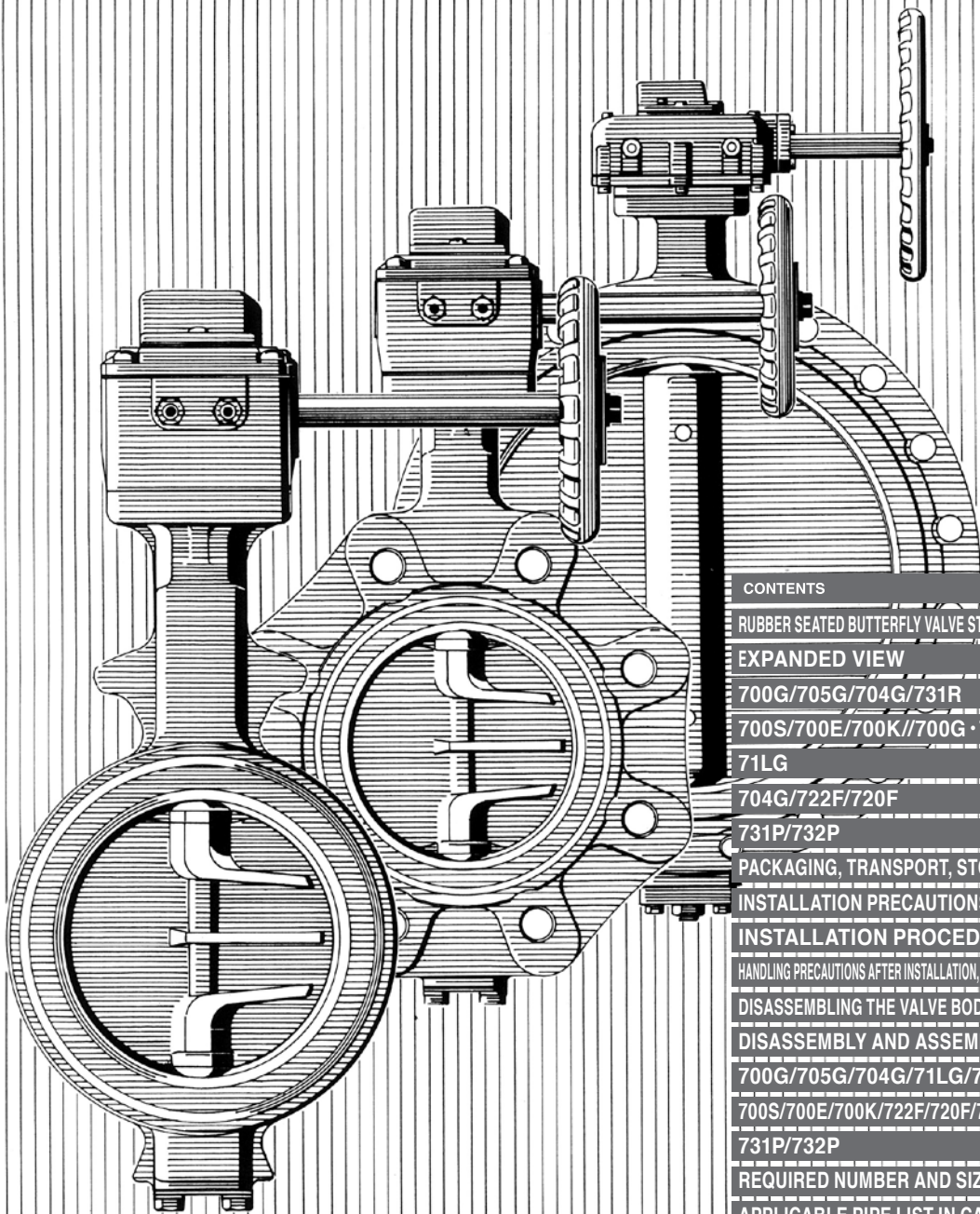


Rubber Seated Butterfly Valve

**700G • 705G • 704G • 700S
700E • 700K • 71LG • 731P
732P • 722F • 720F • 731R**

INSTRUCTION MANUAL



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This instruction manual explains standard usage of the Rubber Seated Butterfly Valve “700G, 705G, 704G, 700S, 700E, 700K, 71LG, 731P, 732P, 722F, 720F, 731R”.

Please read this manual thoroughly in order to ensure correct use of the product.

RUBBER SEATED BUTTERFLY VALVE STANDARD SPECIFICATIONS

1.0 MPa Rubber seated butterfly valve

| Disc type | 700G | | 705G | | 704G | |
|---|---|------------------|---|------------------|---|-----------------------------------|
| Body shape (Connection) | Wafer type | | | | Lugged type | |
| Valve nominal size | 40mm to 300mm | 350mm to 600mm | 50mm to 300mm | 350mm to 600mm | 50mm to 300mm | 350mm to 600mm |
| Applicable flange standard | JIS 5K/10K ANSI 125Lb/150Lb, etc | JIS 5K/10K | JIS 5K/10K, ANSI 125Lb/150Lb, etc | | JIS 5K/10K, ANSI 125Lb/150Lb, etc | |
| Face-to-face dimensions | JIS B2002 (46 series)/ISO 5752 (20 series) 550mm:JIS B2001 1987(44 series) | | JIS B2002 (46 series)/ISO 5752 (20 series) 550mm:JIS B2001 1987(44 series) | | JIS B2002 (46 series)/ISO 5752 (20 series) 550mm:JIS B2001 1987(44 series) | |
| Max. working pressure | 1.0MPa | | 1.0MPa | | 1.0MPa | |
| Working temperature range | *EPDM : -20 to 120 degrees C, NBR : -10 to 80 degrees C | | *EPDM : -20 to 120 degrees C, NBR : -10 to 80 degrees C | | *EPDM : -20 to 120 degrees C, NBR : -10 to 80 degrees C | |
| Allowable temperature in continuous use | *EPDM : 0 to 70 degrees C, NBR : 0 to 60 degrees C | | *EPDM : 0 to 70 degrees C, NBR : 0 to 60 degrees C | | *EPDM : 0 to 70 degrees C, NBR : 0 to 60 degrees C | |
| Standard materials | Body | FCD450 | FC250 | FCD450 | FC250 | FCD450 |
| | Disc | SCS 14, PPS, etc | SCS13, FCD450 | SCS 14, PPS, etc | SCS13, FCD450 | SCS 14, PPS, etc SCS13, FCD450 |
| | Stem | SUS420J2 | 550mm:SUS403 | SUS420J2 | 550mm:SUS403 | SUS420J2 550mm:SUS403 |
| | Seat ring | *EPDM, NBR | | *EPDM, NBR | | *EPDM, NBR |

| Disc type | 700S | 700E | 700K | 704G | 722F | 720F |
|---|---|-----------------|---------------------------|---|---|--------------------------|
| Body shape (Connection) | Wafer type | | | Lugged type | Double flanged type | |
| Valve nominal size | 50mm to 600mm | 650mm to 1350mm | | 50mm to 100mm | 125mm to 800mm | 850mm to 1350mm |
| Applicable flange standard | JIS 5K/10K ANSI 125Lb/150Lb, etc | JIS 5K/10K | ANSI 125Lb/ 150Lb, etc | JIS 5K/10K, ANSI 125Lb/150Lb, etc | JIS 5K/10K, ANSI 125Lb/150Lb, etc | |
| Face-to-face dimensions | Manufactured standard | | | JIS B2002 (46 series)/ISO 5752 (20 series) | JIS B2002 (123 series) | Manufactured standard |
| Max. working pressure | 1.0MPa | | | 1.0MPa | 1.0MPa | |
| Working temperature range | *EPDM : -20 to 120 degrees C, NBR : -10 to 80 degrees C | | | *EPDM : -20 to 120 degrees C, NBR : -10 to 80 degrees C | *EPDM : -20 to 120 degrees C, NBR : -10 to 80 degrees C | |
| Allowable temperature in continuous use | *EPDM : 0 to 70 degrees C, NBR : 0 to 60 degrees C | | | *EPDM : 0 to 70 degrees C, NBR : 0 to 60 degrees C | *EPDM : 0 to 70 degrees C, NBR : 0 to 60 degrees C | |
| Standard materials | Body | FC250 | | SCPH2 | SCPH2 | |
| | Disc | SCS13, FCD450 | | SCS 14, etc | SCS13, FCD450 | |
| | Stem | SUS403 | | SUS420J2 | SUS403 | |
| | Seat ring | *EPDM, NBR | | | *EPDM, NBR | *EPDM, NBR |

1.6 MPa Rubber seated butterfly valve

| Disc type | 731R | 731P | | 71LG |
|---|--|---|----------------|--|
| Body shape (Connection) | Wafer type | | | Concentric butterfly lugged type |
| Valve nominal size | 350mm to 600mm | 50mm to 300mm | 350mm to 600mm | 250mm to 600mm |
| Applicable flange standard | JIS 16K, ANSI 150Lb | JIS 10K/16K, ANSI 150Lb, etc | | JIS 16K |
| Face-to-face dimensions | JIS B2002 (46 series)/ ISO 5752 (20 series) | JIS B2002 (46 series)/ISO 5752 (20 series) | | API 609 for category A/ ISO 5752 (20 series) |
| Max. working pressure | 1.6MPa | 1.6MPa | | 1.6MPa |
| Working temperature range | -20 to 120 degrees C | *EPDM : -20 to 120 degrees C, NBR : -10 to 80 degrees C | | *EPDM : -10 to 80 degrees C, NBR : 0 to 60 degrees C |
| Allowable temperature in continuous use | 0 to 70 degrees C | *EPDM : 0 to 70 degrees C, NBR : 0 to 60 degrees C | | *EPDM : 0 to 70 degrees C, NBR : 0 to 50 degrees C |
| Standard materials | Body | FCD450 | FCD450 | ASTM A536 65-45-12 |
| | Disc | SCS13 | SCS14 | SCS13 |
| | Stem | SUS420J2 | SUS420J2 | SUS420J2+HRC36 |
| | Seat ring | *EPDM | *EPDM, NBR | *EPDM, NBR |

2.0 MPa Rubber seated butterfly valve

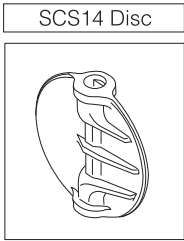
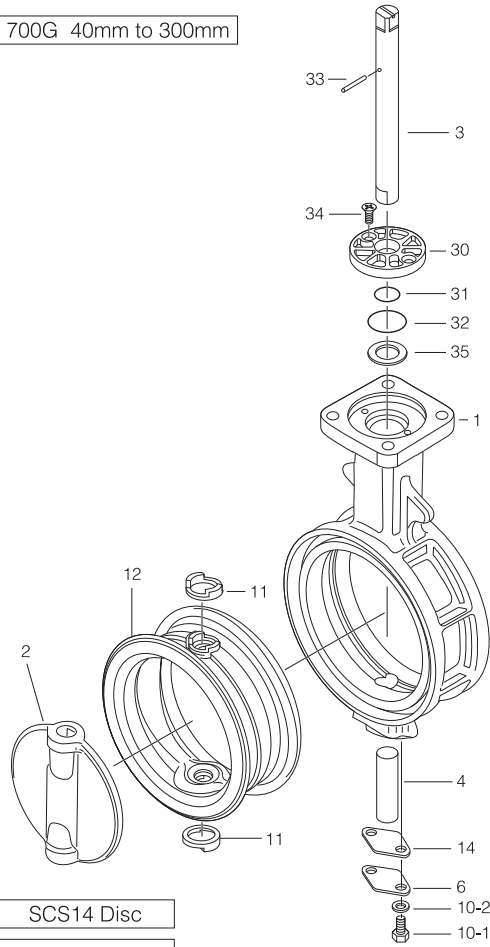
| Disc type | 732P | |
|---|---|----------------|
| Body shape (Connection) | Wafer type | |
| Valve nominal size | 50mm to 300mm | 350mm to 600mm |
| Applicable flange standard | JIS 20K | |
| Face-to-face dimensions | JIS B2002 (46 series)/ISO 5752 (20 series) | |
| Max. working pressure | 2.0MPa | |
| Working temperature range | *EPDM : -20 to 120 degrees C, NBR : -10 to 80 degrees C | |
| Allowable temperature in continuous use | *EPDM : 0 to 70 degrees C, NBR : 0 to 60 degrees C | |
| Standard materials | Body | FCD450 |
| | Disc | SCS14 |
| | Stem | SUS420J2 |
| | Seat ring | *EPDM, NBR |

* Never use an EPDM rubber seat is ring if the valve being used for oil or for a fluid containing even a slight amount of oil.

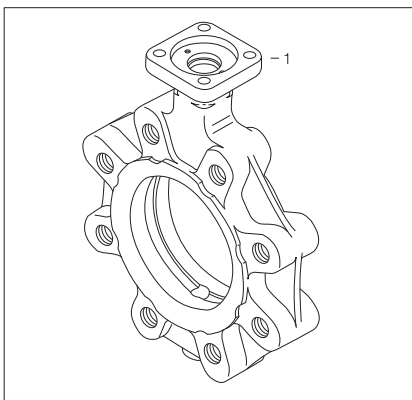
700G/705G/704G/731R

Expanded View

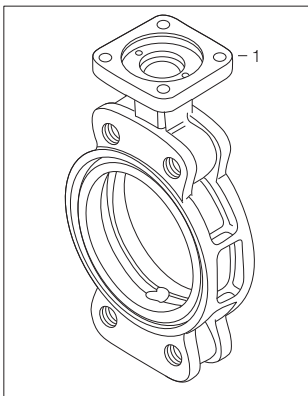
700G 40mm to 300mm



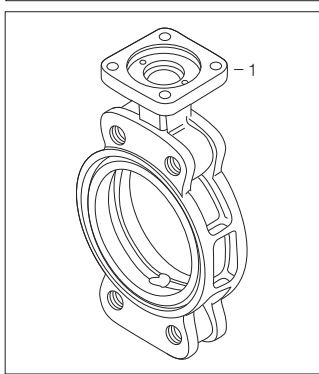
704G 80mm(JIS10K) 100mm to 300mm



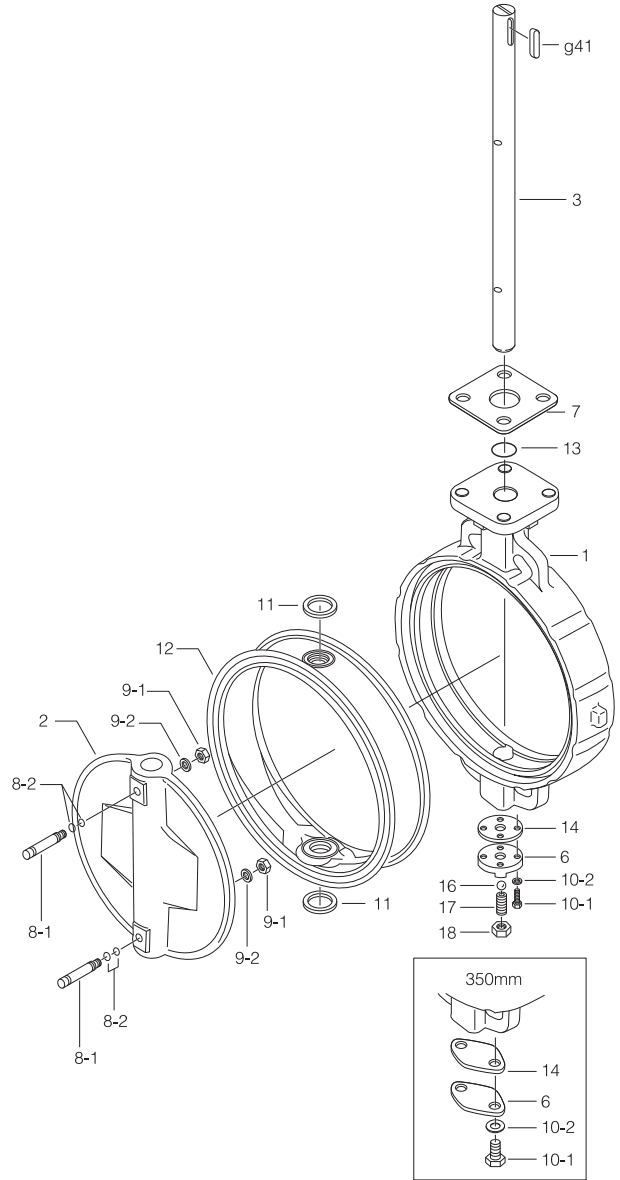
705G 50mm to 300mm



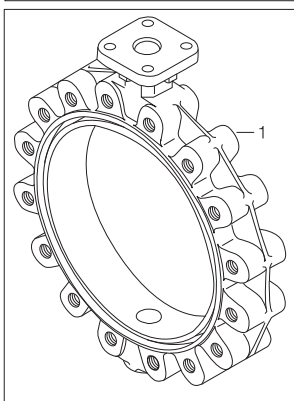
704G 50mm, 65mm, 80mm(JIS 5K)



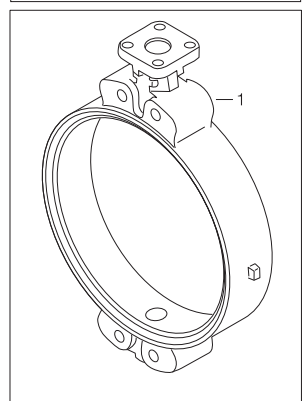
700G 350mm to 600mm



704G 350mm to 600mm



705G•731R 350mm to 600mm



700G Parts list (40mm to 300mm)

| No. | Description | Q'ty | Remarks |
|------|----------------|------|--------------------|
| 1 | Body | 1 | |
| 2 | Disc | 1 | |
| 3 | Upper stem | 1 | |
| 4 | Lower stem | 1 | See Remark 2. |
| 6 | Bottom cover | 1 | |
| 10-1 | Hexagon bolt | 2 | |
| 10-2 | Spring washer | 2 | |
| ★ 11 | Secondary ring | 2 | Only 50mm to 300mm |
| ★ 12 | Seat ring | 1 | |
| ★ 14 | Gasket | 1 | |
| ★ 30 | Bushing | 1 | |
| ★ 31 | O-ring | 1 | |
| ★ 32 | O-ring | 1 | |
| 33 | Spring pin | 1 | |
| 34 | Machine screw | 2 | |
| 35 | Plate | 1 | |

Remark 1: The ★ indicates recommended spare parts. They are supplied as "Seat ring set" with a small hexagonal spanner to remove hollow bolt.

Remark 2: When the disc material is PPS, the lower stem length of types 50mm to 100mm is different from standard.

700G Parts list (350mm to 600mm)

| No. | Description | Q'ty | Remarks |
|-------|----------------|------|---------------------|
| 1 | Body | 1 | |
| 2 | Disc | 1 | |
| 3 | Stem | 1 | |
| 6 | Bottom cover | 1 | |
| 7 | Retainer plate | 1 | Except for 550mm |
| ★ 8-1 | Taper bolt | 2 | |
| ★ 8-2 | O-ring | 4 | |
| ★ 9-1 | Hexagon nut | 2 | |
| ★ 9-2 | Spring washer | 2 | |
| 10-1 | Hexagon bolt | 2 | 350mm |
| | | 4 | 400mm to 600mm |
| 10-2 | Spring washer | 2 | 350mm |
| | | 4 | 400mm to 600mm |
| ★ 11 | Secondary ring | 2 | |
| ★ 12 | Seat ring | 1 | |
| ★ 13 | O-ring | 1 | |
| ★ 14 | Gasket | 1 | |
| 16 | Ball | 1 | Only 400mm to 600mm |
| 17 | Hollow bolt | 1 | Only 400mm to 600mm |
| 18 | Lock nut | 1 | Only 400mm to 600mm |
| g41 | Key | 1 | |

Remark 1: The ★ indicates recommended spare parts. They are supplied as "Seat ring set" with a small hexagonal spanner to remove hollow bolt.

705G Parts list (50mm to 300mm)

| No. | Description | Q'ty | Remarks |
|------|----------------|------|---------------|
| 1 | Body | 1 | |
| 2 | Disc | 1 | |
| 3 | Upper stem | 1 | |
| 4 | Lower stem | 1 | See Remark 2. |
| 6 | Bottom cover | 1 | |
| 10-1 | Hexagon bolt | 2 | |
| 10-2 | Spring washer | 2 | |
| ★ 11 | Secondary ring | 2 | |
| ★ 12 | Seat ring | 1 | |
| ★ 14 | Gasket | 1 | |
| ★ 30 | Bushing | 1 | |
| ★ 31 | O-ring | 1 | |
| ★ 32 | O-ring | 1 | |
| 33 | Spring pin | 1 | |
| 34 | Machine screw | 2 | |
| 35 | Plate | 1 | |

Remark 1: The ★ indicates recommended spare parts. They are supplied as "Seat ring set" with a small hexagonal spanner to remove hollow bolt.

Remark 2: When the disc material is PPS, the lower stem length of types 50mm to 100mm is different from standard.

705G Parts list (350mm to 600mm)

| No. | Description | Q'ty | Remarks |
|-------|----------------|------|---------------------|
| 1 | Body | 1 | |
| 2 | Disc | 1 | |
| 3 | Stem | 1 | |
| 6 | Bottom cover | 1 | |
| 7 | Retainer plate | 1 | Except for 550mm |
| ★ 8-1 | Taper bolt | 2 | |
| ★ 8-2 | O-ring | 4 | |
| ★ 9-1 | Hexagon nut | 2 | |
| ★ 9-2 | Spring washer | 2 | |
| 10-1 | Hexagon bolt | 2 | 350mm |
| | | 4 | 400mm to 600mm |
| 10-2 | Spring washer | 2 | 350mm |
| | | 4 | 400mm to 600mm |
| ★ 11 | Secondary ring | 2 | |
| ★ 12 | Seat ring | 1 | |
| ★ 13 | O-ring | 1 | |
| ★ 14 | Gasket | 1 | |
| 16 | Ball | 1 | Only 400mm to 600mm |
| 17 | Hollow bolt | 1 | Only 400mm to 600mm |
| 18 | Lock nut | 1 | Only 400mm to 600mm |
| g41 | Key | 1 | |

Remark 1: The ★ indicates recommended spare parts. They are supplied as "Seat ring set" with a small hexagonal spanner to remove hollow bolt.

704G Parts list (50mm to 300mm)

| No. | Description | Q'ty | Remarks |
|------|----------------|------|---------------|
| 1 | Body | 1 | |
| 2 | Disc | 1 | |
| 3 | Upper stem | 1 | |
| 4 | Lower stem | 1 | See Remark 2. |
| 6 | Bottom cover | 1 | |
| 10-1 | Hexagon bolt | 2 | |
| 10-2 | Spring washer | 2 | |
| ★ 11 | Secondary ring | 2 | |
| ★ 12 | Seat ring | 1 | |
| ★ 14 | Gasket | 1 | |
| ★ 30 | Bushing | 1 | |
| ★ 31 | O-ring | 1 | |
| ★ 32 | O-ring | 1 | |
| 33 | Spring pin | 1 | |
| 34 | Machine screw | 2 | |
| 35 | Plate | 1 | |

Remark 1: The ★ indicates recommended spare parts. They are supplied as "Seat ring set" with a small hexagonal spanner to remove hollow bolt.

Remark 2: When the disc material is PPS, the lower stem length of types 50mm to 100mm is different from standard.

704G Parts list (350mm to 600mm)

| No. | Description | Q'ty | Remarks |
|-------|----------------|------|---------------------|
| 1 | Body | 1 | |
| 2 | Disc | 1 | |
| 3 | Stem | 1 | |
| 6 | Bottom cover | 1 | |
| 7 | Retainer plate | 1 | |
| ★ 8-1 | Taper bolt | 2 | |
| ★ 8-2 | O-ring | 4 | |
| ★ 9-1 | Hexagon nut | 2 | |
| ★ 9-2 | Spring washer | 2 | |
| 10-1 | Hexagon bolt | 2 | 350mm |
| | | 4 | 400mm to 600mm |
| 10-2 | Spring washer | 2 | 350mm |
| | | 4 | 400mm to 600mm |
| ★ 11 | Secondary ring | 2 | |
| ★ 12 | Seat ring | 1 | |
| ★ 13 | O-ring | 1 | |
| ★ 14 | Gasket | 1 | |
| 16 | Ball | 1 | Only 400mm to 600mm |
| 17 | Hollow bolt | 1 | Only 400mm to 600mm |
| 18 | Lock nut | 1 | Only 400mm to 600mm |
| g41 | Key | 1 | |

Remark 1: The ★ indicates recommended spare parts. They are supplied as "Seat ring set" with a small hexagonal spanner to remove hollow bolt.

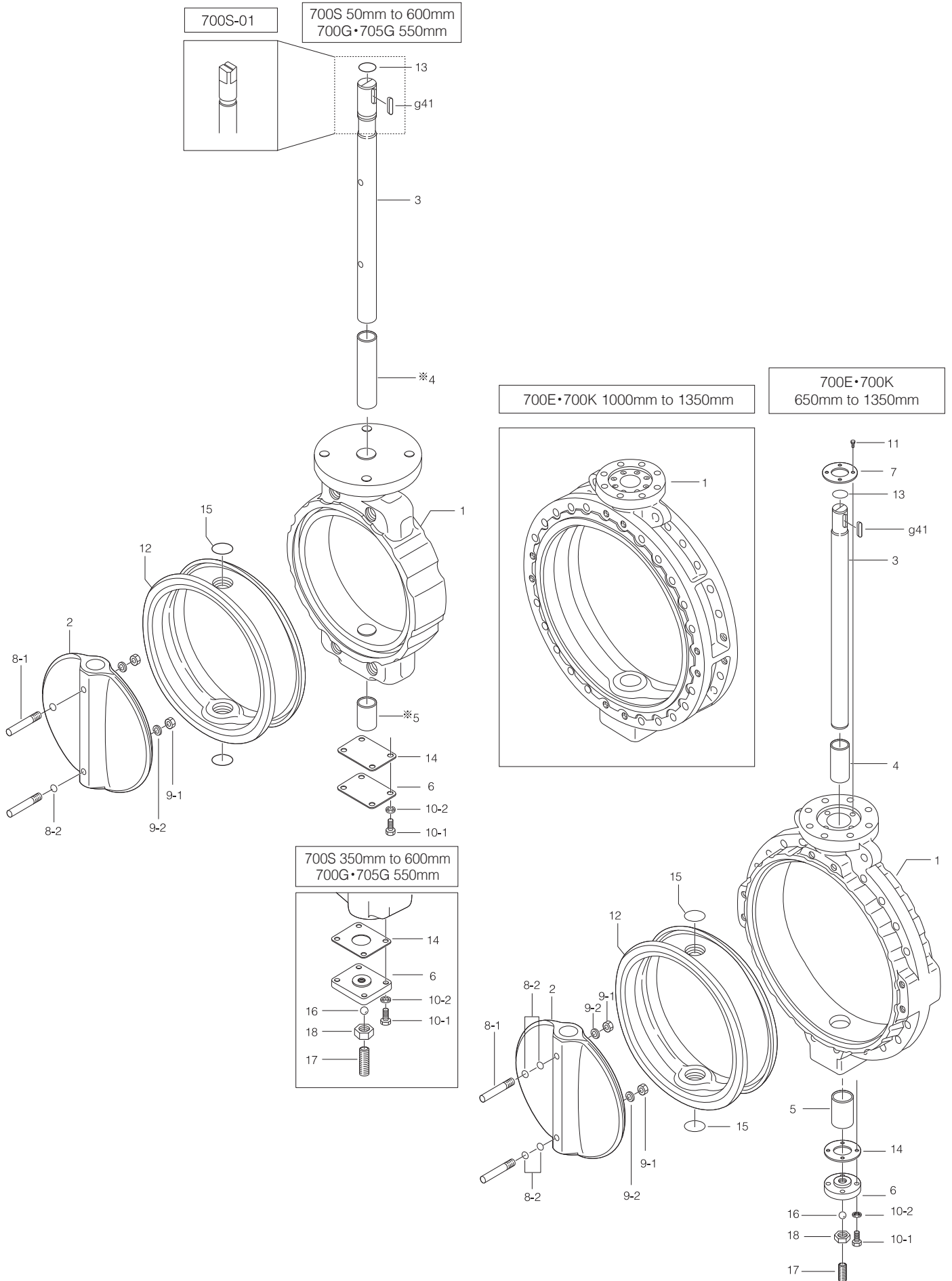
■731R Parts list (350mm to 600mm)

| No. | Description | Q'ty | Remarks |
|-------|----------------|------|---------------------|
| ★ 1 | Body | 1 | |
| 2 | Disc | 1 | |
| 3 | Stem | 1 | |
| 6 | Bottom cover | 1 | |
| 7 | Retainer plate | 1 | |
| ★ 8-1 | Taper bolt | 2 | |
| ★ 8-2 | O-ring | 4 | |
| ★ 9-1 | Hexagon nut | 2 | |
| ★ 9-2 | Spring washer | 2 | |
| 10-1 | Hexagon bolt | 2 | 350mm |
| | | 4 | 400mm to 600mm |
| 10-2 | Spring washer | 2 | 350mm |
| | | 4 | 400mm to 600mm |
| ★ 11 | Secondary ring | 2 | |
| ★ 12 | Seat ring | 1 | Glued to valve body |
| ★ 13 | O-ring | 1 | |
| ★ 14 | Gasket | 1 | |
| 16 | Ball | 1 | Only 400mm to 600mm |
| 17 | Hollow bolt | 1 | Only 400mm to 600mm |
| 18 | Lock nut | 1 | Only 400mm to 600mm |
| g41 | Key | 1 | |

Remark 1: The ★ indicates recommended spare parts. They are supplied as "Seat ring set" with a small hexagonal spanner to remove hollow bolt.

700S/700E/700K/700G•705G (550mm)

Expanded View



■700S Parts list (700S-01/02: 50 mm to 300 mm)

| No. | Description | Q'ty | Remarks |
|-------|---------------|------|----------------------------------|
| 1 | Body | 1 | |
| 2 | Disc | 1 | |
| 3 | Stem | 1 | |
| ★ 4 | *Bushing | 1 | For except "body material FC250" |
| ★ 5 | *Bushing | 1 | For except "body material FC250" |
| 6 | Bottom cover | 1 | Except 100 mm |
| ★ 8-1 | Taper bolt | 1 | 50 mm to 125 mm |
| | | 2 | 150 mm to 300 mm |
| ★ 8-2 | "O" ring | 4 | Only 300 mm |
| ★ 9-1 | Hexagon nut | 1 | 50 mm to 125 mm |
| | | 2 | 150 mm to 300 mm |
| ★ 9-2 | Spring washer | 1 | 50 mm to 125 mm |
| | | 2 | 150 mm to 300 mm |
| 10-1 | Hexagon bolt | 4 | Except 100 mm |
| 10-2 | Spring washer | 4 | Except 100 mm |
| ★ 12 | Seat ring | 1 | |
| ★ 13 | "O" ring | 1 | See Remark 2. |
| 14 | Gasket | 1 | Except 100 mm |
| ★ 15 | "O" ring | 2 | 100 mm to 300 mm, See Remark 2. |
| g41 | Key | 1 | Only 700S-02 |

■700S Parts list

(700S-01: 350 mm to 500 mm/700S-02: 350 mm to 600mm/700G·705G: 550mm)

| No. | Description | Q'ty | Remarks |
|-------|---------------|------|----------------------------------|
| 1 | Body | 1 | |
| 2 | Disc | 1 | |
| 3 | Stem | 1 | |
| ★ 4 | *Bushing | 1 | For except "body material FC250" |
| ★ 5 | *Bushing | 2 | For except "body material FC250" |
| 6 | Bottom cover | 1 | |
| ★ 8-1 | Taper bolt | 2 | |
| ★ 8-2 | "O" ring | 4 | |
| ★ 9-1 | Hexagon nut | 4 | |
| ★ 9-2 | Spring washer | 6 | |
| 10-1 | Hexagon bolt | 4 | 350 mm to 500 mm |
| | | 6 | 550 mm and 600 mm |
| 10-2 | Spring washer | 4 | 350 mm to 500 mm |
| | | 6 | 550 mm and 600 mm |
| ★ 12 | Seat ring | 1 | |
| ★ 13 | "O" ring | 1 | See Remark 2. |
| 14 | Gasket | 1 | |
| ★ 15 | "O" ring | 2 | See Remark 2. |
| 16 | Ball | 1 | |
| 17 | Hollow bolt | 1 | |
| 18 | Nut | 1 | |
| g41 | Key | 1 | Only 700S-02 |

Remark 1: The ★ indicates recommended spare parts. They are supplied as "Seat ring set" with a small hexagonal spanner to remove hollow bolt.

Remark 2: The "O" ring material (item number 13 and 15) should be the same as the seat ring (item number 12).

■700E/700K Parts list (650mm to 1350mm)

| No. | Description | Q'ty | Remarks |
|-------|----------------|------|---|
| 1 | Body | 1 | |
| 2 | Disc | 1 | |
| 3 | Stem | 1 | |
| 4 | Bushing | 1 | |
| 5 | Bushing | 1 | |
| 6 | Bottom cover | 1 | |
| 7 | Retainer plate | 1 | |
| ★ 8-1 | Taper bolt | 2 | 650mm to 900mm |
| | | 4 | 1000mm to 1350mm |
| ★ 8-2 | "O"ring | 4 | 650mm to 900mm |
| | | 8 | 1000mm to 1350mm |
| ★ 9-1 | Hexagon nut | 2 | 650mm to 900mm |
| | | 4 | 1000mm to 1350mm |
| ★ 9-2 | Sp.washer | 2 | 650mm to 900mm |
| | | 4 | 1000mm to 1350mm |
| 10-1 | Hexagon bolt | 4 | 650mm to 850mm |
| | | 8 | 900mm to 1350mm |
| 10-2 | Sp.washer | 4 | 650mm to 850mm |
| | | 8 | 900mm to 1350mm |
| 11 | Hexagon bolt | 4 | 650mm to 850mm |
| | | 8 | 900mm to 1350mm |
| ★ 12 | Seat ring | 1 | 1000mm to 1350mm:Vulcanized to the body |
| ★ 13 | "O"ring | 1 | See Remark 2. |
| 14 | Gasket | 1 | |
| ★ 15 | "O"ring | 2 | See Remark 2. |
| 16 | Ball | 1 | |
| 17 | Hollow bolt | 1 | |
| 18 | Nut | 1 | |
| g41 | Key | 1 | |

Remark 1: The ★ indicates recommended spare parts. They are supplied as "Seat ring set" with a small hexagonal spanner to remove hollow bolt (P.17).

Consult us when repairing the seating on 1000 to 1350mm types as it is vulcanized to the body.

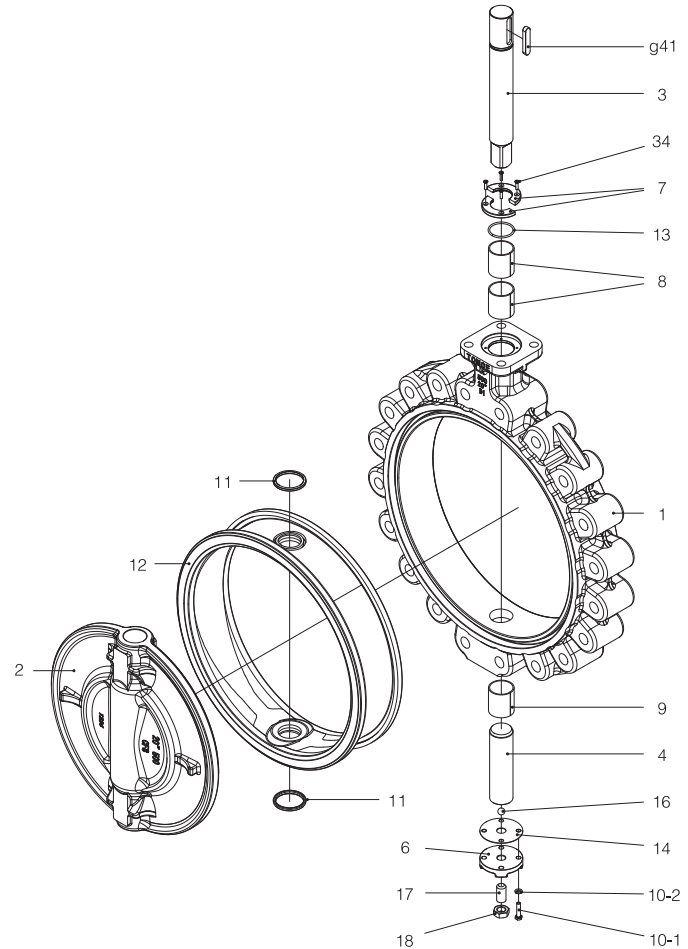
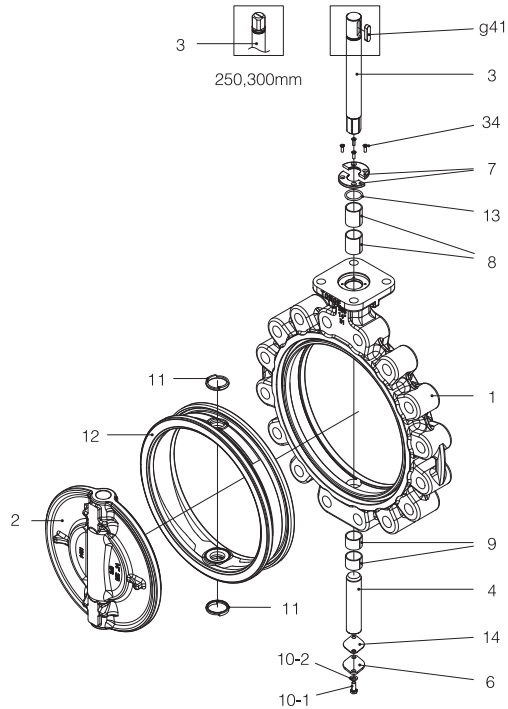
Remark 2: The O-ring material (item numbers 13 and 15) should be the same as the seating (item number 12).

71LG

Expanded View

250mm to 350mm

400mm to 600mm



71LG Parts list (250mm to 350mm)

| No. | Description | Q'ty | Remarks |
|------|----------------|--------|---------------------|
| 1 | Body | 1 | |
| 2 | Disc | 1 | |
| 3 | Upper stem | 1 | |
| 4 | Lower stem | 1 | |
| 6 | Bottom cover | 1 | |
| 7 | Retainer plate | 2 | |
| 8 | Upper bearing | 2 | |
| 9 | Lower bearing | 1 or 2 | 250mm:1 300,350mm:2 |
| 10-1 | Sp. washer | 2 | |
| 10-2 | Hexagon bolt | 2 | |
| 11 | Secondary ring | 2 | |
| 12 | Seat ring | 1 | |
| 13 | "O"ring | 1 | |
| 14 | Gasket | 1 | |
| 34 | Machine screw | 4 | |
| g41 | Key | 0 or 1 | 250,300mm:0 350mm:1 |

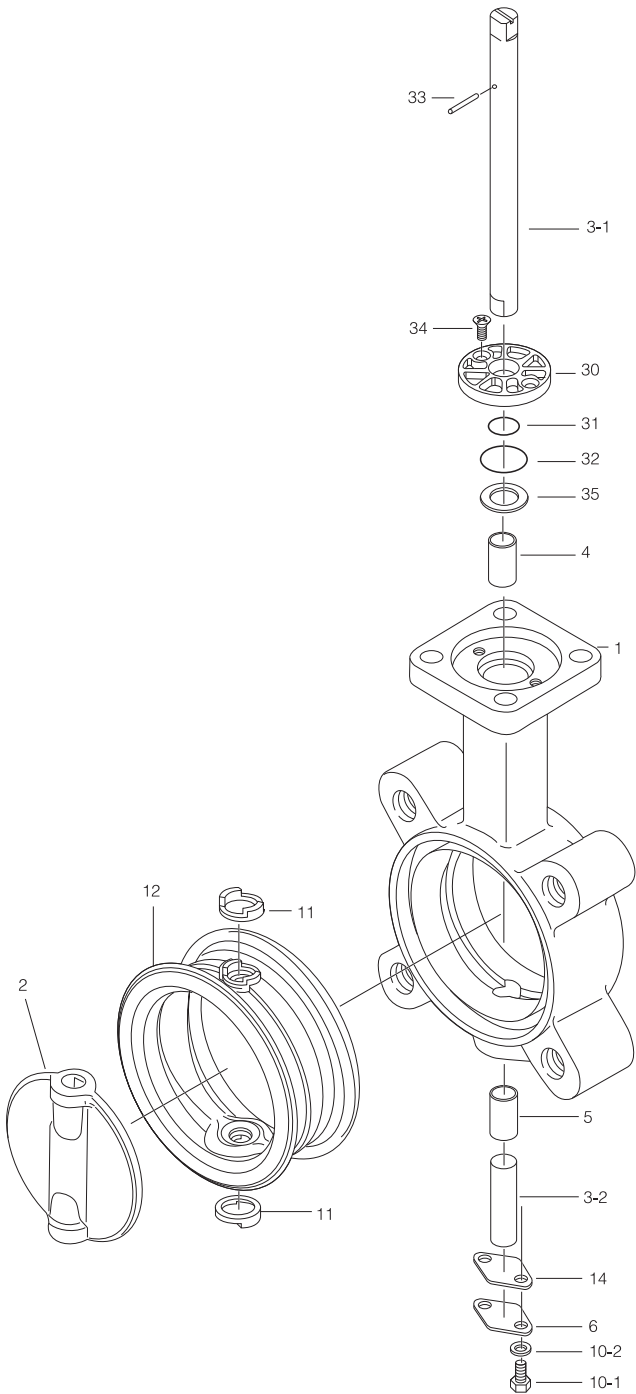
71LG Parts list (400mm to 600mm)

| No. | Description | Q'ty | Remarks |
|------|----------------|------|-----------|
| 1 | Body | 1 | |
| 2 | Disc | 1 | |
| 3 | Upper stem | 1 | |
| 4 | Lower stem | 1 | |
| 6 | Bottom cover | 1 | |
| 7 | Retainer plate | 2 | |
| 8 | Upper bearing | 2 | |
| 9 | Lower bearing | 1 | |
| 10-1 | Sp. washer | 4 | |
| 10-2 | Hexagon bolt | 4 | |
| 11 | Seal ring | 2 | |
| 12 | Seat ring | 1 | |
| 13 | "O"ring | 1 | |
| 14 | Gasket | 1 | |
| 16 | Ball | 1 | |
| 17 | Hollow bolt | 1 | Cup point |
| 18 | Lock nut | 1 | |
| 34 | Machine screw | 4 | |
| g41 | Key | 1 | |

704G/722F/720F

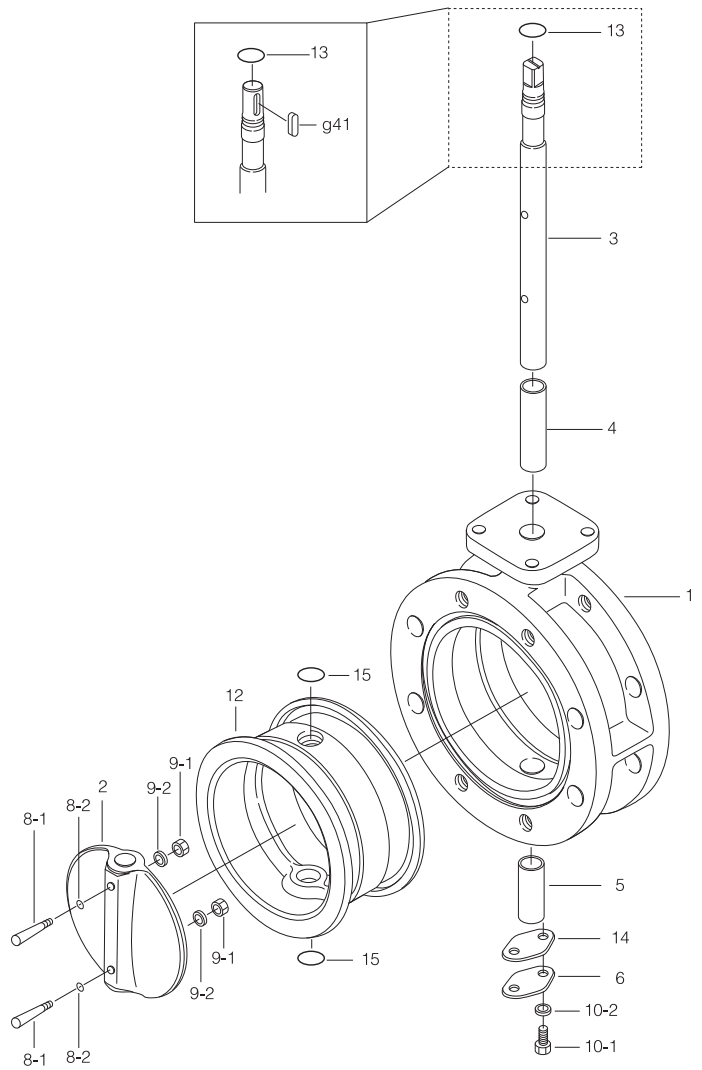
Expanded View

704G 50mm to 100mm

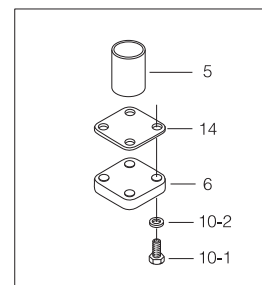


722F 350mm to 600mm

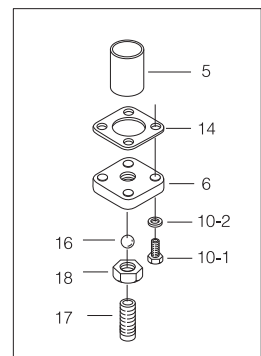
722F 125mm to 300mm



722F 300mm



722F 350mm to 600mm



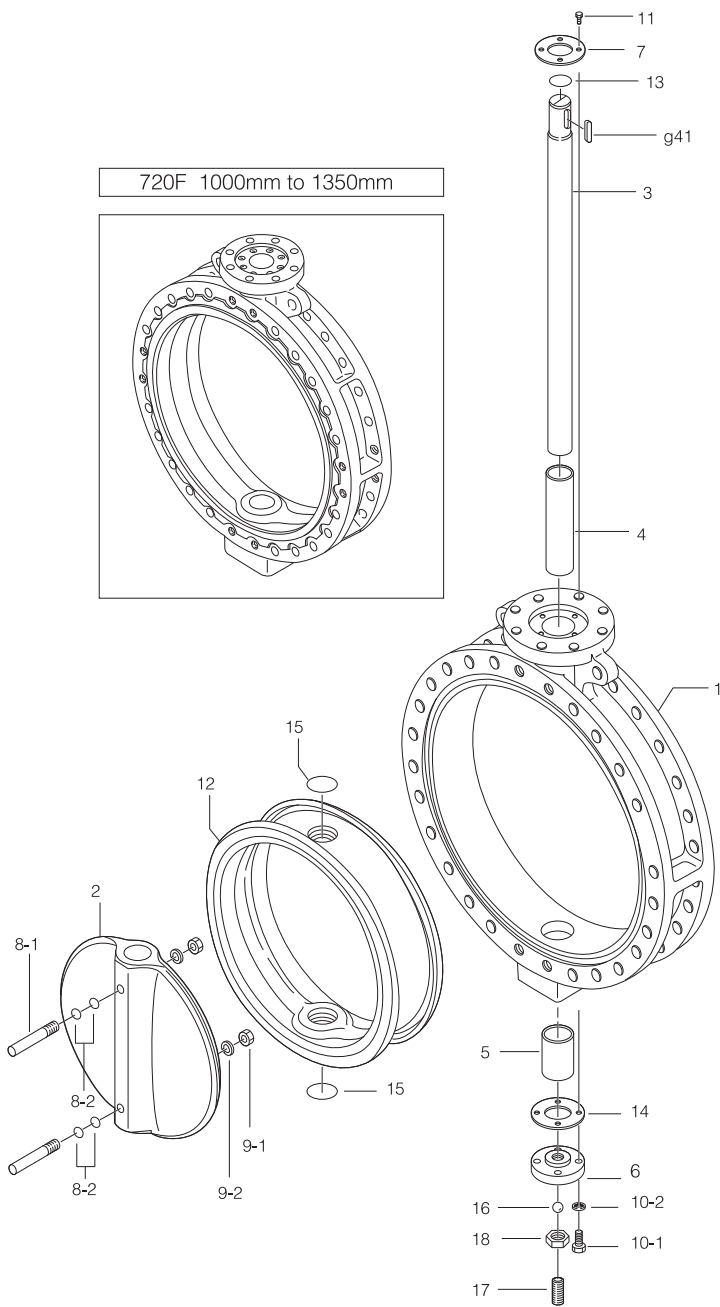
704G Parts list (50mm to 100mm)

| No. | Description | Qty | Remarks |
|------|----------------|-----|---------|
| 1 | Body | 1 | |
| 2 | Disc | 1 | |
| 3-1 | Upper stem | 1 | |
| 3-2 | Lower stem | 1 | |
| 4 | Bearing | 1 | |
| 5 | Bearing | 1 | |
| 6 | Bottom cover | 1 | |
| 10-1 | Hexagon bolt | 2 | |
| 10-2 | Sp. washer | 2 | |
| ★ 11 | Secondary ring | 2 | |
| ★ 12 | Seat ring | 1 | |
| ★ 14 | Gasket | 1 | |
| ★ 30 | Bushing | 1 | |
| ★ 31 | "O"ring | 1 | |
| ★ 32 | "O"ring | 1 | |
| 33 | Spring pin | 1 | |
| 34 | Machine screw | 2 | |
| 35 | Plate | 1 | |

Remark: The ★ indicates recommended spare parts. They are supplied as 'Seat ring set' with a small hexagonal spanner to remove set screws.

722F·720F 650mm to 1350mm

720F 1000mm to 1350mm



722F Parts list (125mm to 300mm)

| No. | Description | Q'ty | Remarks |
|-------|--------------|------|----------------|
| 1 | Body | 1 | |
| 2 | Disc | 1 | |
| 3 | Stem | 1 | |
| 4 | Bushing | 1 | |
| 5 | Bushing | 1 | |
| 6 | Bottom cover | 1 | |
| ★ 8-1 | Taper bolt | 1 | 125mm |
| | | 2 | 150mm to 300mm |
| ★ 8-2 | "O"ring | 4 | Only 300mm |
| ★ 9-1 | Hexagon nut | 1 | 125mm |
| | | 2 | 150mm to 300mm |
| ★ 9-2 | Sp.washer | 1 | 125mm |
| | | 2 | 150mm to 300mm |
| 10-1 | Hexagon bolt | 2 | 125mm to 250mm |
| | | 4 | 300mm |
| 10-2 | Sp.washer | 2 | 125mm to 250mm |
| | | 4 | 300mm |
| ★ 12 | Seat ring | 1 | |
| ★ 13 | "O"ring | 1 | |
| 14 | Gasket | 1 | |
| ★ 15 | "O"ring | 2 | See Remark 2. |

722F Parts list (350mm to 600mm)

| No. | Description | Q'ty | Remarks |
|-------|--------------|------|---------------|
| 1 | Body | 1 | |
| 2 | Disc | 1 | |
| 3 | Stem | 1 | |
| 4 | Bushing | 1 | |
| 5 | Bushing | 1 | |
| 6 | Bottom cover | 1 | |
| ★ 8-1 | Taper bolt | 2 | |
| ★ 8-2 | "O"ring | 4 | |
| ★ 9-1 | Hexagon nut | 2 | |
| ★ 9-2 | Sp.washer | 2 | |
| 10-1 | Hexagon bolt | 4 | |
| 10-2 | Sp.washer | 4 | |
| ★ 12 | Seat ring | 1 | |
| ★ 13 | "O"ring | 1 | |
| 14 | Gasket | 1 | |
| ★ 15 | "O"ring | 2 | See Remark 2. |
| 16 | Ball | 1 | |
| 17 | Hollow bolt | 1 | |
| 18 | Nut | 1 | |
| g41 | Key | 1 | |

Remark 1: The ★ indicates recommended spare parts. They are supplied as "Seat ring set" with a small hexagonal spanner to remove hollow bolt (P.17).
 Remark 2: The O-ring material (item number 15) should be the same as the sea tring (item number 12).

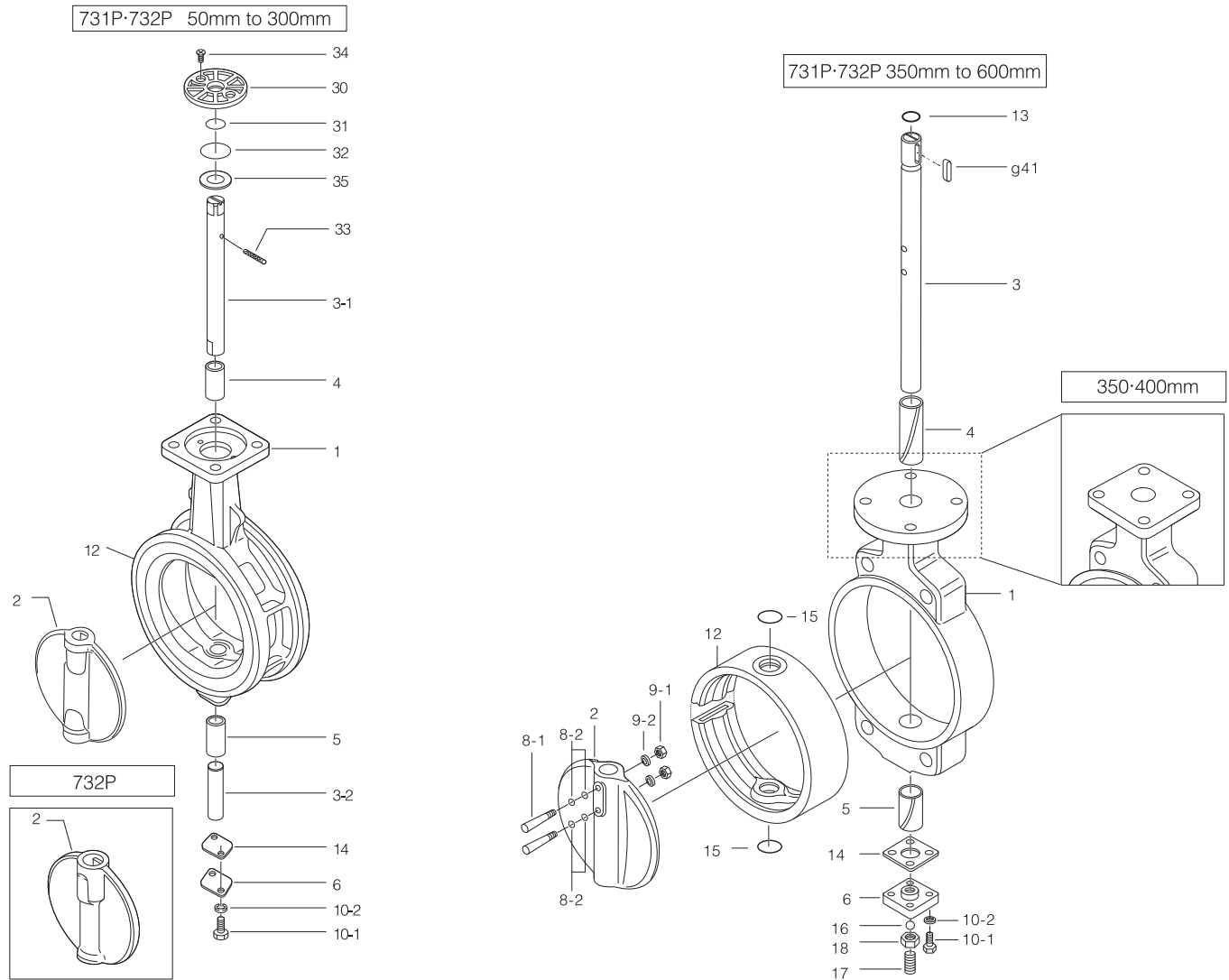
722F and 720F Parts list (722F: 650mm to 800mm / 720F: 850mm to 1350mm)

| No. | Description | Q'ty | Remarks |
|-------|----------------|------|---------------------------------------|
| 1 | Body | 1 | |
| 2 | Disc | 1 | |
| 3 | Stem | 1 | |
| 4 | Bushing | 1 | |
| 5 | Bushing | 1 | |
| 6 | Bottom cover | 1 | |
| 7 | Retainer plate | 1 | |
| ★ 8-1 | Taper bolt | 2 | 650mm to 900mm |
| | | 4 | 1000mm to 1350mm |
| ★ 8-2 | "O"ring | 4 | 650mm to 900mm |
| | | 8 | 1000mm to 1350mm |
| ★ 9-1 | Hexagon nut | 2 | 650mm to 900mm |
| | | 4 | 1000mm to 1350mm |
| ★ 9-2 | Sp.washer | 2 | 650mm to 900mm |
| | | 4 | 1000mm to 1350mm |
| 10-1 | Hexagon bolt | 4 | 650mm to 850mm |
| | | 8 | 900mm to 1350mm |
| 10-2 | Sp.washer | 4 | 650mm to 850mm |
| | | 8 | 900mm to 1350mm |
| 11 | Hexagon bolt | 4 | 650mm to 850mm |
| | | 8 | 900mm to 1350mm |
| ★ 12 | Seat ring | 1 | Vulcanized on 1000mm to 1350mm types. |
| ★ 13 | "O"ring | 1 | See Remark 2. |
| 14 | Gasket | 1 | |
| ★ 15 | "O"ring | 2 | See Remark 2. |
| 16 | Ball | 1 | |
| 17 | Hollow bolt | 1 | |
| 18 | Nut | 1 | |
| g41 | Key | 1 | |

Remark 1: The ★ indicates recommended spare parts. They are supplied as "Seat ring set" with a small hexagonal spanner to remove hollow bolt (P.17).
 Since the seat ring is vulcanized to the body of types 1000mm to 1350mm, please consult us if you wish to replace it.
 Remark 2: The O-ring material (item numbers 13 and 15) should be the same as the seating (item number 12).

731P/732P

Expanded View



731P/732P Parts list (50mm to 300mm)

| No. | Description | Q'ty | Remarks |
|------|---------------|------|--------------------|
| ★ 1 | Body | 1 | |
| 2 | Disc | 1 | |
| 3-1 | Upper stem | 1 | |
| 3-2 | Lower stem | 1 | |
| ★ 4 | Bearing | 1 | |
| ★ 5 | Bearing | 1 | |
| 6 | Bottom cover | 1 | |
| 10-1 | Hexagon bolt | 2 | |
| 10-2 | Sp.washer | 2 | |
| ★ 12 | Seat ring | 1 | Vulcanized to body |
| ★ 14 | Gasket | 1 | |
| ★ 30 | Bushing | 1 | |
| ★ 31 | "O"ring | 1 | |
| ★ 32 | "O"ring | 1 | |
| 33 | Spring pin | 1 | |
| 34 | Machine screw | 2 | |
| 35 | Plate | 1 | |

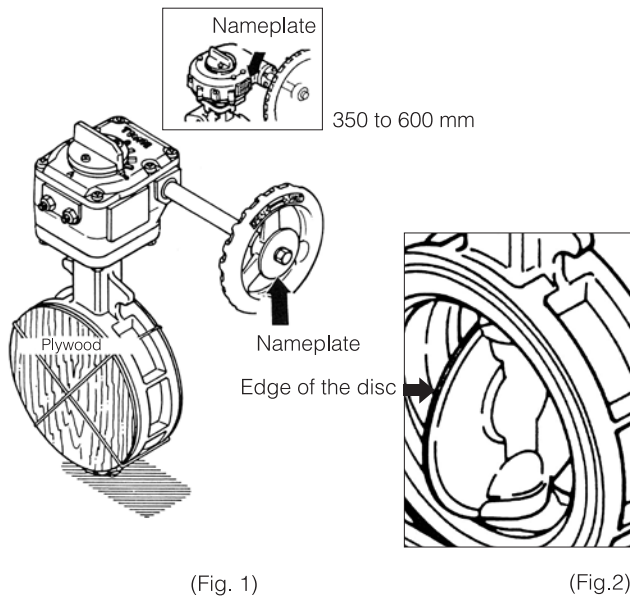
Remark: The ★ indicates recommended spare parts. They are supplied as "Seat ring set" with a small hexagonal spanner to remove hollow bolt (P.17).

731P·732P Parts list (350mm to 600mm)

| No. | Description | Q'ty | Remarks |
|-------|--------------|------|---------|
| 1 | Body | 1 | |
| 2 | Disc | 1 | |
| 3 | Stem | 1 | |
| ★ 4 | Bushing | 1 | |
| ★ 5 | Bushing | 1 | |
| 6 | Bottom cover | 1 | |
| ★ 8-1 | Taper bolt | 2 | |
| ★ 8-2 | "O"ring | 4 | |
| ★ 9-1 | Hexagon nut | 2 | |
| ★ 9-2 | Sp.washer | 2 | |
| 10-1 | Hexagon bolt | 4 | |
| 10-2 | Stem key | 4 | |
| ★ 12 | Seat ring | 1 | |
| ★ 13 | "O"ring | 1 | |
| 14 | Gasket | 1 | |
| ★ 15 | "O"ring | 2 | |
| 16 | Ball | 1 | |
| 17 | Hollow bolt | 1 | |
| 18 | Nut | 1 | |
| g41 | Key | 1 | |

Remark: The ★ indicates recommended spare parts. They are supplied as "Seat ring set" with a small hexagonal spanner to remove hollow bolt (P.17).

PACKAGING

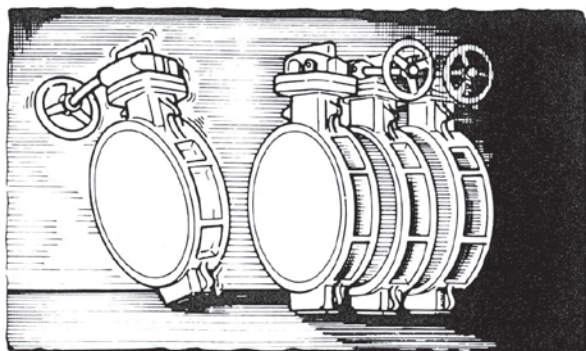


- (1) For 40 to 300 mm, standard gear type and lever type off-the-shelf products are packed in cardboard or wooden boxes. For products other than these, a plywood protective plate is attached to the flange face of the valve body (piping flange contact surface) in order to protect the inside of the valve. (Fig. 1)
- (2) The valve is kept open about 10 degrees from its closed position when shipped.
- (3) Some silicon oil is applied on the edge of the disc. (Fig. 2)
- (4) The valve has a nameplate with which you can verify information such as the nominal size and material. (Fig. 1)
(For lock lever type, this information is provided on the indicator.)

TRANSPORT

- (1) Use containers for ocean transport.
- (2) Use a covered vehicle for inland transport. If an uncovered vehicle is used, be sure to cover the valves with a protective tarp.

STORAGE



- (1) When storing valves, keep them indoors in as cool and dark a place as possible (temperature: -10 to +60 degrees C, humidity: 70% or less) without removing the cardboard packaging or the protective plate attached to the valve.
- (2) For long periods of storage, apply FERROGUARD (use designated product) once per year to the plated parts (indicator, bolts, nuts, handle shaft, etc.).
- (3) Operate the valve once every three months.
- (4) When storing unpackaged butterfly valves, make sure that no unreasonable load is being applied to the valve body and drive member. (Fig. 3)

UNPACKING

- (1) Unpack the valve immediately before installing it into the piping. Do not leave the valve unpacked for long periods of time.

INSTALLATION PRECAUTIONS

Using an impact wrench

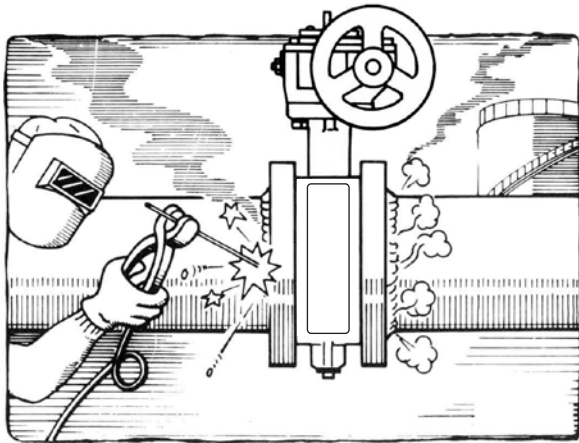
Please be careful when using a high-output impact wrench for installation and tightening piping bolts of rubber seated butterfly valves. Doing so can deform or damage parts such as the valve body, seat ring, piping flange (especially the resin lining pipe) and bolts, depending on the type of impact wrench and how it is used.

If you wish to use an impact wrench, use one with a maximum output that is no more than the values (piping bolt strength) given in the table below.

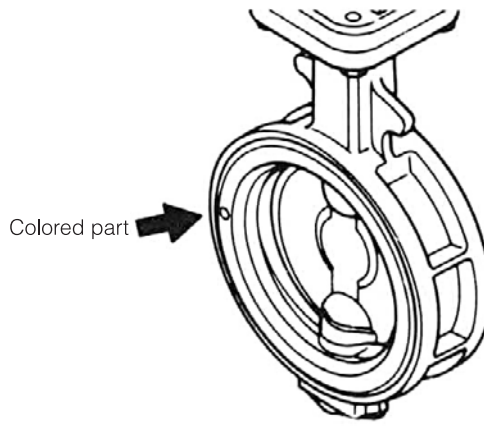
| Bolt dia. | M12 | M16 | M20 | M22 | M24 | M30 | M36 |
|--------------------------------|------------|-------------|-------------|-------------|-------------|--------------|--------------|
| Max. impact wrench output (Nm) | 64 or less | 150 or less | 300 or less | 400 or less | 640 or less | 1260 or less | 2200 or less |

Recommended piping bolt tightening torque (JIS 10K piping) (Nm)

| Valve port dia. | Bolt dia. | Recommended torque |
|-----------------|-----------|--------------------|
| 40 to 100 mm | M16 | 40 |
| 125 to 200 mm | M20 | 80 |
| 250 to 350 mm | M22 | 100 |
| 400 to 500 mm | M24 | 130 |
| 550 to 600 mm | M30 | 250 |



(Fig.5)



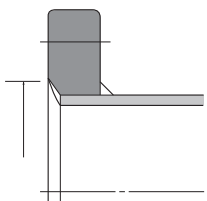
(Fig.4)

- (1) Install after verifying the material of the valve seat ring and disc. The seat ring material is indicated by the color code located at the position indicated by the arrow. (Fig. 4)

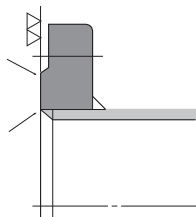
| | |
|---------------|--------------|
| Blue: NBR | Orange: EPDM |
| Red: CR | Yellow: IIR |
| Green: Hi-NBR | Gray: FKM |

Note: 700G, 705G, 704G, 71LG EPDM seat rings are indicated by the raised letters "EPDM" indicated in the position indicated by the arrow.

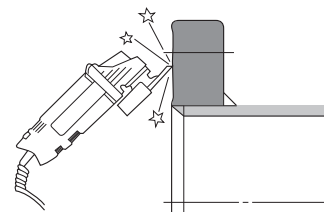
- (2) Installation of the valve immediately after welding the pipe flange will lead to adverse consequences, such as damage to the seat ring. Make sure that the temperature has cooled sufficiently and that you have removed weld spatter before installing the valve. Never weld when the valve is in the piping. (Fig. 5)
- (3) The seat ring might become damaged or the flange may leak if the flange face that contacts the valve seat ring is as shown in Fig. 6. Also, please confirm that there is no distortion to the flange or that there is no damage, such as scratches, to the



• **Excessive weld**
The resulting oversized inner pipe diameter may cause a flange leak.



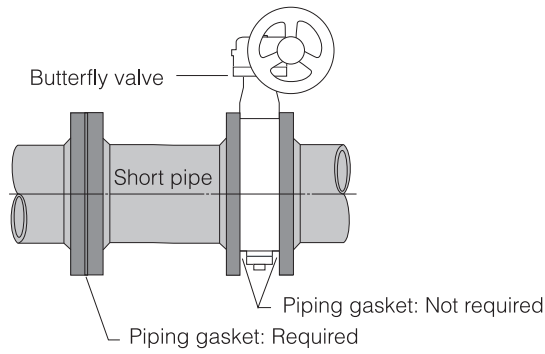
• **Sharp edges**
May cause damage to the seat ring.



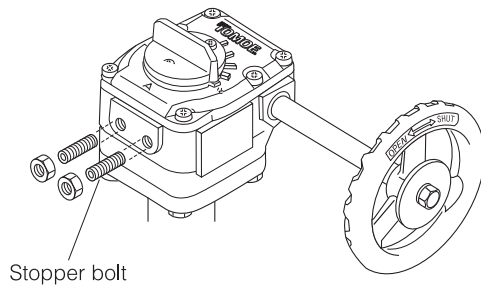
• **Rough surface from grinding**
May cause a flange leak.

(Fig.6)

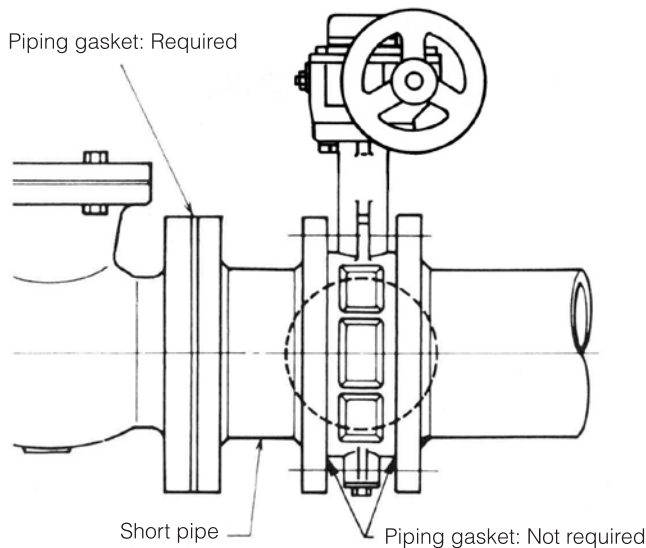
INSTALLATION PRECAUTIONS



(Fig. 7)



(Fig. 8)



(Fig. 9)

(4) A piping gasket is not required. Do not use one. A soft gasket such as one made of rubber will cause the valve to malfunction. Please note, however, that when using a short pipe, a piping gasket may be required for the connection surface that is not the butterfly valve. (Fig. 7)

(5) Do not apply strong shock such as by throwing the valve and do not put objects or put your weight on the lever or handwheel.

(6) Do not touch the stopper bolts on the gear box. Changing the valve close position will cause valve seat leakage. (Fig. 8)

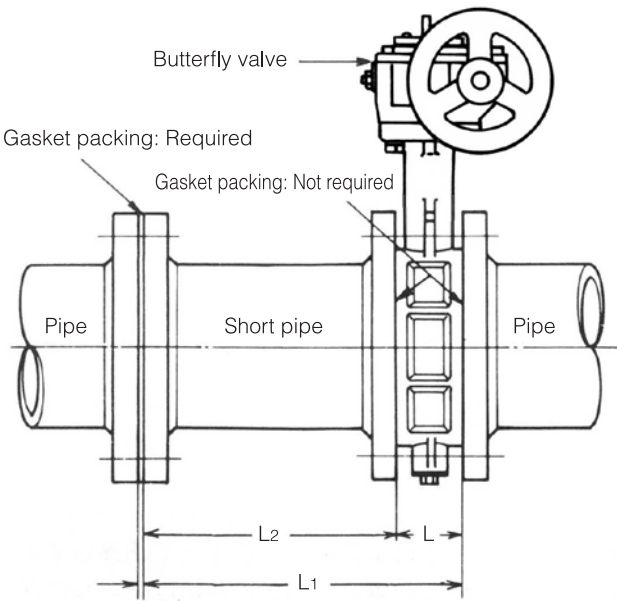
(7) Alignment of the valve to the flange should be done accurately.

In case the set bolt holes are tapped:

Never install the valve to one flange side using the tap holes for the four setting bolts located at the top and bottom of the valve body. The setting bolts are used for piping alignment. Tighten the setting bolts after completely securing the valve with the long bolts.

(8) Before tightening the piping bolts, check that the disc does not touch the inside of the flange when the valve is open.

(9) When installing a non-return valve, pump or flexible rubber joint with a butterfly valve, always insert a short pipe in between. Not doing so will cause the disc to hit during operation and lead to faulty operation. (Fig. 9)



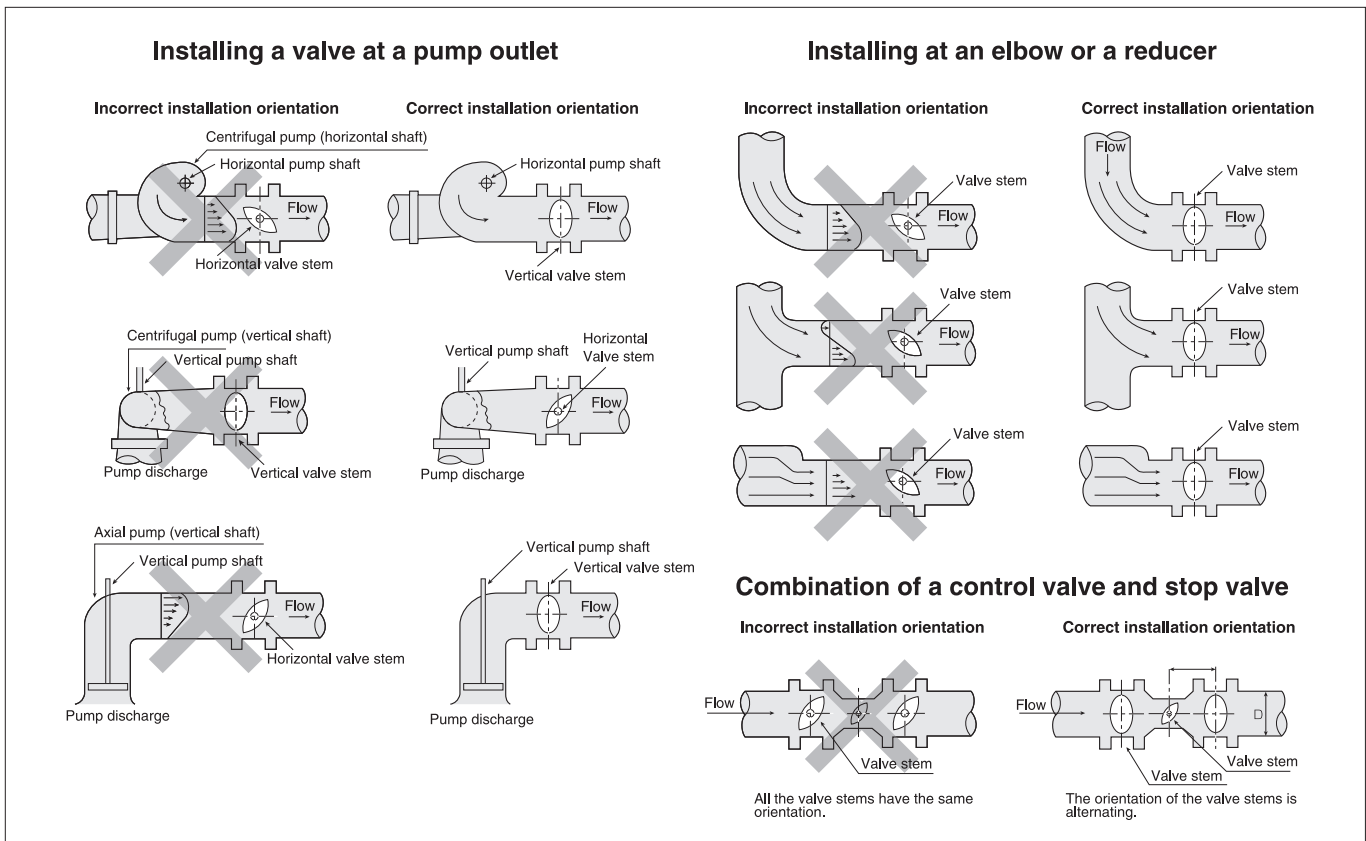
(Fig. 10)

- (10) Make sure no solvent gets onto the seat ring. Also, except for those made of NBR and fluorocarbon rubber (FKM), always keep the seat ring away from any machine oil.
- (11) When installing a resin pipe with tapered core, use one that has a collar and whose internal diameter is more than that of the pipe internal diameters given on page 43.
- (12) When replacing a previously installed regular valve with a butterfly valve, since the face-to-face dimension of the previously installed valve will be greater, you must insert a short pipe and adjust to the face-to-face dimension of the original valve pipe flange. Use the equation below when making the short pipe. (Fig. 10)

Length of short pipe

| | |
|---|----|
| $L_2 = L_1 - L$ | mm |
| L_2 : Length of short pipe | mm |
| L_1 : Face-to-face dimension of existing valve | mm |
| L : Face-to-face dimension of TOMOE butterfly valve | mm |

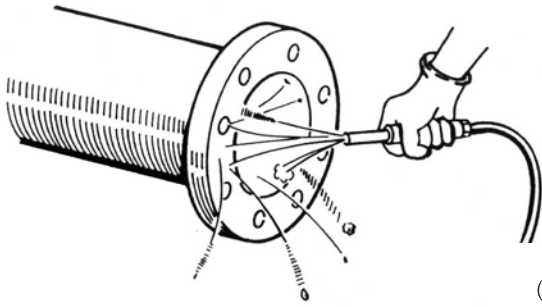
- (13) Although it is okay to install a valve in the direction that makes installation easy, please take caution in the following conditions.
 - 1 Valves with nominal diameters 350 mm and above (700G, 705G, 704G, 71LG are 400 mm and above) have steel balls at the lower end of the stems; therefore, make sure that the drive member does not face downward (relative to horizontal).
 - 2 Be careful of the stem direction when piping conditions are as shown in Fig. 11.



(Fig. 11)

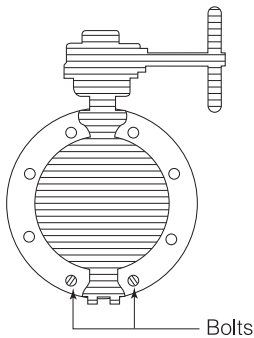
INSTALLATION PROCEDURE

When installing a non-return valve, pump or flexible rubber joint with a butterfly valve, always insert a short pipe in between. Otherwise the disc may hit the other device, resulting in faulty operation.



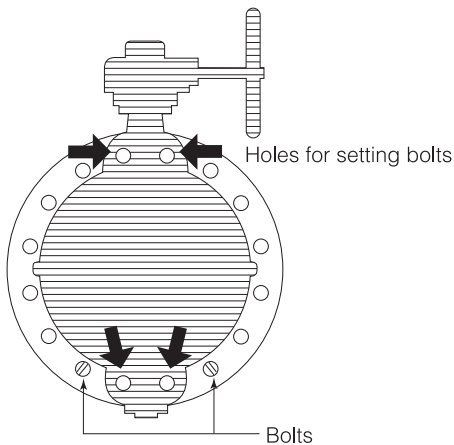
(Fig. 12)

Without setting bolts holes

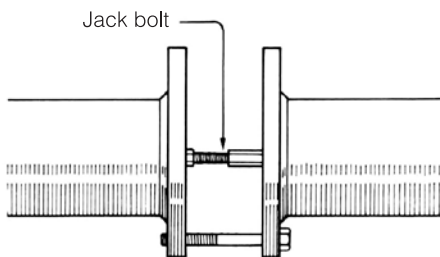


(Fig. 13)

With setting bolt holes



(Fig. 14)

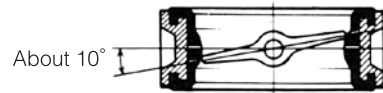


(Fig. 15)

- (1) Use air purging to clean the flange faces that will contact the valve. If there is rust or some other foreign material sticking to a flange face, clean it with a suitable cleaning fluid (alcohol or neutral detergent, etc.). (Fig. 12)

If possible, install in the piping a short pipe with a face-to-face dimension identical to the butterfly valve and blow into the pipe to completely remove foreign substances.

- (2) During installation or removal, keep the disc slightly open (about 10° from the completely shut position).



- (3) After aligning the piping, insert a piping bolt into the position in the figure and secure the valve to prevent it from dropping.

*The valves in Table A have two drilled or tapped setting bolt holes at both the top and bottom of the valve body. Insert piping bolts in the locations shown in the diagram to prevent falling.

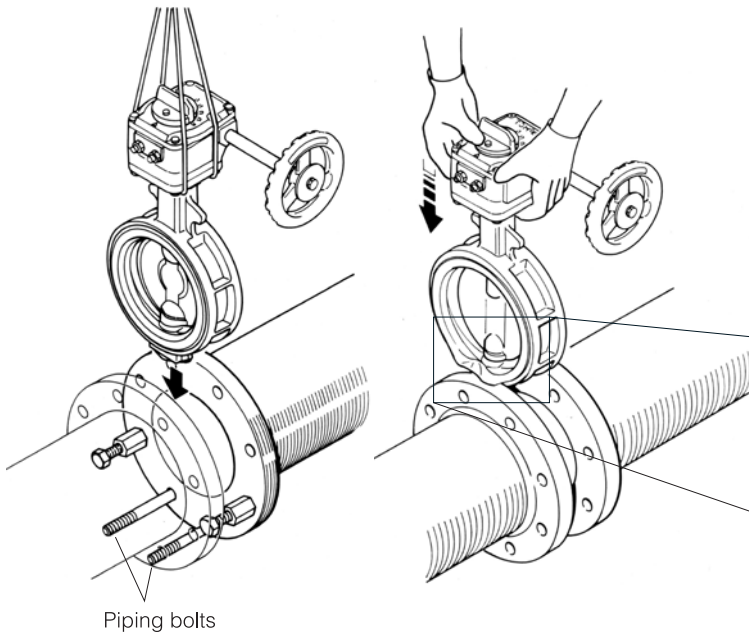
(Fig. 13) (Fig. 14)

Table A

| | |
|----------------|--|
| 700G | 600mm |
| 705G/704G/71LG | 50 mm to 600 mm (All bore diameters) |
| 731P/732P | 350 mm to 600 mm (All bore diameters) |
| 700S | 100 mm to 600 mm |
| 700E | 650 mm to 1350 mm (All bore diameters) |
| 700K | 650 mm to 1350 mm (All bore diameters) |
| 722F | 125 mm to 800 mm (All bore diameters) |
| 720F | 850 mm to 1350 mm (All bore diameters) |

- (4) Place a jack bolt in the position shown in the figure to widen the face-to-face dimension. (If you require, we can supply jack bolts.) Push and widen to make the face-to-face dimension 3 to 5 mm greater than the valve width on each side. (Fig. 15)

- (5) Insert as shown in the diagram, taking care to avoid damaging the seat ring faces of the valve. If the valve is forcibly pushed between the piping edges, the seat rings will be damaged and leakage will result. (Fig. 16) (Fig. 17) In addition, if inserting a blind flange or similar device, forcibly inserting the flange will damage the seat ring and leakage will result.



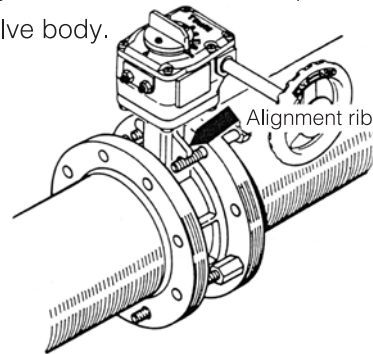
Piping bolts

(Fig. 16)

(Fig. 17)

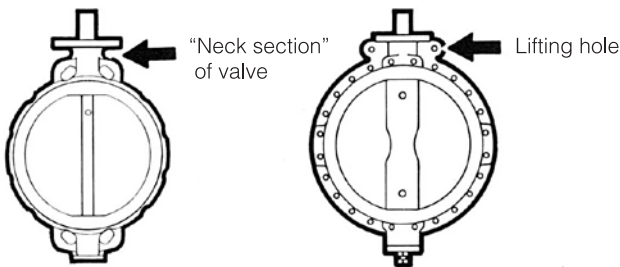
- (6) When the valve is completely inserted, insert piping bolts so that the bolts support the alignment ribs. (Fig. 18)

*If the valve is one of the valves in Table A on the previous page, insert setting bolts in the two setting bolt holes at both the top and the bottom of the valve body.



(Fig. 18)

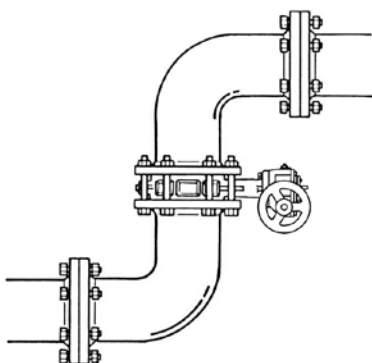
*To facilitate installation, suspend the valve with a crane or similar equipment while working. To lift the valve, use nylon string and lift from the "neck" of the valve if it has no eye bolts or lifting holes. (Fig. 19)



(Fig. 19)

- (7) After inserting all of the bolts, remove the jacking bolts and then gradually tighten the nuts alternating diagonally so that the nuts are tightened evenly. Tighten until the piping flanges come in contact with the faces of the valve (until the seat rings are not longer visible).

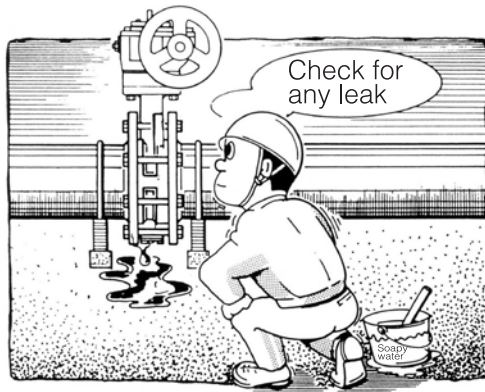
*If using an impact wrench, be sure to read "Installation Precautions" (Page 11) before beginning work.



(Fig. 20)

- (8) Align the valve to the flanges accurately. Loosely tighten both flanges, tighten the valve completely, and then tighten the flanges completely. (Fig. 20)

HANDLING PRECAUTIONS AFTER INSTALLATION

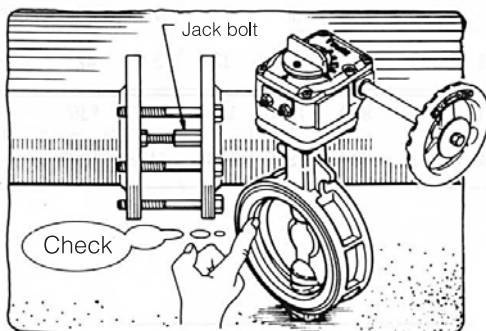


(Fig. 21)

- (1) Before beginning operation, air-purge the outside of the piping and clean the inside of the piping by running water through the piping.
- (2) Prior to operating, increase the internal pressure of the piping and check for possible leakage from the flanges, glands, and bottom cover by employing soapy water or similar. (Fig. 21)
- (3) If leakage is observed from the bottom cover, immediately retighten the bottom cover installation bolts. Alternate and tighten gradually with equal strength to avoid lopsided tightening. If leakage is observed from the flanges or glands, release the internal pressure and remove the valve from the piping. Check that there is nothing wrong with the seat rings.

- (4) Opening and closing operation of the lock lever type and worm gear type must be done by hand. Do not use a pipe on the lever or a Wilky key on the gear handle. Doing so can damage the lever and handle, or break the valve.
- (5) When performing a pressure test (if using a pressure higher than the rated pressure), completely open the valve. Never use a fully closed valve in place of a blind flange. If inserting a blind flange or similar device, take care not to forcibly insert the flange as damage to the seat ring and leakage will result.
- (6) If the system will be not be operated for a prolonged period of time after the piping work is finished, exercise the valve by opening and closing it about once every two weeks.
- (7) Please consult us if the valve is to be used at an opening of 30° or less.

INSPECTION AND MAINTENANCE

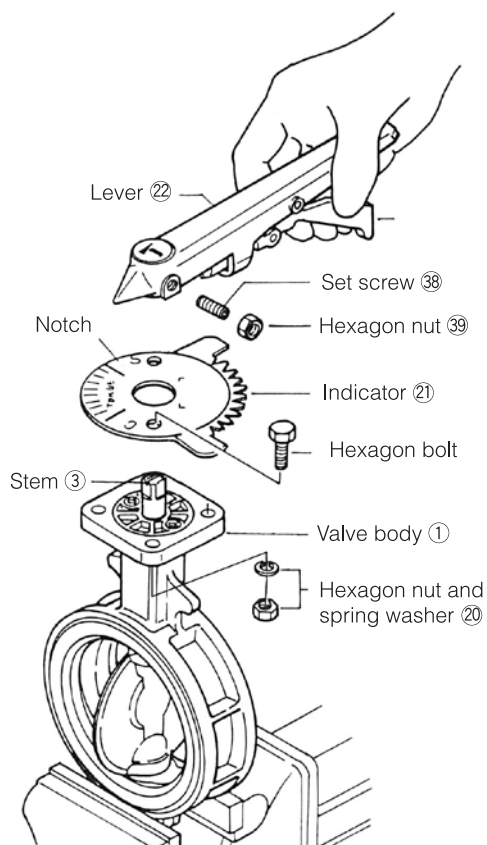


(Fig. 22)

- (1) **Periodic inspection**
Perform an inspection once per year and check for disc corrosion and wear of the seat ring. The gear box and lever unit have been designed to be maintenance-free.
- (2) **Abnormal operation**
Abnormal operation is usually caused by accumulation of foreign material or damage to the seat ring. If foreign material has accumulated and the disc is in the fully open position, it can be removed by maintaining the fully open position and flushing it out. If that does not work and if the seat ring is damaged, remove the valve from the piping and inspect it. (Fig. 22)
- (3) **Lubricants**
Use Lithium-base grease to lubricate the cylinder.
Use grease to lubricate the stem and silicon oil to lubricate the disc edge. (Use only the specified greases.)

| Rust preventive agents and Lubricants | Product name (manufacturers) | To be applied to: |
|---------------------------------------|--|--|
| FELLOW GUARD | FELLOW GUARD #1009 | FCD disc and Plated parts (Indicator, bolts, nuts and handle shaft) |
| Lithium-base grease | Multinoc grease No.2 (Nippon Oil Corporation) | Pneumatic Actuator T-DYNAMO |
| Grease | Shaft grease D (SATO SPECIAL OIL CO., LTD.) | Stem |
| | M ystik JI-6 (Kyodo yushi) | Gear box |
| Silicon oil | Shin-Etsu Silicon KF96H (Shin-Etsu Chemical Co., Ltd.) | Disc edge |

DISASSEMBLING THE VALVE BODY AND DRIVE MEMBER

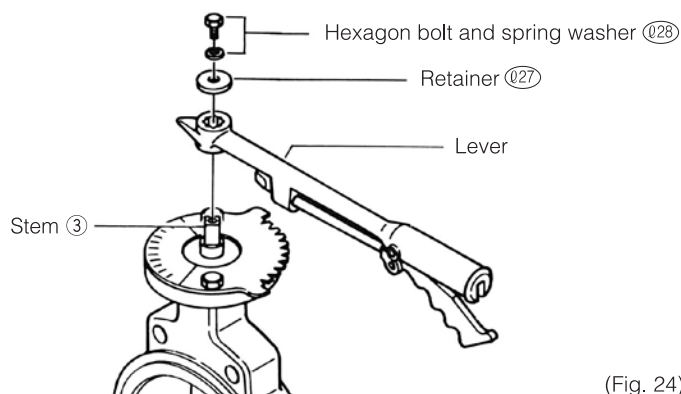


(Fig. 23)

700G / 705G / 704G / 700S / 731P / 732P / 722F / 71LG -1T,1G

Disassembling the lock lever type

- (1) Open the disc completely.
- (2) Remove the hexagon nut and spring washer (20) that secure the indicator (21) to the valve body (1).
- (3) Remove the set screw (38) and the hexagon nut (39) that secure the lever (22) to the stem (3).
- (4) Hold the valve body (1) with a vise or similar tool and pull the indicator (21) and lever up to remove them. The upper stem (3) remains in the valve body (1). (Fig. 23)

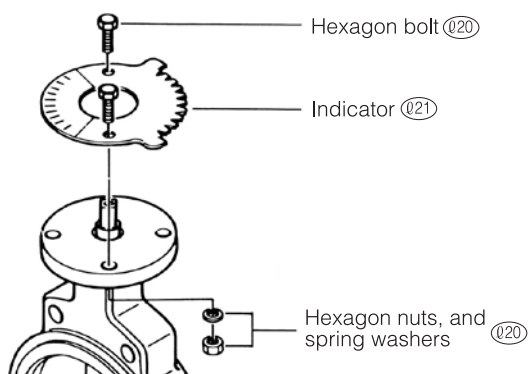


(Fig. 24)

700S-1L

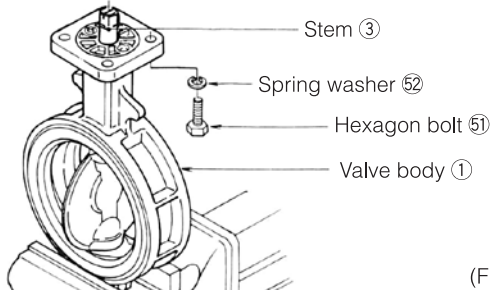
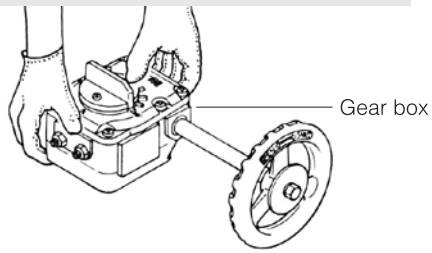
Disassembling the lock lever type

- (1) Loosen the hexagon bolt and spring washer (28) that secure the lever to the stem (3), and remove the retainer (27) and lever. (Fig. 24)
- (2) Loosen the hexagon bolts, hexagon nuts, and spring washers (20), and remove the indicator (21). (Fig. 25)

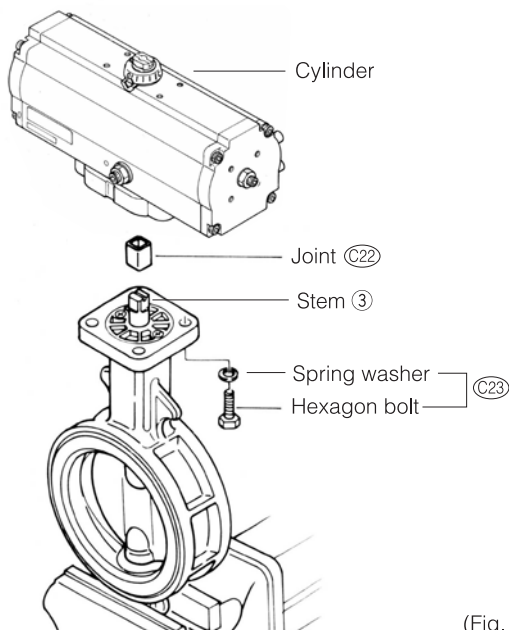


(Fig. 25)

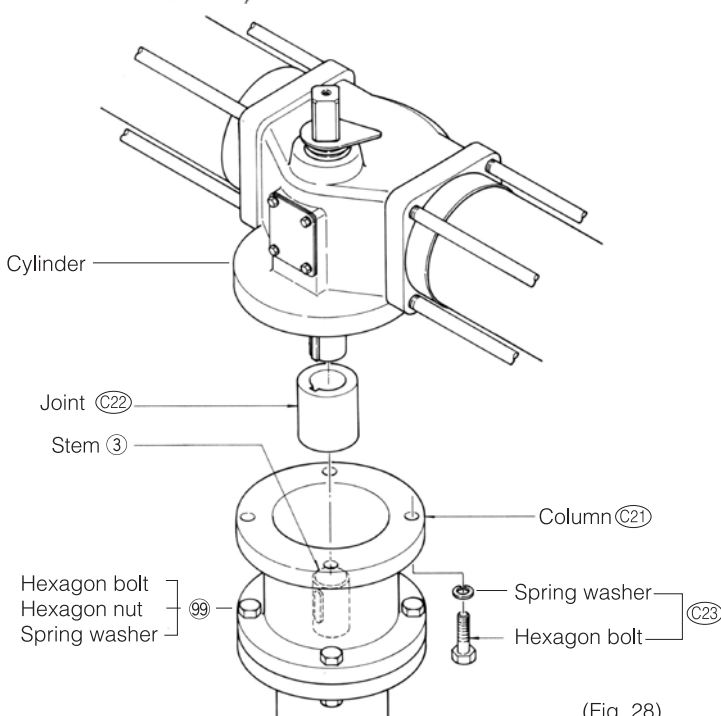
DISASSEMBLING THE VALVE BODY AND DRIVE MEMBER



(Fig. 26)



(Fig. 27)



(Fig. 28)

Disassembling the worm gear type

- (1) Open the disc completely.
- (2) Remove the hexagon bolts ⑤① (4 bolts) that secure the gear box to the valve body ① (2 bolts on a 21 type gearbox).
- (3) Hold the valve body ① with a vise and pull the gear box up to remove it. The stem ③ remains in the valve body ①. (Fig. 26)

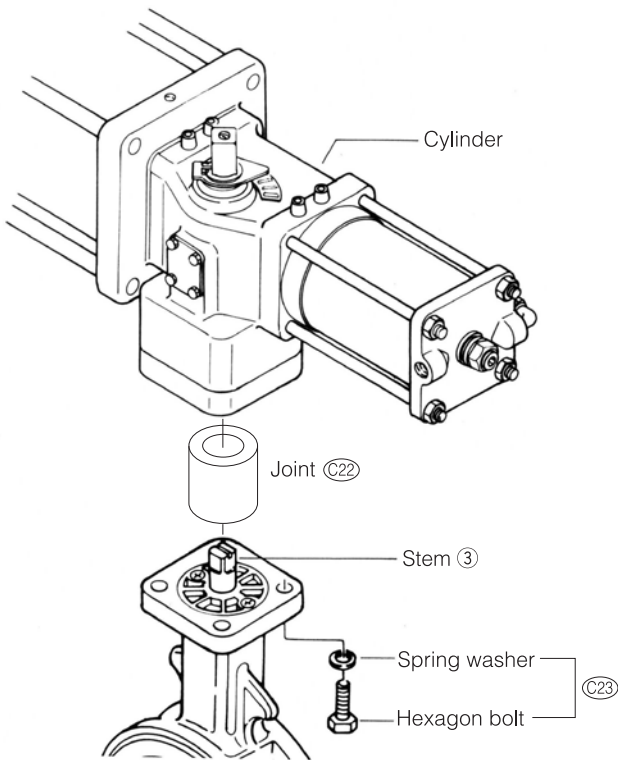
Disassembling the cylinder (T-DYNAMO)

- (1) Loosen the hexagon bolt and spring washer ②③ and then remove the cylinder. (Fig. 27)
- (2) If the joint ②② still remains on the stem ③, remove it.

Disassembling the cylinder (TGA)

- (1) Loosen the hexagon bolt and spring washer ②③ from the column ②① and then remove the cylinder. (Fig. 28)
- (2) Remove the hexagon bolt, hexagon nut, and spring washer ⑨⑨, and then remove the column ②① and joint ②②. (Fig. 28)

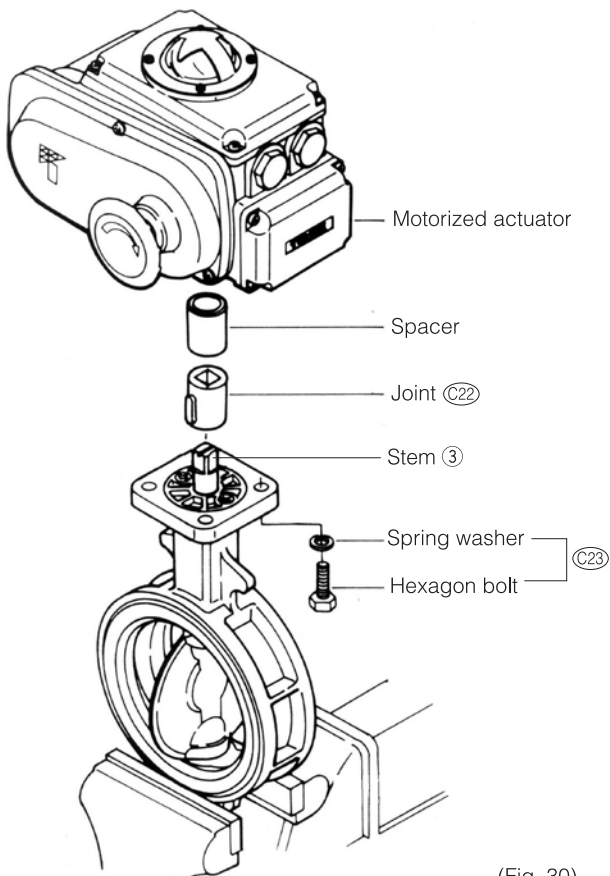
Disassembling the cylinder (TGS)



(Fig. 29)

- (1) Loosen the hexagon bolt and spring washer (C23) and then remove the cylinder. (Fig. 29)
- (2) If the joint (C22) still remains on the stem (3), remove it.

Removing the motorized actuator (New ELMY)



(Fig. 30)

- (1) Loosen the hexagon bolt and spring washer (C23) and then remove the motorized actuator. (Fig. 30)
- (2) If the joint (C22) and spacer still remain on the stem (3), remove them. If the joint and spacer remain on the motorized actuator, take care not to lose them.

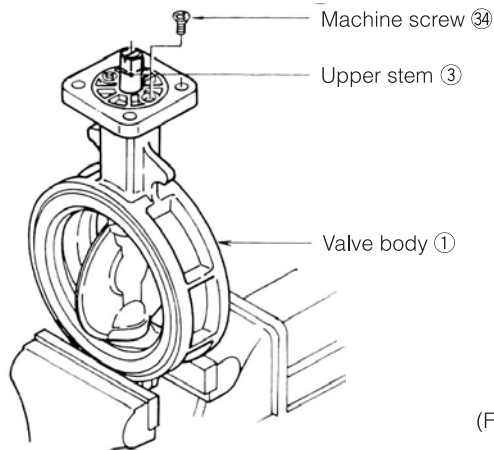
*To assemble the drive member on the valve, reverse the disassembly procedure.

DISASSEMBLY AND ASSEMBLY PROCEDURE

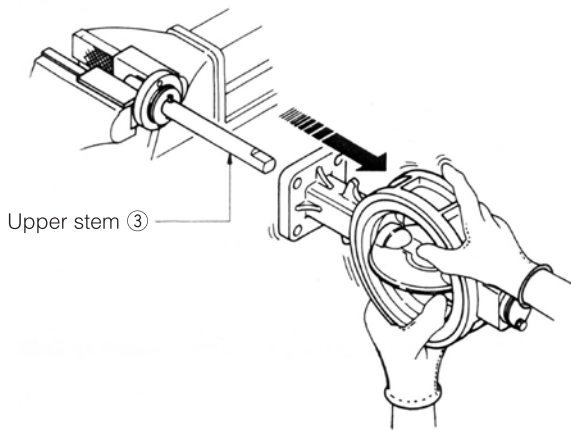
When performing periodic inspection or when trouble has occurred due to a worn or damaged seat ring, refer to the expanded view and follow the steps below to disassemble the valve.

Disassembly procedure of valve body

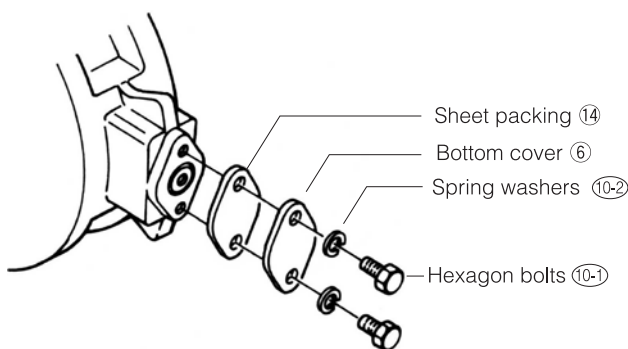
700G (40 to 350 mm)
705G (50 to 350 mm)
704G (50 to 350 mm)



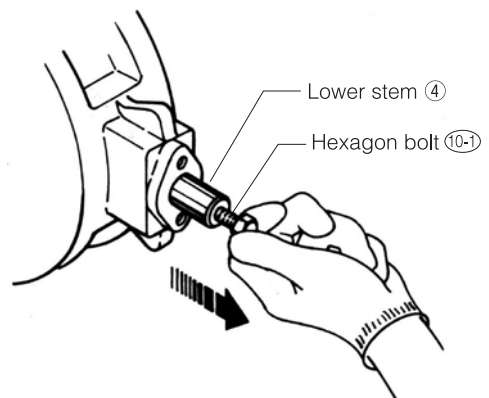
(Fig. 31)



(Fig. 32)



(Fig. 33)



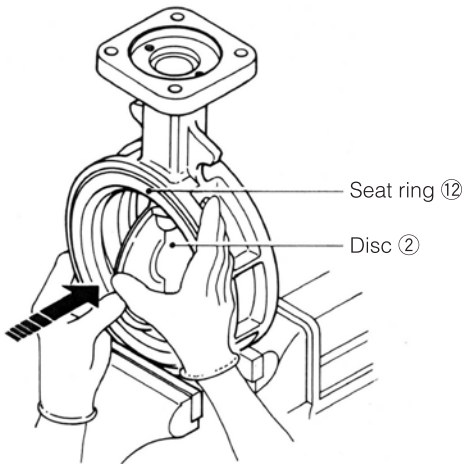
(Fig. 34)

- (1) Hold the valve body ① firmly with a vise and put the disc in the fully open position.
- (2) Remove the machine screw ③④ with a Phillips head screwdriver. (Fig. 31)
- (3) Hold the upper stem ③ with a vise and grasp both sides of the valve body ① to pull it off. (Fig. 32)
- (4) Remove the hexagon bolts ⑩-① and spring washers ⑩-② (two each) that secure the bottom cover ⑥, and remove the bottom cover ⑥ and sheet packing ⑭. (Fig. 33)
- (5) To remove the lower stem ④, first screw one of the hexagon bolts ⑩-① removed in the previous step into the threaded hole in the stem about 3 to 5 threads, and then pull the hexagon bolt ⑩-① to pull out the lower stem. (Fig. 34)

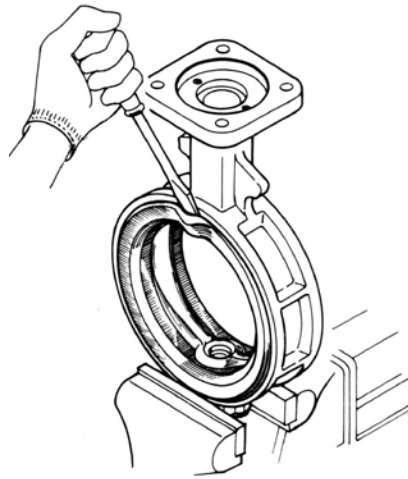
(6) Use both hands to push the disc ② out and remove it from the seat ring ⑫. (Fig. 35)

(7) Insert a flat-blade screwdriver between the outer periphery of the seat ring ⑫ and the valve body ① in order to remove the seat ring. (Fig. 36)

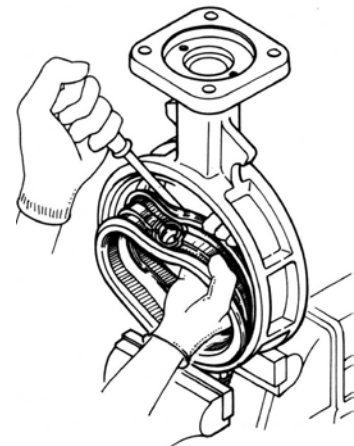
(8) Use a prying motion to insert the screwdriver between the seat ring ⑫ and valve body ①, insert your hand into the gap that is created between the two, and pull the seat ring ⑫ out. (Fig. 37)



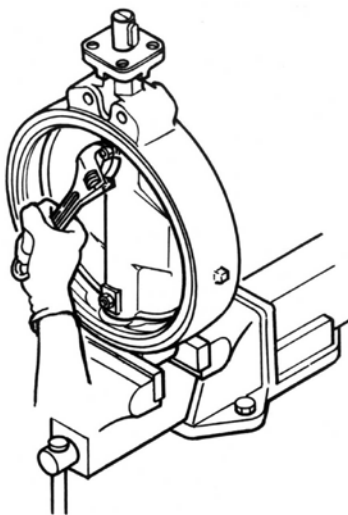
(Fig. 35)



(Fig. 36)



(Fig. 37)



(Fig. 38)

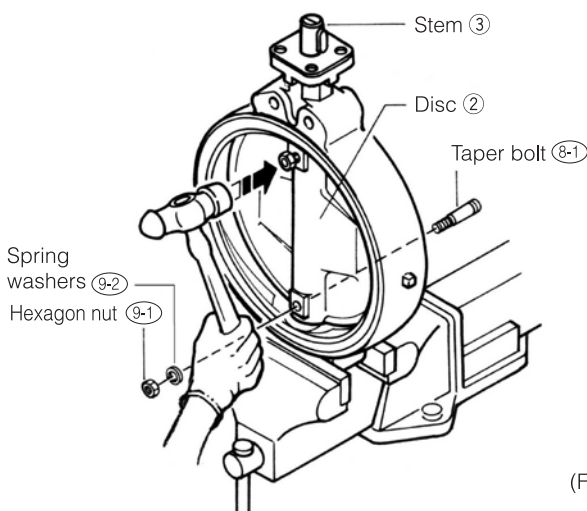
Disassembly Procedure of Valve Body
700G/705G/704G (400 to 600 mm)
71LG (250 to 600 mm, From procedure 4)
731R (350 to 600mm)

Do NOT perform the processes (6) and (7) for 731R because seating is glued to valve body.

(1) Hold the valve body ① firmly in a vise.

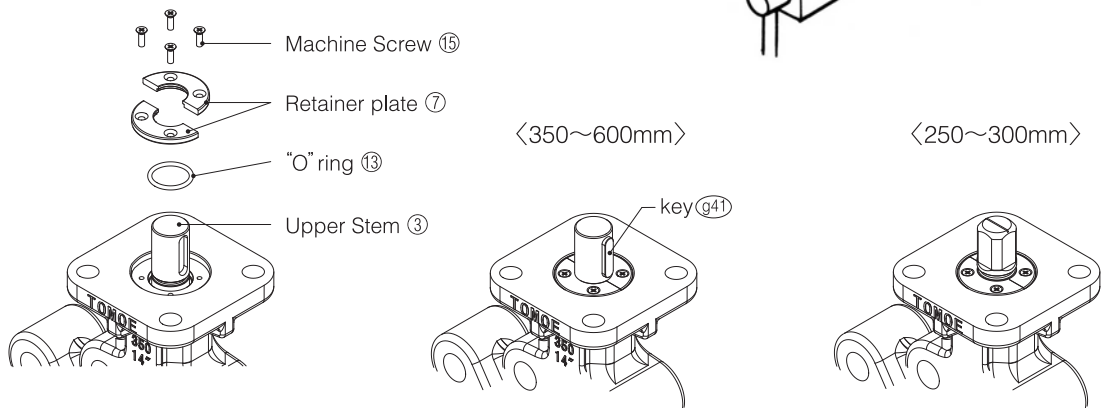
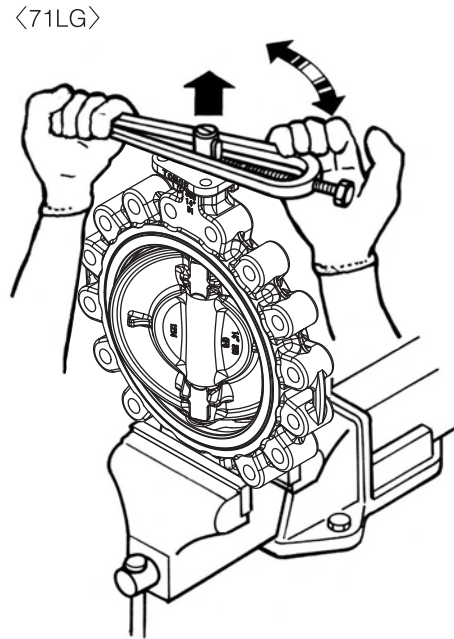
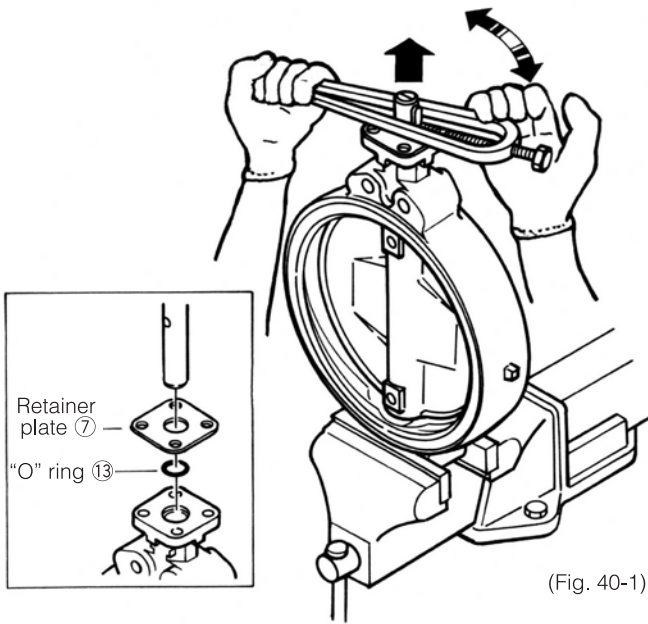
(2) Loosen the hexagon nut ⑨-1 on each taper bolt ⑧-1 that secures the stem ③ and disc ② until it is flush with the threaded end of the taper bolt ⑧-1. (This is to protect the threads when the bolt is tapped by a hammer.) (Fig. 38)

(3) Tap the hexagon nut ⑨-1 straight with a hammer straight to remove the taper bolt ⑧-1. (Fig. 39)

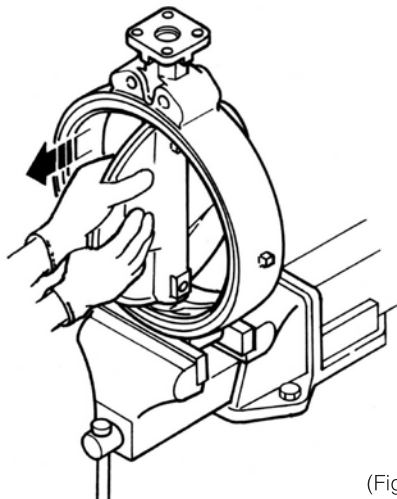


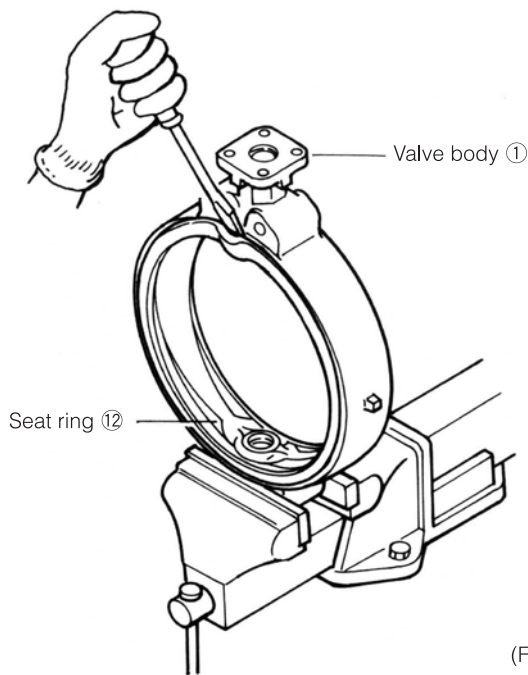
(Fig. 39)

(4) Grip the end of the stem ③ (upper stem for 71LG) with a gripping tool and rotate it back and forth to pull it out. Also remove the retainer plate ⑦ and "O" ring ⑬. (Fig. 40-1, Fig. 40-2)



(5) Rotate the disc ② 90° so that it is fully open and pull it out with both hands. (Fig. 41)

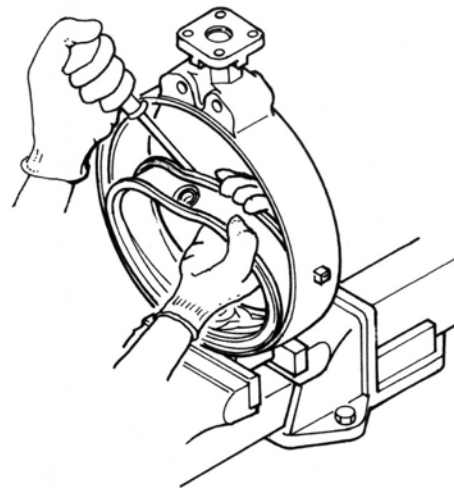




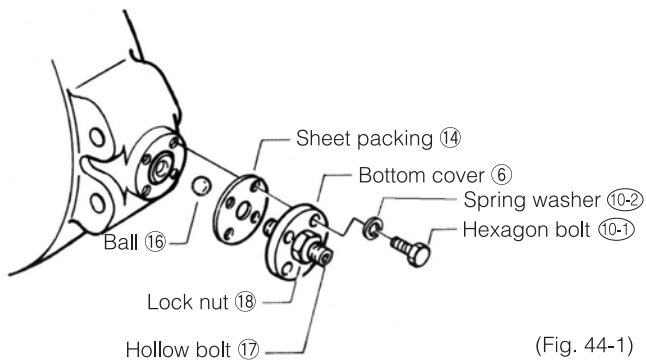
(Fig. 42)

(6) Insert a flat-blade screwdriver between the outer periphery of the seat ring ⑫ and the valve body ① in order to remove the seat ring. (Fig. 42)

(7) Use a prying motion to insert the screwdriver between the seat ring ⑫ and valve body ①, insert your hand into the gap that is created between the two, and pull the seat ring ⑫ out. (Fig. 43)



(Fig. 43)



(Fig. 44-1)

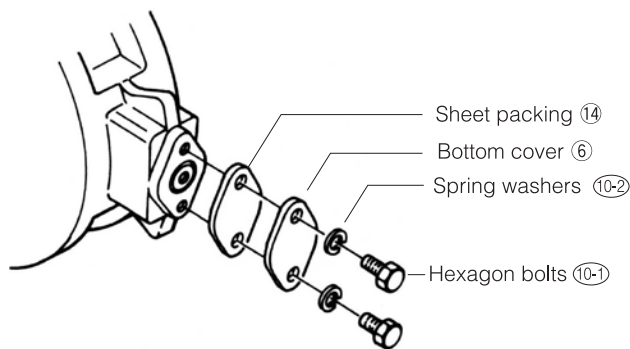
(8) Remove the valve body ① from the vise, remove the hexagon bolt ⑩-1 and spring washer ⑩-2 that secure the bottom cover ⑥, and remove the bottom cover ⑥ and sheet packing ⑭. When removing the bottom cover, keep the hollow bolt ⑰ and lock nut ⑱ on the bottom cover ⑥. Take care not to lose the ball ⑯. (Fig. 44-1)

(9) < For 71LG 250 to 350mm >

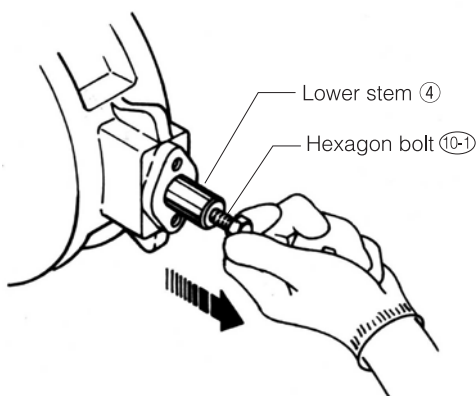
Remove the hexagon bolts ⑩-1 and spring washers ⑩-2 (two each) that secure the bottom cover ⑥, and remove the bottom cover ⑥ and sheet packing ⑭. (Fig. 44-2)

(10) < For 71LG 250 to 600mm >

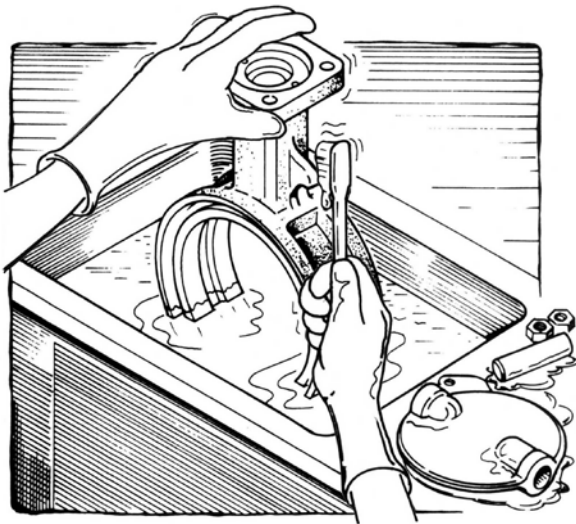
To remove the lower stem ④, first screw one of the hexagon bolts ⑩-1 removed in the previous step into the threaded hole in the stem about 3 to 5 threads, and then pull the hexagon bolt ⑩-1 to pull out the lower stem. (Fig. 44-3)



(Fig. 44-2)



(Fig. 44-3)



(Fig. 45)

Assembling the Valve Body

700G (40 to 300 mm)

705G (50 to 300 mm)

704G (50 to 300 mm)

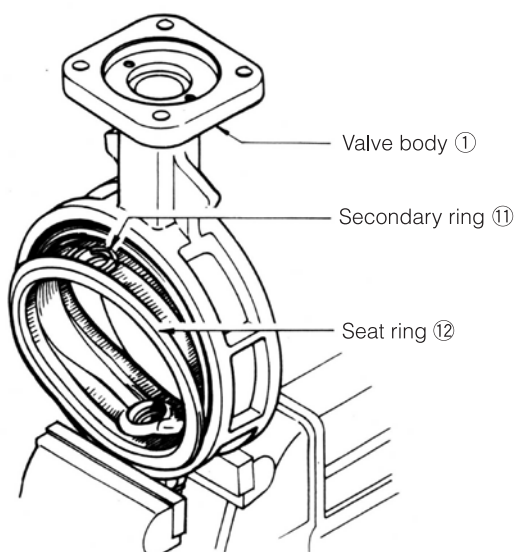
(1) Before assembly, clean all parts well using a cleaning fluid such as alcohol or a neutral detergent and make sure that none are damaged or abnormal. (Fig. 45)

(2) Any parts judged unusable or "O" rings that have deteriorated due to the passage of time (even if not showing signs of wear) should be replaced with new parts.

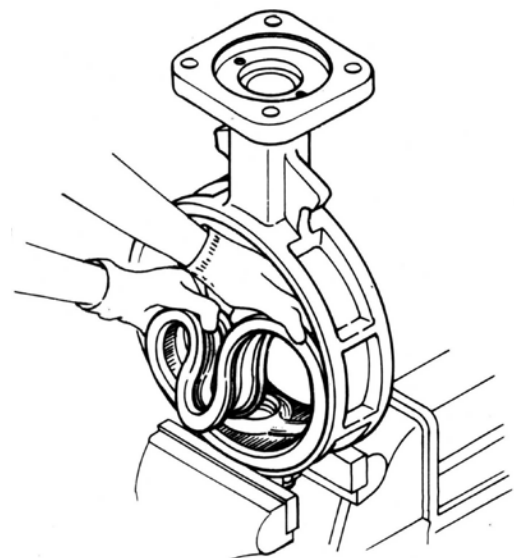
Note: If the seat ring material is other than NBR (EPDM or other material), use only silicon grease for the grease that is applied to the shaft, disc and other parts. Regular grease will cause swelling and corrosion.

(3) When inserting the seat ring ⑫ into the valve body ①, insert from the bottom side. Make sure that the holes in the seat ring ⑫ are correctly aligned with the holes in the valve body ①. (Fig. 46)

(4) Press down on the top part of the seat ring ⑫ with your thumbs to make it curve downward and insert the seat ring ⑫ into the valve body ① working from the bottom up. When inserting the seat ring, make sure that the secondary ring ⑪ does not shift out of position. (Fig. 47)

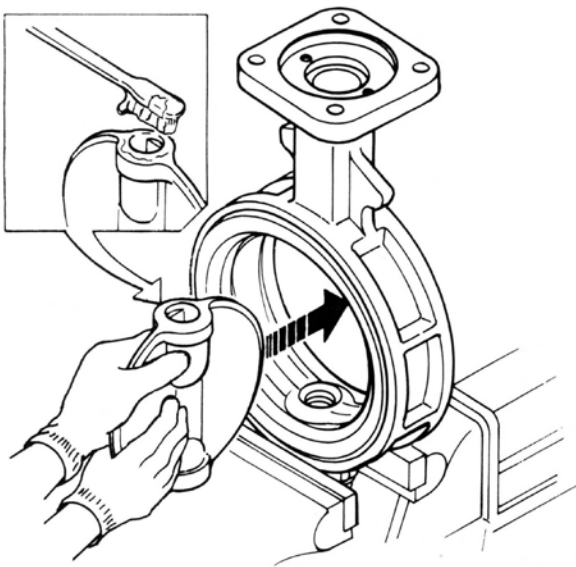


(Fig. 46)

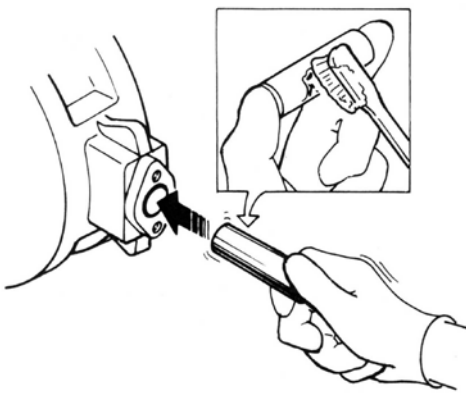


(Fig. 47)

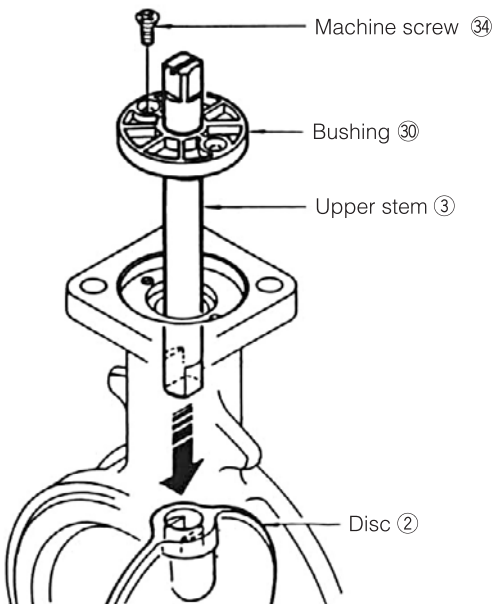
(5) After inserting the seat ring ⑫, verify that the stem holes at the top and bottom of the valve body ① are correctly aligned.



(Fig. 48)

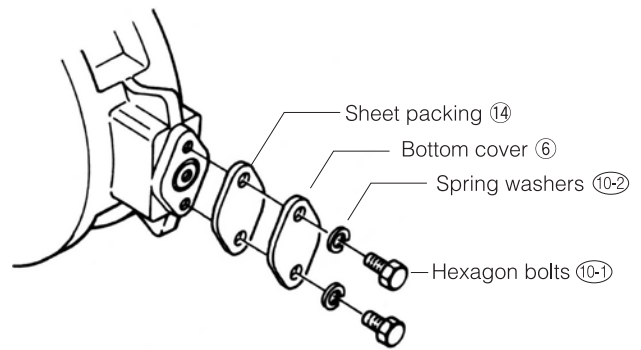


(Fig. 49)



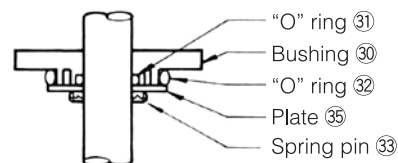
(Fig. 51)

- (6) Apply silicon oil or similar lubricant to the top and bottom of the disc (2) and insert it into the seat ring (12). (Fig. 48)
- (7) Insert the lower stem (4). Apply silicon grease and insert the stem carefully to prevent damage to the hole in the seat ring (12). (Fig. 49)
- (8) Once the stem has been correctly inserted, secure the sheet packing (14) and bottom cover (6) to the bottom of the valve body (1) with the hexagon bolts (10-1) and spring washers (10-2). (Fig. 50)



(Fig. 50)

- (9) Look down through the valve body (1) and verify that the seat ring (12) and disc (2) are set correctly.
- (10) Align the disc (2) with the upper stem (3) slit, apply sufficient silicon grease to the upper stem (3), and insert the upper stem (3) into the valve body (1). Insert the bushing (30) until it is flush with the flange face on the valve body (1) and secure it with the two machine screws (34). Apply sufficient silicon grease to "O" ring (31) and "O" ring (32) on the inside and outside of the bushing (30). (Fig. 51) (Fig. 52)

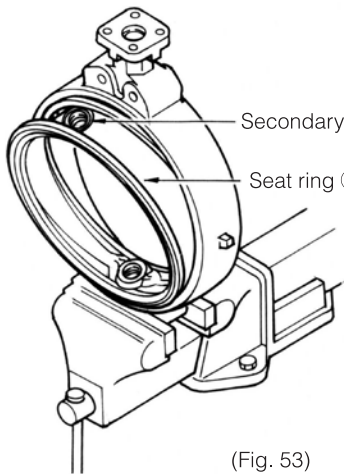


(Fig. 52)

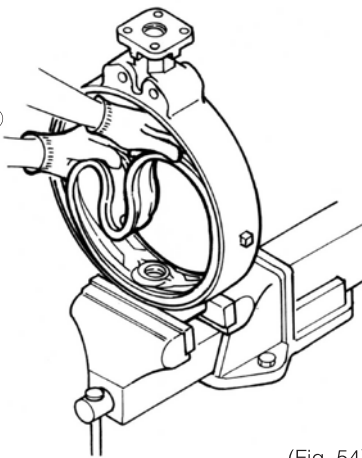
Assembling the Valve Body

700G/705G/704G (350 to 600 mm)
71LG (250 to 600 mm, No procedure 6)
731R (350 to 600mm)

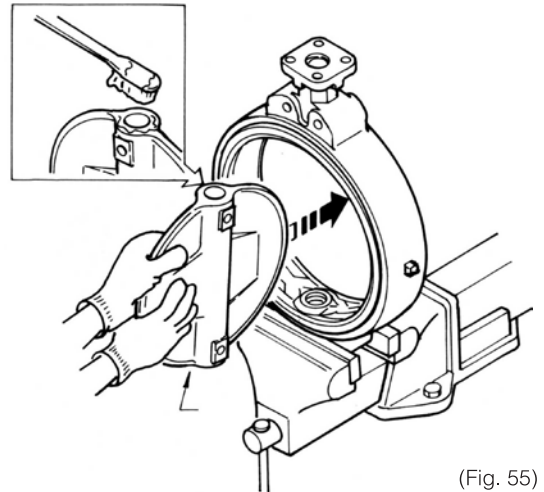
See page 30 for 700G and 705G (550mm).



(Fig. 53)

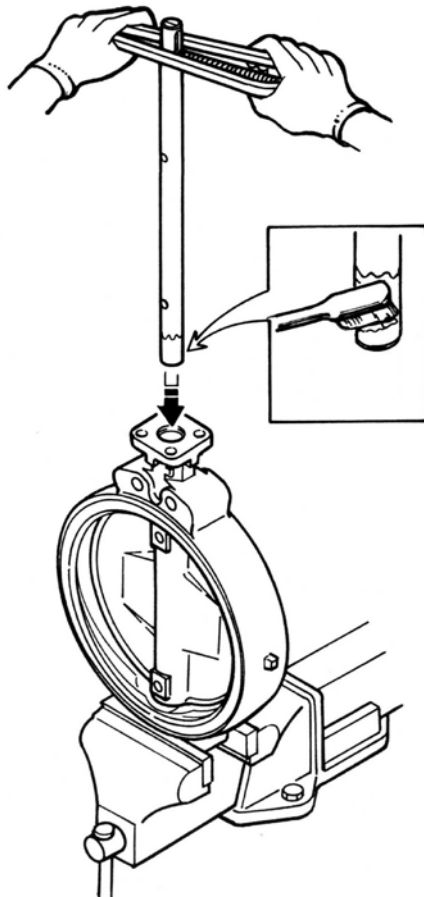


(Fig. 54)



(Fig. 55)

Do NOT perform the processes (1) and (2) for 731R because seating is glued to valve body.



(Fig. 56)

- (1) When inserting the seat ring ⑫ into the valve body ①, insert from the bottom side. Make sure that the holes in the seat ring ⑫ are correctly aligned with the holes in the valve body ①.

(Fig. 53)

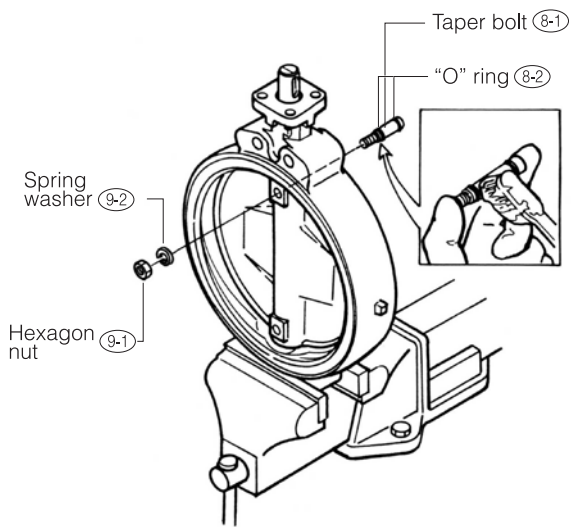
- (2) Press down on the top part of the seat ring ⑫ with your thumbs to make it curve downward and insert the seat ring ⑫ into the valve body ① working from the bottom up. When inserting the seat ring, make sure that the secondary ring ⑪ does not shift out of position. (Fig. 54)

- (3) After inserting the seat ring ⑫, verify that the stem holes at the top and bottom of the valve body ① are correctly aligned.

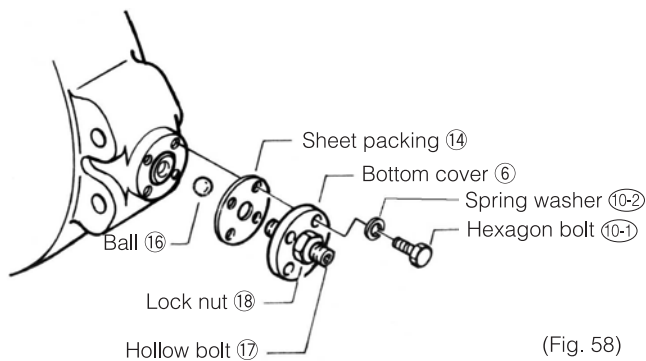
- (4) Apply silicon oil or similar lubricant to the top and bottom of the disc ② and insert it into the seat ring ⑫. (Fig. 55)

*If the bore diameter is large and insertion proves difficult, it may be possible to facilitate insertion by pulling the disc ② in.

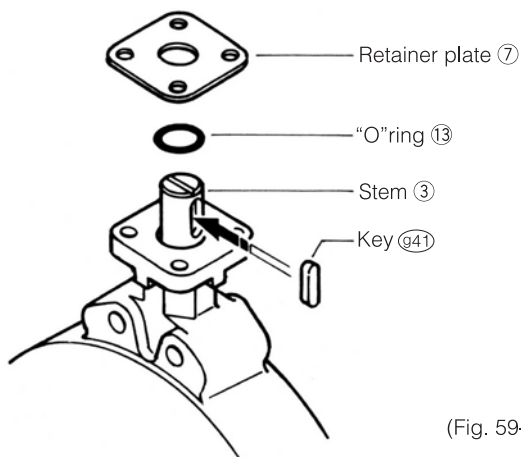
- (5) Insert the stem ③ (Upper stem for 71LG). When inserting the stem, apply silicon grease to the tip of the stem and insert carefully to prevent damage to the hole in the seat ring ⑫ (Fig. 56)



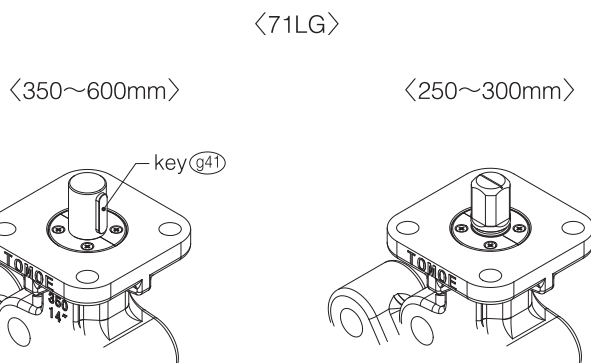
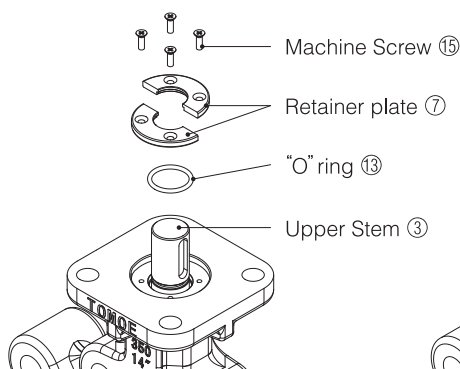
(Fig. 57)



(Fig. 58)



(Fig. 59-1)



(Fig. 59-2)

(6) Rotate the stem (3) and verify that the taper bolt holes in the disc (2) and stem (3) are aligned. Place a new "O" ring (8-2) on the taper bolt (8-1), apply grease to the bolt, and insert it in the taper bolt hole in the disc (2). Next, tap the taper bolt (8-1) in with a hammer and tighten the taper bolt firmly with the hexagon nut (9-1) and spring washer (9-2). (Fig. 57)

(7) Insert the lower stem (4). Apply silicon grease and insert the stem carefully to prevent damage to the hole in the seat ring (12). (Fig. 49)

(8) Secure the sheet packing (14) and bottom cover (6) with the hexagon bolt (10-1) and spring washer (10-2). For 400 mm to 600 mm types, apply grease to the tip of the hollow bolt (17) and use the grease to hold the ball (16) in the tip of the hollow bolt (17). Secure the sheet packing (14) and bottom cover (6) with the hexagon bolt (10-1) and spring washer (10-2). (Fig. 58)

(9-1) Place the "O" ring (13) on the stem (3) and attach the retainer plate (7) to the valve body (1). (Fig. 59-1)

(9-2) Place the "O" ring (13) on the stem (3) and attach the retainer plate (7) to the valve body (1). Fix the retainer plate (7) with the machine screw (34). (Fig. 59-2)

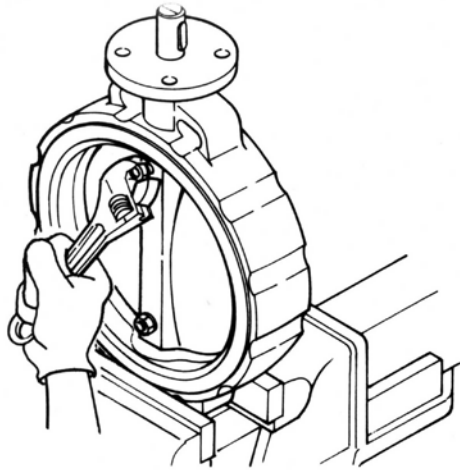
(10) Attach the key (g41) to the stem (3). (Fig. 59-1, Fig. 59-2)

This completes the assembly of the valve body. Verify that no parts were forgotten or assembled incorrectly.

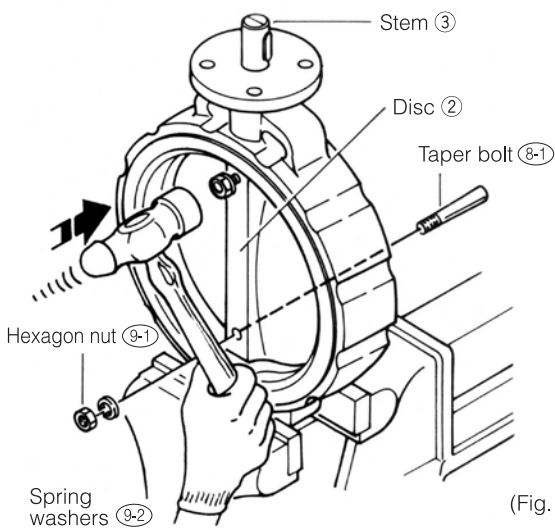
*To assemble the drive member on the valve, reverse the disassembly procedure.

Disassembly Procedure of Valve Body

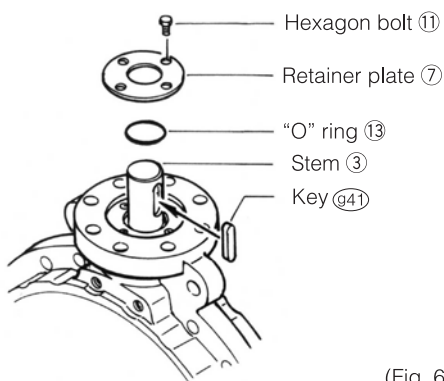
**700S / 700E / 700K / 722F / 720F
700G • 705G(550mm)**



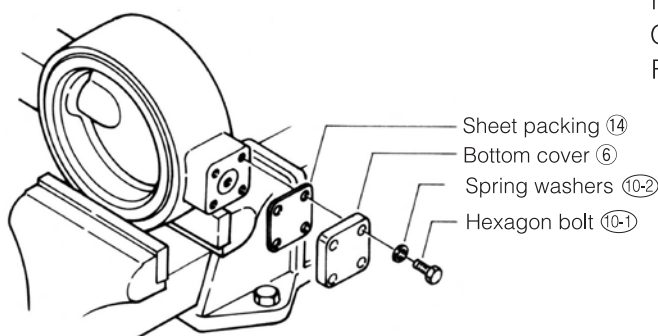
(Fig. 60)



(Fig. 61)

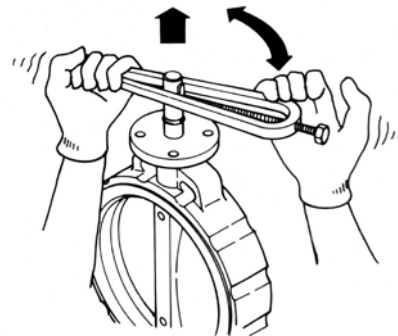


(Fig. 63)



(Fig. 64)

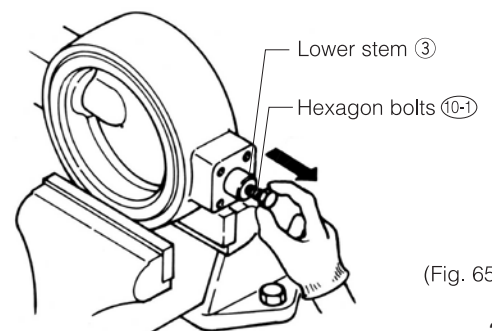
- (1) Hold the valve body ① firmly in a vise.
- (2) Loosen the hexagon nut ⑨-1 on each taper bolt ⑧-1 that secures the stem ③ and disc ② until it is flush with the threaded end of the taper bolt ⑧-1. (This is to protect the threads when the bolt is tapped by a hammer.) (Fig. 60)
- (3) Tap the hexagon nut ⑨-1 straight with a hammer straight to remove the taper bolt ⑧-1. (Fig. 61)
- (4) Grip the end of the stem ③ with a gripping tool and rotate it back and forth to pull it out. (Fig. 62)
On 700S (valve body material other than FC250) and 722F (125 mm to 600 mm) models, the bushing ④ may come off at the same time.



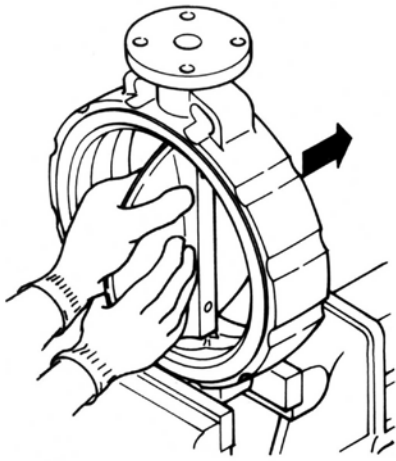
(Fig. 62)

*On **650 mm to 1350 mm** types, first remove the key ⑭ from the stem ③, then remove the hexagon bolt ⑪ and retainer plate ⑦, and then pull out the stem ③. (Fig. 63)

- (5) On **50 mm to 80 mm** types, the stem ③ is an upper and lower two-part stem.
First remove the hexagon bolts ⑩-1 and spring washers ⑩-2 (four each) that secure the bottom cover ⑥, and then remove the bottom cover ⑥ and sheet packing ⑭. (Fig. 64)
- (6) To remove the lower stem, first screw one of the hexagon bolts ⑩-1 removed in the previous step into the threaded hole in the stem about 3 to 5 threads, and then pull the hexagon bolt ⑩-1 to pull out the lower stem. (Fig. 65)
On the 700S model (valve body material other than FC250), the bushing ⑤ may come off at the same time.



(Fig. 65)

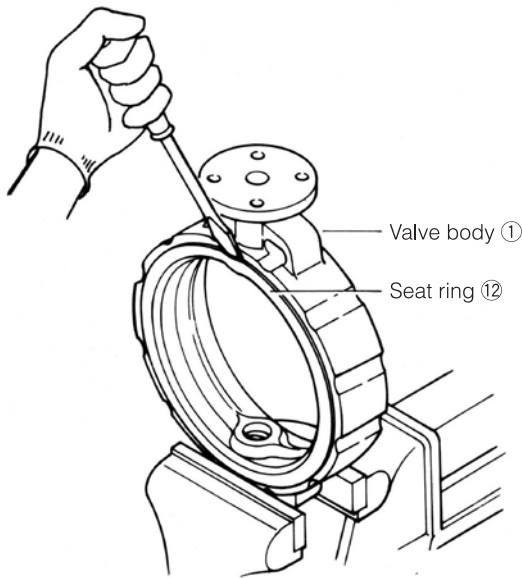


(Fig. 66)

(7) Rotate the disc (2) 90° so that it is completely open and use both hands to push the disc (2) out and remove it from the seat ring (12). (Fig. 66)

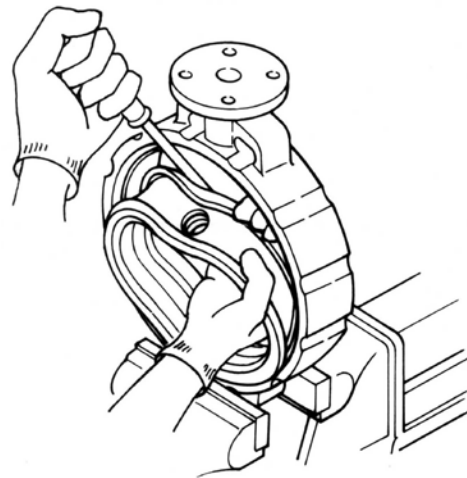
*On **1000 mm to 1350 mm** types, the seat ring (12) is baked onto the valve body (1) and thus cannot be removed. Steps (8) and (9) are not necessary.

(8) Insert a flat-blade screwdriver between the outer periphery of the seat ring (12) and the valve body (1) in order to remove the seat ring. (Fig. 67)



(Fig. 67)

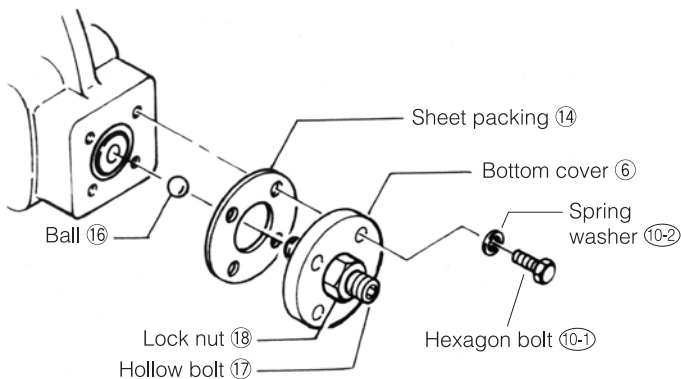
(9) Use a prying motion to insert the screwdriver between the seat ring (12) and valve body (1), insert your hand into the gap that is created between the two, and pull the seat ring (12) out. (Fig. 68)



(Fig. 68)

(10) Remove the “O” ring (15) from the seat ring (12) using a scriber or similar implement.

(11) Remove the valve body (1) from the vise and remove the bottom cover (6) and sheet packing (14) that are secured with the hexagon bolt (10-1) and spring washer (10-2). (Fig. 69)

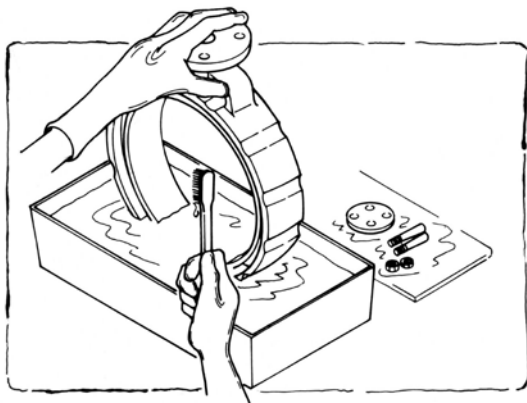


(Fig. 69)

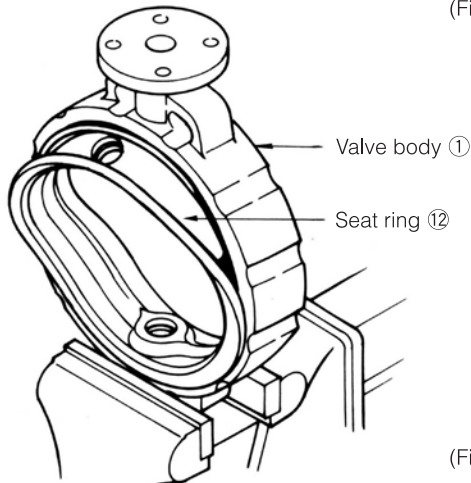
*On **350 mm to 1350 mm** types, a ball (16) is set in the assembly. Take care not to lose the ball. Keep the hollow bolt (17) and lock nut (18) in the bottom cover (6).

(12) On **50 mm to 80 mm** types, there is an “O” ring (13) at the top of the valve body stem hole. Use a scriber or similar implement to remove the “O” ring.

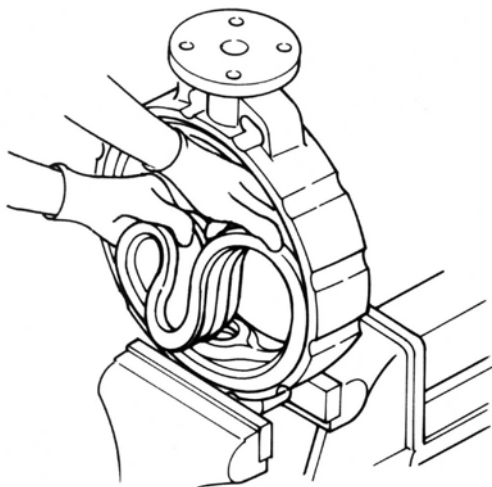
(13) On the 700S (valve body material other than FC250) and 722F (125 mm to 600 mm) models, bushings (4) (5) may remain in the upper and lower stem holes of valve body (1). If so, remove the bushings.



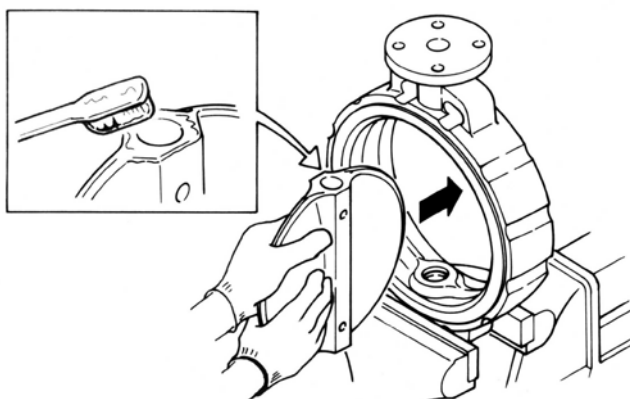
(Fig. 70)



(Fig. 71)



(Fig. 72)



(Fig. 73)

Assembling the Valve Body

**700S / 700E / 700K / 722F / 720F
700G • 705G (550mm)**

(1) Before assembly, clean all parts well using a cleaning fluid such as alcohol or a neutral detergent and make sure that none are damaged or abnormal. (Fig. 70)

(2) Any parts judged unusable or “O” rings and packing that have deteriorated due to the passage of time (even if not showing signs of wear) should be replaced with new parts.

Note: If the seat ring material is other than NBR (EPDM or other material), use only silicon grease for the grease that is applied to the shaft, disc and other parts. Regular grease will cause swelling and corrosion.

(3) Insert “O” rings (15) in the upper and lower stem holes in the seat ring (12).

*Not necessary on **50 mm to 80 mm** types.

*On **1000 mm to 1350 mm** types, the seat ring (12) is baked onto the valve body (1) and thus steps (4) to (6) are not necessary.

(4) When inserting the seat ring (12) into the valve body (1), insert from the bottom side. Make sure that the holes in the seat ring (12) are correctly aligned with the holes in the valve body (1).

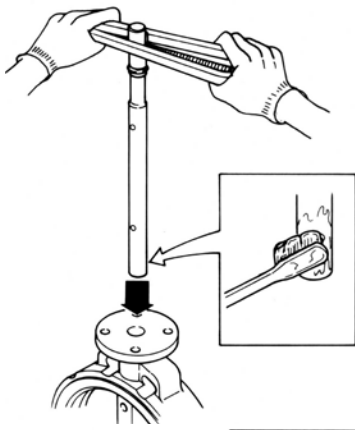
(Fig. 71)

(5) Press down on the top part of the seat ring (12) with your thumbs to make it curve downward and insert the seat ring (12) into the valve body (1) working from the bottom up. (Fig. 72)

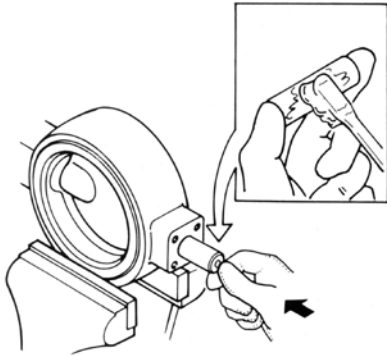
(6) After inserting the seat ring (12), verify that the stem holes at the top and bottom of the valve body (1) are correctly aligned.

(7) Apply silicon oil to the top and bottom of the disc (2) and insert it into the seat ring (12). (Fig. 73)

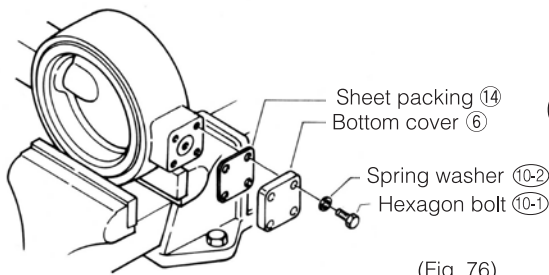
*If the bore diameter is large and insertion proves difficult, it may be possible to facilitate insertion by pulling the disc (2) in.



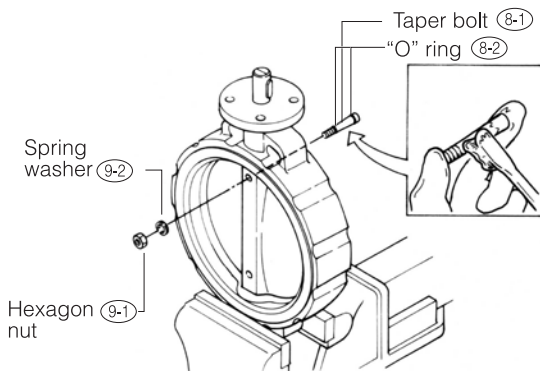
(Fig. 74)



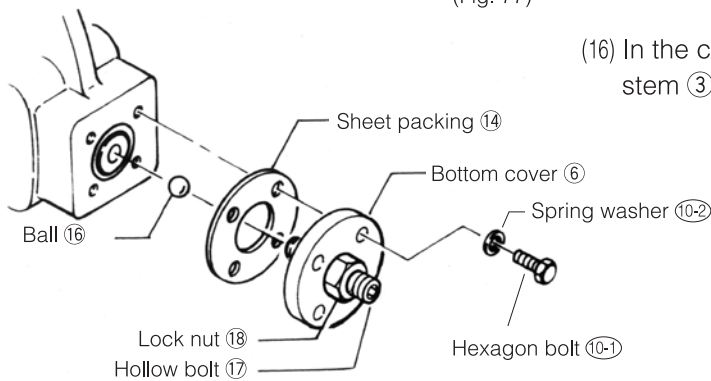
(Fig. 75)



(Fig. 76)



(Fig. 77)



(Fig. 78)

*To assemble the drive member on the valve, reverse the disassembly procedure.

(8) On 50 mm to 80 mm types, insert the “O” ring (13) into the “O” ring groove at the top of the valve body stem hole. On 100 mm to 600 mm types, place the “O” ring (13) in the “O” ring groove at the top of the stem.

(9) On 700S (valve body material other than FC250) and 722F (125 mm to 600 mm) models, round the bushings (4) (5) into a cylinder shape, apply grease to the outer surface, and insert the bushings into the upper and lower stem holes of valve body (1). The longer bushing goes into the upper stem hole.

(10) Insert the stem (3). When inserting the stem, apply silicon grease to the tip of the stem and insert carefully to prevent damage to the hole in the seat ring (12) (Fig. 74)

(11) On 50 mm to 80 mm types, the stem (3) is an upper and lower two-part stem. Insert the lower stem first. Apply silicon grease and insert the stem carefully to prevent damage to the hole in the seat ring (12) (Fig. 75)

(12) Once the stem has been correctly inserted, secure the sheet packing (14) and bottom cover (6) to the bottom of the valve body (1) with the hexagon bolts (10-1) and spring washers (10-2) . (Fig. 76)

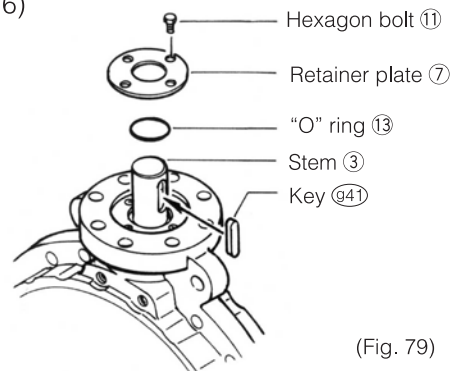
(13) Rotate the stem (3) and verify that the taper bolt holes in the disc (2) and stem (3) are aligned. Place a new “O” ring (8-2) on the taper bolt (8-1) (an “O” ring is not used on 50 mm to 250 mm types), apply grease to the bolt, and insert it in the taper bolt hole in the disc. Next, tap the taper bolt (8-1) in with a hammer and tighten firmly with the hexagon nut (9-1) and spring washer (9-2) . (Fig. 77)

(14) Secure the sheet packing (14) and bottom cover (6) with the hexagon bolt (10-1) and spring washer (10-2) . (Fig. 78)

On 350 mm or larger types, apply grease to the tip of the hollow bolt (17) and use the grease to hold the ball (16) in the tip of the hollow bolt (17). Secure the sheet packing (14) and bottom cover (6) with the hexagon bolt (10-1) and spring washer (10-2) .

(15) **On 650 mm or larger types**, insert the “O” ring (13) and then attach the retainer plate (7) with the hexagon bolt (11). (Fig. 79)

(16) In the case of a O2 stem (round) only, attach the key (g41) to the stem (3). (Fig. 76)

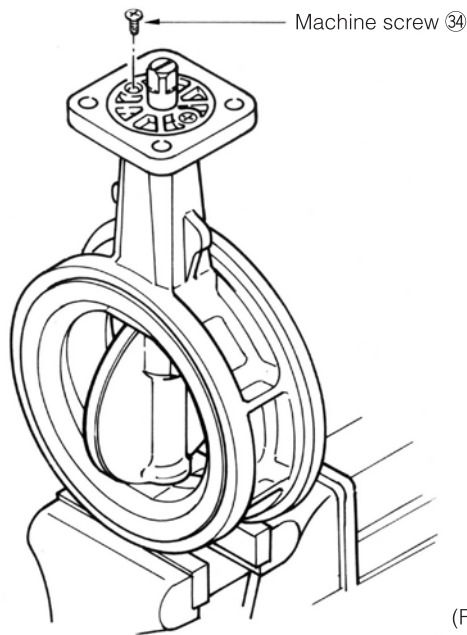


(Fig. 79)

This completes the assembly of the valve body. Verify that no parts were forgotten or assembled incorrectly.

Disassembly Procedure of Valve Body

731P/732P (50 mm to 300 mm)

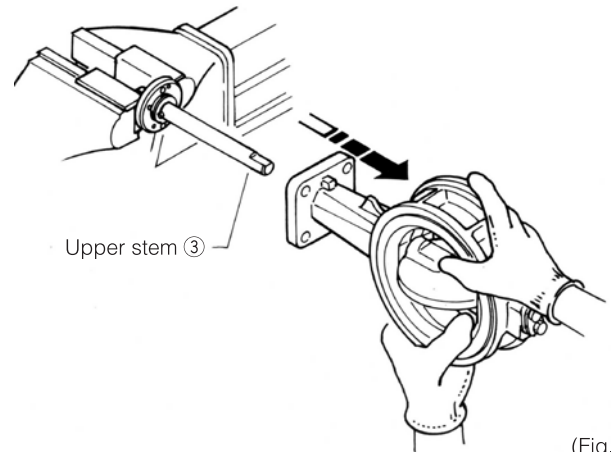


(Fig. 80)

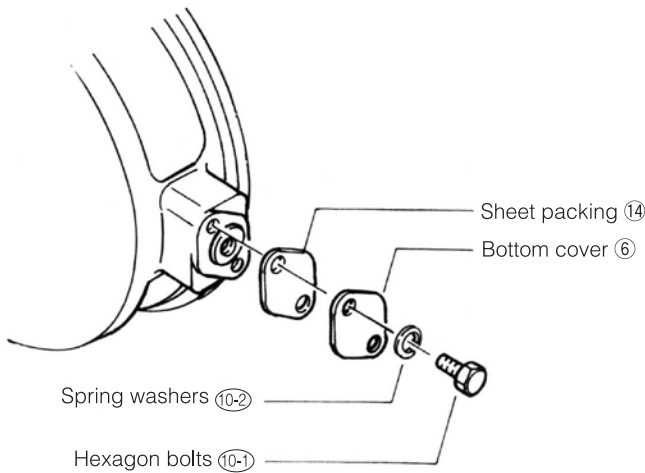
(1) Rotate the disc ② to the completely open position.

(2) Remove the machine screw ③④ with a Phillips head screwdriver. (Fig. 80)

(3) Hold the upper stem ③ with a vise and grasp both sides of the valve body ① to pull it off. (Fig. 81)



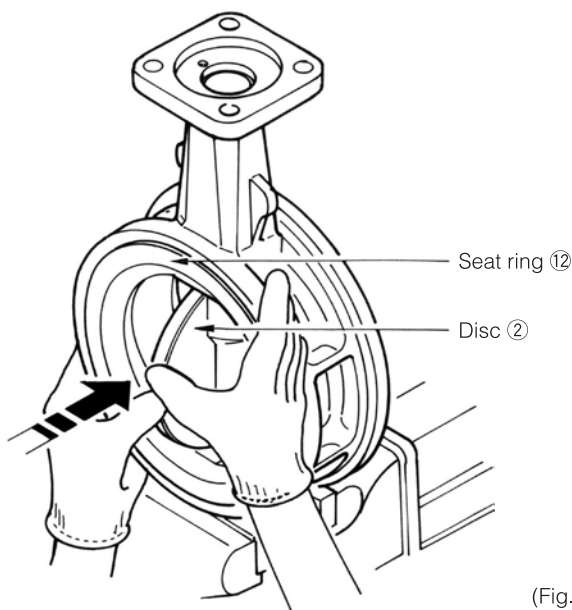
(Fig. 81)



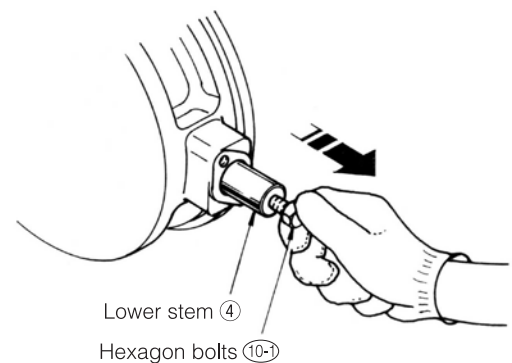
(Fig. 82)

(4) Remove the hexagon bolts ⑩-① and spring washers ⑩-② (two each) that secure the bottom cover ⑥, and remove the bottom cover ⑥ and sheet packing ⑭. (Fig. 82)

(5) To remove the lower stem ④, first screw one of the hexagon bolts ⑩-① removed in the previous step into the threaded hole in the stem about 3 to 5 threads, and then pull the hexagon bolt ⑩-① to pull out the lower stem ④. (Fig. 83)



(Fig. 84)

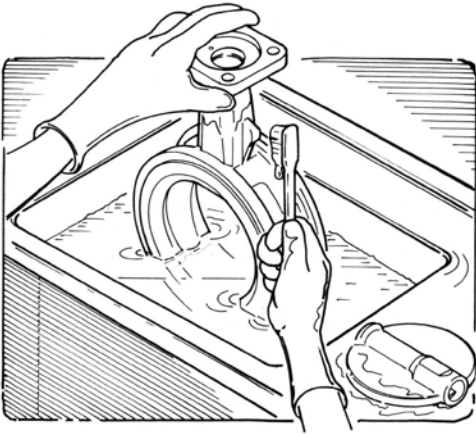


(Fig. 83)

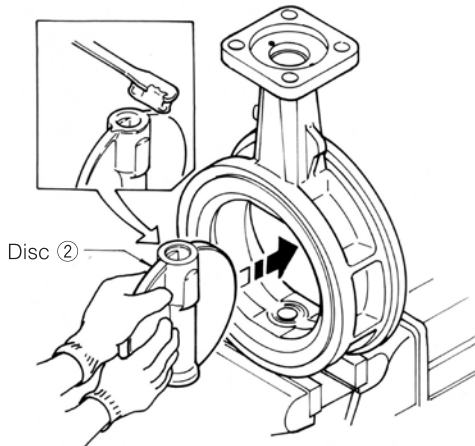
(6) Use both hands to push the disc ② out and remove it from the seat ring ⑫. The seat ring ⑫ is baked onto the valve body ① and cannot be removed. (Fig. 84)

Assembling the Valve Body

731P/732P (50 mm to 300 mm)



(Fig. 85)



(Fig. 86)

(1) Before assembly, clean all parts well using a cleaning fluid such as alcohol or a neutral detergent and make sure that none are damaged or abnormal. (Fig. 85)

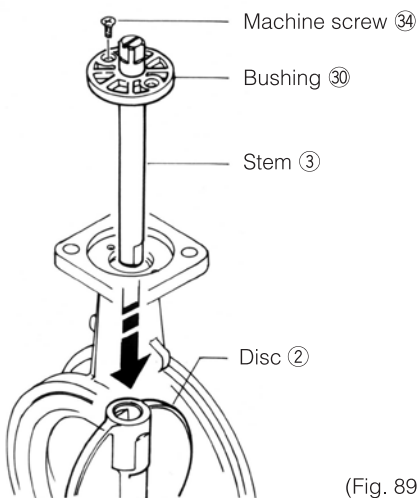
(2) Any parts judged unusable or "O" rings that have deteriorated due to the passage of time (even if not showing signs of wear) should be replaced with new parts.

Note: If the seat ring material is other than NBR (EPDM or other material), use only silicon grease for the grease that is applied to the shaft, disc and other parts. Regular grease will cause swelling and corrosion.

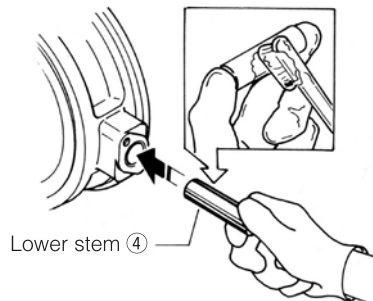
(3) Apply silicon oil or similar lubricant to the top and bottom of the disc ② and insert it into the seat ring ⑫. (Fig. 86)

(4) Insert the lower stem ④. Apply silicon grease and insert the stem carefully to prevent damage to the hole in the seat ring ⑫. (Fig. 87)

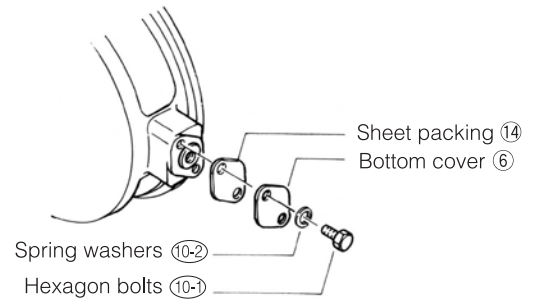
(5) Once the stem has been correctly inserted, secure the sheet packing ⑭ and bottom cover ⑥ to the bottom of the valve body ① with the hexagon bolts ⑩-1 and spring washers ⑩-2. (Fig. 88)



(Fig. 89)



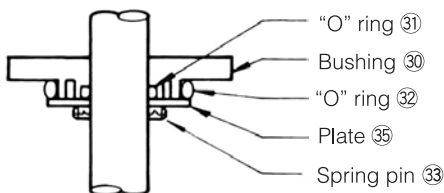
(Fig. 87)



(Fig. 88)

(6) Look down through the valve body ① and verify that the seat ring ⑫ and disc ② are set correctly.

(7) Align the disc ② with the upper stem ③ slit, apply sufficient silicon grease to the upper stem ③, and insert the stem ③ into the valve body ①. Insert the bushing ⑩ until it is flush with the flange face on the valve body ① and secure it with the two machine screws ⑭. Apply sufficient silicon grease to "O" ring ① and "O" ring ② on the inside and outside of the bushing ⑩. (Fig. 89) (Fig. 90)



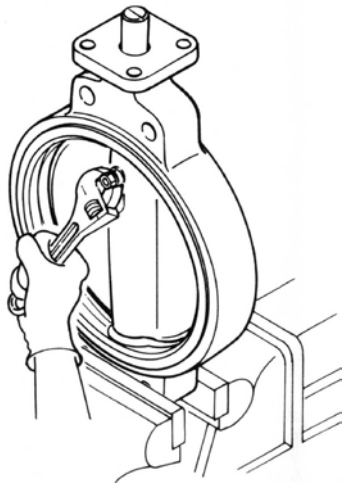
(Fig. 90)

*To assemble the drive member on the valve, reverse the disassembly procedure.

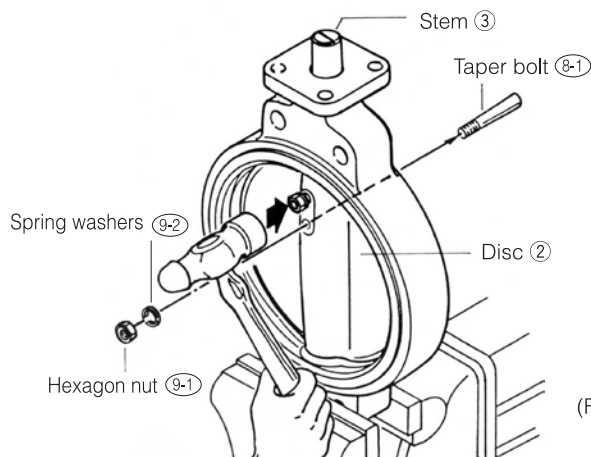
This completes the assembly of the valve body. Verify that no parts were forgotten or assembled incorrectly.

Disassembly Procedure of Valve Body

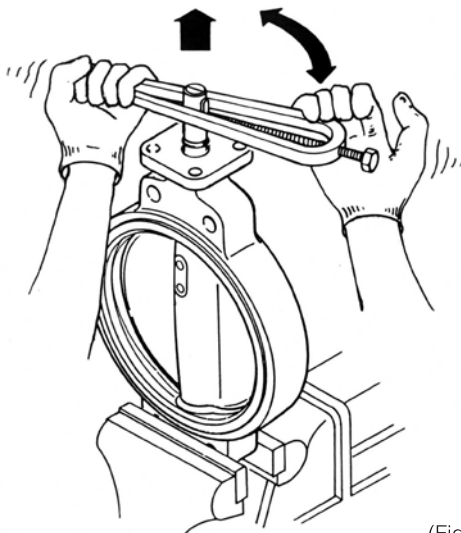
731P/732P (350mm to 600mm)



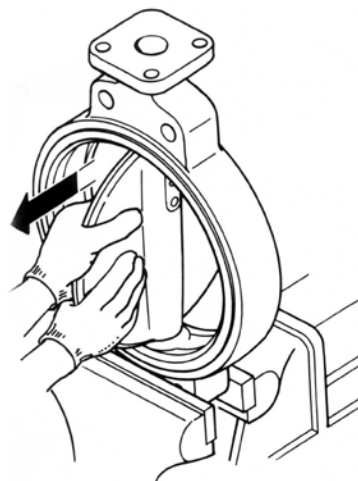
(Fig. 91)



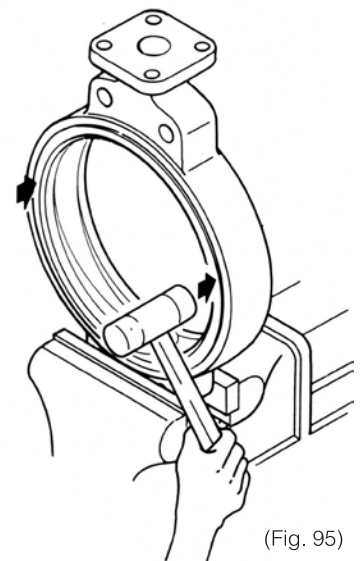
(Fig. 92)



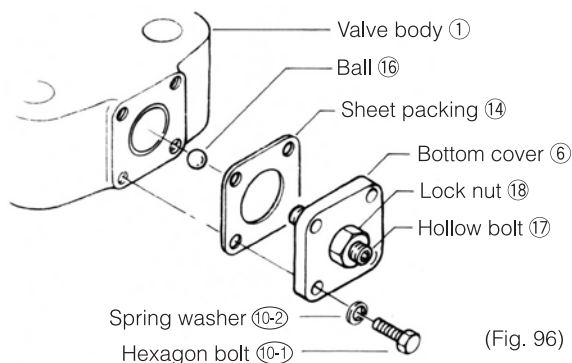
(Fig. 93)



(Fig. 94)

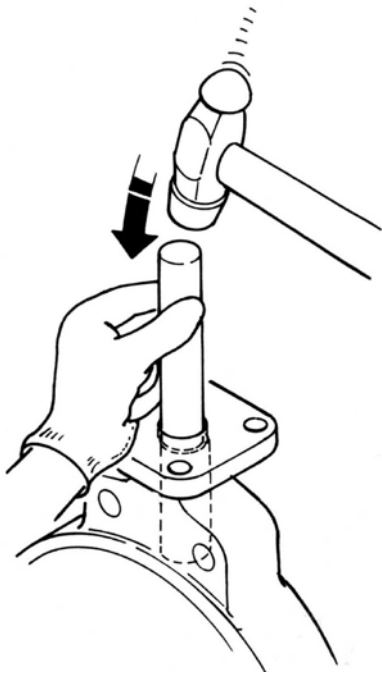


(Fig. 95)

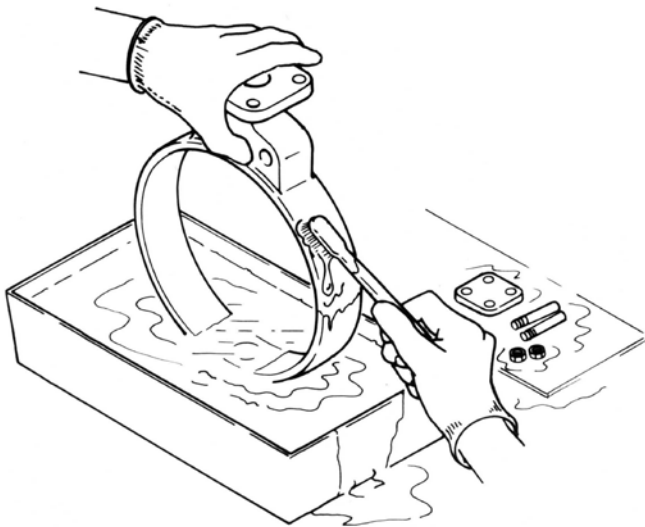


(Fig. 96)

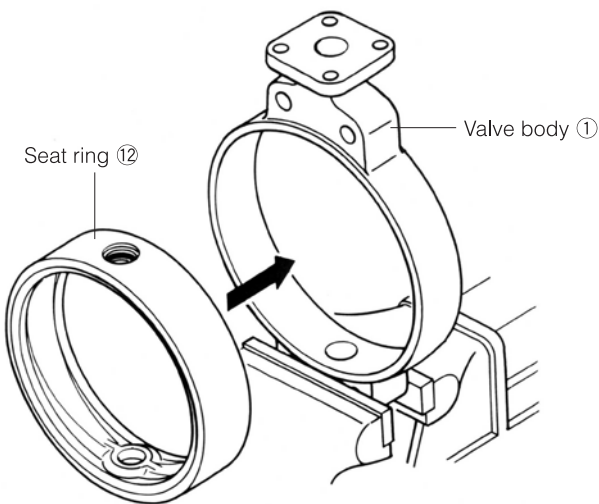
- (1) Hold the valve body ① firmly in a vise.
- (2) Loosen the hexagon nut ⑨-1 on each taper bolt ⑧-1 that secures the stem ③ and disc ② until it is flush with the threaded end of the taper bolt ⑧-1. (This is to protect the threads when the bolt is tapped by a hammer.) (Fig. 91)
- (3) Tap the hexagon nut ⑨-1 straight with a hammer straight to remove the taper bolt ⑧-1. (Fig. 92)
- (4) Grip the end of the stem ③ with a gripping tool and rotate it back and forth to pull it out. (Fig. 93)
- (5) Rotate the disc ② 90° so that it is fully open and pull it out with both hands. (Fig. 94)
- (6) Gently tap around the edge of the seat ring ⑫ with a plastic hammer or similar tool to remove it. (Fig. 95)
- (7) Remove the "O" ring ⑮ from the seat ring ⑫ using a scriber or similar implement.
- (8) Remove the valve body ① from the vise and remove the bottom cover ⑥ and sheet packing ⑭ that are secured with the hexagon bolt ⑩-1 and spring washer ⑩-2. When removing the bottom cover, keep the hollow bolt ⑰ and lock nut ⑱ on the bottom cover ⑥. Take care not to lose the ball ⑯. (Fig. 96)



(Fig. 97)



(Fig. 98)



(Fig. 99)

- (9) Insert a round rod with an outer diameter approximately 1 mm larger than the stem diameter into the stem hole and tap it gently with a hammer to remove bushing ④ and bushing ⑤ from the valve body ①. (Fig. 97)

Assembling the Valve Body

731P/732P (350 mm to 600 mm)

- (1) Before assembly, clean all parts well using a cleaning fluid such as alcohol or a neutral detergent and make sure that none are damaged or abnormal. (Fig. 98)

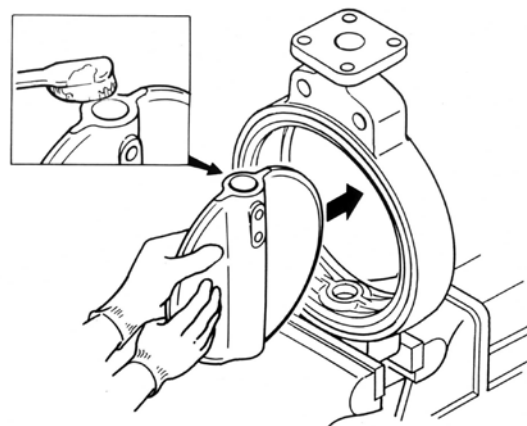
- (2) Any parts judged unusable or “O” rings that have deteriorated due to the passage of time (even if not showing signs of wear) should be replaced with new parts.

Note: If the seat ring material is other than NBR (EPDM or other material), use only silicon grease for the grease that is applied to the shaft, disc and other parts. Regular grease will cause swelling and corrosion.

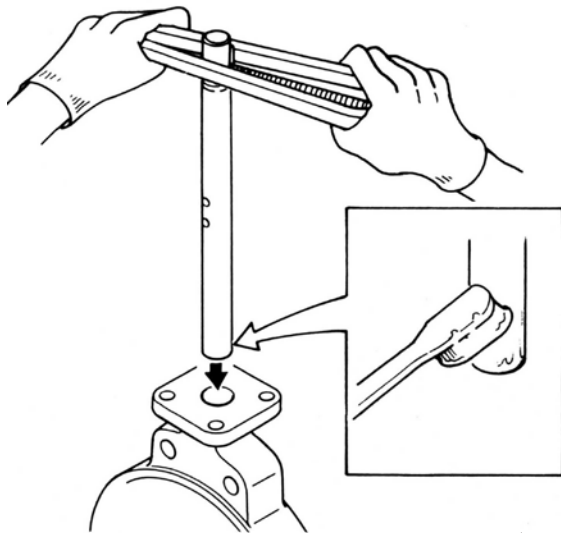
- (3) Insert “O” rings ⑮ in the upper and lower stem holes in the seat ring ⑫.

- (4) Apply silicon oil to the outer periphery of the seat ring ⑫ and tap it gently and evenly with a plastic hammer to insert it into the valve body ①. At this time, verify that the stem holes at the top and bottom of the seat ring ⑫ and valve body ① are correctly aligned. (Fig. 99)

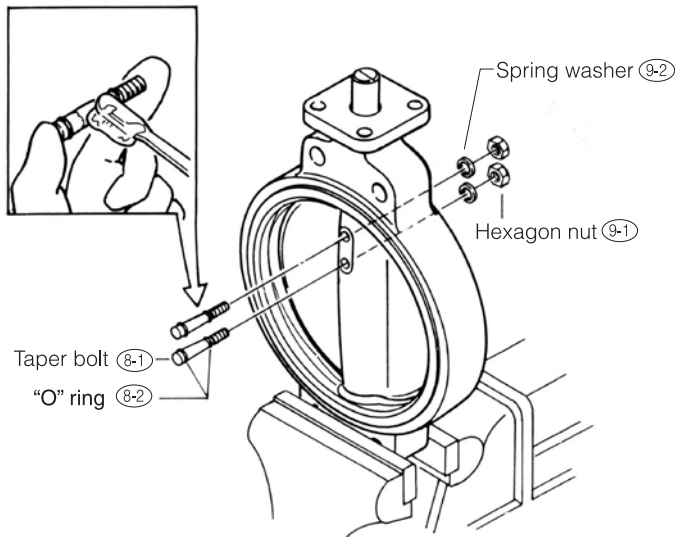
- (5) Apply silicon oil or similar lubricant to the top and bottom of the disc ② and insert it into the seat ring ⑫. (Fig. 100)



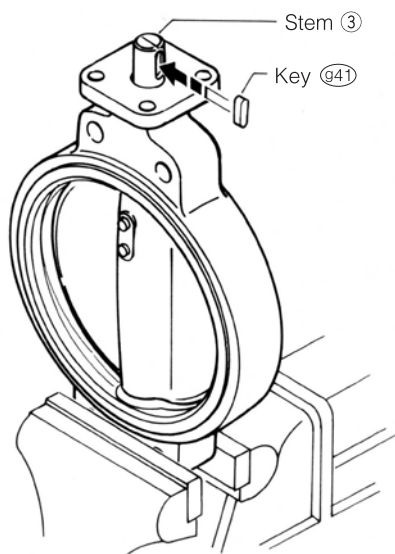
(Fig. 100)



(Fig. 102)



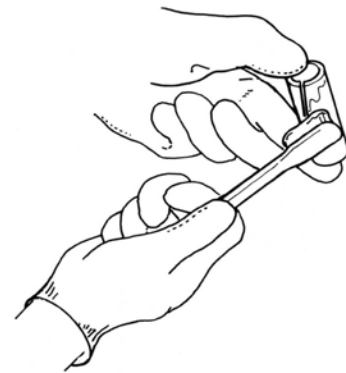
(Fig. 103)



(Fig. 105)

*To assemble the drive member on the valve, reverse the disassembly procedure.

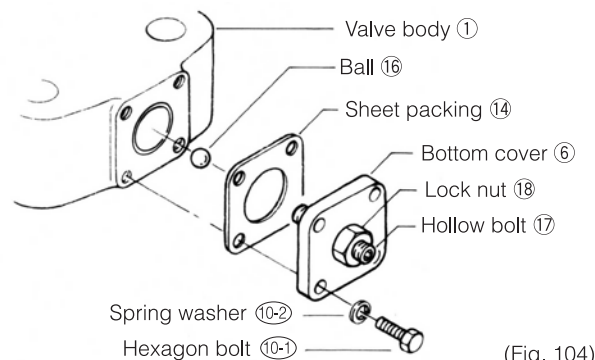
(6) Round the bushings ④ ⑤ into a cylinder shape, apply grease to the outer surface, and insert the bushings into the stem holes in the valve body ①. At this time, make sure that the direction of turning of the bushings is correct. The longer bushing goes into the upper stem hole. (Fig. 101)



(Fig. 101)

(7) Insert the stem ③. When inserting the stem, apply silicon grease to the tip of the stem ③ and insert carefully to prevent damage to the hole in the seat ring ⑫ (Fig. 102)

(8) Rotate the stem ③ and verify that the taper bolt holes in the disc ② and stem ③ are aligned. Place a new "O" ring ⑧-2 on the taper bolt ⑧-1, apply grease to the bolt, and insert it in the taper bolt hole in the disc ②. Next, tap the taper bolt ⑧-1 in with a hammer and tighten the taper bolt firmly with the hexagon nut ⑨-1 and spring washer ⑨-2. (Fig. 103)



(Fig. 104)

(9) Apply grease to the tip of the hollow bolt ⑰ and use the grease to hold the ball ⑱ in the tip of the hollow bolt ⑰. Secure the sheet packing ⑭ and bottom cover ⑥ with the hexagon bolt ⑩-1 and spring washer ⑩-2. (Fig. 104)

(10) Attach the key ④① to the stem ③. (Fig. 105)

This completes the assembly of the valve body. Verify that no parts were forgotten or assembled incorrectly.

Closed position adjustment Procedure of the Valve

This adjustment procedure readjusts the valve closed position when the fully closed stopper bolt is loosened or the alignment mark disappears at disassembly, so that it can not be returned to its original position. If setting it incorrectly, be aware that there is a risk of valve seat leakage, malfunction and breakage of valve stem.

With the valve removed from the piping, it is assumed that the actuator is correctly installed. In addition, the seat ring material is EPDM or NBR and is in a new condition. (The old seat ring changes its closed position due to wear and aged deterioration.)

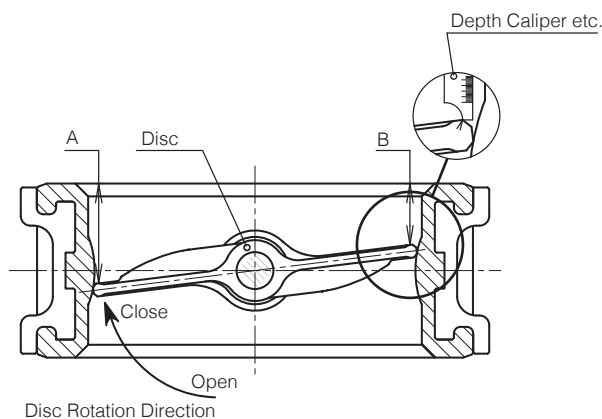
Procedure for closed position adjustment (in case of Lever/Gear actuator)

- (1) Slightly open the valve disc.
- (2) Loosen the closing stopper bolt until it is about to come off.
- (3) Close the valve slowly manually until the valve position reaches the fully closed reference position in the figure below. Be sure to operate to the closing direction. In case the valve is too closed, open it then close it again until the valve position reaches the fully closed reference position. Adjust closing stopper bolt to apply closed position.
- (4) Close the valve until the stopper bolt lightly hits the worm wheel, then fix the stopper bolt position using nut (there is a actuator with no nut). In case of lever actuator, there is no stopper bolt. Adjust position indicator.
- (5) Open and close again, measure the closed position gap, and the indicator shows the correct close and open position.

Closed position gap (in case of Lever/Gear actuator)

Measure A and B dimensions on the figure below and evaluate by the gap between A and B.

| Size (mm) | Closed Position Gap (A-Bmm) | | | |
|-----------|-----------------------------|--------------------------------|-----------|-------|
| | 700G 704G·705G | 700S·700E 700K·722F 720F | 731P·732P | 731R |
| 40-65 | 0~4 | 0~4 | 0~4 | — |
| 80 | 0~4 | 0~5 | 0~4 | — |
| 100 | 0~5 | 0~5 | 0~5 | — |
| 125 | 0~6 | 0~6 | 0~6 | — |
| 150 | 0~7 | 0~6 | 0~7 | — |
| 200 | 0~8 | 0~8 | 0~8 | — |
| 250 · 300 | 0~10 | 0~10 | 0~10 | — |
| 350 · 400 | 8~12 | 0~12 | 0~12 | 7~10 |
| 450 | 8~15 | 0~12 | 0~12 | 15~19 |
| 500 | 8~15 | 0~12 | 0~12 | 19~23 |
| 550 | 0~12 | 0~12 | — | — |
| 600 | 8~20 | 0~15 | 0~15 | 19~23 |
| 650-750 | — | 0~15 | — | — |
| 800-900 | — | 0~20 | — | — |
| 1000-1350 | — | 0~20 | — | — |



In case the actuator is a pneumatic cylinder or electric motor, the fully closed reference position changes with the type of the actuator, fluid condition, material and etc. For details, please contact our sales department.

In the fully closed position, when the A - B is zero, the sealing capacity becomes the maximum. However, the closing torque also becomes the maximum, so excessive closing may cause malfunction due to excessive torque and durability of the valve stem / drive part . Please observe the values in the table above or the fully closed position suggested by us.

REQUIRED NUMBER AND SIZE OF PIPING BOLTS

705G (Flange bolt hole: drilled holes) and 700G Piping bolts and nuts sizes

For hexagon bolts and nuts

| Nominal size | | JIS 5K | | JIS 10K | |
|--------------|-------|------------------------|---------------|------------------------|---------------|
| mm | inch | Hexagon bolts and nuts | Setting bolts | Hexagon bolts and nuts | Setting bolts |
| 40 | 1 1/2 | 4-M12× 75×30 | — | 4-M16× 90×38 | — |
| 50 | 2 | 4-M12× 90×30 | — | 4-M16×100×38 | — |
| 65 | 2 1/2 | 4-M12× 90×30 | — | 4-M16×105×38 | — |
| 80 | 3 | 4-M16× 95×38 | — | 8-M16×105×38 | — |
| 100 | 4 | 8-M16×105×38 | — | 8-M16×110×38 | — |
| 125 | 5 | 8-M16×110×38 | — | 8-M20×125×46 | — |
| 150 | 6 | 8-M16×115×38 | — | 8-M20×130×52 | — |
| 200 | 8 | 8-M20×130×52 | — | 12-M20×130×52 | — |
| 250 | 10 | 12-M20×140×52 | — | 12-M22×150×60 | — |
| 300 | 12 | 12-M20×150×52 | — | 16-M22×160×60 | — |
| 350 | 14 | 12-M22×155×45 | — | 16-M22×160×45 | — |
| 400 | 16 | 16-M22×180×45 | — | 16-M24×190×45 | — |
| 450 | 18 | 16-M22×190×45 | — | 20-M24×205×45 | — |
| 500 | 20 | 20-M22×205×45 | — | 20-M24×215×45 | — |
| 550 | 22 | 16-M24×235×50 | 8-M24× 65×54 | 16-M30×255×60 | 8-M30× 80×66 |
| 600 | 24 | 16-M24×235×50 | 8-M24× 70×54 | 20-M30×255×60 | 8-M30× 70×60 |

For long bolts and nuts

| Nominal size | | JIS 5K | | JIS 10K | | ANSI 125Lb/150Lb | |
|--------------|-------|---------------------|---------------|---------------------|---------------|---------------------|----------------|
| mm | inch | Long bolts and nuts | Setting bolts | Long bolts and nuts | Setting bolts | Long bolts and nuts | Hexagon bolts |
| 40 | 1 1/2 | 4-M12× 95×25 | — | 4-M16×110×25 | — | 4-U1/2 ×110×32 | — |
| 50 | 2 | 4-M12×105×25 | — | 4-M16×120×30 | — | 4-U5/8 ×140×38 | — |
| 65 | 2 1/2 | 4-M12×110×25 | — | 4-M16×125×30 | — | 4-U5/8 ×140×38 | — |
| 80 | 3 | 4-M16×120×30 | — | 8-M16×125×30 | — | 4-U5/8 ×140×38 | — |
| 100 | 4 | 8-M16×130×30 | — | 8-M16×130×30 | — | 8-U5/8 ×150×38 | — |
| 125 | 5 | 8-M16×130×30 | — | 8-M20×150×40 | — | 8-U3/4 ×160×51 | — |
| 150 | 6 | 8-M16×140×35 | — | 8-M20×155×40 | — | 8-U3/4 ×165×51 | — |
| 200 | 8 | 8-M20×155×40 | — | 12-M20×155×40 | — | 8-U3/4 ×175×51 | — |
| 250 | 10 | 12-M20×165×40 | — | 12-M22×175×45 | — | 12-U7/8 ×195×58 | — |
| 300 | 12 | 12-M20×175×40 | — | 16-M22×185×45 | — | 12-U7/8 ×205×58 | — |
| 350 | 14 | 12-M22×185×45 | — | 16-M22×185×45 | — | 12-U1 ×225 | — |
| 400 | 16 | 16-M22×205×45 | — | 16-M24×220×50 | — | 16-U1 ×255 | — |
| 450 | 18 | 16-M22×225×45 | — | 20-M24×230×50 | — | 16-U1 1/8 ×280 | — |
| 500 | 20 | 20-M22×230×45 | — | 20-M24×245×50 | — | 20-U1 1/8 ×295 | — |
| 550 | 22 | 16-M24×265×50 | 8-M24× 65×54 | 16-M30×290×60 | 8-M30× 80×66 | — | — |
| 600 | 24 | 16-M24×275×50 | 8-M24× 70×54 | 20-M30×290×60 | 8-M30× 75×60 | 16-U1 1/4 ×340 | 8-U1 1/4×95×70 |

Remarks:

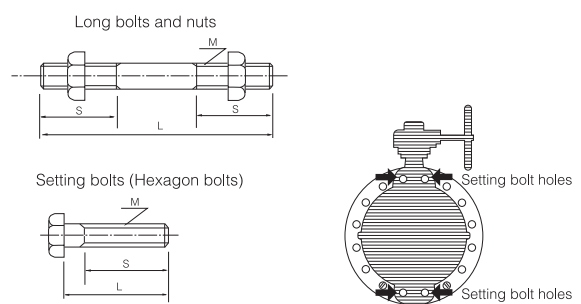
1. Please use a hexagon nut with 80% threading. (For ANSI, use heavy nut.)
2. A unified screw should have 8 threads per inch if its nominal diameter exceeds 1 inch.

* Nominal size "550 mm and 600 mm" requires hexagon bolt for setting.

Example

Long bolts: 4 - M12 × 95 × 25
 Quantity Nominal size (M) Length of bolt (L) Effective screw length (S)

Setting bolts: 8 - M24 × 70 × 54
 (Hexagon bolts)
 Quantity Nominal size (M) Length of bolt (L) Effective screw length (S)



REQUIRED NUMBER AND SIZE OF PIPING BOLTS

705G Piping bolts and nuts sizes

For hexagon bolts and nuts (Flange bolt hole: tapped holes)

| Nominal size | | JIS 5K | | JIS 10K | |
|--------------|-------|------------------------|---------------|------------------------|---------------|
| mm | inch | Hexagon bolts and nuts | Setting bolts | Hexagon bolts and nuts | Setting bolts |
| 50 | 2 | — | 8-M12× 30×28 | — | 8-M16× 35×32 |
| 65 | 2 1/2 | — | 8-M12× 35×33 | — | 8-M16× 35×32 |
| 80 | 3 | — | 8-M16× 35×32 | 4-M16×110×40 | 8-M16× 35×32 |
| 100 | 4 | 4-M16×110×40 | 8-M16× 40×38 | 4-M16×110×40 | 8-M16× 40×38 |
| 125 | 5 | 4-M16×110×40 | 8-M16× 40×38 | 4-M20×120×50 | 8-M20× 45×41 |
| 150 | 6 | 4-M16×120×40 | 8-M16× 40×38 | 4-M20×130×50 | 8-M20× 45×41 |
| 200 | 8 | 4-M20×130×50 | 8-M20× 45×41 | 8-M20×135×50 | 8-M20× 50×46 |
| 250 | 10 | 8-M20×135×50 | 8-M20× 50×46 | 8-M22×150×60 | 8-M22× 55×50 |
| 300 | 12 | 8-M20×150×50 | 8-M20× 55×51 | 12-M22×160×60 | 8-M22× 60×50 |
| 350 | 14 | 8-M22×160×60 | 8-M22× 60×50 | 12-M22×160×60 | 8-M22× 60×50 |
| 400 | 16 | 12-M22×175×45 | 8-M22× 60×50 | 12-M24×190×45 | 8-M24× 70×50 |
| 450 | 18 | 12-M22×185×45 | 8-M22× 60×50 | 16-M24×205×45 | 8-M24× 70×50 |
| 500 | 20 | 16-M22×205×45 | 8-M22× 60×50 | 16-M24×215×45 | 8-M24× 70×50 |
| 550 | 22 | 16-M24×265×50 | 8-M24× 65×54 | 16-M30×290×60 | 8-M30× 80×66 |
| 600 | 24 | 16-M24×235×50 | 8-M24× 70×54 | 20-M30×255×50 | 8-M30× 70×60 |

For long bolts and nuts (Flange bolt hole: tapped holes)

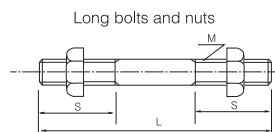
| Nominal size | | JIS5K | | JIS10K | | ANSI125Lb/150Lb | |
|--------------|-------|---------------------|---------------|---------------------|---------------|---------------------|--|
| mm | inch | Long bolts and nuts | Setting bolts | Long bolts and nuts | Setting bolts | Long bolts and nuts | Setting bolts |
| 50 | 2 | — | 8-M12× 30×28 | — | 8-M16× 35×32 | — | 8-U5/8-11UNC×35×30 |
| 65 | 2 1/2 | — | 8-M12× 35×33 | — | 8-M16× 35×32 | — | 8-U5/8-11UNC×40×30 (8-U5/8-11UNC×35×30) |
| 80 | 3 | — | 8-M16× 35×32 | 4-M16×125×30 | 8-M16× 35×32 | — | 8-U5/8-11UNC×45×38 (8-U5/8-11UNC×40×30) |
| 100 | 4 | 4-M16×130×30 | 8-M16× 40×38 | 4-M16×130×30 | 8-M16× 40×38 | 4-U5/8-11UNC×165×50 | 8-U5/8-11UNC×45×38 |
| 125 | 5 | 4-M16×130×30 | 8-M16× 40×38 | 4-M20×150×40 | 8-M20× 45×41 | 4-U3/4-10UNC×175×55 | 8-U3/4-10UNC×50×44 |
| 150 | 6 | 4-M16×140×35 | 8-M16× 40×38 | 4-M20×155×40 | 8-M20× 45×41 | 4-U3/4-10UNC×175×55 | 8-U3/4-10UNC×50×44 |
| 200 | 8 | 4-M20×155×40 | 8-M20× 45×41 | 8-M20×155×40 | 8-M20× 50×46 | 4-U3/4-10UNC×175×55 | 8-U3/4-10UNC×55×44 |
| 250 | 10 | 8-M20×165×40 | 8-M20× 50×46 | 8-M22×175×45 | 8-M22× 55×50 | 8-U7/8- 9UNC×215×55 | 8-U7/8- 9UNC×60×50 |
| 300 | 12 | 8-M20×175×40 | 8-M20× 55×51 | 12-M22×185×45 | 8-M22× 60×55 | 8-U7/8- 9UNC×215×55 | 8-U7/8- 9UNC×60×50 |
| 350 | 14 | 8-M22×185×45 | 8-M22× 60×50 | 12-M22×185×45 | 8-M22× 60×50 | 8-U1 - 8UNC×225 | 8-U1 - 8UNC×70×57 |
| 400 | 16 | 12-M22×205×45 | 8-M22× 60×50 | 12-M24×220×50 | 8-M24× 70×50 | 12-U1 - 8UNC×255 | 8-U1 - 8UNC×75×57 |
| 450 | 18 | 12-M22×225×45 | 8-M22× 60×50 | 16-M24×230×50 | 8-M24× 70×50 | 12-U1 1/8- 8UNC×280 | 8-U1 1/8-8UNC×85×63 |
| 500 | 20 | 16-M22×230×45 | 8-M22× 60×50 | 16-M24×245×50 | 8-M24× 70×50 | 16-U1 1/8- 8UNC×295 | 8-U1 1/8-8UNC×85×63 |
| 600 | 24 | 16-M24×275×50 | 8-M24× 70×54 | 20-M30×290×60 | 8-M30× 70×60 | 16-U1 1/4- 8UNC×340 | 8-U1 1/4-8UNC×95×70 |

Remarks:
 Bolt/Nut material: SS400/SS400, SUS304/SUS304
 The dimensions in parenthesis show ANSI125Lb. (for 65 mm and 80 mm)
 Heavy nut shall be used for ANSI125Lb/150Lb hexagon nuts.
 A unified screw should have 8 threads per inch if its nominal diameter exceeds 1 inch.

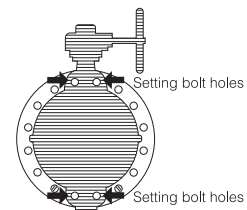
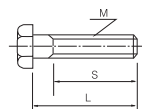
Example

Long bolts: 4 - M16 × 130 × 30
 Quantity Nominal size (M) Length of bolt (L) Effective screw length (S)

Setting bolts: 8 - M12 × 30 × 28
 (Hexagon bolts)
 Quantity Nominal size (M) Length of bolt (L) Effective screw length (S)



Setting bolts (Hexagon bolts)



704G Piping bolts and nuts sizes

* Dimensions on the table show when the piping flange hole are tapped. For drilled holes, please consult us.

| Nominal size | | JIS 5K | JIS 10K | ANSI 125Lb | ANSI 150Lb | DIN NP10 BS 4504 PN10 |
|--------------|-------|--------------|--------------|-----------------|-----------------|--------------------------|
| mm | inch | | | | | |
| 50 | 2 | 8-M12×30×25 | 8-M16×35×30 | 8-U 5/8×35×30 | 8-U 5/8×40×30 | 8-M16×35×33 |
| 65 | 2 1/2 | 8-M12×35×30 | 8-M16×35×30 | 8-U 5/8×40×30 | 8-U 5/8×40×30 | 8-M16×35×33 |
| 80 | 3 | 8-M16×35×30 | 16-M16×35×30 | 8-U 5/8×40×38 | 8-U 5/8×45×38 | 16-M16×40×38 |
| 100 | 4 | 16-M16×40×35 | 16-M16×40×35 | 16-U 5/8×45×38 | 16-U 5/8×45×38 | 16-M16×40×38 |
| 125 | 5 | 16-M16×40×38 | 16-M20×45×41 | 16-U 3/4×50×44 | 16-U 3/4×50×44 | 16-M16×40×38 |
| 150 | 6 | 16-M16×40×38 | 16-M20×45×41 | 16-U 3/4×50×44 | 16-U 3/4×50×44 | 16-M20×45×41 |
| 200 | 8 | 16-M20×45×41 | 24-M20×50×46 | 16-U 3/4×55×44 | 16-U 3/4×55×44 | 16-M20×50×46 |
| 250 | 10 | 24-M20×50×46 | 24-M22×50×46 | 24-U 7/8×60×50 | 24-U 7/8×60×50 | 24-M20×55×50 |
| 300 | 12 | 24-M20×55×51 | 32-M22×55×51 | 24-U 7/8×60×50 | 24-U 7/8×60×50 | 24-M20×55×50 |
| 350 | 14 | 24-M22×60×50 | 32-M22×60×50 | 24-U1 ×70×57 | 24-U1 ×70×57 | 32-M20×60×46 |
| 400 | 16 | 32-M22×60×50 | 32-M24×70×50 | 32-U1 ×75×57 | 32-U1 ×75×57 | 32-M24×70×50 |
| 450 | 18 | 32-M22×60×50 | 40-M24×70×50 | 32-U1·1/8×85×63 | 32-U1·1/8×85×63 | 40-M24×70×50 |
| 500 | 20 | 40-M22×60×50 | 40-M24×70×50 | 40-U1·1/8×85×63 | 40-U1·1/8×85×63 | 40-M24×70×50 |
| 600 | 24 | 40-M24×70×50 | 48-M30×75×60 | 40-U1·1/4×95×70 | 40-U1·1/4×95×70 | 40-M27×80×60 |

Remarks:

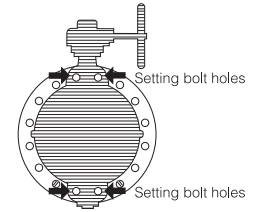
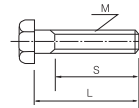
1. The bolt lengths are in accordance with thickness of steel flanges.
2. A unified screw should have 8 threads per inch if its nominal diameter exceeds 1 inch.
3. The list is exclusively for standard material "SS400".

Example

Setting bolts: 8 - M12 × 30 × 28
(Hexagon bolts)

Quantity Nominal size (M) Length of bolt (L) Effective screw length (S)

Setting bolts (Hexagon bolts)



731R(Flange bolt hole:Drilled holes) Piping bolts and nuts sizes

■ For hexagon bolts and nuts

| Nominal size | | JIS 16K | | ASME class150 | |
|--------------|------|------------------------|---------------|------------------------|---------------|
| mm | inch | Hexagon bolts and nuts | Setting bolts | Hexagon bolts and nuts | Setting bolts |
| 350 | 14 | 16-M30×(P3)×180 | — | 12-U1×180 | — |
| 400 | 16 | 16-M30×(P3)×215 | — | 16-U1×210 | — |
| 450 | 18 | 20-M30×(P3)×230 | — | 16-U1·1/8×230 | — |
| 500 | 20 | 20-M30×(P3)×245 | — | 20-U1·1/8×250 | — |
| 600 | 24 | 20-M36×(P3)×285 | 8-M36×(P3)×85 | 16-U1·1/4×290 | 8-U1·1/4×85 |

■ For long bolts and nuts

| Nominal size | | JIS 16K | | ASME class150 | |
|--------------|------|---------------------|---------------|---------------------|---------------|
| mm | inch | Long bolts and nuts | Setting bolts | Long bolts and nuts | Setting bolts |
| 350 | 14 | 16-M30×(P3)×225 | — | 12-U1×225 | — |
| 400 | 16 | 16-M30×(P3)×260 | — | 16-U1×260 | — |
| 450 | 18 | 20-M30×(P3)×280 | — | 16-U1·1/8×280 | — |
| 500 | 20 | 20-M30×(P3)×295 | — | 20-U1·1/8×295 | — |
| 600 | 24 | 20-M36×(P3)×340 | 8-M36×(P3)×85 | 16-U1·1/4×340 | 8-U1·1/4×85 |

731R(Flange bolt hole: Tapped holes) Piping bolts and nuts sizes

■ For hexagon bolts and nuts

| Nominal size | | JIS 16K | | ASME class150 | |
|--------------|------|------------------------|---------------|------------------------|---------------|
| mm | inch | Hexagon bolts and nuts | Setting bolts | Hexagon bolts and nuts | Setting bolts |
| 350 | 14 | 12-M30×(P3)×180 | 8-M30×(P3)×70 | 8-U1×180 | 8-U1×70 |
| 400 | 16 | 12-M30×(P3)×215 | 8-M30×(P3)×75 | 12-U1×210 | 8-U1×75 |
| 450 | 18 | 16-M30×(P3)×230 | 8-M30×(P3)×80 | 12-U1·1/8×230 | 8-U1·1/8×80 |
| 500 | 20 | 16-M30×(P3)×245 | 8-M30×(P3)×85 | 16-U1·1/8×250 | 8-U1·1/8×85 |
| 600 | 24 | 20-M36×(P3)×285 | 8-M36×(P3)×85 | 16-U1·1/4×290 | 8-U1·1/4×85 |

■ For long bolts and nuts

| Nominal size | | JIS 16K | | ASME class150 | |
|--------------|------|---------------------|---------------|---------------------|---------------|
| mm | inch | Long bolts and nuts | Setting bolts | Long bolts and nuts | Setting bolts |
| 350 | 14 | 12-M30×(P3)×225 | 8-M30×(P3)×70 | 8-U1×225 | 8-U1×70 |
| 400 | 16 | 12-M30×(P3)×260 | 8-M30×(P3)×75 | 12-U1×260 | 8-U1×75 |
| 450 | 18 | 16-M30×(P3)×280 | 8-M30×(P3)×80 | 12-U1·1/8×280 | 8-U1·1/8×80 |
| 500 | 20 | 16-M30×(P3)×295 | 8-M30×(P3)×85 | 16-U1·1/8×295 | 8-U1·1/8×85 |
| 600 | 24 | 20-M36×(P3)×340 | 8-M36×(P3)×85 | 16-U1·1/4×340 | 8-U1·1/4×85 |

REQUIRED NUMBER AND SIZE OF PIPING BOLTS

700S/700E/700K Piping bolts and nuts sizes

For 700S hexagon bolts and nuts (Flange bolt hole: drilled holes)

| Nominal size | | JIS 5K | JIS 10K |
|--------------|-------|------------------------|------------------------|
| mm | inch | Hexagon bolts and nuts | Hexagon bolts and nuts |
| 50 | 2 | 4-M12× 90×30 | 4-M16×100×40 |
| 65 | 2 1/2 | 4-M12× 90×30 | 4-M16×100×40 |
| 80 | 3 | 4-M16×100×40 | 8-M16×110×40 |
| 100 | 4 | 8-M16×100×40 | 8-M16×110×40 |
| 125 | 5 | 8-M16×110×40 | 8-M20×120×50 |
| 150 | 6 | 8-M16×120×40 | 8-M20×130×50 |
| 200 | 8 | 8-M20×130×50 | 12-M20×135×50 |
| 250 | 10 | 12-M20×150×50 | 12-M22×160×60 |
| 300 | 12 | 12-M20×160×50 | 16-M22×170×60 |
| 350 | 14 | 12-M22×175×45 | 16-M22×180×45 |
| 400 | 16 | 16-M22×185×45 | 16-M24×195×50 |
| 450 | 18 | 16-M22×195×45 | 20-M24×210×50 |
| 500 | 20 | 20-M22×215×45 | 20-M24×230×50 |

For 700S long bolts and nuts (Flange bolt hole: drilled holes)

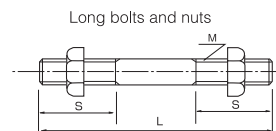
| Nominal size | | JIS5K | JIS10K | ANSI125Lb/150Lb |
|--------------|-------|---------------------|---------------------|-----------------------|
| mm | inch | Long bolts and nuts | Long bolts and nuts | Long bolts and nuts |
| 50 | 2 | 4-M12×110×25 | 4-M16×120×30 | 4-U5/8-11UNC×140×40 |
| 65 | 2 1/2 | 4-M12×110×25 | 4-M16×125×30 | 4-U5/8-11UNC×140×40 |
| 80 | 3 | 4-M16×120×30 | 8-M16×130×30 | 4-U5/8-11UNC×150×50 |
| 100 | 4 | 8-M16×125×30 | 8-M16×130×30 | 8-U5/8-11UNC×150×50 |
| 125 | 5 | 8-M16×130×30 | 8-M20×145×35 | 8-U3/4-10UNC×165×50 |
| 150 | 6 | 8-M16×140×35 | 8-M20×155×40 | 8-U3/4-10UNC×165×50 |
| 200 | 8 | 8-M20×155×40 | 12-M20×160×40 | 8-U3/4-10UNC×180×50 |
| 250 | 10 | 12-M20×175×40 | 12-M22×185×45 | 12-U7/8- 9UNC×220×55 |
| 300 | 12 | 12-M20×185×40 | 16-M22×195×45 | 12-U7/8- 9UNC×220×55 |
| 350 | 14 | 12-M22×205×45 | 16-M22×205×45 | 12-U1 - 8UNC×260×60 |
| 400 | 16 | 16-M22×215×45 | 16-M24×230×50 | 16-U1 - 8UNC×260×60 |
| 450 | 18 | 16-M22×225×45 | 20-M24×245×50 | 16-U1 1/8- 8UN×285×65 |
| 500 | 20 | 20-M22×245×45 | 20-M24×265×50 | 20-U1 1/8- 8UN×310×65 |

Remarks:
 Bolt/Nut material: SS400/SS400, SUS304/SUS304
 Heavy nut shall be used for ANSI125Lb/150Lb hexagon nuts.
 A unified screw should have 8 threads per inch if its nominal diameter exceeds 1 inch.

Example

Long bolts: 4 - M12 × 110 × 25

Quantity Nominal size (M) Length of bolt (L) Effective screw length (S)



700S/700E/700K Piping bolts and nuts sizes

■ For long bolts and nuts (Flange bolt hole: tapped holes)

| Type | Nominal size | | JIS5K | | JIS10K | | ANSI125Lb/150Lb | |
|------|--------------|---------------|---------------------|---------------|---------------------|----------------------|----------------------|--------------------|
| | mm | inch | Long bolts and nuts | Setting bolts | Long bolts and nuts | Setting bolts | Long bolts and nuts | Setting bolts |
| 700S | 100 | 4 | 4-M16×125×30 | 8-M16×40×38 | 4-M16×130×30 | 8-M16×40×38 | 4-U5/8-11UNC×150×50 | 8-U5/8-11UNC×45×38 |
| | 125 | 5 | 4-M16×130×30 | 8-M16×40×38 | 4-M20×145×35 | 8-M20×45×45 | 4-U3/4-10UNC×165×50 | 8-U3/4-10UNC×50×44 |
| | 150 | 6 | 4-M16×140×35 | 8-M16×40×38 | 4-M20×155×40 | 8-M20×50×46 | 4-U3/4-10UNC×165×50 | 8-U3/4-10UNC×50×44 |
| | 200 | 8 | 4-M20×155×40 | 8-M20×50×46 | 8-M20×160×40 | 8-M20×50×46 | 4-U3/4-10UNC×180×50 | 8-U3/4-10UNC×55×44 |
| | 250 | 10 | 8-M20×175×40 | 8-M20×50×46 | 8-M22×185×45 | 8-M22×55×50 | 8-U7/8-9UNC×220×55 | 8-U7/8-9UNC×65×50 |
| | 300 | 12 | 8-M20×185×40 | 8-M20×50×46 | 12-M22×195×45 | 8-M22×55×50 | 8-U7/8-9UNC×220×55 | 8-U7/8-9UNC×65×50 |
| | 350 | 14 | 8-M22×205×45 | 8-M22×60×50 | 12-M22×205×45 | 8-M22×60×50 | 8-U1-8UNC×260×60 | 8-U1-8UNC×75×57 |
| | 400 | 16 | 12-M22×215×45 | 8-M22×60×50 | 12-M24×230×50 | 8-M24×70×54 | 12-U1-8UNC×260×60 | 8-U1-8UNC×75×57 |
| | 450 | 18 | 12-M22×225×45 | 8-M22×60×50 | 16-M24×245×50 | 8-M24×70×54 | 12-U1 1/8-8UN×285×65 | 8-U1 1/8-8UN×85×63 |
| | 500 | 20 | 16-M22×245×45 | 8-M22×60×50 | 16-M24×265×50 | 8-M24×70×54 | 16-U1 1/8-8UN×310×65 | 8-U1 1/8-8UN×85×63 |
| | 550 | 22 | 16-M24×265×50 | 8-M24×65×54 | 16-M30×290×60 | 8-M30×80×66 | — | — |
| 600 | 24 | 16-M24×275×50 | 8-M24×65×54 | 20-M30×300×60 | 8-M30×80×66 | 16-U1 1/4-8UN×345×70 | 8-U1 1/4-8UN×95×70 | |
| 700E | 650 | 26 | 16-M24×285×50 | 16-M24×65×54 | 16-M30×310×60 | 16-M30×80×66 | — | — |
| | 700 | 28 | 16-M24×295×50 | 16-M24×65×54 | 16-M30×320×60 | 16-M30×80×66 | — | — |
| | 750 | 30 | 16-M30×320×60 | 16-M30×75×66 | 16-M30×335×60 | 16-M30×80×66 | — | — |
| | 800 | 32 | 16-M30×335×60 | 16-M30×75×66 | 20-M30×345×60 | 16-M30×80×66 | — | — |
| | 850 | 34 | 16-M30×345×60 | 16-M30×75×66 | 20-M30×360×60 | 16-M30×80×66 | — | — |
| | 900 | 36 | 16-M30×360×60 | 16-M30×75×66 | 20-M30×385×65 | 16-M30×85×66 | — | — |
| | 1000 | 40 | 20-M30×385×65 | 16-M30×85×66 | 20-M36×420×75 | 16-M36×100×78 | — | — |
| | 1100 | 44 | 20-M30×420×65 | 16-M30×85×66 | 20-M36×450×80 | 16-M36×100×78 | — | — |
| | 1200 | 48 | 24-M30×445×65 | 16-M30×85×66 | 24-M36×475×80 | 16-M36×100×78 | — | — |
| 1350 | 54 | 24-M30×475×65 | 16-M30×85×66 | 28-M42×525×80 | 16-M42×100×90 | — | — | |

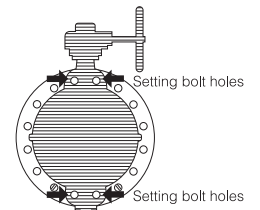
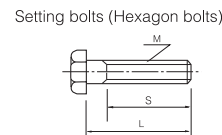
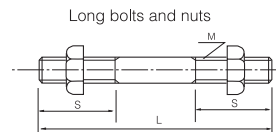
| Type | Nominal size | | ANSI125Lb | |
|------|--------------|----------------------|----------------------|----------------------|
| | mm | inch | Long bolts and nuts | Setting bolts |
| 700K | 650 | 26 | 16-U1 1/4-8UN×390×70 | 16-U1 1/4-8UN×110×70 |
| | 700 | 28 | 20-U1 1/4-8UN×410×70 | 16-U1 1/4-8UN×110×70 |
| | 750 | 30 | 20-U1 1/4-8UN×425×70 | 16-U1 1/4-8UN×125×70 |
| | 800 | 32 | 20-U1 1/2-8UN×460×80 | 16-U1 1/4-8UN×125×80 |
| | 850 | 34 | 24-U1 1/2-8UN×475×80 | 16-U1 1/4-8UN×135×80 |
| | 900 | 36 | 24-U1 1/2-8UN×510×80 | 16-U1 1/4-8UN×145×80 |
| | 1000 | 40 | 28-U1 1/2-8UN×530×80 | 16-U1 1/4-8UN×145×80 |
| | 1100 | 44 | 32-U1 1/2-8UN×580×80 | 16-U1 1/4-8UN×155×80 |
| 1200 | 48 | 36-U1 1/2-8UN×615×80 | 16-U1 1/4-8UN×160×80 | |

Remarks:
 Bolt/Nut material: SS400/SS400, SUS304/SUS304
 Heavy nut shall be used for ANSI125Lb/150Lb hexagon nuts.
 A unified screw should have 8 threads per inch if its nominal diameter exceeds 1 inch.

Example

Long bolts: 4 - M16 × 125 × 30
 Quantity Nominal size (M) Length of bolt (L) Effective screw length (S)

Setting bolts: 8 - M16 × 40 × 38
 (Hexagon bolts) Quantity Nominal size (M) Length of bolt (L) Effective screw length (S)



731P Piping bolt and nut sizes

Hexagon bolt and nut

| Type | Nominal size | | JIS 10K | | JIS 16K | |
|------|--------------|-------|---------------|---------------|---------------------|----------------|
| | mm | inch | Hexagon bolts | Setting bolts | Hexagon bolts | Setting bolts |
| 731P | 50 | 2 | 4-M16×105×40 | — | 8-M16× 95×35 | — |
| | 65 | 2 1/2 | 4-M16×105×40 | — | 8-M16×105×40 | — |
| | 80 | 3 | 8-M16×110×40 | — | 8-M20×110×50 | — |
| | 100 | 4 | 8-M16×110×40 | — | 8-M20×120×50 | — |
| | 125 | 5 | 8-M20×120×50 | — | 8-M22×130×40 | — |
| | 150 | 6 | 8-M20×130×50 | — | 12-M22×130×40 | — |
| | 200 | 8 | 12-M20×135×50 | — | 12-M22×140×40 | — |
| | 250 | 10 | 12-M22×150×60 | — | 12-M24×155×50 | — |
| | 300 | 12 | 16-M22×160×60 | — | 16-M24×170×50 | — |
| | 350 | 14 | 16-M22×160×60 | — | 16-M30 (P3) ×180×55 | — |
| | 400 | 16 | 16-M24×190×45 | — | 16-M30 (P3) ×215×55 | — |
| | 450 | 18 | 20-M24×205×45 | — | 20-M30 (P3) ×230×55 | — |
| | 500 | 20 | 20-M24×215×45 | — | 20-M30 (P3) ×245×55 | — |
| | 600 | 24 | 20-M30×260×50 | 8-M30× 70×60 | 20-M36 (P3) ×285×65 | 8-M36 (P3) ×85 |

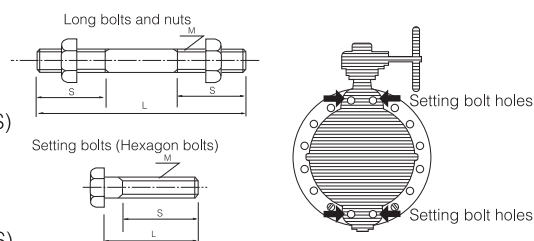
Long bolt and nut

| Type | Nominal size | | JIS 10K | | JIS 16K | |
|------|--------------|-------|---------------------|---------------|---------------------|----------------|
| | mm | inch | Long bolts and nuts | Setting bolts | Long bolts and nuts | Setting bolts |
| 731P | 50 | 2 | 4-M16×120×30 | — | 8-M16×125 | — |
| | 65 | 2 1/2 | 4-M16×125×30 | — | 8-M16×125 | — |
| | 80 | 3 | 8-M16×125×30 | — | 8-M20×135 | — |
| | 100 | 4 | 8-M16×130×30 | — | 8-M20×150 | — |
| | 125 | 5 | 8-M20×150×40 | — | 8-M22×165 | — |
| | 150 | 6 | 8-M20×155×40 | — | 12-M22×165 | — |
| | 200 | 8 | 12-M20×155×40 | — | 12-M22×170 | — |
| | 250 | 10 | 12-M22×175×45 | — | 12-M24×190 | — |
| | 300 | 12 | 16-M22×185×45 | — | 16-M24×210 | — |
| | 350 | 14 | 16-M22×185×45 | — | 16-M30 (P3) ×225 | — |
| | 400 | 16 | 16-M24×220×50 | — | 16-M30 (P3) ×260 | — |
| | 450 | 18 | 20-M24×230×50 | — | 20-M30 (P3) ×280 | — |
| | 500 | 20 | 20-M24×245×50 | — | 20-M30 (P3) ×295 | — |
| | 600 | 24 | 20-M30×290×60 | 8-M30×70×60 | 20-M36 (P3) ×340 | 8-M36 (P3) ×85 |

Example

Long bolts: 4 - M16 × 120 × 30
 Quantity Nominal size (M) Length of bolt (L) Effective screw length (S)

Setting bolts : 8 - M30 × 70 × 60
 (Hexagon bolts) Quantity Nominal size (M) Length of bolt (L) Effective screw length (S)



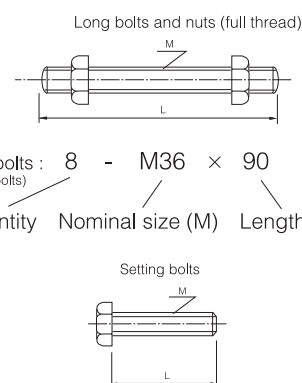
732P Piping bolt and nut sizes

| Type | Nominal size | | 732P | |
|------|--------------|------------------|---------------------|---------------|
| | mm | inch | Long bolts and nuts | Setting bolts |
| 732P | | | JIS 20K | |
| | 50 | 2 | 8-M16×125 | — |
| | 65 | 2 1/2 | 8-M16×125 | — |
| | 80 | 3 | 8-M20×135 | — |
| | 100 | 4 | 8-M20×150 | — |
| | 125 | 5 | 8-M22×165 | — |
| | 150 | 6 | 12-M22×165 | — |
| | 200 | 8 | 12-M22×170 | — |
| | 250 | 10 | 12-M24×190 | — |
| | 300 | 12 | 16-M24×210 | — |
| | 350 | 14 | 16-M30 (P3) ×225 | — |
| | 400 | 16 | 16-M30 (P3) ×260 | — |
| | 450 | 18 | 20-M30 (P3) ×280 | — |
| | 500 | 20 | 20-M30 (P3) ×295 | — |
| 600 | 24 | 20-M36 (P3) ×340 | 8-M36 (P3) ×90 | |

Example

Long bolts: 8 - M16 × 125
 Quantity Nominal size (M) Length of bolt (L)

Setting bolts : 8 - M36 × 90
 (Hexagon bolts) Quantity Nominal size (M) Length of bolt (L)



704G/722F/720F Piping bolts sizes

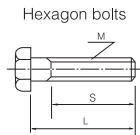
| Type | Nominal size | | JIS 5K | | JIS 10K | |
|------|--------------|-------|------------------------|---------------|------------------------|---------------|
| | mm | inch | Hexagon bolts and nuts | Hexagon bolts | Hexagon bolts and nuts | Hexagon bolts |
| 704G | 50 | 2 | — | 8-M12×30×25 | — | 8-M16×35×30 |
| | 65 | 2 1/2 | — | 8-M12×35×30 | — | 8-M16×35×30 |
| | 80 | 3 | — | 8-M16×35×30 | — | 16-M16×35×30 |
| | 100 | 4 | — | 16-M16×40×35 | — | 16-M16×40×35 |
| 722F | 125 | 5 | 8-M16×60×38 | 8-M16×40×35 | 8-M20×65×46 | 8-M20×45×37 |
| | 150 | 6 | 8-M16×60×38 | 8-M16×40×35 | 8-M20×70×46 | 8-M20×50×42 |
| | 200 | 8 | 8-M20×65×46 | 8-M20×50×42 | 16-M20×70×46 | 8-M20×50×42 |
| | 250 | 10 | 16-M20×70×46 | 8-M20×50×42 | 16-M22×75×50 | 8-M22×50×42 |
| | 300 | 12 | 16-M20×70×46 | 8-M20×50×42 | 24-M22×75×50 | 8-M22×50×42 |
| | 350 | 14 | 16-M22×80×50 | 8-M22×55×47 | 24-M22×80×50 | 8-M22×55×47 |
| | 400 | 16 | 24-M22×85×50 | 8-M22×55×47 | 24-M24×90×54 | 8-M24×60×50 |
| | 450 | 18 | 24-M22×90×50 | 8-M22×60×50 | 32-M24×100×54 | 8-M24×65×54 |
| | 500 | 20 | 32-M22×90×50 | 8-M22×60×50 | 32-M24×100×54 | 8-M24×70×54 |
| | 550 | 22 | 32-M24×100×54 | 8-M24×65×54 | 32-M30×110×66 | 8-M30×70×54 |
| | 600 | 24 | 32-M24×100×54 | 8-M24×65×54 | 40-M30×110×66 | 8-M30×70×54 |
| | 650 | 26 | 40-M24×100×54 | 8-M24×70×54 | 40-M30×110×66 | 8-M30×80×66 |
| | 700 | 28 | 40-M24×100×54 | 8-M24×70×54 | 40-M30×110×66 | 8-M30×80×66 |
| | 750 | 30 | 40-M30×110×66 | 8-M30×80×66 | 40-M30×115×66 | 8-M30×80×66 |
| 720F | 800 | 32 | 40-M30×110×66 | 8-M30×80×66 | 48-M30×115×66 | 8-M30×80×66 |
| | 850 | 34 | 40-M30×110×66 | 8-M30×80×66 | 48-M30×115×66 | 8-M30×80×66 |
| | 900 | 36 | 40-M30×115×66 | 8-M30×75×66 | 48-M30×120×66 | 8-M30×80×66 |
| | 1000 | 40 | 40-M30×130×72 | 16-M30×90×66 | 40-M36×145×84 | 16-M36×110×78 |
| | 1100 | 44 | 40-M30×130×72 | 16-M30×90×66 | 40-M36×145×84 | 16-M36×110×78 |
| | 1200 | 48 | 48-M30×130×72 | 16-M30×90×66 | 48-M36×150×84 | 16-M36×110×78 |
| | 1350 | 54 | 56-M30×135×72 | 16-M30×90×66 | 56-M42×165×96 | 16-M42×110×90 |

- Remarks:
1. The bolt for valve positioning uses the screw hole.
 2. The hexagon bolt is used in the screw hole part for valve positioning.
 3. Please use a hexagon nut with 80% threading.
 4. For uses other than marine, use SS400 as the bolt (and nut) material.

Example

Hexagon bolts: 4 - M30 × 95 × 65

Quantity Nominal size (M) Length of bolt (L) Effective screw length (S)



REQUIRED NUMBER AND SIZE OF PIPING BOLTS

71LG Piping bolt sizes

1. Scope

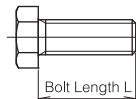
The scope is from 71LG 250mm to 600mm. The body which correspond to each connection flange standard is different. Please referring to document 「71LG (50mm to 600mm) Applicable flange standard table 【Doc.No. TBS-KA-151-E】」 for details.

2. Dimension and Material

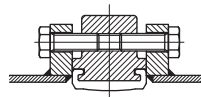
Example

16 - M27 × 75
 No. of bolts Nominal dia. Bolt length

Hexagon bolts



Example of application



Material
 SUS304 or SS400

2.1 FLANGE CONNECTION ASME CLASS 125/150

| Nominal size | | ASME CLASS 125/150 | | |
|--------------|------|--------------------|---------------|-----|
| mm | inch | Q'TY | Hexagon bolts | L |
| 250 | 10 | 24 | 7/8-9UNC | 60 |
| 300 | 12 | 24 | 7/8-9UNC | 65 |
| 350 | 14 | 24 | 1-8UNC | 70 |
| 400 | 16 | 32 | 1-8UNC | 80 |
| 450 | 18 | 32 | 1 1/8-8UN | 90 |
| 500 | 20 | 40 | 1 1/8-8UN | 95 |
| 600 | 24 | 40 | 1 1/4-8UN | 110 |

- Remarks:
 1 The bolt material SUS304 is used for marine.
 For uses other than marine, use SS400 as the bolt material with Bright chromate treatment.
 2 The quantity is showed for 1 set.(1 valve)
 3 The size 350mm and 400mm are exclusive body of ASME.

2.2 FLANGE CONNECTION BS4504 PN 16

| Nominal size | | BS4504 PN 16 | | |
|--------------|------|--------------|---------------|-----|
| mm | inch | Q'TY | Hexagon bolts | L |
| 250 | 10 | 24 | M24 | 55 |
| 300 | 12 | 24 | M24 | 60 |
| 350 | 14 | 32 | M24 | 65 |
| 400 | 16 | 32 | M27 | 75 |
| 450 | 18 | 40 | M27 | 85 |
| 500 | 20 | 40 | M30 | 90 |
| 600 | 24 | 40 | M33 | 100 |

- Remarks:
 1 The bolt material SUS304 is used for marine.
 For uses other than marine, use SS400 as the bolt material with Bright chromate treatment.
 2 The quantity is showed for 1 set.(1 valve)

2.3 FLANGE CONNECTION DIN2633 PN 16

| Nominal size | | DIN2633 PN 16 | | |
|--------------|------|---------------|---------------|-----|
| mm | inch | Q'TY | Hexagon bolts | L |
| 250 | 10 | 24 | M24 | 55 |
| 300 | 12 | 24 | M24 | 60 |
| 350 | 14 | 32 | M24 | 65 |
| 400 | 16 | 32 | M27 | 75 |
| 450 | 18 | — | — | — |
| 500 | 20 | 40 | M30 | 90 |
| 600 | 24 | 40 | M33 | 100 |

- Remarks:
 1 The bolt material SUS304 is used for marine.
 For uses other than marine, use SS400 as the bolt material with Bright chromate treatment.
 2 The quantity is showed for 1 set.(1 valve)
 3 DIN2633 PN16-450mm : The standard is none.

2.4 FLANGE CONNECTION GB/T 9113.1 PN1.6

| Nominal size | | GB/T 9113.1 PN1.6 | | |
|--------------|------|-------------------|---------------|-----|
| mm | inch | Q'TY | Hexagon bolts | L |
| 250 | 10 | 24 | M24 | 55 |
| 300 | 12 | 24 | M24 | 60 |
| 350 | 14 | 32 | M24 | 65 |
| 400 | 16 | 32 | M27 | 75 |
| 450 | 18 | 40 | M27 | 90 |
| 500 | 20 | 40 | M30 | 100 |
| 600 | 24 | 40 | M33 | 115 |

- Remarks:
 1 The bolt material SUS304 is used for marine.
 For uses other than marine, use SS400 as the bolt material with Bright chromate treatment.
 2 The quantity is showed for 1 set.(1 valve)

2.5 FLANGE CONNECTION BS4504 PN 10

| Nominal size | | BS4504 PN 10 | | |
|--------------|------|--------------|---------------|----|
| mm | inch | Q'TY | Hexagon bolts | L |
| 250 | 10 | 24 | M20 | 55 |
| 300 | 12 | 24 | M20 | 60 |
| 350 | 14 | 32 | M20 | 60 |
| 400 | 16 | 32 | M24 | 70 |
| 450 | 18 | 40 | M24 | 80 |
| 500 | 20 | 40 | M24 | 80 |
| 600 | 24 | 40 | M27 | 90 |

Remarks:

- 1 The bolt material SUS304 is used for marine.
For uses other than marine, use SS400 as the bolt material with Bright chromate treatment.
- 2 The quantity is showed for 1 set.(1 valve)

2.6 FLANGE CONNECTION DIN2632 PN 10

| Nominal size | | DIN2632 PN 10 | | |
|--------------|------|---------------|---------------|----|
| mm | inch | Q'TY | Hexagon bolts | L |
| 250 | 10 | 24 | M20 | 55 |
| 300 | 12 | 24 | M20 | 60 |
| 350 | 14 | 32 | M20 | 60 |
| 400 | 16 | 32 | M24 | 70 |
| 450 | 18 | — | — | — |
| 500 | 20 | 40 | M24 | 80 |
| 600 | 24 | 40 | M27 | 90 |

Remarks:

- 1 The bolt material SUS304 is used for marine.
For uses other than marine, use SS400 as the bolt material with Bright chromate treatment.
- 2 The quantity is showed for 1 set.(1 valve)
- 3 DIN2632 PN10-450mm : The standard is none.

2.7 FLANGE CONNECTION GB/T 9113.1 PN1.0

| Nominal size | | GB/T 9113.1 PN1.0 | | |
|--------------|------|-------------------|---------------|----|
| mm | inch | Q'TY | Hexagon bolts | L |
| 250 | 10 | 24 | M20 | 55 |
| 300 | 12 | 24 | M20 | 60 |
| 350 | 14 | 32 | M20 | 60 |
| 400 | 16 | 32 | M24 | 70 |
| 450 | 18 | 40 | M24 | 80 |
| 500 | 20 | 40 | M24 | 80 |
| 600 | 24 | 40 | M27 | 90 |

Remarks:

- 1 The bolt material SUS304 is used for marine.
For uses other than marine, use SS400 as the bolt material with Bright chromate treatment.
- 2 The quantity is showed for 1 set.(1 valve)

2.8 FLANGE CONNECTION JIS 16K

| Nominal size | | JIS 16K | | |
|--------------|------|---------|---------------|----|
| mm | inch | Q'TY | Hexagon bolts | L |
| 250 | 10 | 24 | M24 | 55 |
| 300 | 12 | 32 | M24 | 60 |
| 350 | 14 | 32 | M30×P3 | 70 |
| 400 | 16 | 32 | M30×P3 | 80 |
| 450 | 18 | 40 | M30×P3 | 90 |
| 500 | 20 | 40 | M30×P3 | 95 |
| 600 | 24 | 48 | M36×P3 | 95 |

Remarks:

- 1 The bolt material SUS304 is used for marine.
For uses other than marine, use SS400 as the bolt material with Bright chromate treatment.
- 2 The quantity is showed for 1 set.(1 valve)
- 3 The size 350mm and 600mm are exclusive body of JIS 16K/10K.

2.9 FLANGE CONNECTION JIS 10K

| Nominal size | | JIS 10K | | |
|--------------|------|---------|---------------|----|
| mm | inch | Q'TY | Hexagon bolts | L |
| 250 | 10 | 24 | M22 | 50 |
| 300 | 12 | 32 | M22 | 55 |
| 350 | 14 | 32 | M22 | 60 |
| 400 | 16 | 32 | M24 | 70 |
| 450 | 18 | 40 | M24 | 80 |
| 500 | 20 | 40 | M24 | 80 |
| 600 | 24 | 48 | M30 | 80 |

Remarks:

- 1 The bolt material SUS304 is used for marine.
For uses other than marine, use SS400 as the bolt material with Bright chromate treatment.
- 2 The quantity is showed for 1 set.(1 valve)
- 3 The size 350mm and 600mm are exclusive body of JIS 16K/10K.

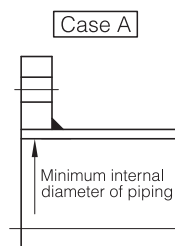
REQUIRED NUMBER AND SIZE OF PIPING BOLTS

71LG Applicable pipe list, Minimum internal diameters of piping and Exposed dimension of disc

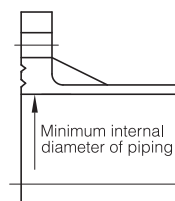
○ : Piping possible — : Not standardized

1.1 Applicable pipe list in case of A and VP pipe with TS flange

| Nominal size | | SGP | STPY | Sch20 | VP (TS flange) | Sch10S | Sch20S |
|--------------|------|-----|------|-------|-------------------|--------|--------|
| mm | inch | | | | | | |
| 250 | 10 | ○ | — | ○ | ○ | ○ | ○ |
| 300 | 12 | ○ | — | ○ | ○ | ○ | ○ |
| 350 | 14 | ○ | ○ | ○ | — | ○ | ○ |
| 400 | 16 | ○ | ○ | ○ | — | ○ | ○ |
| 450 | 18 | ○ | ○ | ○ | — | ○ | ○ |
| 500 | 20 | ○ | ○ | ○ | — | ○ | ○ |
| 600 | 24 | — | ○ | ○ | — | ○ | ○ |



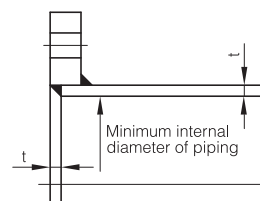
VP pipe (TS flange)



1.2 Applicable pipe list in case of B

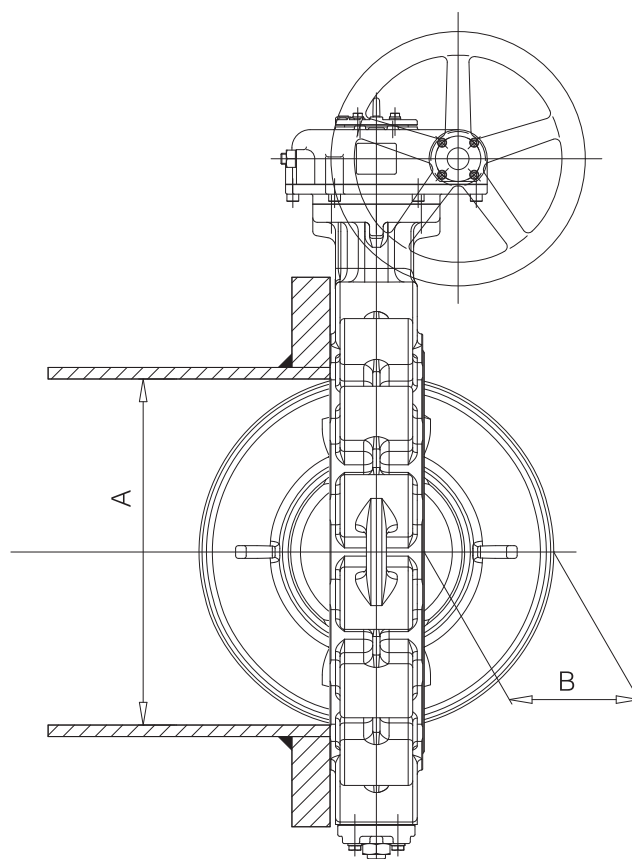
| Nominal size | | SGP | STPY | Sch20 | Sch40 | Sch10S | Sch20S |
|--------------|------|-----|------|-------|-------|--------|--------|
| mm | inch | | | | | | |
| 250 | 10 | ○ | — | ○ | ○ | ○ | ○ |
| 300 | 12 | ○ | — | ○ | ○ | ○ | ○ |
| 350 | 14 | ○ | ○ | ○ | ○ | ○ | ○ |
| 400 | 16 | ○ | ○ | ○ | ○ | ○ | ○ |
| 450 | 18 | ○ | ○ | ○ | ○ | ○ | ○ |
| 500 | 20 | ○ | ○ | ○ | ○ | ○ | ○ |
| 600 | 24 | — | ○ | ○ | ○ | ○ | ○ |

Case B



2 Minimum internal diameters of piping and Exposed dimension of disc

| Nominal size | | Minimum internal diameters of piping | Exposed dimension |
|--------------|------|--------------------------------------|-------------------|
| mm | inch | A (mm) | B (mm) |
| 250 | 10 | 249 | 92 |
| 300 | 12 | 298 | 112 |
| 350 | 14 | 334 | 129 |
| 400 | 16 | 383 | 144 |
| 450 | 18 | 429 | 162 |
| 500 | 20 | 479 | 182 |
| 600 | 24 | 572 | 213 |



APPLICABLE PIPE LIST IN CASE OF A AND B

○: Installation possible, —: No standard, /: No supported nominal size

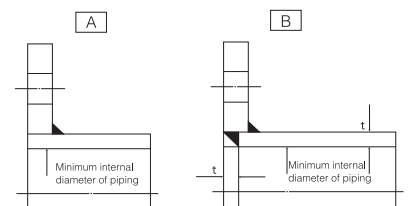
| Nominal size (mm) | SGP | | | | | STPY | | | | | Sch20 | | | | |
|-------------------|------|-----------|-----------|-----------|----------------|------|-----------|-----------|----------------|----------------|-------|-----------|-----------|----------------|----------------|
| | 700G | 705G 704G | 731P 732P | 700S 700E | 704G 722F 720F | 700G | 705G 704G | 731P 732P | 700S 700E 700K | 704G 722F 720F | 700G | 705G 704G | 731P 732P | 700S 700E 700K | 704G 722F 720F |
| 40 | ○ | / | / | / | / | — | / | / | / | / | — | / | / | / | / |
| 50 | ○ | ○ | ○ | ○ | ○ | — | — | — | — | — | ○ | ○ | ○ | ○ | ○ |
| 65 | ○ | ○ | ○ | ○ | ○ | — | — | — | — | — | ○ | ○ | ○ | ○ | ○ |
| 80 | ○ | ○ | ○ | ○ | ○ | — | — | — | — | — | ○ | ○ | ○ | ○ | ○ |
| 100 | ○ | ○ | ○ | ○ | ○ | — | — | — | — | — | ○ | ○ | ○ | ○ | ○ |
| 125 | ○ | ○ | ○ | ○ | ○ | — | — | — | — | — | ○ | ○ | ○ | ○ | ○ |
| 150 | ○ | ○ | ○ | ○ | ○ | — | — | — | — | — | ○ | ○ | ○ | ○ | ○ |
| 200 | ○ | ○ | ○ | ○ | ○ | — | — | — | — | — | ○ | ○ | ○ | ○ | ○ |
| 250 | ○ | ○ | ○ | ○ | ○ | — | — | — | — | — | ○ | ○ | ○ | ○ | ○ |
| 300 | ○ | ○ | ○ | ○ | ○ | — | — | — | — | — | ○ | ○ | ○ | ○ | ○ |
| 350 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 400 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 450 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 500 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 550 | / | / | / | — | — | / | / | / | ○ | ○ | / | / | / | ○ | ○ |
| 600 | — | — | — | — | — | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 650 | / | / | / | — | — | / | / | / | ○ | ○ | / | / | / | ○ | ○ |
| 700 | / | / | / | — | — | / | / | / | ○ | ○ | / | / | / | — | — |
| 750 | / | / | / | — | — | / | / | / | ○ | ○ | / | / | / | — | — |
| 800 | / | / | / | — | — | / | / | / | ○ | ○ | / | / | / | — | — |
| 850 | / | / | / | — | — | / | / | / | ○ | ○ | / | / | / | — | — |
| 900 | / | / | / | — | — | / | / | / | ○ | ○ | / | / | / | — | — |
| 1000 | / | / | / | — | — | / | / | / | ○ | ○ | / | / | / | — | — |
| 1100 | / | / | / | — | — | / | / | / | ○ | ○ | / | / | / | — | — |
| 1200 | / | / | / | — | — | / | / | / | ○ | ○ | / | / | / | — | — |
| 1350 | / | / | / | — | — | / | / | / | ○ | ○ | / | / | / | — | — |

○: Installation possible, —: No standard, /: No supported nominal size

| Nominal size (mm) | Sch40 | | | | | Minimum internal diameters of piping (mm) | | | | |
|-------------------|-------|-----------|-----------|----------------|----------------|---|-----------|-----------|----------------|----------------|
| | 700G | 705G 704G | 731P 732P | 700S 700E 700K | 704G 722F 720F | 700G | 705G 704G | 731P 732P | 700S 700E 700K | 704G 722F 720F |
| 40 | ○ | / | / | / | / | 29 | / | / | / | / |
| 50 | ○ | ○ | ○ | ○ | ○ | 38 | 38 | 34 | 37 | 34 |
| 65 | ○ | ○ | ○ | ○ | ○ | 54 | 54 | 51 | 59 | 51 |
| 80 | ○ | ○ | ○ | ○ | ○ | 72 | 72 | 70 | 67 | 70 |
| 100 | ○ | ○ | ○ | ○ | ○ | 92 | 92 | 91 | 91 | 91 |
| 125 | ○ | ○ | ○ | ○ | ○ | 119 | 119 | 118 | 118 | 118 |
| 150 | ○ | ○ | ○ | ○ | ○ | 145 | 145 | 144 | 143 | 143 |
| 200 | ○ | ○ | ○ | ○ | ○ | 194 | 194 | 194 | 187 | 187 |
| 250 | ○ | ○ | ○ | ○ | ○ | 247 | 247 | 246 | 240 | 240 |
| 300 | ○ | ○ | ○ | ○ | ○ | 295 | 295 | 294 | 286 | 286 |
| 350 | ○ | ○ | ○ | ○ | ○ | 333 | 333 | 332 | 322 | 322 |
| 400 | ○ | ○ | ○ | ○ | ○ | 382 | 382 | 379 | 372 | 372 |
| 450 | ○ | ○ | ○ | ○ | ○ | 427 | 427 | 428 | 421 | 421 |
| 500 | ○ | ○ | ○ | ○ | ○ | 477 | 477 | 477 | 463 | 463 |
| 550 | / | / | / | ○ | ○ | 509 | 509 | / | 509 | 509 |
| 600 | ○ | ○ | ○ | ○ | ○ | 569 | 569 | 569 | 566 | 566 |
| 650 | / | / | / | ○ | ○ | / | / | / | 612 | 612 |
| 700 | / | / | / | — | — | / | / | / | 653 | 653 |
| 750 | / | / | / | — | — | / | / | / | 705 | 705 |
| 800 | / | / | / | — | — | / | / | / | 754 | 754 |
| 850 | / | / | / | — | — | / | / | / | 803 | 803 |
| 900 | / | / | / | — | — | / | / | / | 834 | 834 |
| 1000 | / | / | / | — | — | / | / | / | 950 | 950 |
| 1100 | / | / | / | — | — | / | / | / | 1040 | 1040 |
| 1200 | / | / | / | — | — | / | / | / | 1138 | 1138 |
| 1350 | / | / | / | — | — | / | / | / | 1277 | 1277 |

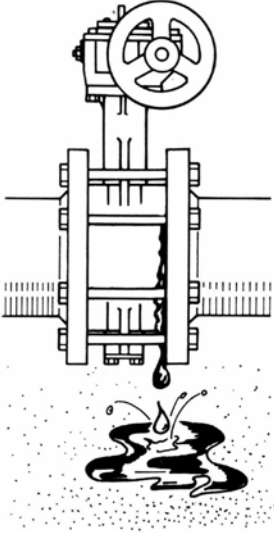
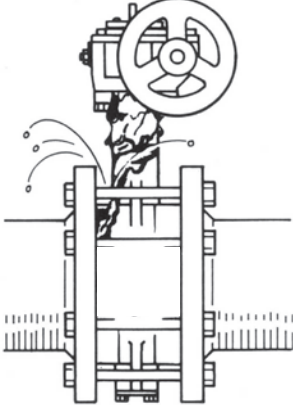
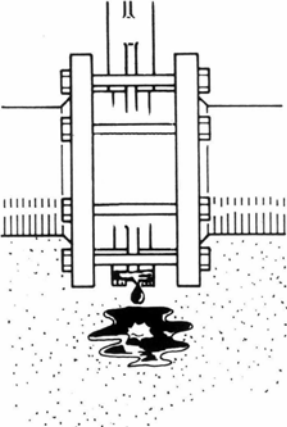
Remark:

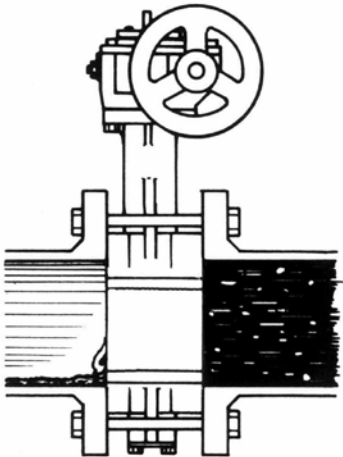
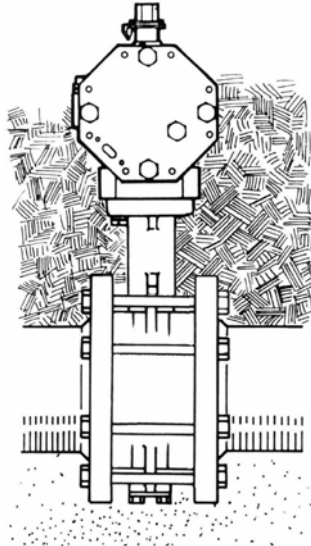
Butterfly valves are inserted into a pipe that was fitted with the disc when fully open. You are using a pipe or flange that is less than the minimum inner pipe diameter, use is still possible if means are taken such as inserting a spacer between the valve and flange. For details, please consult us.



TROUBLESHOOTING

Please refer to the following when there is a problem with a valve.

| Problem | Cause | Countermeasure |
|--|---|--|
| <p data-bbox="102 353 504 416">There is a leak between the body and pipe flange faces.</p>  | <p data-bbox="557 353 959 416">The piping bolts are loose or they were not tightened evenly.</p> | <p data-bbox="1015 353 1374 416">Loosen the bolts and then retighten them.</p> |
| | <p data-bbox="557 461 927 584">The flange gasket face is scratched or there is waste material or other foreign matter adhering.</p> | <p data-bbox="1015 461 1410 555">Remove the body and clean the flange gasket face. Clean the piping flange gasket face and re-install the valve.</p> |
| | <p data-bbox="557 647 847 674">The valve is misaligned.</p> | <p data-bbox="1015 647 1401 710">Loosen the bolts and realign the valve correctly.</p> |
| | <p data-bbox="557 757 876 784">Torn or damaged seat ring</p> | <p data-bbox="1015 757 1414 909">Remove the valve body and check the seat ring for signs of tearing or other damage. If any damage is observed, replace the seat ring.</p> |
| <p data-bbox="102 1025 464 1052">There is a leak from the gland.</p>  | <p data-bbox="557 1025 847 1052">The valve is misaligned.</p> | <p data-bbox="1015 1025 1401 1088">Loosen the bolts and realign the valve correctly.</p> |
| | <p data-bbox="557 1133 876 1160">Torn or damaged seat ring</p> | <p data-bbox="1015 1133 1414 1285">Remove the valve body and check the seat ring for signs of tearing or other damage. If any damage is observed, replace the seat ring.</p> |
| <p data-bbox="102 1585 475 1648">There is a leak from the bottom cover.</p>  | <p data-bbox="557 1585 903 1648">The bottom cover installation bolts are loose.</p> | <p data-bbox="1015 1585 1350 1648">Re-tighten the bottom cover installation bolts.</p> |
| | <p data-bbox="557 1693 951 1756">The seat packing is damaged or has deteriorated.</p> | <p data-bbox="1015 1693 1401 1756">Replace the seat packing with a new one.</p> |
| | <p data-bbox="557 1803 847 1830">The valve is misaligned.</p> | <p data-bbox="1015 1803 1401 1865">Loosen the bolts and realign the valve correctly.</p> |
| | <p data-bbox="557 1912 876 1939">Torn or damaged seat ring</p> | <p data-bbox="1015 1912 1414 2065">Remove the valve body and check the seat ring for signs of tearing or other damage. If any damage is observed, replace the seat ring.</p> |

| Problem | Cause | Countermeasure |
|--|---|--|
| <p data-bbox="180 136 584 203">There is leaking from the valve seat.</p>  | <p data-bbox="630 136 1038 226">The wrong material was selected for the fluid application. (Parts are being corroded.)</p> | <p data-bbox="1086 136 1433 226">Change the material. Please inquire with us regarding selection.</p> |
| | <p data-bbox="630 286 1054 376">There is damage to the disc seal or seat ring due to the presence of foreign matter inside the piping.</p> | <p data-bbox="1086 286 1474 353">Replace the disc seal wrapping and the seat ring.</p> |
| | <p data-bbox="630 443 975 510">Movement of disc in the fully closed position.</p> | <p data-bbox="1086 443 1490 510">Adjust the fully closed position of the disc.</p> |
| | <p data-bbox="630 555 1054 622">The disc cannot fully close due to insufficient output from the actuator.</p> | <p data-bbox="1086 555 1453 622">Refer to the actuator selection table for correction.</p> |
| | <p data-bbox="630 701 1054 790">Fluid specification is not compatible with valve specification. (Specifications have been exceeded.)</p> | <p data-bbox="1086 701 1433 734">Re-check the specifications.</p> |
| | <p data-bbox="630 813 1034 902">There is torsion of stem due to an unusual increase in opening/closing torque.</p> | <p data-bbox="1086 813 1385 846">Replace the valve body.</p> |
| | <p data-bbox="630 925 1018 1014">Movement of disc in fully closed position due to loose actuator installation bolts.</p> | <p data-bbox="1086 925 1453 1014">Re-adjust the fully closed disc position by re-tightening the installation bolts.</p> |
| | <p data-bbox="630 1037 1034 1126">Uneven connection between seat ring and disc due to unequal tightening of piping bolts.</p> | <p data-bbox="1086 1037 1490 1104">Loosen the piping bolts and then re-tighten them.</p> |
| | <p data-bbox="630 1182 1018 1249">Wearing of seat ring due to long period of use.</p> | <p data-bbox="1086 1182 1353 1216">Replace the seat ring.</p> |
| <p data-bbox="180 1294 584 1361">Faulty operation (The valve does not work.)</p>  | <p data-bbox="630 1294 1050 1361">Prescribed actuator air pressure or voltage not being supplied.</p> | <p data-bbox="1086 1294 1417 1361">Check by using a pressure gauge, tester, or similar.</p> |
| | <p data-bbox="630 1402 1023 1536">For pneumatic pressure cylinder types, diaphragm of speed controller is stuck in the fully closed position.</p> | <p data-bbox="1086 1402 1422 1469">Open the diaphragm of the speed controller.</p> |
| | <p data-bbox="630 1559 970 1626">By-pass valve is in the open position.</p> | <p data-bbox="1086 1559 1390 1592">Close the by-pass valve.</p> |
| | <p data-bbox="630 1637 1050 1704">Insufficient output due to damaged cylinder parts.</p> | <p data-bbox="1086 1637 1465 1760">Apply the prescribed pressure and observe functioning. If defective parts are suspected, replace them with new parts.</p> |
| | <p data-bbox="630 1783 979 1816">Erroneous actuator selection.</p> | <p data-bbox="1086 1783 1453 1850">Refer to the actuator selection table for correction.</p> |
| | <p data-bbox="630 1895 1038 1962">Increased torque due to presence of foreign matter in the piping.</p> | <p data-bbox="1086 1895 1490 1995">Keep valve in the fully opened position and flush out the foreign material.</p> |

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