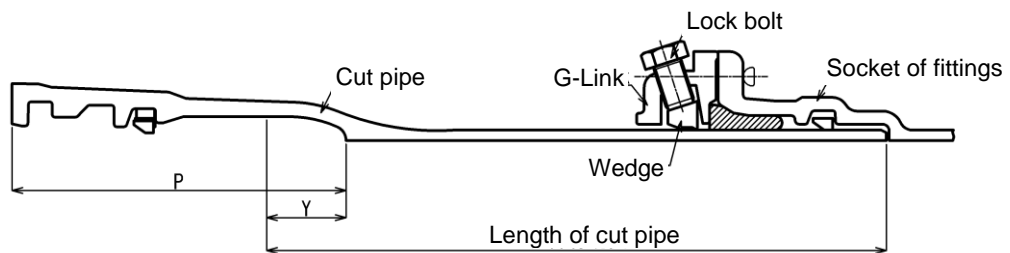


Fig.-23 Length of cut pipe with G-Link

- (2) Chamfer the sharp edges of the cut pipe end with a file or a grinder.

After chamfered, apply the repair paint "RP 102" to the cut end of the pipe.

- (3) Measure the socket depth of fittings then mark a circumferential white line or several short lines around the spigot for the indication of socket depth (see 2.3).

5.1.2 Jointing of cut pipe and fittings with G-Link

- (1) Confirm that wedges and lock bolts are properly attached (Fig.-24).

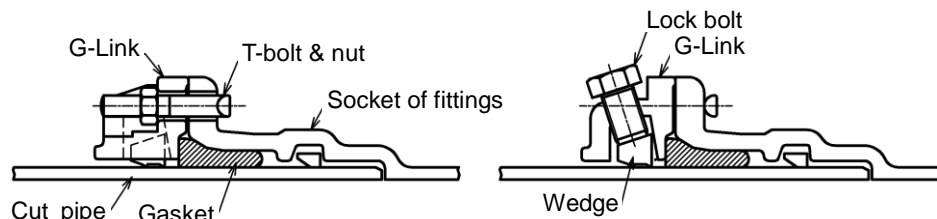


Fig.-24 Wedges and lock bolts of G-Link

Confirm that wedges do not protrude from the groove. If wedges are out of the groove, reset them.

- (2) Remove all foreign materials such as sand, mud, gravel and deposited paint.

Then joint the spigot of cut pipe and socket of fittings with G-Link with the same manner as fittings (see 2.).

However, in case of G-Link, the number of T-bolts is double of the gland and the confirmation of locked joint by rocking the pipe (see 2.6.2) is unnecessary.

- (3) Tighten all lock bolts by hand until all wedges touch the pipe. Then tighten all lock bolts with the torque wrench evenly alternating from one side to the other side with bolting torque 100 N-m (75 ft-lb).

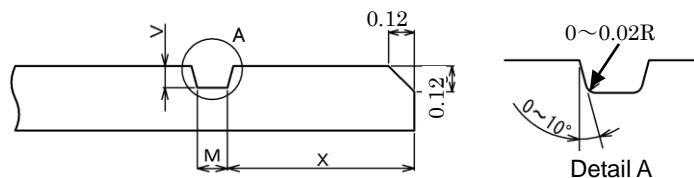
5.2 Connecting cut pipe with spigot projection formed by Spigot ring to socket of pipe

5.2.1 Cutting and grooving of pipe

- (1) Cut the pipe then make a groove around the spigot with the Grooving machine (refer to Annex (8)). In this case, Class T52 or T54 (marked "T52" or "T54" on the socket face) pipe shall be cut. Chamfer the spigot end for GX joint. The shape and dimensions of the spigot are given in Table-6.

⚠ Caution: When using a cutting or grooving machine, follow the manufacturer's instruction.

Table-6 Shape and dimensions of the spigot and groove



Size	M	V	X
6", 8"	0.18 +0.04 / 0	0.10 0 / -0.02	0.96 +0.04 / -0.08
12"	0.18 +0.04 / 0	0.10 0 / -0.02	0.79 +0.04 / -0.08

- (2) Confirm the shape and dimensions of the groove with the check gauge (see Annex (9)). There shall be no gap between the spigot surface and the gauge when the depth of the groove is checked all around the spigot (Fig-25). If any gap is found, the groove is shallower therefore groove again to the sufficient depth. The gauge shall not go in the groove when the length from the spigot end is checked (Fig.-26). If the gauge goes in the groove, reject the groove and cut another portion of the pipe.

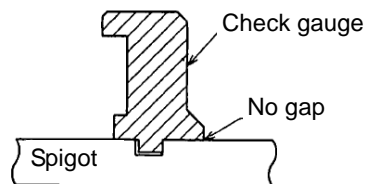


Fig.-25 Check of groove depth

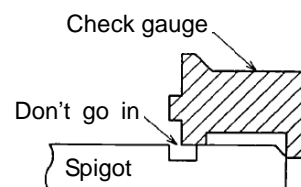
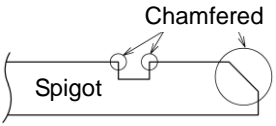


Fig.-26 Check of length from pipe end

- (3) Chamfer the sharp edges of the groove and cut end with a file or a grinder (Fig.-27). For 12" pipe, at the cut end on which the split portion of spigot ring is placed, bevel the cut end carefully as shown in Fig.-27. After chamfering, apply the repair paint "RP 102" to the groove and cut end of the pipe.

At the cut end of 6" and 8" pipe



At the cut end of 12" pipe

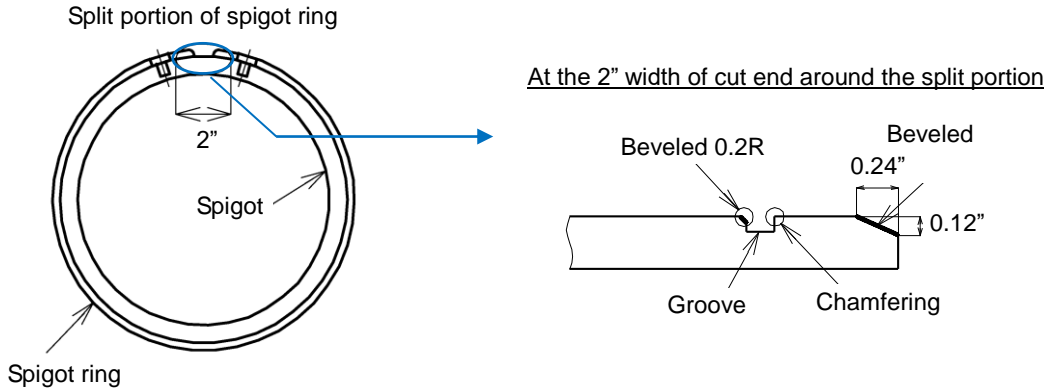


Fig.-27 Chamfering and Beveling

5.2.2 Installation of Spigot ring in the groove

- (1) Confirm that O-ring rubber coheres to the inside of Spigot ring at the guide hole (Fig.-28). If not, adhere it with cyanoacrylate adhesive. Confirm also that seal rubber is attached to Tapping screw (Fig.-29).

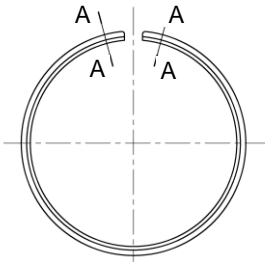


Fig.-28 Spigot ring for cut pipe

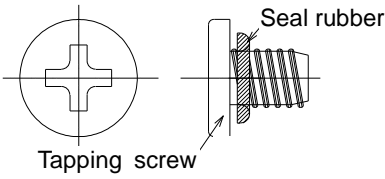
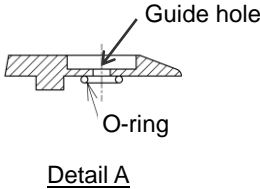


Fig.-29 Tapping screw

- (2) Confirm that there are no foreign materials such as sand in the groove then expand Spigot ring with Expander (refer to Annex (10)) and place it on the spigot (Fig.-30).

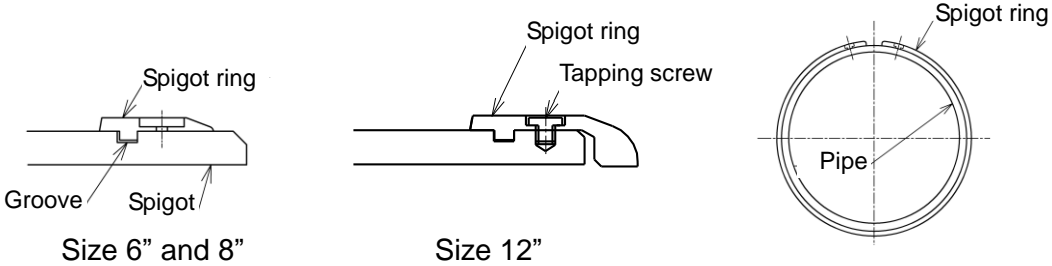


Fig.-30 Spigot ring set on the spigot end

- (3) Retain the Spigot ring on the spigot with clamps from the bottom to the top (Fig.-31).
In this case, place the cut portion of Spigot ring on the top.

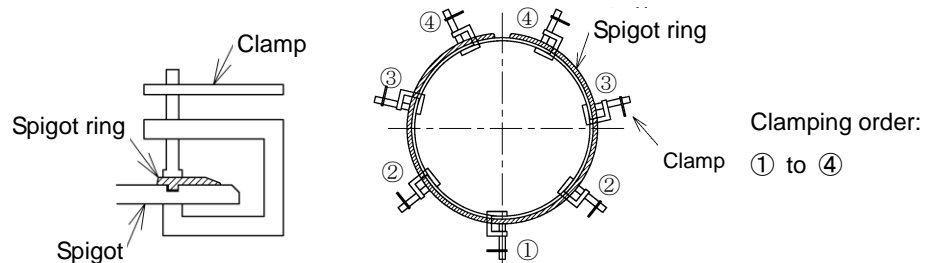


Fig.-31 Retainment of Spigot ring with clamps

- (4) Confirm that 0.02 in. thick gauge does not go into the gap between the spigot and Spigot ring all around the pipe (Fig.-32). If so, remove all clamps and retain Spigot ring again.

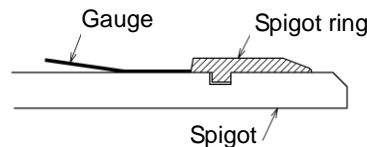


Fig.-32 Check of gap between spigot and Spigot ring

- (5) Drill two holes on the spigot at the guide holes on Spigot ring with a drilling machine (Fig.-33). Use the special drill bit with a stopper to limit the drilling depth to be 0.28 to 0.30 in. (refer to Annex (11)).
After drilled, remove the chips from the drilled holes by brush.

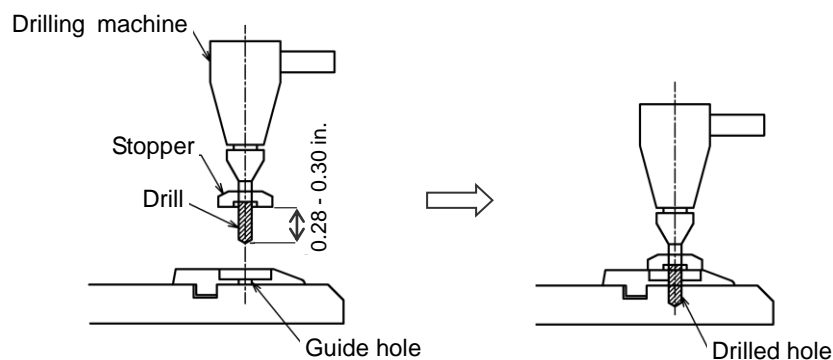


Fig.-33 Drilling

- (6) Install Spigot ring on the spigot by screwing Tapping screw into the drilled holes with a screw driver until its head does not protrude from Spigot ring (Fig.-34). If it cannot be screwed flat, remove Tapping screw and Spigot ring then apply the paint "RP 102" to the drilled holes on the spigot and drill new holes at 90° rotated position around the spigot.

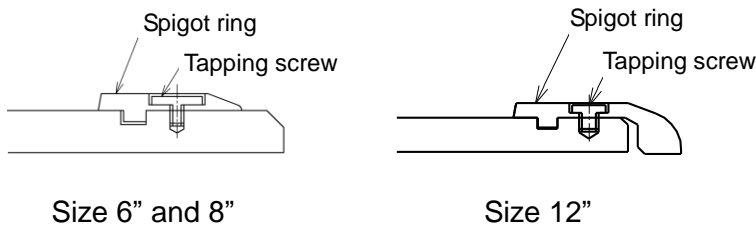


Fig.-34 Spigot ring installed with Tapping screw

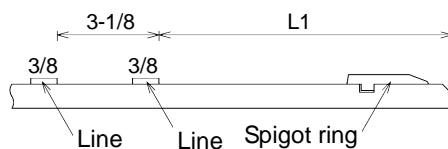
When installing Spigot ring on the spigot, follow the below steps.

- i) Use a screw driver suitable for Tapping screw.
- ii) When Tapping screw is hardly screwed, loosen it once then try to screw again.
- iii) Fasten Tapping screw carefully to avoid the collapse of the cross on the head. Press and fasten Tapping screw.
- iv) When using an electric driver, it shall be able to limit the torque to 1.5 to 2 N-m (1.1 to 1.5 ft-lb).

- (7) Remove all clamps then confirm again that 0.02 in. thick gauge does not go into the gap between the spigot and Spigot ring all around the pipe (see Fig.-32). If so, reinstall Spigot ring with the same manner as the method in (6).

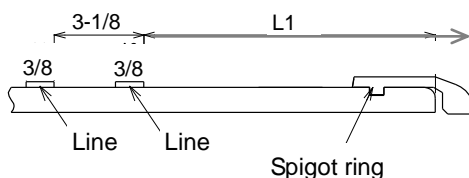
5.2.3 Marking of white lines on the spigot

Draw two white lines for jointing on the spigot (Fig.-35).



Size 6" and 8"

Size	L1 (in.)
6"	7-5/16
8"	7-11/16
12"	8-7/8



Size 12"

Fig.-35 White lines for jointing

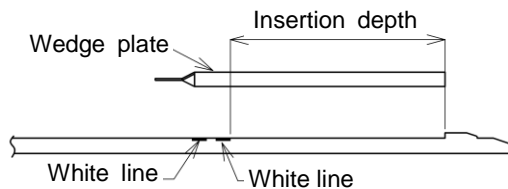
6. Disassembling of Joint

6.1 Pipes

(1) Align the pipes in straight. Disassembling with deflected joint is difficult.

(2) Mark the insertion depth (see Table-7) on the wedge plates (refer to Annex (12)).

Table-7 Insertion depth of wedge plate



Size	Insertion depth (in.)	
	For pipe	For P-Link
6"	6	5-1/8
8"	6-3/8	5-1/2
12"	7-1/2	6-11/16

Apply lubricant to the wedge plates then push them into the gap between the socket and spigot. In this case, the tapered end is placed upward, not upside down (Fig.-36).

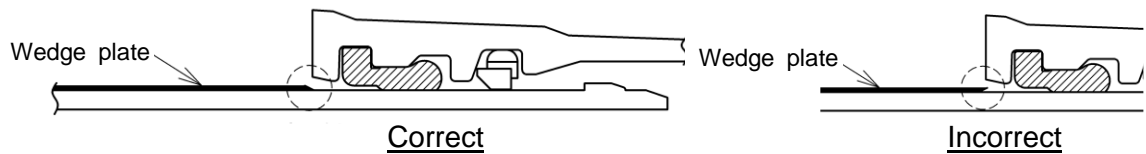


Fig.-36 Tapered end of wedge plate

Hammer the wedge plates with the cap (refer to Annex (12)) until they touch the spigot projection (Fig.-37). When the mark on the wedge plate comes to the white line on the spigot, the wedge plate properly reaches the spigot projection.

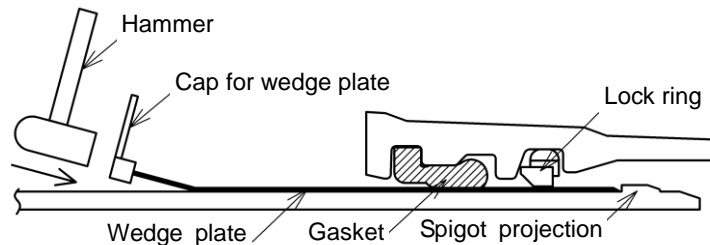


Fig.-37 Pushed wedge plate into socket

Note. Inadequate or excessive insertion of the wedge plate will keep the joint from disassembling (Fig.-38).

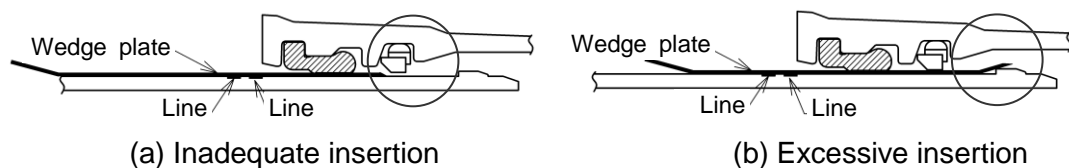


Fig.-38 Improper insertion of wedge plate

Repeat the same process at 8 to 12 positions with even pitches around the socket.

Note. When the joint is locked (see Fig.-39), push the spigot into the socket a little.

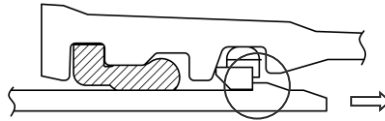


Fig.-39 Locked joint

- (3) Place a split retainer gland (refer to Annex (13)) on the spigot. Place two hydraulic jacks between the split retainer gland and socket end on each side of the pipe (see Fig-40). Then operate the hydraulic jacks and disassemble the joint.

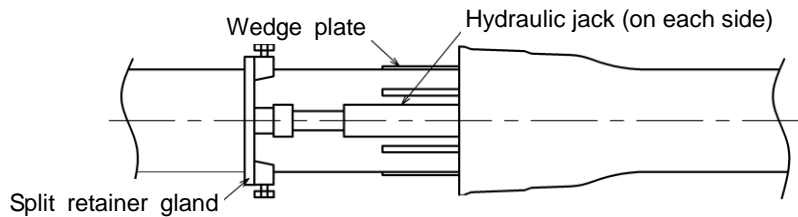


Fig.-40 Layout of disassembling tools

6.2 Fittings

- (1) Loosen and remove all T-head bolts and nuts then pull back the gland. Pull out the rubber gasket from the socket with a suitable tool such as a screw driver.
- (2) Apply lubricant to the 0.12in. thick wedge plate for fittings (refer to Annex (12)). Push the wedge plates into the gap between the socket and spigot through the gland and rubber gasket then hammer it until it reaches the spigot projection (Fig.-41). Repeat the same process at 8 to 12 positions with even pitches around the socket.

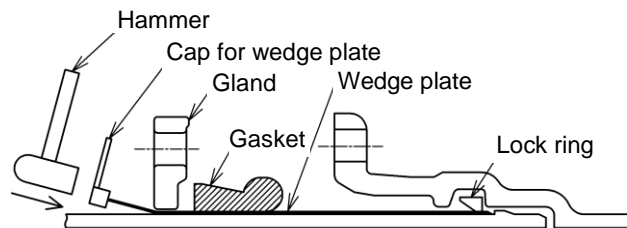


Fig.-41 Wedge plate into socket

- (3) Rock the pipe and pull it out slowly.

6.3 G-Link

- (1) Loosen all lock bolts sufficiently.
- (2) Place the 0.04 in. thick thin plate (refer to Annex (14)) into the gap between the wedge of G-Link and spigot under the lock bolt then hammer it to lift the wedge (Fig.-42). Repeat the same process at all lock bolts.

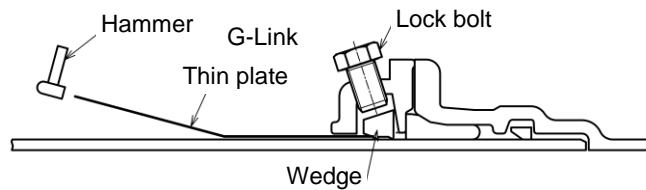


Fig.-42 Placing thin plate into G-Link

- (3) Loosen and remove all T-bolts and nuts then pull back G-Link. Pull out the rubber gasket from the socket with a suitable tool such as a screw driver.
- (4) Rock the cut pipe and pull it out slowly.

Annex I

Special Tools for GX Joint Assembling/Disassembling and Pipe Cutting

Description		Quantity	Remark
1. Tools for assembly			
(1)	Special pliers for Lock ring	2	for repositioning Lock ring
(2)	Lever hoist [8 kN (1800 lbf)]	2	for 6" and 8" pipe
	Lever hoist [20 kN (4500 lbf)]	2	for 12" pipe
(3)	Sling belt	8	for 6" and 8" pipe
	Round sling	8	for 12" pipe
(4)-1	Check gauge for rubber gasket	10	for pipe
(4)-2	Stainless ruler (150mm long, 0.5mm thick)	10	for fittings
(5)-1	Lock ring expander for 6" and 8"	1	for repositioning stopper
(5)-2	Lock ring expander for 12"	2	for repositioning stopper
(6)-1	Impact Long Socket (M20mm)	2	Socket Size 30mm. Electric impact wrench is provided by user.
(6)-2	Universal joint	1	
(7)	Torque wrench [M20mm, 100 N-m (75 ft-lb)]	2	for G-Link
(8)	Gasket remover	1	
2. Tools for cutting and grooving			
(9)-1	Cutting and Grooving machine set	1	Set of Cutting machine and Grooving machine
(9)-2	9.5mm Spacer for cutting machine	2	for 6" and 8" cut
(9)-3	5.0mm Spacer for cutting machine	2	for 12" cut
(9)-4	Guide Ring (Size 6")	1	AWWA size (Size 6")
(9)-5	Guide Ring (Size 8")	1	AWWA size (Size 8")
(9)-6	Guide Ring (Size 12")	1	AWWA size (Size 12")
(10)-1	Groove check gauge for size 6" and 8"	5	
(10)-2	Groove check gauge for size 12"	5	
(11)	Spigot ring expander	1	
(12)	Drill bit with stopper	5	Drilling machine is provided by user.
(13)	Pipe roller	4	
(14)	C-Clamp (2in. throat)	7	
(15)	T-handle Hex key wrench (6mm)	2	
(16)	Ratchet wrench with Hex key (6mm)	1	
(17)	Hex key wrench (6mm)	10	Extra Hex keys for guide ring

Special Tools for GX Joint Assembling/Disassembling and Pipe Cutting (Continued)

Description		Quantity	Remark
3. Tools for disassembly			
(18)	Wedge plate [3.0mm thick and 12in. long]	24	for 6" and 8" pipe
	Wedge plate [3.0mm thick and 7-1/2 in. long]	8	for 6" and 8" fittings
	Wedge plate [3.5mm thick and 12in. long]	24	for 12" pipe
	Wedge plate [3.5mm thick and 7-1/2 in. long]	8	for 12" fittings
(19)	Cap for wedge plate	2	
(20)-1	6" Split retainer gland	1	for disassembly
(20)-2	8" Split retainer gland	1	for disassembly
(20)-3	12" Split retainer gland	1	for disassembly
(21)	Hydraulic bottle Jack (5T)	2	for disassembly
4. Miscellaneous			
(22)	Tool Bag (Large)	6	

(1) Special pliers for Lock ring

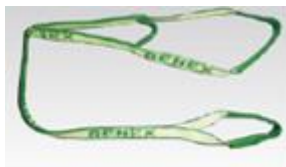


(2) Lever hoist



Size	Capacity (kN)
6" and 8"	8 (1800 lbf)
12"	20 (4500 lbf)

(3) Sling belt and Round sling

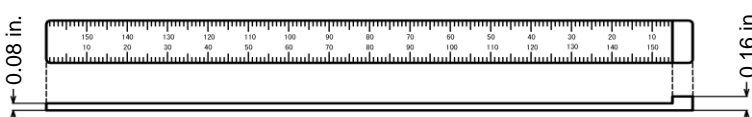


Sling belt for size 6" and 8"



Round sling for size 12"

(4)-1 Check gauge for rubber gasket



Material: Plastic

(4)-2 Stainless ruler (150-mm long, 0.5-mm thick)



(5)-1, 2 Lock ring Expander for fittings



(6)-1 Impact Long Socket (M20mm), (6)-2 Universal joint



Size	Connector Sq. (mm)	Torque Max. (N-m)
6" to 12"	20	350 (260 ft-lb)

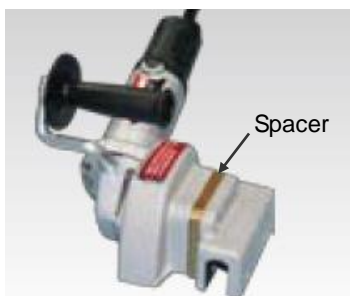
(7) Torque wrench for P-Link and G-Link [M20mm, 100 N-m (75 ft-lb)]



(8) Gasket remover



(9)-1 Cutting and Grooving machine set, (9)-2, 3 Spacer, (9)-4, 5 Guide Ring



Guide ring

(10)-1, 2 Groove check gauge



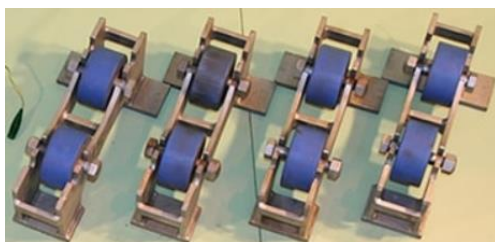
(11) Spigot ring expander



(12) Drill bit with stopper



(13) Pipe roller



(14) C-Clamp (2in. throat)



(15) T-handle Hex key wrench (6mm)



(16) Ratchet wrench with Hex key (6mm)



(17) Hex key wrench (6mm)



(18) Wedge plate



(a) For pipe (L = 12 in.)



(b) For fittings (L = 7-1/2 in.)

(19) Cap for wedge plate



(20)-1, 2, 3 Split retainer gland



(21) Hydraulic bottle Jack (5T)



(22) Tool Bag (Large)

