

# VOITH

Voith Turbo, Inc.

**Installation and Operating Instructions**  
**For VOITH TURBO Couplings with Geared (XG)**  
**Connection Couplings**  
**Supplement to VOITH Manual 3626-011000en**  
**Revision 04/2006**



**Table of Contents**

**1. Introduction, General Information.....3**

**2. Installation and Alignment Instructions.....3**

    2.1 Installation of motor and reducer (output side) coupling halves.....3

    2.2 Shaft gap.....4

    2.3 Shaft alignment.....4

    2.4 Installation of fluid coupling.....4

    2.5 Gear coupling lubrication.....5

**3. Maintenance.....6**

**4. Spare Parts.....7**

    4.1 274 XG spares.....8

    4.2 366 XG spares.....9

    4.3 422 XG spares.....10

    4.4 487 XG spares.....11

    4.5 422 XG spares (Old Design, Short Shaft Gap).....12

    4.6 422 XG spares (ANDALEX).....13

    4.7 487 XG spares (Sleeve Design).....14

This manual has been issued with great care. However, in case you should need any further information, please contact:

**Voith Turbo, Inc. (U.S.A.)**  
25 Winship Road  
York, PA 17402  
U.S.A.  
Phone (717) 767-3200 FAX (717) 767-3210

© 1998  
This manual is protected by copyright.  
Voith reserves the right for modifications.

**Voith Turbo, Inc. (Canada)**  
2-106 Rayette Road  
Concord, Ontario L4K 2G3  
Canada  
Phone (905) 738-1829 FAX (905) 738-9462

## **1. Introduction**

Voith XG mount style fluid couplings provide for a radially removable mount style arrangement while at the same time providing a generous misalignment tolerance. This mount style also reduces the overhung load on the reducer or driven shaft.

The gear couplings are designed to provide trouble free operation provided the couplings are installed and maintained according to the attached instructions and periodic maintenance and inspections are implemented to assure the original installed conditions are maintained, (alignment, lubrication, and bolt torque).

The four most important factors in achieving good service life on the XG mount style are:

1. Proper assembly i.e., proper bolt torque, o-ring and gasket installation.
2. Input and output shafts are aligned within the tolerances listed.
3. The "gap" between the face of the motor side coupling half and the reducer (or output) shaft coupling half is properly set at installation.
4. Regular lubrication intervals. The gear couplings must be lubricated regularly using any of the listed lubricants or equivalents.

## **2. Installation and Alignment Instructions**

### **2.1 Installation of motor and reducer (output side) coupling halves.**

1. Determine which hubs match the motor shaft diameter and reducer (or output) shaft diameter. The motor and reducer side coupling halves are supplied with an interference fit.
2. Place one gear coupling sleeve, complete with o-ring seal, on each shaft. Coat the o-ring seals lightly with grease. Do not allow o-ring seals to contact heated hubs.
3. Both the motor side and reducer side coupling halves may be heated to 250°F or 300°F to facilitate installation onto the shafts. Use a torch with a rosebud tip, an oil bath or other method to assure uniform heating. Cooling of the shafts with dry ice is also acceptable. Do not spot heat the hubs or distortion may occur! Do not apply heat directly to the gears. Never use excessive force or "hammer" the hubs onto the shafts. Improper installation practices could seriously damage the drive components and result in premature failure. It is recommended that the face of the coupling half be mounted flush with the end of the shaft to facilitate radial removal of the fluid coupling. Be sure to remove all "burrs" from shaft and bore surfaces. Application of an anti-seize compound is recommended.

**Installation and Alignment Instructions cont:**

**2.2 Shaft gap**

1. Adjust the shaft gap of the motor and reducer hubs to the appropriate dimension in TABLE 1. (Face to face between the coupling halves.)

**TABLE 1  
"Shaft Gap"**

TYPE	274	274 D	366	422	487	SIZE
T-XG	7.80"	9.37"	10.25"	13.08"	14.25"	GAP +.01" -.00"
TV-XG	N/A	N/A	11.34"	14.62"	16.26"	
TVV-XG	N/A	N/A	14.09"	17.69"	19.61"	
TVVS-XG	N/A	N/A	N/A	17.69"	19.61"	

**2.3 Shaft alignment**

The large shaft gap required for XG mount style couplings makes alignment by conventional means (dial indicators) difficult. VTI highly recommends the use of an optical alignment tool. Otherwise, use a bridge arrangement and dial indicators. Be sure the bridge has adequate stiffness to obtain good alignment.

Proceed by installing the alignment equipment onto the shafts as recommended by the manufacturer.

The alignment values in TABLE 2 should be used when checking alignment prior to the installation of the fluid coupling.

**TABLE 2  
"Angular and Parallel Misalignment Tolerances"**

SIZE	MAX ANGULAR T.I.R.	MAX PARALLEL T.I.R.
274 / 274 D	.010"	.024"
366	.013"	.048"
422	.015"	.053"
487	.018"	.064"

**2.4 Installation of fluid coupling**

Verify that the existing gap between the hub faces is no shorter than the values listed in TABLE 1. **The use of a torque wrench is necessary for the following steps.**

**Installation and Alignment Instructions cont:**

Mount the input adapter flange, position 1900 as shown on page 7, with the paper gasket onto the motor side gear coupling half and install the bolts with high collar lock washers until they are finger tight.

The fluid coupling assembly can now be positioned between the motor and reducer. See the certified drawing or TABLE 3 to determine the weight of the particular coupling unit you are installing.

Before installing the output side gear coupling bolts, position the paper gasket in between the mating flange. Then, install the bolts with high collar lock washers finger tight.

Install the input adapter flange bolts with wave washers finger tight.

Now begin to torque all of the bolts in a "criss-cross" pattern to one half the value listed on the certified drawing or TABLE 4. Proceed to torque the bolts to the full torque value utilizing the previously stated method

**TABLE 3**  
**"Coupling Weights"**

TYPE	274	274 D	366	422	487
T-XG	65 lbs.	77 lbs.	133 lbs.	231 lbs.	345 lbs.
TV-XG	N/A.	N/A.	142 lbs.	235 lbs.	347 lbs.
TVV-XG	N/A	N/A	187 lbs.	242 lbs.	365 lbs.
TVVS-XG	N/A	N/A	N/A	250 lbs.	392 lbs.

**TABLE 4**  
**"Bolt Torques"**

SIZE	GEAR COUPLING BOLTS (oil lubricated)	ADAPTER FLANGE BOLTS (oil lubricated)
274 / 274 D	35 lb.ft.	45 lb.ft. (M12)
366	35 lb.ft.	55 lb.ft. (M12)
422	65 lb.ft.	45 lb.ft. (M12)
487	65 lb.ft.	55 lb.ft. (M12)

**2.5 Gear coupling lubrication**

Remove both dryseal lubrication plugs from each gear coupling sleeve. Insert the tip of the grease gun into the top most opening and pump grease into the gear coupling until old grease comes out the other open fitting. Clean both of the plugs, replace and retighten in the gear coupling sleeve.

**Installation and Alignment Instructions cont:**

The lubricants in TABLE 5 below are recommended by their manufacturers for the conditions indicated. This listing is for the convenience of gear coupling users and does not constitute endorsement. This list is not complete and does not restrict the use of equivalent lubricants developed by continuous research by various manufacturers.

CAUTION: Do not use ordinary bearing or cup grease.

**TABLE 5**  
**“Recommended Lubricants and Conditions of Use“**

Trade Name	Normal Operation	Moist or Wet	High Temperature 150° to 300° F
Amoco	Rykon 2EP		
Arco	Arco MP or Litholine HEP2		Dominion H2
Chevron	Industrial Grease Medium		
Citgo	Citgo HEP2		
Exxon	Ronex WB		
Gulf	Gulf High Temp Grease or Gulf Crown EP2		Gulf High Temp Grease
Keystone	Zeniplex No.1		
Mobil	Mobilux EP1		Mobiltemp 78
Shell	Alvania EP Grease 1		
Sunoco	Sunaplex 991EP or Prestige 741EP		
Texaco	Marfak 1		Marfak Heavy Duty 3

**3. Maintenance**

At regular intervals, check the tightness of all flange bolts and lube plugs. Every six months, change the lubricant. The approximate quantity of lubricant needed is shown in TABLE 6. Conditions such as high temperature and severe environments may require lubrication at shorter intervals.

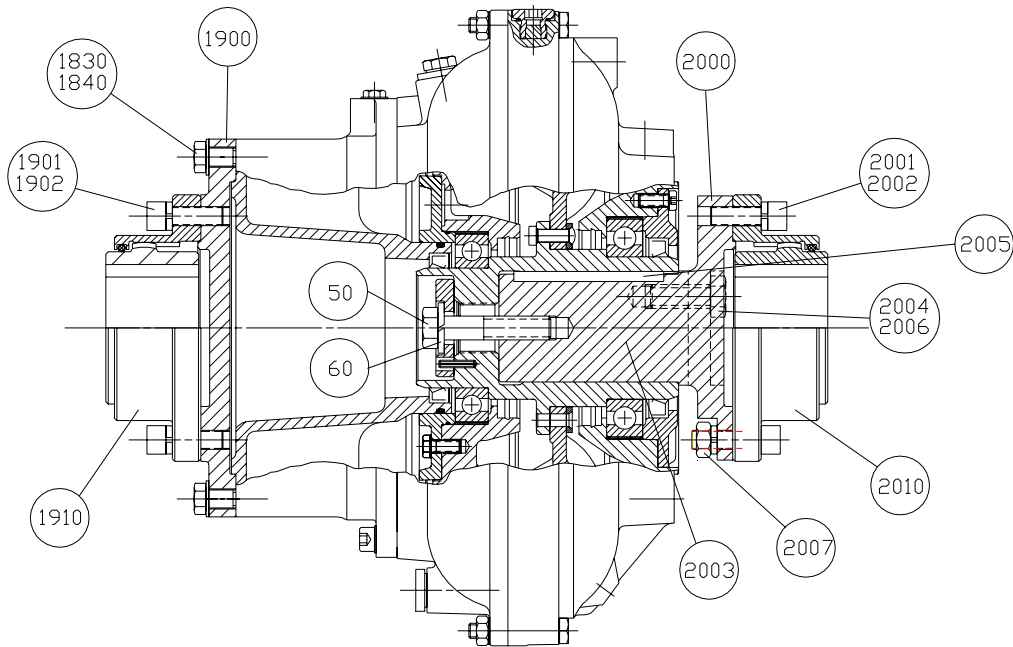
Every three years, remove the fluid coupling and clean all grease from the gear couplings. Check all components for wear and replace any and all components if necessary. Check the alignment between the coupling halves, and replace the fluid coupling.

**TABLE 6**  
**"Approximate Lubricant Quantities"**

SIZE	WEIGHT	VOLUME
274 / 274 D	.18 lbs.	.10 qts.
366	.18 lbs.	.10 qts.
422	.33 lbs.	.19 qts.
487	.46 lbs.	.26 qts.

**4. Spare Parts**

For T, TV, TVV, & TVVS fluid coupling parts, see "Installation & Operating Instructions for Turbo Couplings with Constant Filling", manual 3626-011000 en.





**4.1 T / DT-XG**

**Bill of Material**

**Size: 274 Sleeve Design**

ITEM NO.	PART NO.	QTY.	DESCRIPTION
50	304001080	1	Hex Bolt; M16 x 60 Grade 8.8
60	304001150	1	Wave Washer; 16 mm
1830	304001068	8	Hex Bolt; M12 x 35 Grade 8.8
1840	304001149	8	Wave Washer; 12 mm
1900	304001972	1	Input Flange, 274
1901,2001	304003563	12	Socket Head Cap Screw; ½" UNC 13 x 1.5" Long
1902,2002	304003885	12	½" Hi-Collar Lock Washer
1910,2010	304002145	2	Size 2 Gear Coupling Half Complete
2000	304003018	1	Output Flange; 274
2005	TCR03160065	1	Hub Key; 274

For T, TV, & TVV Fluid Coupling Parts, see "Installation & Operating Instructions for Turbo Couplings with Constant Filling", manual number 3626 - 011000 en.

**4.2 T,TV,&TVV-XG**

**Bill of Material**

**Size: 366 Sleeve Design**

ITEM NO.	PART NO.	QTY.	DESCRIPTION
50	304003785	1	Hex Bolt; M16 x 75 Grade 8.8
60	304001150	1	Wave Washer; 16 mm
1830	304001068	8	Hex Bolt; M12 x 35 Grade 8.8
1840	304001149	8	Wave Washer; 12 mm
1900	304001972	1	Input Flange; 366
1901,2001	304003563	12	Socket Head Cap Screw; ½" UNC 13 x 1.5" Long
1902,2002	304003885	12	½" Hi-Collar Lock Washer
1910,2010	304002145	2	Size 2 Gear Coupling Half Complete
2000	304001973	1	Output Flange; 366
2005	TCR03160116	1	Hub Key; 366

For T, TV, & TVV Fluid Coupling Parts, see "Installation & Operating Instructions for Turbo Couplings with Constant Filling", manual number 3626 - 011000 en.

**4.3 T,TV,TVV,&TVVS-XG**

**Bill of Material**

**Size: 422 Sleeve Design**

ITEM NO.	PART NO.	QTY.	DESCRIPTION
50	304003528	1	Holding Bolt; ¾-10x3.5" Lg.
60	304003641	1	Lock Washer; ¾" Spring
1830	304001072	8	Hex Bolt; M12 x 55 Grade 8.8
1840	304001149	8	Wave Washer; 12 mm
1900	304002294	1	Input Flange; 422
1901	304003598	12	Socket Head Cap Screw; 5/8" UNC 11 x 2" Long
1902,2002	304003886	12	5/8" Hi-Collar Lock Washer
1910,2010	304002158	2	Size 2.5 Gear Coupling Half Complete
2000	304008435	1	Output Flange; 422
2005	TCR03160166	1	Hub Key; 422

For T, TV, TVV, & TVVS Fluid Coupling Parts, see "Installation & Operating Instructions for Turbo Couplings with Constant Filling", manual number 3626 - 011000 en.

**4.4 T,TV,TVV,&TVVS-XG**      **Bill of Material**      **Size: 487 Bolted Output Flange**

ITEM NO.	PART NO.	QTY.	DESCRIPTION
1830	304001072	12	Hex Bolt; M12 x 55 Grade 8.8
1840	304001149	12	Wave Washer; 12 mm
1900	304001708	1	Input Flange; 487
1901	304003598	8	Socket Head Cap Screw; 5/8" UNC 11 x 2" Long
1902,2002	304003886	16	5/8" Hi-Collar Lock Washer
1910,2010	304002159	2	Size 3 Gear Coupling Half Complete
2000	304002157	1	Output Flange; 487
2001	304003899	8	Socket Head Cap Screw; 5/8" UNC 11 x 3" Long
2004	304001091	6	Hex Bolt; M20 x 80 mm Grade 8.8

For T, TV, TVV, & TVVS Fluid Coupling Parts, see "Installation & Operating Instructions for Turbo Couplings with Constant Filling", manual number 3626 - 011000 en.

**4.3 T,TV,TVV,&TVVS-XG**

**Bill of Material**

**Size: 422 Bolted Output Flange**

ITEM NO.	PART NO.	QTY.	DESCRIPTION
1830	304001072	8	Hex Bolt; M12 x 55 Grade 8.8
1840	304001149	8	Wave Washer; 12 mm
1900	304002294	1	Input Flange; 422
1901	304003598	6	Socket Head Cap Screw; 5/8" UNC 11 x 2" Long
1902,2002	304003886	12	5/8" Hi-Collar Lock Washer
1910,2010	304002158	2	Size 2.5 Gear Coupling Half Complete
2000	304002156	1	Output Flange; 422
2001	304003899	6	Socket Head Cap Screw; 5/8" UNC 11 x 3" Long
2004	304003900	6	Hex Bolt; M16 x 90 mm Grade 8.8

For T, TV, TVV, & TVVS Fluid Coupling Parts, see "Installation & Operating Instructions for Turbo Couplings with Constant Filling", manual number 3626 - 011000 en.

**4.5 T,TV,TVV,&TVVS-XG**

**Bill of Material**

**Size: 422 Old Design  
Short Shaft Gap**

ITEM NO.	PART NO.	QTY.	DESCRIPTION
50	304003528	1	Holding Bolt; ¾-10x3.5" Lg.
60	304002260	1	Lock Washer; ¾" Spring
1830	304001072	8	Hex Bolt; M12 x 55 Grade 8.8
1840	304001149	8	Wave Washer; 12 mm
1900	C032680	1	Input Flange 8.375" DIA. Pilot; 422 Old Design
1901,2001	304003641	12	Socket Head Cap Screw; 5/8" UNC 11 x 2" Long
1902,2002	304003886	12	5/8" Hi-Collar Lock Washer
1910,2010	304002158	2	Size 2.5 Gear Coupling Half Complete
2000	C032670	1	Output Flange 8.375" DIA. Pilot; Old Design 422
2005	TCR03160166	1	Hub Key; 422

For T, TV, TVV, & TVVS Fluid Coupling Parts, see "Installation & Operating Instructions for Turbo Couplings with Constant Filling", manual number 3626 - 011000 en.

**4.6 T,TV,TVV,&TVVS-XG**

**Bill of Material**

**Size: 422 ANDALEX**

ITEM NO.	PART NO.	QTY.	DESCRIPTION
1830	304001072	8	Hex Bolt; M12 x 55 Grade 8.8
1840	304001149	8	Wave Washer; 12 mm
1900	C032670	1	Input Flange 8.375" DIA. Pilot; 422 Old Design
1901	304003598	6	Socket Head Cap Screw; 5/8" UNC 11 x 2" Long
1902,2002	304003886	12	5/8" Hi-Collar Lock Washer
1910,2010	304002158	2	Size 2.5 Gear Coupling Half Complete
2000	304002900	1	Output Flange New Style Shortened to 1.76"; 422
2001	304005748	6	Socket Head Cap Screw; 5/8" UNC 11 x 2.5" Long
2005	304001080	6	Hex Bolt; M16 x 60 mm Grade 8.8

For T, TV, TVV, & TVVS Fluid Coupling Parts, see "Installation & Operating Instructions for Turbo Couplings with Constant Filling", manual number 3626 - 011000 en.

**4.7 T,TV,TVV &TVVS-XG**

**Bill of Material**

**Size: 487 Sleeve Design**

ITEM NO.	PART NO.	QTY.	DESCRIPTION
50	304005746	1	Holding Bolt; 7/8" UNC 9 x 3.5" Long
60	304005747	1	Lock Washer; 7/8" Spring
1830	304001072	12	Hex Bolt; M12 x 55 Grade 8.8
1840	304001149	12	Wave Washer; 12 mm
1900	304001708	1	Input Flange; 487
1901	304003598	8	Socket Head Cap Screw; 5/8" UNC 11 x 2" Long
1902,2002	304003886	16	5/8" Hi-Collar Lock Washer
1910,2010	304002159	2	Size 3 Gear Coupling Half Complete
2000	304001709	1	Output Flange; 487
2001	304005748	8	Socket Head Cap Screw; 5/8" UNC 11 x 2.5" Long
2003	304001710	1	Output Stub Shaft; 487
2004	304003598	9	Socket Head Cap Screw; 5/8" UNC 11 x 2" Long
2005	TCR03160174	1	Hub Key; 487
2006	304003886	9	5/8" Hi-Collar Lock Washer
2007	304003441	8	5/8" UNC 11 Nut

For T, TV, & TVV Fluid Coupling Parts, see "Installation & Operating Instructions for Turbo Couplings with Constant Filling", manual number 3626 - 011000 en.





**Voith Turbo, Inc. (U.S.A.)**

25 Winship Road

York, PA 17402

Phone: (717) 767-3200

Fax: (717) 767-3210

E-Mail: [information@voithusa.com](mailto:information@voithusa.com)

WWW: <http://www.voithusa.com>

**Voith Turbo, Inc. (Canada)**

2-106 Rayette Road

Concord, ONT L4K 2G3

Phone: (905) 738-1829

Fax: (905) 738-9462

**VOITH**

GROUP OF COMPANIES