

**Installation  
Operation &  
Maintenance Data**

**I S S U E D**

**ENGINEERING DEPT.  
COTTA TRANSMISSION CO.**



THIS SYMBOL MEANS A WARNING OR CRITICAL INFORMATION.



THIS SYMBOL IS USED TO LIST ADDITIONAL INFORMATION AND TIPS.



**PLEASE READ AND OBSERVE ALL THE INFORMATION IN THIS MANUAL. FAILURE TO COMPLY WITH THE RECOMMENDATIONS AND PROCEDURES DESCRIBED HEREAFTER CAN RESULT IN PREMATURE COMPONENT FAILURE AND/OR WARRANTY DENIAL.**



ALL PERSONNEL SERVICING THIS UNIT SHOULD EMPLOY SAFE OPERATING PROCEDURES. COTTA TRANSMISSION CO, LLC (COTTA) WILL NOT BE RESPONSIBLE FOR PERSONAL INJURY RESULTING FROM CARELESS USE OF HAND TOOLS, LIFTING EQUIPMENT, POWER TOOLS, OR UNACCEPTED MAINTENANCE/WORKING PRACTICES. BECAUSE OF THE 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. INSPECTIONS SHOULD BE MADE AS NECESSARY TO ASSURE SAFE OPERATION UNDER PREVAILING CONDITIONS. PROPER GUARDS AND OTHER SUITABLE SAFETY DEVICES OR PROCEDURES THAT MAY BE DESIREABLE OR SPECIFIED IN SAFETY CODES SHOULD BE PROVIDED. THESE DEVICES ARE NEITHER PROVIDED BY COTTA, NOR ARE THEY THE RESPONSIBILITY OF COTTA.



# GENERAL TECHNICAL MANUAL INSTALLATION, OPERATION AND MAINTENANCE FOR A COTTA TRANSMISSION

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**WARNING: THIS TRANSMISSION IS SHIPPED WITHOUT OIL. FILL THE UNIT WITH OIL TYPE AND QUANTITY AS SPECIFIED PRIOR TO OPERATION OF THE 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. To request the latest revision blueprint, 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. UNIT 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.

***NOTIFY COTTA OF ANY DAMAGE TO THE GEARBOX UPON RECEIPT.***

## 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. 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. The rust inhibitor can be applied through a cover or inspection plate. If no plate is supplied, the unit can be completely filled with lube oil. Note that the standard Cotta paint is not suitable for storage outside or in corrosive environments.

## 3. LIFTING AND HANDLING



**AVOID DIRECT SUNLIGHT ON THE GEARBOX WHILE IN STORAGE TO PREVENT CONDENSATION.**



**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

Many gearboxes are mounted to an engine flywheel using a flexible coupling or over center clutch. If the gearbox is mounted to an engine flywheel, several checks should be made to insure successful operation. Contact the engine manufacturer for their mounting procedure or use SAE specification J1033(Procedure for measuring bore and face runout of flywheels, flywheel housing, and flywheel adapters.) If the transmission exceeds the allowable measurement, contact Cotta for assistance.

**(PROPER INSTALLATION REDUCES THE POSSIBILITY OF BEARING FAILURE, SHAFT BREAKAGE, AND EXCESSIVE DRIVING PLATE TOOTH WEAR RESULTING FROM MISALIGNMENT.)**

It is also necessary to check the engine crankshaft axial endplay prior to and after mounting the gearbox. If the endplay measurement is not the same, this would indicate possible interference. Remove the gearbox, determine the problem source, and correct prior to reinstallation of the gearbox.

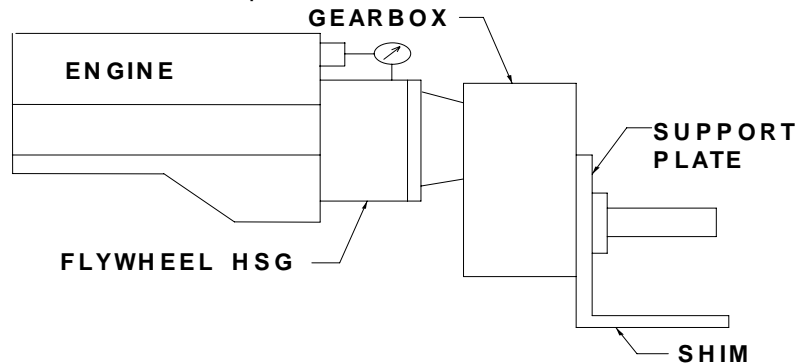


**REGARDLESS OF THE PROBLEM SOURCE, COTTA WILL NOT BE RESPONSIBLE FOR DAMAGE TO THE ENGINE OR SYSTEM AS A RESULT OF POSSIBLE INTERFERENCE.**

The gear units are supplied with a method of mounting to a base. Some units have feet with clearance holes for direct mounting. Other gearboxes have threaded holes on the face or on the side to mount with supports of the customer's design. After the engine is mounted to the base, the gearbox is to be shimmed under the supports for proper alignment using the following procedure.

- 4.1 Attach a dial indicator to the engine block with the stem resting on the top of the engine flywheel housing.
- 4.2 Set indicator to zero.

- 4.3 Install the gearbox to the engine using enough shims to allow assembly.
- 4.4 Install mounting bolts to gearbox feet. Note any deflections on the indicator, and shim as required to return the indicator to zero.



**WHEN ASSEMBLING A COUPLING OR SHEAVE TO A GEARBOX SHAFT, NEVER HAMMER OR PRESS USING THE GEARBOX BEARINGS AS A FULCRUM OR DAMAGE WILL RESULT.**

## 5. FLYWHEEL COUPLING

The gearbox may be equipped with several types of flywheel couplings including overcenter clutches, torsional couplings, and drive plates. Some of these may have pre-operational checks or initial adjustments that must be made. If anything other than an overcenter clutch is used, refer to the manufacturer's instructions or contact Cotta for instructions. Overcenter clutch information is included in the following.

- 5.1. Before operation, lubricate the throwout collar using the grease fitting provided on the outside of the bell housing. Observe through the access hole in the bell that the collar is sufficiently greased but not over greased. A bronze collar should be re-lubed every 10 hours, a ball bearing collar should be re-lubed every 100 hours with any high grade, lithium based, short fiber grease approved for use with anti-friction bearings with operating temperatures of 200 degrees F (NLGI #2 grease).
- 5.2. The clutch remains in or out of engagement until changed by the operator. Engagement should progress from "release" to "on center" to slightly "over center" where the clutch locks firmly. Disengagement is positive, using a toggle

arrangement. A new clutch may require several adjustments until the friction material is worn in. If the clutch will not pull the load or heats excessively, it may need adjustment.



**THE CLUTCH IS NOT ADJUSTED BY COTTA. DO NOT OPERATE THE GEARBOX UNTIL INITIAL CLUTCH ADJUSTMENTS ARE MADE.**

5.3. To adjust a Twin Disc clutch, remove the hand hole cover on the bell housing and rotate clutch until adjustment lock pin can be reached. Disengage the lock pin and turn the adjusting yoke or ring to the right, or clockwise, until the operating lever requires the correct force to engage. Force required for various clutches are listed below. The length dimension given is the distance in inches from the hand lever cross shaft centerline to the area on the hand lever to place a spring scale. Maximum and minimum values in pounds are given for measuring the spring force. If the gearbox is equipped with any other manufacturer's clutch, see the manufacturer's instructions.

Clutch Model	Length Dimension	Force in Pounds
C106, C107	13.6	58 to 76
C108	13.6	63 to 83
C110	13.6	78 to 103
SP111	13.6	96 to 125
SP211	13.6	118 to 156
SP114, SP214, SP314	21.3	123 to 163
IBF214, IBF314	21.3	135 to 180
SP218, SP318	27.3	226 to 297
IBF318	39.7	172 to 227
SP321, IBF321	39.7	155 to 204

## 6. LUBRICATION

The gearbox is shipped from the factory empty except some residual oil from testing and must be filled to the proper level with lubricant specified on the nameplate. Cotta technical bulletin TB97-101 (Lubrication of Cotta Transmissions) lists recommended oil viscosities. In addition, the nameplate lists the recommended oil viscosity based upon the ambient temperature in which the gearbox will be operated. The 80VX1023 and 80VX1048 nameplates are not superceded by TB97-101. In these cases, the oil viscosity is listed on the nameplate.

Fill the gearbox to the proper level as indicated by sight glass, dipstick, or level plug, and run the gearbox for 5 minutes. (This will ensure that all of the hoses and manifolds are full.) Check the oil level in the box, and add any additional oil needed to achieve the proper oil level. ***(AVOID ANY CONTAMINATION OF THE OIL WHEN FILLING THE GEARBOX)*** A good grade of clean hose or pipe should be used if user is supplying any plumbing.



**DO NOT CHECK THE OIL LEVEL WITH THE UNIT RUNNING. SOME GEARBOXES HAVE INTERNAL OIL RESERVOIRS THAT REQUIRE A DRAIN BACK PERIODS. GEARBOXES OF THIS TYPE HAVE A SPECIAL NAMEPLATE ADJACENT TO THE LEVEL GAGE.**



**DO NOT USE SEALANT TAPE TO SEAL PIPE THREADS OR FITTINGS.**

**THE USE OF SEALANT TAPE VOIDS ANY WARRANTY!**



## 7. LUBRICATION PUMP

Some gearboxes are supplied with lube pumps. A variety of different pumps are supplied depending on the requirements of the gearbox. If removing the pump for service, note the orientation of the pump inlet and outlet ports relative to the shaft centerline. Improper orientation will result in the suction and pressure ports to be reversed, which can cause damage to the gearbox.

## 8. HEAT EXCHANGER

A heat exchanger is used on some gearboxes to keep the lube oil temperature within the operating range. If the lube system includes a heat exchanger, the customer is to furnish an adequate coolant supply at the proper temperature. 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.



**IF USING SALT WATER FOR COOLANT, MAKE SURE THAT THE HEAT EXCHANGER AND ALL PLUMBING ARE DESIGNED FOR USE WITH SALT WATER.**

## 9. FILTER

An oil filter will be supplied with a gearbox if the lube system requires the filtration of larger particles from the oil. Replace the filter element when the pressure drop through filter is greater than the bypass pressure. Read bypass pressure when oil is at normal operating temperature. When element replacement is required, do not substitute a different filtration level without written approval from Cotta.



**USE OF THE WRONG SIZE FILTER COULD RESTRICT OR BLOCK THE OIL FLOW IN THE GEARBOX. POOR OIL CIRCULATION CAN SEVERLY DAMAGE THE GEARBOX.**

## 10. ELECTRICAL

Some gearboxes may be supplied with an interlock switch to protect the unit from damage caused by a pressure lube system failure or improper cooling. The switch may be wired by the user to shut off the rotating equipment, operate a warning light, or sound an alarm.

## 11. START UP

Prior to starting the gearbox, make sure that the oil level is correct. Some gearboxes with a pressurized lube oil system will be supplied with a lube manifold. The pressure at the manifold is set at the factory, but should be checked and adjusted at the relief valve by the user if necessary. The pressure should only be checked after the gearbox has reached the normal operating temperature.

If starting the gearbox below 50 degrees F., Cotta recommends the gearbox be run with no load or a slight load until the lube oil temp has reached 90 degrees F. If this is not possible, oil sump heaters may be required.

## 12. BREAK-IN OPERATION

After 100 hours or 3 months of operation, whichever occurs first, the oil should be drained, the case flushed with a fluid that is compatible with the gearbox oil, and the case refilled with clean oil of the proper specification. After the first oil change, the oil should be changed every 2500 hours or 6 months, whichever occurs first. **(UNLESS OTHERWISE NOTED ON THE NAMEPLATE.)** When operating in a severe environment (i.e. moist, dusty, outdoors, or in a hazardous environment) more frequent oil changes may be necessary.

## 13. SAFETY NOTICE

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:

- 14.1. Maximum operating speeds are not exceeded.
- 14.2. Maximum acceleration/deceleration rates are not exceeded.
- 14.3. Maximum operating torques are not exceeded.
- 14.4. Only lubricants specified on the nameplate are used.



**THE USE OF SUBSTITUTE LUBRICANTS MAY GENERATE UNACCEPTABLE HEAT AND INSUFFICIENTLY LUBRICATE INTERNAL COMPONENTS. THIS MAY RESULT IN IMMEDIATE COMPONENT DAMAGE.**

- 14.5. Appropriate warm-up procedures are adhered to.



**IT IS REQUIRED TO WARM UP THIS EQUIPMENT TO MAINTAIN PROPER OPERATION. LACK OF A WARM-UP PERIOD MAY RESULT IN IMMEDIATE COMPONENT DAMAGE. SEE START UP SECTION.**

## 15. MAINTENANCE

Operational maintenance consists of routine care at regular intervals.

- 15.1. Inspect oil level at startup and add oil as required.
- 15.2. Check shaft alignment occasionally and correct if necessary.
- 15.3. Keep all bolts and fittings properly torqued.
- 15.4. Replace leaky gaskets and seals.
- 15.5. Prevent inside and outside corrosion.
- 15.6. Should any adverse operating conditions occur, internal inspection may be required. Consult with Cotta in this instance. Note that any disassembly without prior express written consent from Cotta voids any warranty.
- 15.7. Maintain proper oil change intervals, see section 12.

## 16. SERVICING

No attempt should be made to service this unit with any substitute parts without written approval from Cotta. The main Case and Cover of the gearbox are sometimes manufactured as a set and should not be individually replaced. Contact Cotta with the unit serial number for part availability.

## 17. GENERAL NOTES

- 17.1. Oil will aerate in the gearbox under normal operating conditions.
- 17.2. The temperature of the gearbox casing should not exceed 220 degrees F.
- 17.3. Cotta manufactures many different models of gearboxes, so step by step assembly and disassembly instructions are not part of this manual. The following is a list of general assembly comments.



**Note: The warranty is void in the event that repairs of the goods are made by anyone other than Cotta without prior authorization from Cotta.**

- 17.3.1. Assembly and disassembly of the gearbox should be done with the shafts vertical. The case and cover are dowel pinned together, threaded puller holes are provided to aid separation.



- 17.3.2. Cotta uses a silicone rubber sealant or Loctite 515 instead of gaskets on newer designs where possible. Gaskets cannot be replaced with sealant or vice versa.
- 17.3.3. Most gearboxes use tapered roller bearings. These bearings must be shimmed to achieve the end play setting noted on the assembly drawing. Endplay setting and checking should be done with the shaft vertical.
- 17.3.4. Most gears are assembled to 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.
- 17.3.5. Some shafts use tapered roller bearing kits. These consist of two bearings and two spacers. Do not replace individual components in the kit without insuring proper bench endplay. Contact Cotta for more information.
- 17.3.6. Bearing locknuts and lockwashers should not be reused.

## **18. CONTACT INFORMATION**

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