



SHOP REBUILD AND SERVICE PARTS MANUAL



DANA ELECTRIC TRANSAXLE

STARTING MODEL YEAR: 2008

SHOP REBUILD AND PARTS MANUAL

DANA ELECTRIC TRANSAXLE



E-Z-GO Division of Textron reserves the right to make design changes without obligation to make these changes on units previously sold and the information contained in this manual is subject to change without notice.

E-Z-GO Division of Textron is not liable for errors in this manual or for incidental or consequential damages that result from the use of the material in this manual.

CUSTOMER SERVICE DEPARTMENT IN USA PHONE: 1-800-241-5855, FAX: 1-800-448-8124 OUTSIDE USA PHONE: 010-1-706-798-4311, FAX: 010-1-706-771-4609 E-Z-GO DIVISION OF TEXTRON, INC., 1451 MARVIN GRIFFIN RD., AUGUSTA, GA 30906-3852 U.S.A.



Dana Electric Transaxle Shop Rebuild and Parts Manual

NOTES

Notes:		



INTRODUCTION

Read all of each section before attempting any procedure. Pay particular attention to all Warnings, Cautions, and Notes.

HOW TO USE THIS MANUAL

This manual is designed to suit the needs of mechanics at all levels of experience with the E-Z-GO electric transaxle. The outline format will allow the mechanic to choose the level of instructional detail needed to completely disassemble, diagnose, repair/overhaul, and reassemble the transaxle.

The manual is divided into four major operational sections, which are each divided into smaller operational sections. At the beginning of each major section is a list of tools that will be required to perform the operations desired in that section. Do not use non-specified tools (Vise-grips[®], hammers, adjustable wrenches, etc.). The use of these tools could cause permanent damage to the transaxle components.

The objective of this manual is to provide instructions for the disassembly and reassembly of the transaxle after it has been removed intact from the vehicle. Although we strongly recommend that the entire transaxle be removed from the vehicle before attempting to disassemble or repair any part of it, there are several operations covered that may be completed, on only one side of the transaxle at a time, without removing the entire transaxle:

- 1. Remove and inspect/replace one axle shaft and/or axle shaft bearing.
- 2. Remove and inspect one axle tube.
- 3. Inspect/replace one axle oil seal in the transaxle casing.
- 4. Remove and inspect/replace the input shaft, shifter shaft, and governor shaft oil seals.

We strongly recommend that no matter what your experience level, you use this manual as a guide when disassembling, repairing/overhauling, and reassembling the transaxle. Before working on the transaxle, read and understand the text and in particular each WARNING, CAUTION, and NOTE.

Some illustrations may show components that differ from your transaxle. This is the result of ongoing improvements to the transaxle design.

WARNINGS, CAUTIONS, AND NOTES

Throughout this manual, the following **WARNINGS**, **CAUTIONS**, and **NOTES** are used. For the protection of all personnel and the vehicle, be aware of and observe the following:

🏠 WARNING

A WARNING indicates a hazardous condition which could result in serious injury or death.

CAUTION

A CAUTION indicates a condition that may result in damage to the vehicle or surrounding facilities.

NOTE

A NOTE indicates a condition that should be observed.

IMPORTANT SAFETY WARNINGS

In any product, components will eventually fail to perform properly as the result of normal use, age, wear, or abuse.

It is virtually impossible to anticipate all possible component failures or the manner in which each component may fail.

Be aware that a vehicle requiring repair indicates that the vehicle is no longer functioning as designed and therefore should be considered potentially hazardous. Use extreme care when working on any vehicle. When diagnosing, removing, or replacing any components that are not operating correctly, take the time to consider the safety of yourself and others around you if the component should move unexpectedly.

Some components are heavy, spring-loaded, highly-corrosive, and explosive or may produce high amperage or reach high temperatures. Gasoline, carbon monoxide, battery acid, and hydrogen gas could result in serious bodily injury to the technician/mechanic and bystanders if not treated with utmost caution. Be careful not to place hands, face, feet, or body in a location that could expose them to injury should an unforeseen situation occur.

Always use the appropriate tools listed in the tool list and wear approved safety equipment.



INTRODUCTION

Read all of each section before attempting any procedure. Pay particular attention to all Warnings, Cautions, and Notes.

WARNING

Before working on vehicle, remove all jewelry (watch, rings, necklaces, etc.).

Be sure that no loose clothing or hair can contact moving parts.



Wear eye protection when working on or around vehicle. In particular, use care when working around batteries, or when using solvents or compressed air.

Use care not to contact hot objects.

Before attempting to operate or adjust the powertrain, the rear of the vehicle must be raised and supported on jack stands.

Wear OSHA approved clothing and eye protection when working on anything that could expose the body or eyes to potential injury. In particular, use care when working with or around batteries, compressed air, or solvents.

Always turn the key switch to 'OFF' and remove the key before disconnecting a live circuit.

When connecting battery cables, pay particular attention to the polarity of the battery terminals. Never confuse the positive and negative cables.

Battery posts, terminals and related accessories contain lead and lead compounds. Wash hands after handling.

Set the parking brake before performing any work on the vehicle.

Keep all smoking materials, open flame, or sparks away from gasoline or batteries.

If repairs are to be made that will require welding or cutting, the battery and fuel tank must be removed and the fuel system drained.

Never operate the starter with the spark plugs removed unless the ignition system has been disabled and the engine/exhaust is cold. Fuel expelled from the cylinders could be ignited by the ignition system or the hot exhaust system.

Never work on an engine that is hot.

Never work around or operate a vehicle in an environment that does not ventilate exhaust gases from the area.

Exhaust gas (carbon monoxide) is deadly. Carbon monoxide is an odorless gas that is formed as a natural part of the incomplete combustion of hydrocarbon fuels. Carbon monoxide is a dangerous gas that can cause unconsciousness and is potentially lethal.

The following are symptoms of carbon monoxide inhalation:

- Dizziness
- Vomiting
- Intense headache
- Muscular twitching
- Weakness and sleepiness
- Throbbing in temples

If experiencing any of these symptoms, get fresh air immediately.

Never test the ignition system without either connecting the spark plug lead to a tester or spare grounded spark plug.

If the spark function is to be observed at the spark plug, be sure to install a spare spark plug into the open cylinder before operating the starter.

Never test the function of a fuel pump in the vicinity of a hot engine or other source of flame or combustion.

Never confuse the hoses to and from the fuel pump. Verify that the carburetor and pulse lines are correctly installed before starting the engine (see FUEL SYSTEM Section in your Repair and Service Manual).

Aerosol containers of battery terminal protectant must be used with extreme care. Insulate the metal container to prevent the metal can from contacting battery terminals which could result in an explosion.



TABLE OF CONTENTS

TITLE

PAGE

Transaxle Disassembly

Differential cover Plate Removal	A-1
Axle Shaft Assembly Removal	. A-3
Input Gear Assembly Removal	
Differential-Carrier Assembly Removal	
Intermediate Gear Assembly Removal	A-6

Inspection of Parts

Oil Seal InspectionB	-1
Bearing InspectionB	
Cover Plate Inspection	6-1
Gear Teeth Inspection	6-1

Transaxle Reassembly

Intermediate Gear Assembly Installation	C-2
Differential-Carrier Assembly Installation	
Input Gear Assembly Installation	
Axle Shaft Installation	
Differential Cover Plate Installation	C-6

Illustrated Parts Breakdown

TABLE OF CONTENTS

Notes:	



Tool List

Qty. Required

Extension, 4", 3/8" drive 1
Small diameter pick-up magnet1
Rubber mallet, medium 1
Snap ring pliers, medium 1
Snap ring pliers, small1
Standard pliers 1
Seal puller 1
Ratchet, 3/8" drive 1
Ratchet, 1/2" drive 1
Flat blade screwdriver, small 1
Phillips screwdriver, #21
Socket, 12mm, 3/8" drive 1
Socket, 14mm, 3/8" drive 1
Socket, 17mm, 3/8" drive 1
Socket, 1/2", 3/8" drive 1
Socket, 1 1/8", 1/2" drive 1
Socket, 15/16", 1/2" drive 1
Combination wrench, 1/2" 1
Lug wrench, 3/4" 1

NOTE

It is assumed that the wheels have been removed, the oil drained from the transaxle, and that the transaxle has been removed from the vehicle. If these things have not been done, do so before continuing with this section. Refer to the Repair and Service Manual of the specific vehicle for information and safety considerations when removing the transaxle.

Press-fit shaft bearings should be cleaned and inspected; and replaced only if they appear to be damaged or excessively worn. Replace bearings that are pitted, nicked, burred, discolored, or that rotate roughly or noisily.

A WARNING

Keep work area clean and well organized while performing the operations described in this manual. This will help prevent accidents and reduce the possibility of mistakes that could damage or impair the performance of the transaxle.



Because some mating parts with wear surfaces were machined together when the transaxle was manufactured, or have established wear patterns during operation, the reassembly of parts in their original positions and orientations, with their original mating parts, is critical to the performance and life expectancy of the transaxle. Mark and sort all parts as they are disassembled so that they will be reassembled and installed in their original positions.

Differential Cover Plate Removal

1. Remove rubber plug. Take care not to damage the plug flange. (Ref Fig. A-1 on page A-1) (Ref Fig. A-2 on page A-1)



Fig. A-1 Rubber Plug Removal, Step 1



Fig. A-2 Rubber Plug Removal, Step 2

┲┛┖╹

2. Remove ten bolts from differential cover plate. (Ref Fig. A-3 on page A-2) (Ref Fig. A-4 on page A-2)



Fig. A-3 Differential Cover Plate, Assembled

 Carefully insert a rigid gasket scraper between the cover plate and the differential housing. Pry gently and remove differential cover plate. Use caution when prying to avoid bending cover plate. (Ref Fig. A-5 on page A-2) (Ref Fig. A-6 on page A-2)



Fig. A-5 Removing Differential Cover Plate



Fig. A-4 Removing Bolts from Differential Cover Plate



Fig. A-6 Bolts and Differential Cover Plate Removed



Axle Shaft Assembly Removal

1. Remove outside axle nut, spacer, and hub from driver-side axle tube, using a 15/16" socket. Repeat on passenger-side axle tube. (Ref Fig. A-7 on page A-3) (Ref Fig. A-8 on page A-3)



Fig. A-7 Assembled End of Axle Tube

2. Remove outer snap ring and axle shaft from driver-side axle tube. The bearing, inner snap ring, and oil seal remain assembled to axle shaft. Repeat on passenger-side axle tube. (Ref Fig. A-9 on page A-3) (Ref Fig. A-10 on page A-3)



Fig. A-9 Axle Shaft, Outer Snap Ring, and Bearing Shown Assembled in Axle Tube



Fig. A-8 Hardware and Hub Removed from End of Axle Tube



Fig. A-10 Removing Axle Shaft From Axle Tube

3. Remove bearing, inner snap ring, and oil seal from driver-side axle shaft. Repeat on passenger-side axle shaft.



Input Gear Assembly Removal

1. At axle housing, using a seal puller, remove oil seal from Input Gear Assembly. Discard oil seal. (Ref Fig. A-11 on page A-4)



Fig. A-11 Removing Oil Seal from Input Gear Assembly

2. At axle housing, remove retaining ring from input gear assembly. (Ref Fig. A-12 on page A-4)



Fig. A-12 Removing Retaining Ring from Input Gear Assembly

 At axle housing, remove input gear assembly. The input shaft bearing and housing should be a slipfit. Use channel-lock or standard pliers for gripping and removing. Discard O-ring found in the differential housing groove. (Ref Fig. A-14 on page A-4). Two bearings remain assembled to input gear assembly. (Ref Fig. A-13 on page A-4) (Ref Fig. A-14 on page A-4)



Fig. A-13 Oil Seal, Retaining Ring, and Input Gear (With Two Bearings Attached) Removed

4. Remove O-ring from axle housing. Discard O-ring.



Fig. A-14 Axle Housing with Input Gear Assembly and Hardware Removed



Differential-Carrier Assembly Removal

 From axle housing, remove four saddle bolts from saddles, then remove saddles. (Ref Fig. A-15 on page A-5)

NOTE

Note the alignment marks on both the housing and saddles. Saddles must be reassembled on the same side from which removed. If alignment marks are missing, use a permanent marker to mark saddle and housing.



Fig. A-15 Removing Saddle Bolts from Saddles

2. Remove differential-carrier assembly from axle housing. (Ref Fig. A-16 on page A-5)



Fig. A-16 Removing Differential-Carrier Assembly from Axle Housing



Fig. A-17 Saddle Bolts, Saddles, and Differential-Carrier Assembly Removed

3. Remove drive gear (2) from differential-carrier (3) by removing four locknuts and four hex head bolts (1).

NOTE

Do not remove bearings from differential-carrier.

The differential-carrier is replaced as a single unit. No disassembly of the clutch is required.



If working on a hard surface, handle the ring gear carefully to prevent damage to the ring gear teeth.



Intermediate Gear Assembly Removal

1. Remove two end cap plugs from axle housing. (Ref Fig. A-18 on page A-6)



Fig. A-18 End Cap Plug



To remove end cap plug, drill a small hole in the plug, insert a screw into the drilled hole, and pull the plug out using pliers. Do not pry the plug out of the axle housing. Prying the end plug out of the axle housing may cause damage to the housing.

2. Using snap-ring pliers, remove two retaining rings from axle housing. (Ref Fig. A-19 on page A-6)



Fig. A-19 Removing Retaining Rings

 Push intermediate gear assembly (1) toward wide opening of axle housing (2) and remove bearing (3) from intermediate gear assembly shaft (4).

- 4. Push intermediate gear assembly (1) to narrow side of gear housing and remove bearing (5) from intermediate gear assembly shaft (4).
- 5. Remove intermediate gear assembly by tilting upward (on wide side) and lifting outward to clear slot. (Ref Fig. A-20 on page A-6)





- 6. Remove intermediate gear assembly from axle housing.
- 7. If damaged, remove two O-rings from intermediate gear assembly shaft. Discard O-rings.
- 8. Remove two O-rings from axle housing. Discard O-rings. (Ref Fig. A-21 on page A-6)



Fig. A-21 O-Rings Removed from Axle Housing



INSPECTION OF PARTS

NOTE

We strongly recommend that all parts found to be damaged be replaced.

CAUTION

All parts must be thoroughly cleaned, and free of all dirt, oil, grease, or residue of any kind before beginning this section. It is especially important that your work area be clean and well-organized while performing the operations described in this section.

Oil Seal Inspection

NOTE

It is recommended that any oil seals that are removed, (and all seals, if a transaxle is more than one year old when disassembled), be replaced with new ones.

1. Perform visual inspection of all oil seals for damage of any kind. Replace as necessary.

Bearing Inspection

NOTE

Remove press-fit bearings only if they are damaged, excessively worn, or if it is necessary in order to remove other parts. It is recommended that removed press-fit bearings be replaced with new ones.

1. Perform visual inspection of all bearings for damage and excessive wear. Replace bearings that are pitted, nicked, burred, discolored, or that rotate roughly or noisily.

Cover Plate Inspection

1. Perform visual inspection of inside of differential cover plate for contact with gear teeth. Replace as necessary.

Gear Teeth Inspection

1. Perform visual inspection of gears for unusual wear patterns, and chipped, broken, or missing teeth. Replace as necessary.

INSPECTION OF PARTS

Notes:	



Tool List

Qty. Required

Extension, 4", 3/8" drive, 1
Ball peen hammer, small1
Seal installer 1
Rubber mallet, medium 1
Snap ring pliers, medium 1
Snap ring pliers, small1
Standard pliers 1
Mechanical press 1
Non-ferrous punch, medium1
Non-ferrous punch, small 1
Ratchet, 3/8" drive 1
Ratchet, 1/2" drive 1
Flat Blade screwdriver, medium 1
Phillips screwdriver, #21
Socket, 12mm, 3/8" drive 1
Socket, 14mm, 3/8" drive 1
Socket, 17mm, 3/8" drive 1
Socket, 1/2", 3/8" drive 1
Socket, 1 1/8", 1/2" drive 1
Socket, 15/16", 1/2" drive 1
Combination wrench, 1/2" 1
Lug wrench, 3/4" 1
Torque wrench, 3/8" drive 1



Prior to transaxle reassembly, all parts must be thoroughly cleaned and free of dirt, oil, grease, or residue of any kind, free of nicks, burrs, or damage of any kind to wear surfaces, and inspected for excessive wear. Parts that are damaged or are not within dimensional specifications should be replaced.

Because some mating parts with wear surfaces were machined together when the transaxle was manufactured, or have established wear patterns during operation, the reassembly of transaxle parts in their original positions and orientations with their original mating parts is critical to the performance and life expectancy of the transaxle.

Make sure all threaded surfaces are clean and free of gasket material/residue.

When tightening a number of screws or bolts in a given pattern, tighten them in two stages. Tighten them to 1/2 of specified torque in one pass through the pattern, and then to specified torque on the second pass.

NOTE

Fasteners that are plated, or are lubricated when installed, are considered "wet" and require approximately 80% of the specified torque for "dry" fasteners. All transaxle fasteners are considered "wet".

NOTE

Because assemblies of moving parts establish wear patterns together, it is recommended that all parts of an assembly be replaced if one part is found to be damaged. Noise levels during operation may be increased if only individual parts are replaced.

Intermediate Gear Assembly Installation

1. Lubricate two O-rings with 30W motor oil and install them into axle housing. (Ref Fig. A-1 on page C-2)



Fig. A-1 Intermediate Gear Assembly O-Rings Installed

- 2. If damaged or removed, install two new O-rings on intermediate gear assembly shaft.
- 3. Tilt intermediate gear assembly (1) upward on wide opening of axle housing (2), lower over slot, and slip into gear housing.



Fig. A-2 Intermediate Gear Assembly Components

4. Push intermediate gear assembly (1) toward narrow side of gear housing and install bearing (3) on intermediate gear assembly shaft (4).

 Push intermediate gear assembly (1) toward wide opening of axle housing (2) and install bearing (5) on intermediate gear assembly shaft (4). (Ref Fig. A-3 on page C-2)



Fig. A-3 Intermediate Gear Assembly Installed

6. Using snap-ring pliers, install two retaining rings into axle housing. (Ref Fig. A-4 on page C-2)



Fig. A-4 Retaining Rings Installed



7. Install two new end cap plugs into axle housing. (Ref Fig. A-5 on page C-3)



Fig. A-5 End Cap Installed

Differential-Carrier Assembly Installation

 Install drive gear (2) on differential-carrier (3) using four hex head bolts and four locknuts (1). Tighten locknuts to 55 to 63 lb-ft (75 to 85 N•m).



Fig. A-6 Saddle Bolts, Saddles, and Differential-Carrier Assembly Removed

2. Position differential-carrier into axle housing. (Ref Fig. A-7 on page C-3)



Fig. A-7 Installing Differential-Carrier into Axle Housing



For accurate torque readings, make sure threads are clean and lightly lubricated.

NOTE

Make sure the saddles are installed in their original positions and orientation. Align the saddles with the alignment marks prior to installation.

 Install saddles into axle housing using four saddle bolts. Tighten bolts to 35 to 45 lb-ft (46 to 61 N•m). (Ref Fig. A-8 on page C-3)



Fig. A-8 Installing Saddle Bolts and Saddles



Input Gear Assembly Installation

1. Lubricate O-ring with 30W motor oil and install into axle housing groove. (Ref Fig. A-9 on page C-4)



Fig. A-9 O-Ring Installed in Input Gear Assembly

 Install input gear assembly (with bearings) into axle housing by tilting assembly slightly upward at an angle while pushing inward to clear the intermediate gear.



Fig. A-10 Oil Seal, Retaining Ring, and Input Gear (With Two Bearings Attached)

3. Install retaining ring into the axle housing groove. (Ref Fig. A-11 on page C-4)



Fig. A-11 Installing Retaining Ring into Input Gear Assembly and Axle Housing

4. Install oil seal over input gear assembly and into axle housing. Seal must be installed evenly by using a seal driver or similar tool. (Ref Fig. A-12 on page C-4)



Fig. A-12 Installing Oil Seal into Input Gear Assembly



Axle Shaft Installation

NOTE

During installation, it may be necessary to tap axle shafts into axle tubes using a hammer handle.

 Install axle shafts, including bearings, inner snap rings, and oil seals into driver-side and passengerside axle tubes. Secure in place with outer snap rings. (Ref Fig. A-13 on page C-5)



Fig. A-13 Axle Shaft, Outer Snap Ring, and Bearing Shown Assembled in Axle Tube

NOTE

Apply anti-seize compound to axle splines before installing hubs.

2. Install hub, washer, and outside axle nut on driverside and passenger-side axle tube. Tighten outside axle nut to a minimum of 70 lb-ft (95 N•m). Continue to tighten until nut slots are aligned with the hole in the axle shaft. Insert and secure cotter pin. (Ref Fig. A-14 on page C-5)



Fig. A-14 Assembled End of Axle Tube



Differential Cover Plate Installation



Thoroughly inspect housing bolt threads for silicone residue. Failure to properly clean the threads may result in false torque readings and oil leakage.



Apply Permatex RTV to differential cover plate prior to installation.

- 1. Install differential cover plate using ten bolts. Torque bolts in a cross pattern to 16 to 24 lb-ft (22 to 33 N•m).
- 2. Install rubber plug.



Fig. A-15 Bolts and Differential Cover Plate



Fig. A-16 Differential Cover Plate



DANA ELECTRIC TRANSAXLE ILLUSTRATED PARTS BREAKDOWN



DANA ELECTRIC TRANSAXLE





Electric Vehicle

DANA ELECTRIC TRANSAXLE

ITEM	E-Z GO PART NO.	1 2 3 4 5 DESCRIPTION	QTY.
		MODEL 012AJ408-1 - AXLE ASSEMBLY, REAR (ELECTRIC)	
1	620326	HOUSING, AXLE, SERVICE	
2	620327	GEAR, INPUT	
3	620329	KIT, INPUT GEAR (INCL. 2, 4, 5, 6, 7, 8)	
4	620328	SEAL, OIL	1
5	620332	RING, RETAINING	
6	620334	O-RING	1
7	620336	BEARING, BALL	1
8	620338	BEARING, BALL	1
9	608811	END CAP PLUG	2
10	620340	BEARING, BALL	1
11	620337	SHAFT, AXLE, DS LONG	1
12	620341	SHAFT, AXLE, PS SHORT	1
13	620342	RING, RETAINING	4
14	620343	BEARING, BALL	2
15	620344	SEAL, OIL	2
16	620345	O-RING	2
17	620330	BEARING, BALL	2
18	605754	CARRIER, DIFF, LIMITED SLIP	1
19	620333	3/8" - 24 UNF FL LOCK NUT	4
20	620335	3/8" - 24 UNF x 1.25" FLHD HEX BOLT	4
21	620346	5/16" - 18 x .75" FLHD SELF TAP SC	10
22	620347	PLUG, RUBBER	1
23	620348	COVER PLATE DIFFERENTIAL	1
24	620349	ASSEMBLY, INTERMEDIATE GEAR	1
25	620350	GEAR, DRIVE	1
26	620335	BEARING, BALL	1
27	620357	VENT	1
28	620358	O-RING	2

When ordering parts, please specify the model and serial number of the product.



Dana Electric Transaxle Shop Rebuild and Parts Manual

DANA ELECTRIC TRANSAXLE

ITEM	E-Z GO PART NO.	1 2 3 4 5 DESCRIPTION	QTY.
29	620359	RING, RETAINING	
30	620360	SEALANT, DIFFERENTIAL COVER PLATE	
31	620361	KIT, INTERNAL GEARS (INCL. 2, 24, 25)	
32	620362	KIT, BALL BEARING (INCL. 7, 8, 10, 17, 26)	
33	620363	KIT, DIFFERENTIAL COVER ASSEMBLY (INCL. 22, 23)	-

When ordering parts, please specify the model and serial number of the product.





a **HEXTRON** Company

E-Z-GO DIVISION OF TEXTRON, INC. 1451 MARVIN GRIFFIN RD., AUGUSTA, GA 30906-3852, USA Inside USA Phone: 1-800-241-5855, FAX: 1-800-448-8124 Outside USA Phone: 010-1-706-798-4311, FAX: 010-1-706-771-4609

> Copyrighted Material This manual may not be reproduced in whole or in part without the express permission of E-Z-GO Division of Textron Inc. Technical Communications Department