

INSTRUCTIONS PERTAINING TO INSTALLATION, OPERATION, AND MAINTENANCE OF A COTTA TRANSMISSION HIGH SPEED GEARBOX

NOTE: This manual provides information about the installation of Cotta transmissions. Detailed overhaul, assembly, and repair information is not part of this manual. For repair information, consult the applicable blueprint drawing. For operational specifications, consult the specification sheet (form DE-0103) for the unit part number. To request the latest revision blueprint or operational specification sheet, call the Customer Service department at 608-368-5600. Operation and maintenance personnel responsible for this equipment should have this manual at their disposal and be familiar with its contents. Applying the information in the manual will result in consistent performance from the unit and help reduce downtime.

1. Receiving Inspection

The gear units and/or parts are properly boxed when shipped from the factory. A careful inspection should be made for in-transit damage when received. File all claims with the carrier before accepting the shipment. At this time, please notify Cotta.

Caution: If any damage is discovered after accepting shipment, do not attempt to operate the unit and contact Cotta.

2. Long Term Storage

If the unit is to be stored or not used for a period of time exceeding (1) month, it should be protected against corrosion. Coat all outside unpainted surfaces with a rust inhibitor. Seal the gearbox from ambient air by plugging the breather and covering any labyrinth seals with a protective film. It is highly recommended to operate the lube system with or without unit rotation for at least 5 minutes every month of non-use. If the unit is in storage, a rust-inhibiting compound that is compatible with the lube oil should be applied to all the internal components of the gearbox through a cover or inspection plate. Rotate the unit by hand while applying to insure that all components are protected. Avoid direct sunlight on the gearbox while in storage to prevent condensation on the interior from temperature changes. Note that the standard Cotta paint is not suitable for storage outside or in corrosive environments.

3. Lifting and Handling

Caution: Lifting provisions on Cotta components are for lifting of that component only and may not be adequate to lift customer mounted equipment such as shaft couplings, clutches, or driven equipment.

Use of proper equipment, rigging techniques, and safety procedures relative to the size and weight of the gearbox must be exercised in order to prevent personal injury and product damage. Threaded holes or lifting tabs are provided for lifting. These holes are for lifting the gearbox only. Select lifting eyebolts to obtain maximum thread engagement without contacting the bottom of the hole.

4. Installation

Most units are designed to be driven through a flexible coupling. However, it is still necessary to accurately align the shaft prior to coupling assembly by proper shimming of the unit mounting pads.

A coupling hub should never be hammered onto the drive shaft, as damage to the bearings will result.

Caution: Do not exceed the coupling manufacturer's specifications regarding alignment, maximum temperature for heated assembly, and proper lubrication.

Notice: It is the installer's responsibility to properly guard and/or shield the rotating equipment to prevent injury to personnel.

Cotta does not supply couplings, or specify alignment procedures. When selecting a coupling, consideration should be given to the noise and vibration dampening characteristics of the coupling. Noise or vibration transmitted through a coupling, or generated by the coupling itself, can cause gear rattle.

5. Plumbing

A good grade of clean pipe, hose, or tubing should be used. Do not use sealant tape to seal pipe threads or fittings. Use Loctite 565 or equivalent on all pipe threads.

Notice: The use of sealant tape voids any warranty!

Unless otherwise noted, feed and drain lines installed by the customer must not be smaller than the connection size to the gearbox.

If possible, mount the lube components below the oil level of the gearbox to prevent drainback when the lube system is not in use.

Caution: The gearbox may utilize orifices to control oil flow, which are easily plugged by foreign objects. It is important that the lube system be clean and free of any foreign objects and contaminants. Flush and clean all lines, fittings, and other components used in the fabrication of the lube system.

6. Lubrication

Units are shipped from the factory dry except for some residual oil from testing and must be filled to the proper level with lubricant specified on the nameplate. Contact Cotta for any technical information assistance concerning lubricant selection. Guard against contamination when filling.

Caution: The use of incorrect oil can cause gearbox damage and void any warranty.

Units operating with cooling and/or lube systems must be refilled to the proper level after a short run to charge the system. Do not check the oil level with the unit running.

7. Lube Oil Pumps

If supplied, the separate motor driven pump must operate in the same direction at all times. When wiring the pump motor, insure the motor is turning the proper direction by loosening a fitting on the discharge side to see oil is flowing. If not, reverse motor direction and check again.

8. Heat Exchanger

Heat exchangers are supplied (when requested) to keep the lube oil temperature within the operating range. If the exchanger is not supplied by Cotta, it is the customer's responsibility to supply the proper inlet oil temperature.

Heat exchangers are to be mounted between the discharge side of the pump and the unit sump or lube manifold.

A Cotta supplied water-cooled heat exchanger may be installed vertically or horizontally. The oil discharge port in either case must be on top to prevent air lock. In connecting a multi-pass exchanger, the shell fluid should enter the exchanger at the same end at which the tube fluid enters, with the oil piped to the shell side.

The user is to furnish adequate coolant supply at the proper temperature to the heat exchanger. In some areas, raw water is extremely corrosive and should be treated to prevent damage to the heat exchanger. Treating the water will also increase the time interval between cleanings of the heat exchanger. It is the users responsibility to insure that the coolant is compatible with the heat exchanger.

Note: If using salt water for coolant, make sure that the heat exchanger and all plumbing are designed for use with salt water

9. Filters

Most units are equipped with a filter. The proper micron filtration has been furnished with each unit.

Replace the filter element when the pressure drop through the filter is greater than the bypass pressure. Read the bypass pressure when the oil is at normal operating temperature. When element replacement is required, do not substitute a different filtration level without written approval of Cotta.

CAUTION: USE OF THE WRONG SIZE FILTER OR MICRON RATING COULD RESTRICT OR BLOCK THE OIL FLOW IN THE GEARBOX. POOR OIL CIRCULATION AND/OR FILTRATION CAN SEVERLY DAMAGE THE GEARBOX AND VOID ANY WARRANTY.

10. Electrical

Most units that have a Cotta supplied lube system are equipped with protective interlock switches to protect the unit from damage resulting from failure of the pressure lube system or improper cooling. Protective interlock switches for low pressure and high temperature are recommended if the customer supplies the lube system.

These switches may be wired to shut off the rotating equipment, operate a warning light, or sound an alarm. These interlocks are not pre-connected and must be interfaced with the users equipment by the installer.

Thermocouple ports are usually provided to monitor bearing outer race temperatures. It is recommended that high speed bearing temperatures be monitored at all times during operation and interfaced with the warning / shutdown circuitry. See operation section for maximum temperatures.

11. Start Up

Prior to starting the gearbox, make sure that the oil level is correct. When unit is equipped with a separate motor driven pump, the lube system should be started and reach full charge pressure prior to any unit rotation. Unless otherwise noted on the specification sheet for the model, the minimum start-up oil temperature is 90°F (32°C). Use sump heaters, run the lube system only, or run the unit at below 1/5 maximum output speed when the oil temperature is below these values.

The lube pressure at the manifold has been set at the factory, but due to varied pump locations, this should be checked and adjusted if necessary by the user. The inlet oil pressure and temperature should only be checked after the gearbox has reached the normal operating temperature. Monitor the pressure and temperature at lube system startup and adjust during the gearbox start-up period until the unit is at operating temperature.

It is desirable at this time to check proper adjustment of the protective interlock switches for both pressure and temperature.

Unless otherwise noted on the model specification sheet, start the unit at slow speed, at or below 1/5 maximum output speed, while checking for unusual noise, vibration, leakage, or other problems.

12. Break-In Operation

After 100 hours or 3 months of break-in operation, whichever occurs first, the oil should be drained, the case flushed with clean oil, and refilled with clean oil of the proper specification. At this time, replace the filter element. After the break-in, the oil and filter element should be changed every 2500 hours of operation or every six months, whichever occurs first, UNLESS OTHERWISE NOTED ON THE NAMEPLATE. Where operating conditions are severe, such as moist or dusty atmosphere, presence of chemical fumes, or outdoor operation, a more frequent oil change may be necessary.

13. Safety Notice

If unit is equipped with SAE and/or aerospace accessory pads, do not exceed the maximum accessory weight or maximum overhung moment as damage to both the unit and driven equipment may result.

When unit is equipped with a drive spline, the splines should be lubricated with a high pressure lubricant such as Dow Corning® 321 or equivalent if the spline is not pressure lubricated with oil. Reapply the lubricant at 250 operational hour intervals maximum.

All driven equipment should be mounted and operated according to the manufacturer's operating instructions.

To guard against damaging rotordynamic vibrations, a lateral critical frequency analysis should be performed by the system builder. Cotta provides no guarantees against lateral or torsional critical frequencies.

Caution: Safe operating practices should be employed by all personnel servicing this unit. Cotta will not be responsible for personal injury resulting from careless use of tools, lifting equipment, or unaccepted maintenance/working practices. Because of possible danger to person(s) or property from accidents, which may result from the use of manufactured products, it is important that correct procedures be followed. Products must be used in accordance with the engineering information specified. Proper installation, maintenance, and operation procedures must be observed. Daily and/or periodic inspection should be made as necessary to assure safe operation under prevailing conditions. Proper guards and other suitable safety devices or procedures that may be desirable or specified in safety codes should be provided. These devices are neither provided by Cotta nor are they the responsibility of Cotta.

14. Operation

It is the customer's responsibility to install, maintain, and operate the unit in accordance with the manufacturer's specifications and recommendations. It is up to the customer to ensure that:

- 1: Maximum operating speeds are not exceeded.
- 2: Maximum acceleration/deceleration rates are not exceeded.
- 3: Maximum operating torques are not exceeded.
- 4: Only lubricant grades specified are used.

Caution: The use of substitute lubricants may generate unacceptable heat and insufficiently lubricate internal components. This may result in immediate component damage and may void any warranty.

- 5: Appropriate warm-up procedures are adhered to.

Caution: It is required to warm up this equipment to maintain proper operation. The lack of a warm-up period may result in immediate component damage and may void any warranty. See Startup Section.

- 6: Bearing outer race temperatures do not exceed 210°F. If exceeded, shut down and contact Cotta.
- 7: Lubricant temperatures do not exceed 225°F. If exceeded, shut down and contact Cotta.

15. Shut Down

Normal shut downs require post lube for three minutes minimum. Emergency shut down requires post lube until equipment rotation has stopped.

16. Maintenance

Operational maintenance amounts to little more than routine care at regular intervals.

- 1: Inspect oil level at startup and add oil as required.
- 2: Check shaft alignment occasionally and correct if necessary.
- 3: Keep all bolts and fittings properly torqued.
- 4: Replace leaky gaskets and seals.
- 5: Prevent inside and outside corrosion.
- 6: Should any adverse operating conditions occur, internal inspection may be required. Consult with Cotta in this instance.
- 7: Maintain proper oil change intervals, see section 12.
- 8: Drain, flush entire system, and refill oil, replace oil filter element and replace heat exchanger in the event of a failure or if contaminants are introduced to the system.

17. Servicing

No attempt should be made to service this unit with any substitute parts whatsoever without written approval of Cotta Transmission Company. The sale of service parts to a user does not imply authorization to repair a Cotta gearbox. Do not repair a Cotta gearbox in the warranty period without the written authorization of Cotta.

18. General Notes

- Oil will aerate in the gearbox under normal operating conditions.

- The temperature of the gearbox casing should not exceed 220 degrees F.
- Cotta manufactures many different models of gearboxes, so step by step assembly and disassembly instructions are not part of this manual.
- Cotta uses a silicone rubber sealant on unmachined interfaces or Loctite 515 on machined interfaces instead of gaskets on newer designs where possible. Gaskets cannot be replaced with Loctite 515 or vice versa. Gaskets can be replaced with silicone rubber sealant on unmachined interfaces and vice versa.
- Most gears are assembled to the mating shafts using a key and interference fit. A hydraulic press will be required to separate them. Heating the gear to re-assemble is recommended. Do not heat any component more than 300 degrees F.
- Bearing locknuts and lockwashers should not be reused.

19. Contact Information

COTTA TRANSMISSION COMPANY, LLC
1301 Prince Hall Drive
Beloit, WI 53511-4439
PHONE: 608-368-5600
FAX: 608-368-5605
www.cotta.com

20. Warranty

Cotta's warranty is available by contacting Cotta at the address above, or by visiting our website at www.cotta.com.