F2S Type
Attachment and Detachment of Hollow Shaft

Attachment of Hollow Shaft and Driven Shaft of Reducer

1. Apply anti-seizing agent proper for the using circumstance such as molybdenum disulfide, on the surface of the driven shaft and the bore of the hollow shaft, and then insert the reducer in the driven shaft.
2. In case impact does not affect in the uniform load, "h_7" tolerance is recommended for the driven shaft. In case shock load is imposed or great radial load is observed, tighten the fittings. "H_2" tolerance is recommended for the bore of the hollow shaft.
3. If the fitting is too tight, tap the edge of the hollow drive shaft with the plastic hummer and fit together. In this case, never hit the casing. Smoother insert can be obtained if you prepare jigs shown in the figure below:

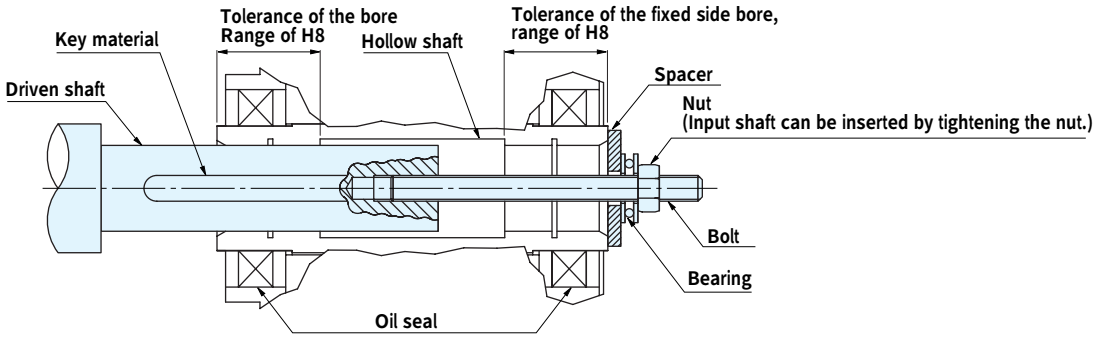


Figure-1

Spacer, nuts, bolts, key materials and bearing parts should be prepared by customer.

4. The length of the driven shaft and the fixing key are recommended to be within the tolerance of H_8 range of the fixed side bore. (The dimension of the bore H_8 tolerance part can be seen as L1 in the "Detailed figure of the Hollow Shaft" on page E53.)
5. It is recommended to supress the fluctuation at the edge of the driven shaft below 0.05. The greater fluctuation at operation may give harmful effect to the reducer.

Connecting Reducer with Driven Shaft

1. Driven shaft with shoulder

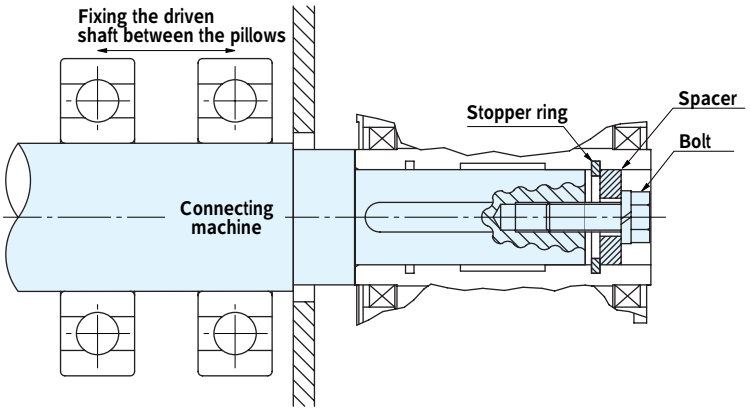


Figure-2 Fixing by spacer and stopper ring

(The spacer, bolt and retaining ring parts should be prepared by customer.)

Note) Excessive tightening of the bolt may cause deformation of the retaining ring, which carefully note.

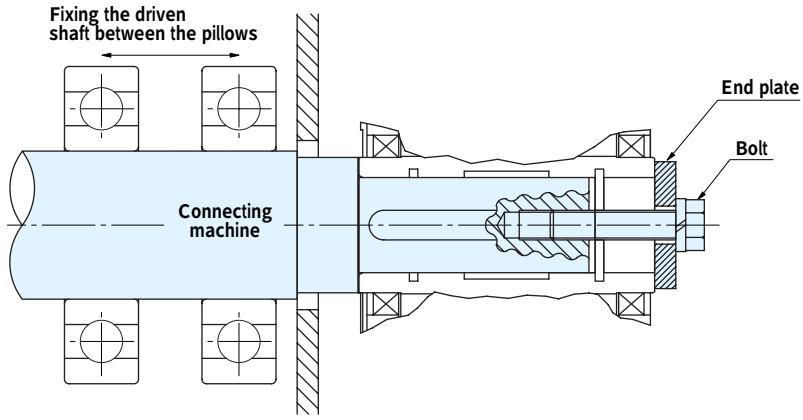


Figure-3 Fixing by End plate
(End plate, bolt parts should be prepared by customer.)

② **Driven shaft without shoulder**

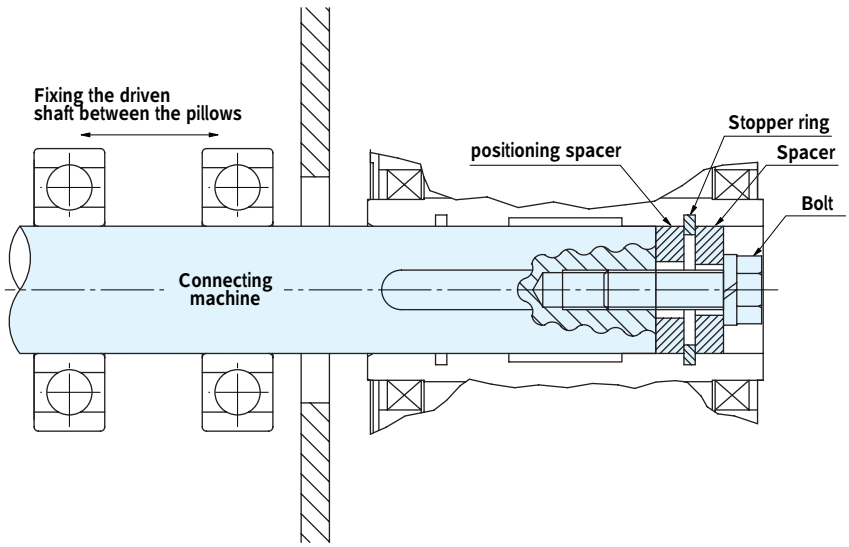


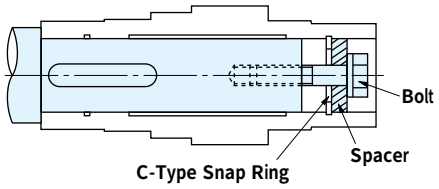
Figure-4 Fixing by spacer and stopper ring
(Spacer, positioning spacer, bolt and stopper ring parts should be prepared by customer.)

Note) Be sure to have space between the outer diameter of the spacer and the inner diameter of the hollow shaft. Excessive tightness of the fitting or inaccuracy of the spacer's diameter may cause greater fluctuation on the driven and hollow shafts. Positioning spacer is used when deciding the position of the reducer. In case the length of the driven shaft is clarified preliminarily, positioning spacer is not necessary. By having positioning spacer, smooth detachment from the hollow shaft can be obtained. (For the details of detachment from the hollow shaft, refer to Figure-5 on page E82.)

F2S Type Attachment and Detachment of Hollow Shaft

Recommended size for the driven shaft fixing part

For the attachment of the hollow shaft in general use, we recommend you to refer to the dimensions shown on the right as a guide line for the strength when designing.

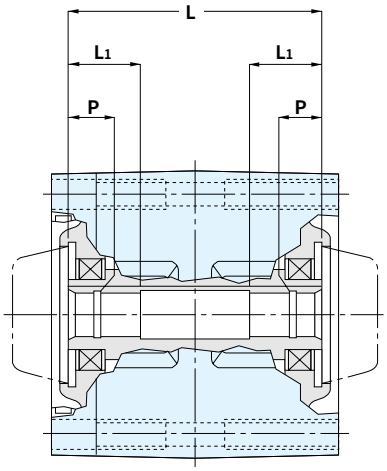


〈Recommended sizes for the driven shaft fixing parts〉

	Bolt size	Spacer measurements			Nominal designation for C-type stopper ring
		Outer diameter	Inner diameter	Width	
F2S-12	M5	ϕ11.5	ϕ6	3	12
F2S-15	M6	ϕ14.5	ϕ7	3	15

About the length of driven shaft

The driven shaft must be reached to the both side of the L1 part. (As shown on the figure on the right) However, be sure to have allowance for the spacer's dimension necessary at the "detachment from the hollow shaft" stated below.



About the length of key for the driven shaft

The length of the key should be more than 1.5 times of the diameter of hollow shaft. Also, the key inserting position should be the place where more than 1/2 of the total key length can be reached to L1. (Refer to the figure on the right)

Detaching from the Hollow Shaft

Make sure to avoid excessive force between the casing and the hollow shaft. Smoother detachment can be obtained by using a jig as shown in the figure below:

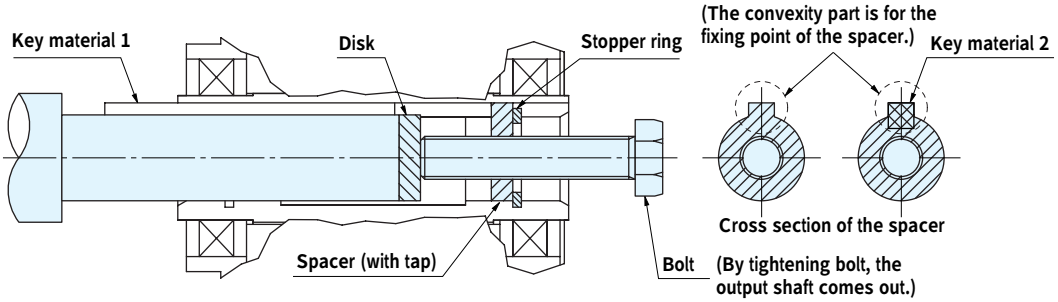


Figure-5

(Parts such as spacer, disk, bolt, stopper ring, etc. should be prepared by customer.)

Attaching Reducer

Merits and demerits of flange mounted and torque arm mounted.

	Merits	Demerits
Flange Mounted	•Direct attachment to the machine is possible. •Space saving	•Alignment with the connecting machine is needed. •Four(4) attaching taps are needed for connecting with other machine.
Torque Arm Mounted	•Easy alignment with the connecting machine •Only one fixing point is needed for fixing with other machine	•Torque arm is needed. •Space for attaching torque arm is needed.