

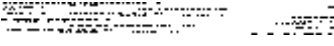
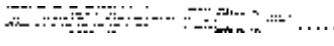
ZT-2800[®]/ZT-3100[™]/ZT-3400[™]

Integrated Zero-Turn Transaxle

Service and Repair Manual

BLN-52441
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FOREWORD

Headquartered in Sullivan, Illinois, Hydro-Gear® is a world leader in the design, manufacture, and service of quality hydrostatic transaxles for the lawn and garden industry. The mission of our company is to be recognized by our customers and the industry as a world-class supplier and the quality leader in everything we do.

This Service and Repair Manual is designed to provide information useful in servicing and troubleshooting the Hydro-Gear ZT-2800® and ZT-3400 Integrated Zero-Turn Transaxles.

Also included is a glossary of terms that are frequently used throughout the industry and in Hydro-Gear service publications. Understanding terminology is very important!

It is necessary, and a good shop practice, that your service area be equipped with the proper tools and the mechanics be supplied the latest information available. All repair procedures illustrated in this guide are suggested, but preferred methods of repair.

Internal repair procedures require that the transaxle unit be removed from the vehicle.

representing EETC (Equipment & Engine Training Council) at (262) 367-6700 or their Hydro-Gear Central Service Distributor. Many distributors guides will cover most of the products and manufacturers in our industry.

For more information about Hydro-Gear or our products, please contact your Central Service Distributor, or call our Customer Service Department at (217) 728-2581.

DESCRIPTION AND OPERATION

Introduction

The purpose of this manual is to provide information useful in servicing the Hydro-Gear® ZT-2800®, ZT-3100™ and ZT-3400™ Integrated Zero-Turn Transaxles. This manual includes the general descriptions, hydraulic schematics, shooting procedures for both transaxles.

the transaxle normally will not require servicing during the life of the vehicle in which it is installed. Should other servicing be required, the exterior of the transaxle will need to be thoroughly cleaned before beginning most procedures. Do not wash the transaxle while it is hot. **Do not use a pressure washer to clean the unit.**

General Description

The ZT-2800, ZT-3100 and ZT-3400 are self contained units designed for the transfer and able speed range between zero and maximum in both forward and reverse modes of operation.

The ZT-2800 and ZT-3100 transaxle uses a variable displacement pump with a maximum displacement of 10cc per revolution. The ZT-3400 transaxle uses a variable displacement pump with a maximum displacement of 12cc per revolution. Both transaxles use a motor with variable displacement pump features a trunnion mounted swashplate with a direct-proportional displacement control. Reversing the direction the pump and thus reverses the direction of the motor output rotation. The pump and motor are of the axial piston design and utilize spherical nosed pistons which are held against a thrust race by internal compression springs.

common external expansion tank assures the

the transaxle allows for easy oil maintenance. The ZT-2800 is designed for both charged and uncharged product versions. In the uncharged

tank and the negative pressure created at the pump inlet during piston operation.

is used in the ZT-3100 and ZT-3400 version.

low pressure side of the system is passed over a charge relief valve and back into the transaxle case.

The check valves in the center section are used low pressure side of the loop.

The ZT-2800, ZT-3100 and ZT-3400 have an internal cog style parking brake. It is essential to fully disengage the brake prior to operation.

A cam style, block lifting bypass is utilized in the ZT-2800, ZT-3100 and ZT-3400 to permit moving the vehicle for a short distance at a maximum of 2 m.p.h. (3.2 Km/h) without starting the engine. The brake must be disengaged prior to actuating the bypass mechanism.



WARNING

Actuating the bypass will result in the loss of hydrostatic braking capacity. The machine must be stationary on a level surface and in neutral when actuating the bypass.

HYDRAULIC SCHEMATIC

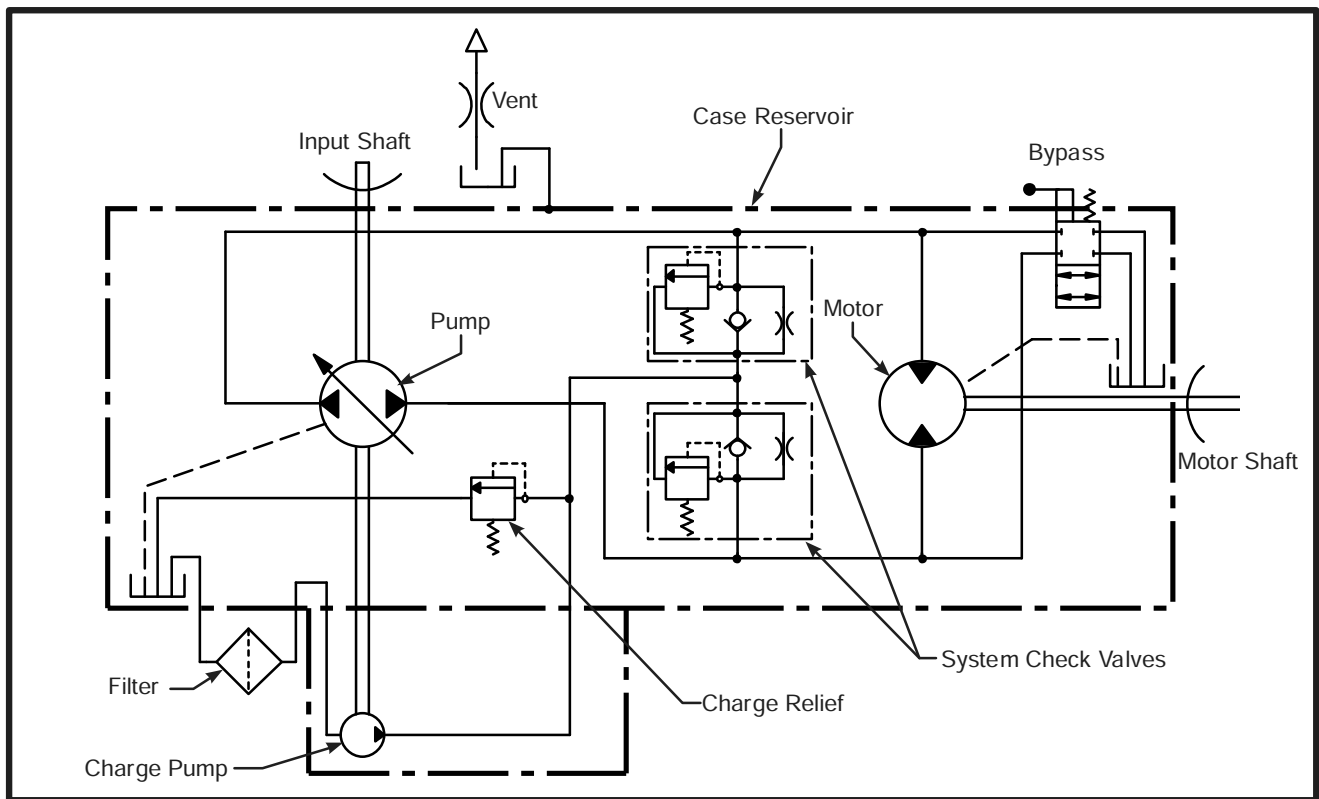


Figure 1, Hydraulic Schematic With Charge Pump

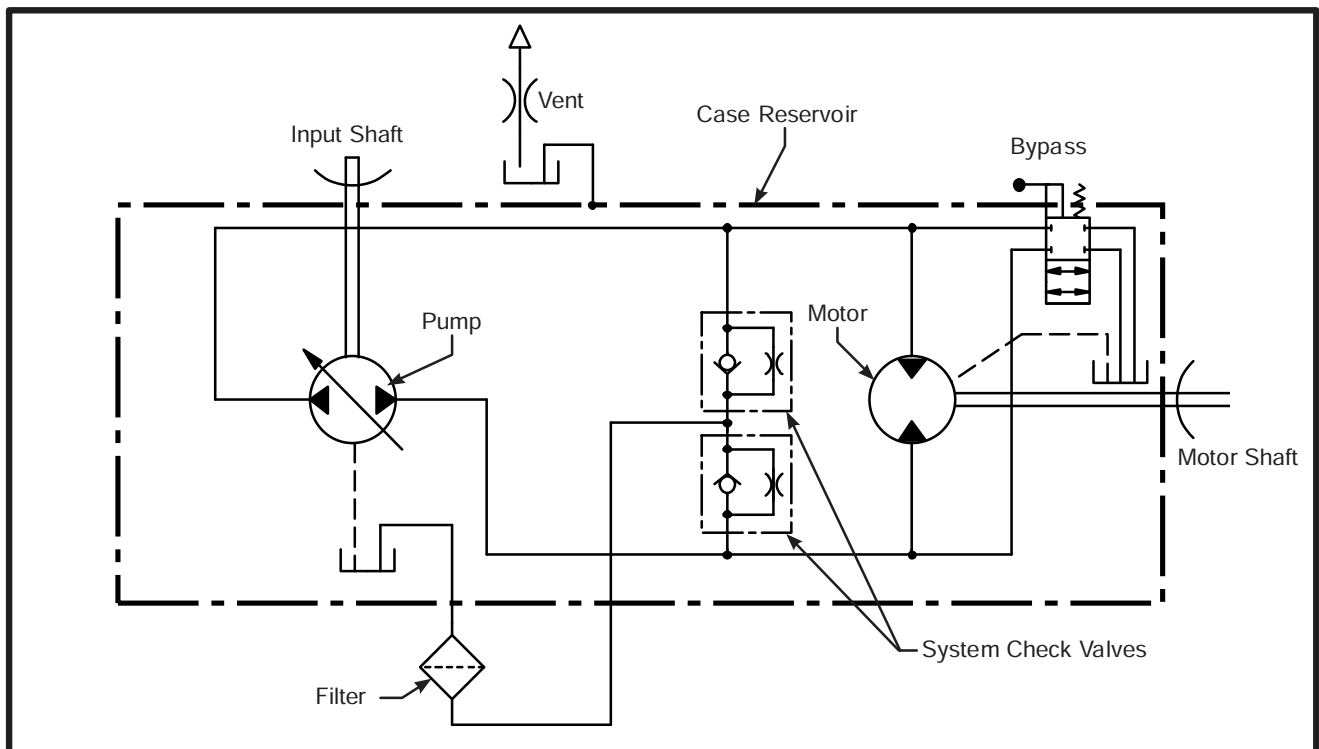
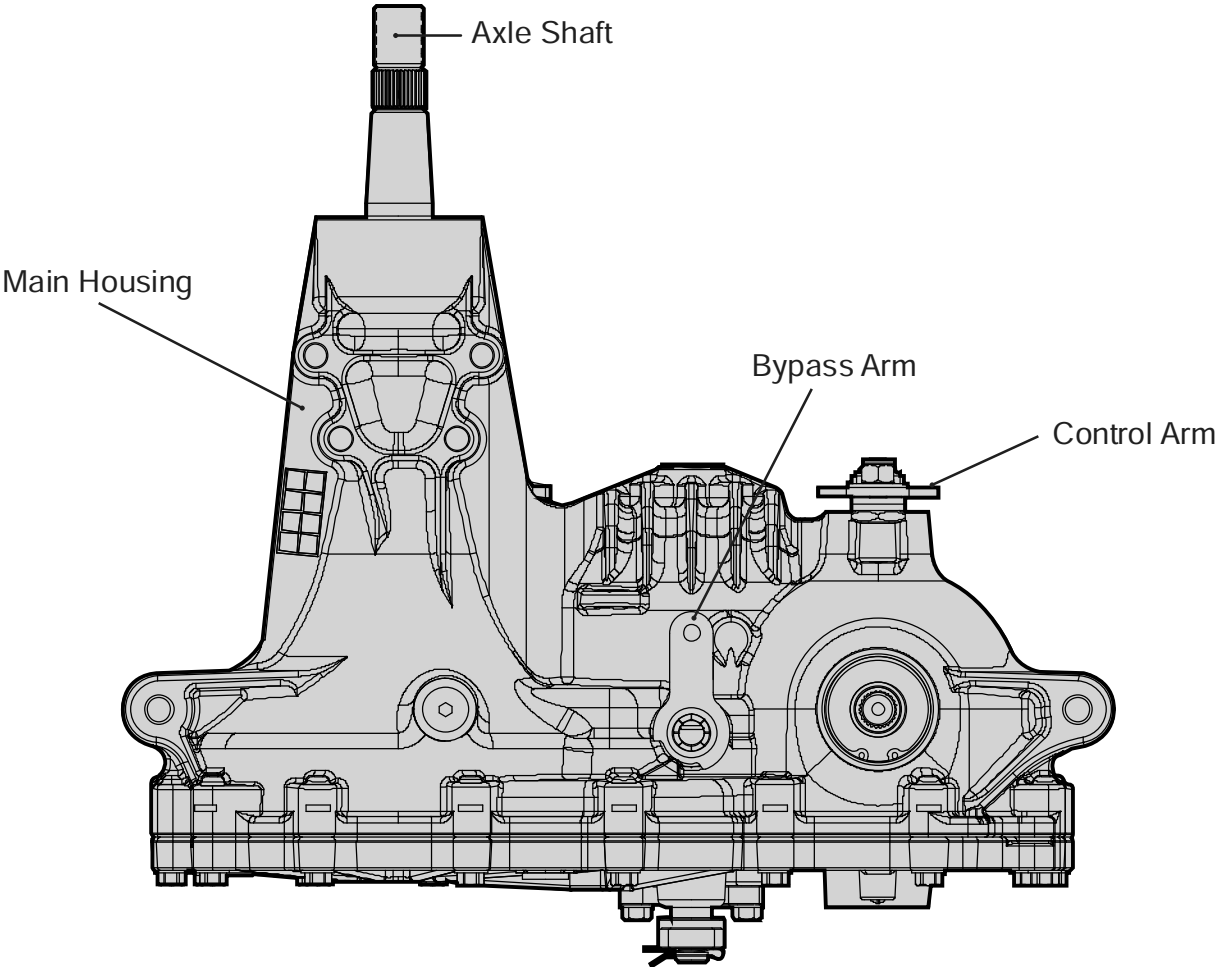
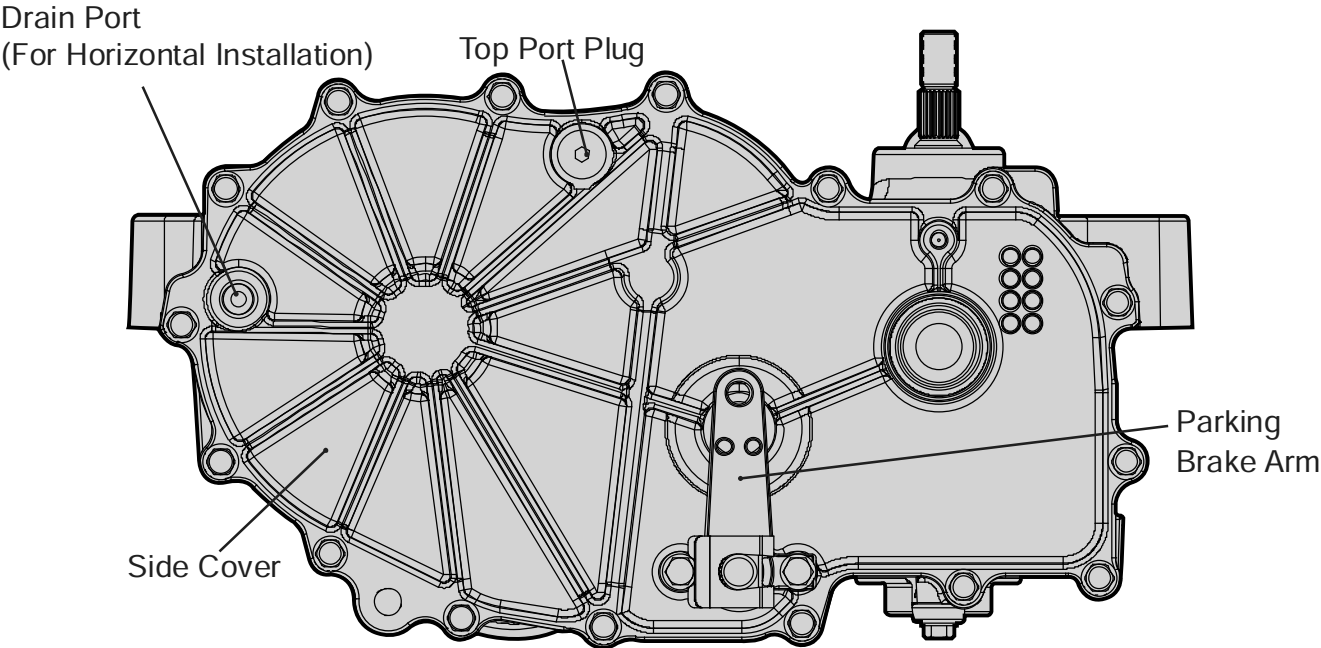


Figure 2, Hydraulic Schematic Without Charge Pump (ZT-2800)

EXTERNAL FEATURES ZT-2800®/ZT-3100 (ZT-3400 similar)

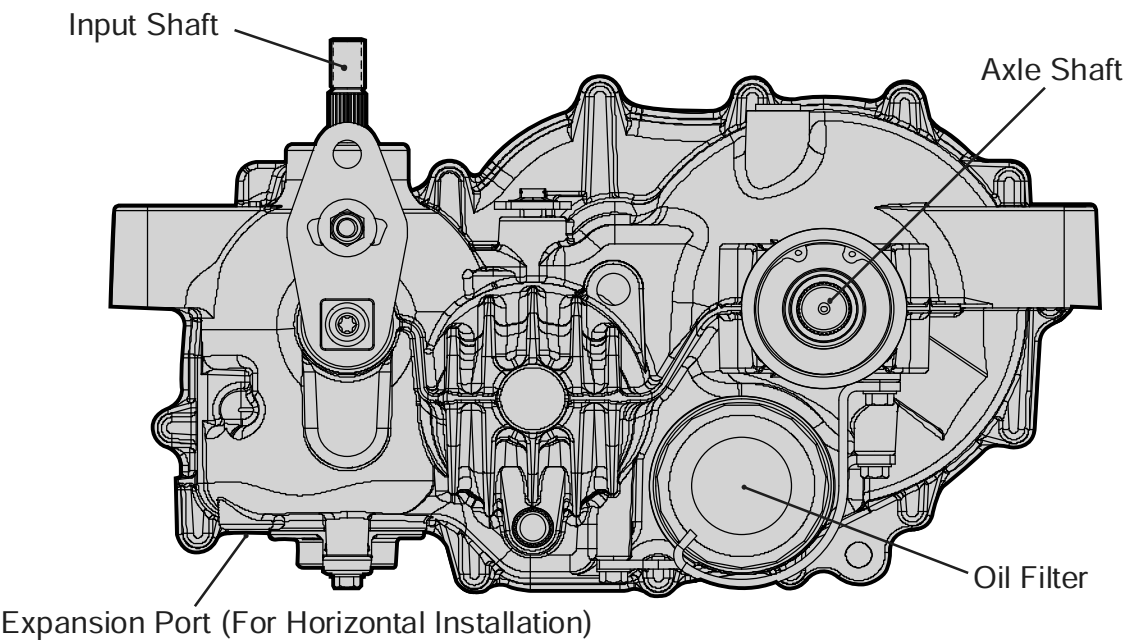


— Top View —

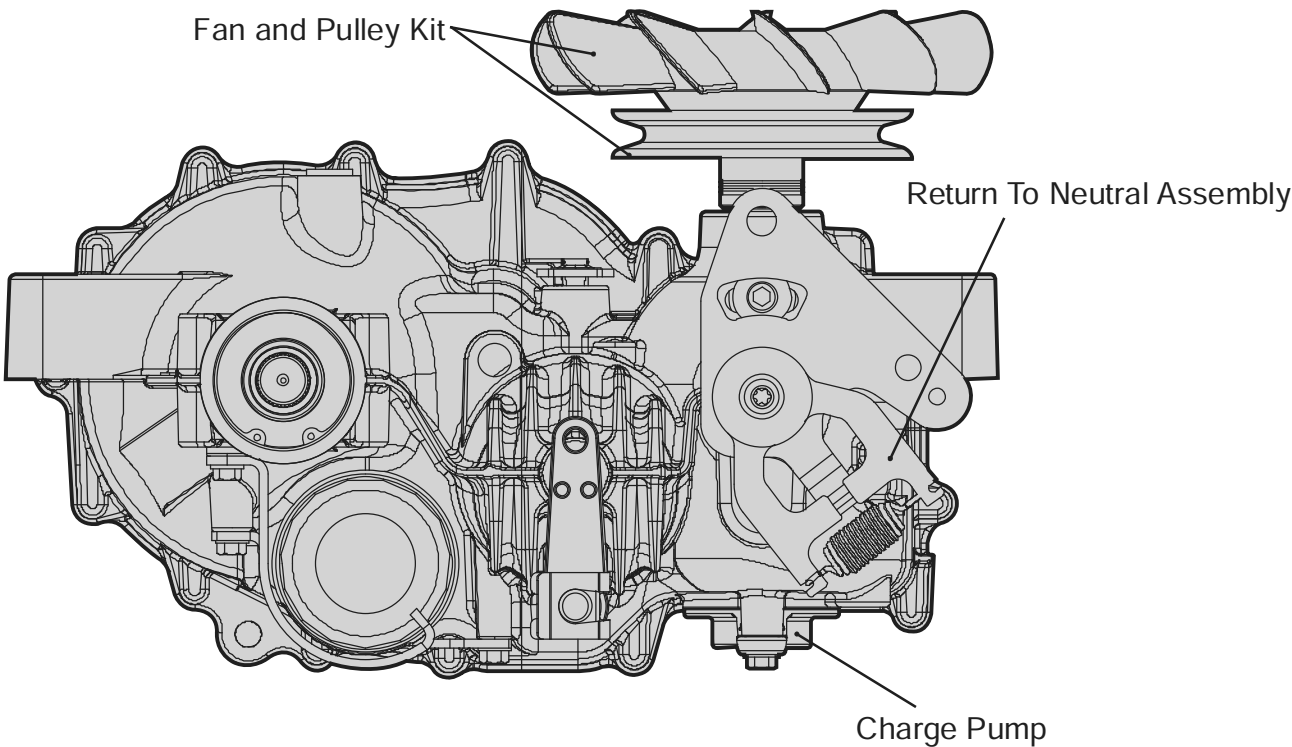


— Inboard View —

EXTERNAL FEATURES ZT-2800®/ZT-3100 (ZT-3400 similar)



— Outboard View—Left (Standard Control) —



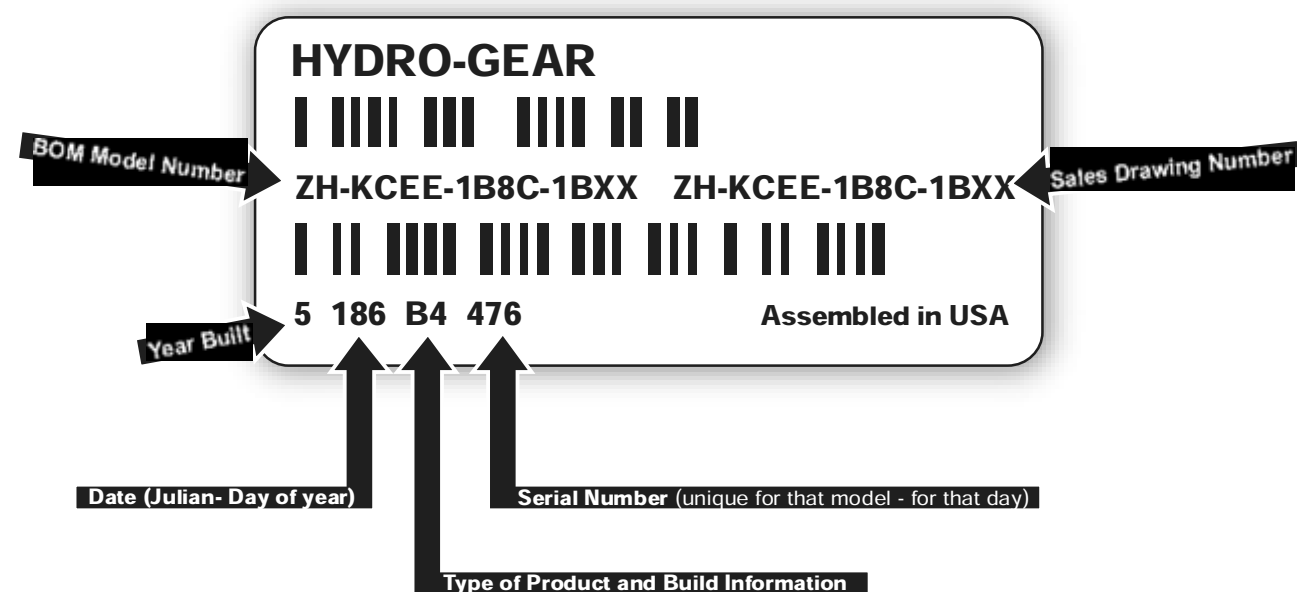
— Outboard View—Right (Return To Neutral Control) —

TECHNICAL SPECIFICATIONS

ZT-2800®/ZT-3100				ZT-3400
Overall Transaxle Reduction	20.69:1 ZH/ZJ	24.74:1 ZK/ZL	27.23:1 ZM	23.16:1 ZU
Input Speeds Maximum Hi-Idle (No Load) Minimum	3000 rpm Non-Charge — 3600 rpm Charged 1800 rpm			3600 rpm 1800 rpm
Output Torque Intermittent Continuous	300 lb-ft (406 N-m) 160 lb-ft (217 N-m)	340 lb-ft (461 N-m) 180 lb-ft (244 N-m)	370 lb-ft (502 N-m) 200 lb-ft (270 N-m)	370 lb-ft (502 N-m) 200 lb-ft (270 N-m)
Weight on Tires (per unit) Maximum with 18" tires Maximum with 20" tires Maximum with 22" tires Maximum with 23" tires	400 lb (181 kg) 360 lb (163 kg) — —	480 lb (217 kg) 440 lb (199 kg) 400 lb (181 kg) —	540 lb (244 kg) 480 lb (217 kg) 440 lb (199 kg) —	— 650 lb (295 kg) 625 lb (283 kg) 600 lb (272 kg)
Axle Shaft Diameter	1.00 in (25.4 mm)			1.125 in (28.5 mm)
Axle Shaft End Options	Tapered 4-Bolt Flange			Tapered 4-Bolt Flange Tapered 5-Bolt Flange
Parking Brake Type	Internal			Internal
Weight of Unit	32 lb (14.5 kg)			33 lb (14.9 kg)

PRODUCT IDENTIFICATION

label found on the transaxle.



SAFETY



This symbol points out important safety instructions which, if not followed, could endanger the personal safety and/or property of yourself and others. Read and follow all instructions in this manual before attempting maintenance on your transaxle. When you see this symbol - **HEED ITS WARNING.**



WARNING

POTENTIAL FOR SERIOUS INJURY

Inattention to proper safety, operation, or maintenance procedures could result in personal injury, or damage to the equipment. Before servicing or repairing the transaxle, fully read and understand the safety precautions described in this section.

Personal Safety

Certain safety precautions must be observed while servicing or repairing the transaxle. This section addresses some of these precautions but must not be considered an all-inclusive source on safety information. This section is to be used in conjunction with all other safety material which may apply, such as:

1. Other manuals pertaining to this machine,
2. Local and shop safety rules and codes,
3. Governmental safety laws and regulations.

Be sure that you know and understand the equipment and the hazards associated with it. Do not place speed above safety.

Notify your supervisor whenever you feel there is any hazard involving the equipment or the performance of your job.

Never allow untrained or unauthorized personnel to service or repair the equipment.

Wear appropriate clothing. Loose or hanging clothing or jewelry can be hazardous. Use the appropriate safety equipment, such as eye and hearing protection, and safety-toe and slip-proof shoes.

Never use compressed air to clean debris from yourself or your clothing.

Tool Safety

Use the proper tools and equipment for the task.

Inspect each tool before use and replace any tool that may be damaged or defective.

Work Area Safety

Keep the work area neat and orderly. Be sure it is well lit, that extra tools are put away, trash and refuse are in the proper containers, and dirt or debris have been removed from the working areas of the machine.

tension cords or similar trip hazards should be removed.

Servicing Safety

Certain procedures may require the vehicle to be disabled in order to prevent possible injury to the servicing technician and/or bystanders.

The loss of hydrostatic drive line power may result in the loss of hydrostatic braking capability.

only approved cleaning materials: Do not use equipment.

solvents in an area where a source of ignition may be present.

Discard used cleaning material in the appropriate containers.

TROUBLESHOOTING



WARNING

Do not attempt any servicing or adjustments with the engine running. Use extreme caution while inspecting the drive belt assembly and all vehicle linkage!

Follow all safety procedures outlined in the vehicle owner's manual.

In many cases, problems with a transaxle are not related to a defective transaxle, but are caused by slipping drive belts, partially engaged bypass valves, and loose or damaged control linkages. Be sure to perform all operational checks and adjustments outlined in Service and Maintenance, before assuming the transaxle is malfunctioning. The table below provides a troubleshooting checklist to help determine the cause of operational problems.

TROUBLESHOOTING CHECKLIST

Possible Cause	Corrective Action
Unit Operates In One Direction Only	
Control linkage bent or out of adjustment	Repair or replace linkage, Page 9
Drive belt slipping or pulley damaged	Repair or replace drive belt or pulley, Page 9
Vehicle Does Not Drive/Track Straight	
Vehicle tire pressure	Refer to vehicle manufacturer suggested pressure
Control linkage bent or out of adjustment	Repair or replace linkage, Pages 9 and 13
Bypass assembly sticking	Repair or replace bypass, Page 29
Brake Partially Engaged	Disengage Brake, Replace Broken or Missing Brake Return Spring
Unit Is Noisy	
Oil level low or contaminated oil	Fill to proper level or change oil, Page 11
Excessive loading	Reduce vehicle loading, Page 9
Loose parts	Repair or replace loose parts
Bypass assembly sticking	Repair or replace linkage, Page 9
Air trapped in hydraulic system	Purge hydraulic system, Page 12
Brake Partially Engaged	Disengage Brake, Replace Broken or Missing Brake Return Spring
Unit Has No/Low Power	
Engine speed low	Adjust to correct setting
Control linkage bent or out of adjustment	Repair or replace linkage, Page 9
Drive belt slipping or pulley damaged	Repair or replace drive belt or pulley, Page 9
Oil level low or contaminated oil	Fill to proper level or change oil, Page 11
Excessive loading	Reduce vehicle loading, Page 9
Bypass assembly sticking	Repair or replace linkage, Page 9
Air trapped in hydraulic system	Purge hydraulic system, Page 12
Brake Partially Engaged	Disengage Brake, Replace Broken or Missing Brake Return Spring
Unit Is Operating Hot	
Debris buildup around transaxle	Clean off debris, Page 20
Cooling fan damaged	Repair or replace cooling fan, Pages 22-24
Oil level low or contaminated oil	Fill to proper level or change oil, Page 11
Excessive loading	Reduce vehicle loading, Page 9
Air trapped in hydraulic system	Purge hydraulic system, Page 12
Brake Partially Engaged	Disengage Brake, Replace Broken or Missing Brake Return Spring
Transaxle Leaks Oil	
Damaged seals, housing, or gaskets	Replace damaged components
Air trapped in hydraulic system	Purge hydraulic system, Page 12

SERVICE AND MAINTENANCE

External Maintenance

Regular external maintenance of the transaxle should include the following:

1. Check the vehicle operator's manual for the recommended load ratings. Insure that the current application does not exceed load rating.
2. Check oil level in accordance with "Fluid Change Procedure," step 12. Refer to page 11.
3. Inspect the vehicle drive belt, idler pulley(s), and idler spring(s). Insure that no belt slippage can occur. Slippage can cause low input speed to the transaxle.
4. Inspect the vehicle control linkage to the directional control arm on the transaxle. Also insure that the control arm is securely fastened to the trunnion arm of the transaxle.
5. Inspect the bypass mechanism on the transaxle and the vehicle linkage to insure that both actuate and release fully.

Service and Maintenance Procedures

Some of the service procedures presented on the following pages can be performed while the transaxle is mounted on the vehicle. Any repair procedures as mentioned in the repair section of this manual must be performed after the unit has been removed from the vehicle.

Fluids

been carefully selected, and only equivalent, or better products should be substituted.

Typically, an engine oil with a minimum rating of 9.0 cSt (55 SUS) at 230° F (110° C) and an 20W50 engine oil has been selected for use by the factory and is recommended for normal operating procedures.

Fluid Volume and Level

Fluid volume information is provided in the table below. Total system volume will depend on expansion tank size, hose length and transaxle volume.

to be added or even replaced. Refer to page 10

Purging will be required if oil has been changed. Refer to the purging procedures on page 12.

Fluid Description	
20W50 engine oil	
ZT-2800/ZT-3100/ZT-3400	
Component	Volume

Note:

FILTER AND FILTER GUARD

Disassembly

1. Remove the hex head screws (105), and

NOTE:

3. Remove the metal oil drain plug (5) or the remaining oil to drain from the transaxle.

Inspection

1. Inspect all parts for excessive wear or damage. Replace if necessary.

Assembly

1. Reassemble all parts in the reverse order of disassembly.
2. When tightening the fasteners, refer to the table on page 21 for the required torque values.
3. Fill transaxle with oil. Refer to "Fluid Change

NOTE:

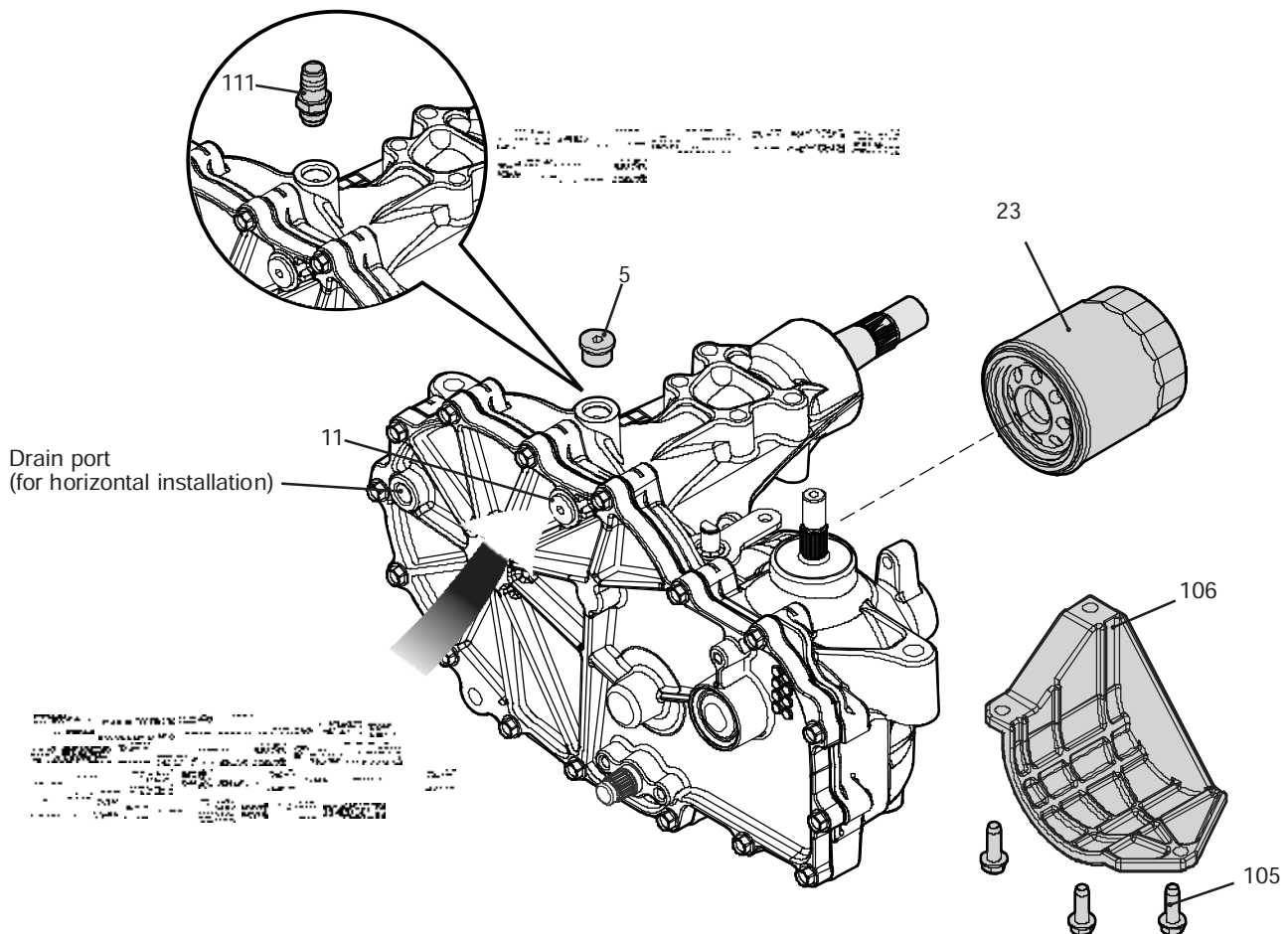


Figure 4, Filter and Guard

FLUID CHANGE PROCEDURE

for ease of maintenance. To ensure constant 400 hours thereafter is recommended.

The following procedure can be performed with the transaxles installed in the vehicle, and the vehicle on level ground. Apply the bypass valve for each transaxle and lock the vehicle parking brake.

- 5 and 6.
2. Place an oil drain pan (12" or more diameter and 8 qt. capacity is optimal) beneath transaxle.

Gear part number 52114).

screws. Torque screws to 65 in. lbs. (7.3 Nm) each.

6. Repeat steps 1-5 on the opposite side transaxle drive.

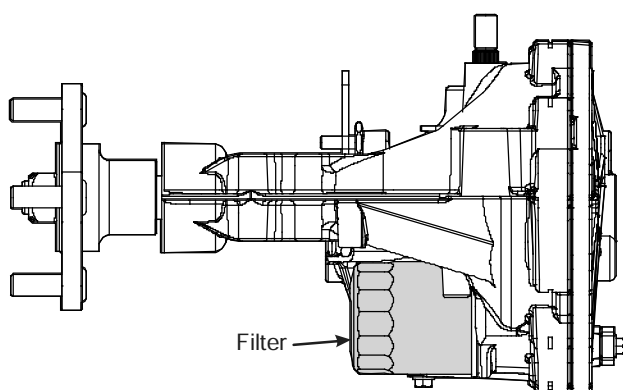


Figure 5, Filter Location

to disposal. Place used oil in appropriate containers and deliver to an approved recycling collection facility.

left side and right side transaxles prior to

9. Remove the cap from the transaxle's expansion tank located on the vehicle frame.
10. Fill with 20W50 motor oil until oil just appears at the bottom of each transaxle's top port (approximately 2 qts. per transaxle, 4 qts. total). Install the top port plug into each transaxle as the oil level reaches this port. See Figure 6.
11. Install and torque the top port plugs to 180 in. lbs. (20.3 Nm).

expansion tank until the "Full Cold" line is reached on the Hydro-Gear expansion tank volumes).

13. Re-install the expansion tank cap by hand. Be careful to not overtighten.
14. Proceed to the purge procedure.

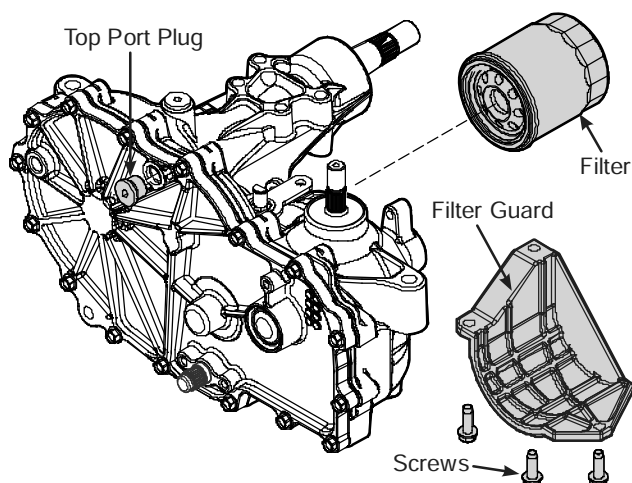


Figure 6, Filter And Filter Guard

PURGING PROCEDURES

In hydrostatic drive applications, it is critical that it is purged from the system.

Compression and expansion rate is higher than that of the oil approved for use in hydrostatic drive systems.

These purge procedures should be implemented any time a hydrostatic system has been opened to facilitate maintenance or the oil has been changed.

The resulting symptoms in hydrostatic systems may be:

1. Noisy operation.
2. Lack of power or drive after short term operation.
3. High operation temperature and excessive expansion of oil.

Before starting, make sure the transaxle is at the correct oil level. Follow the oil change procedures outlined in this manual.

The following procedures are best performed with the vehicle drive wheels off the ground. Then repeated under normal operating conditions. If this is not possible, then the procedure should be performed in an open area free of any objects or bystanders.

1. Disengage the brake if activated.
2. With the bypass valve open and the engine running, slowly move the directional control in both forward and reverse directions (5 or 6 times).
3. With the bypass valve closed and the engine running, slowly move the directional control in both forward and reverse directions (5 to 6 times). Check the oil level, and add oil as required after stopping the engine.
4. It may be necessary to repeat Steps 2 and 3 until all the air is completely purged from the system. When the transaxle operates at normal noise levels and moves smoothly forward and reverse at normal speeds, then the transaxle is considered purged.

RETURN TO NEUTRAL SETTING



WARNING

POTENTIAL FOR SERIOUS INJURY

Inattention to proper safety, operation, or maintenance procedures could result in personal injury, or damage to the equipment. Before servicing or repairing the transaxle, fully read and understand the safety precautions described in this section.



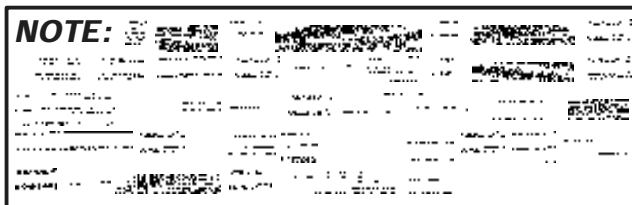
WARNING

Do not attempt any servicing or adjustments with the engine running. Use extreme caution while inspecting the drive belt assembly and all vehicle linkage!

Follow all safety procedures outlined in the vehicle owner's manual.

The return to neutral mechanism on the transaxle is designed to set the directional control into a neutral position when the operator releases the vehicle hand control. Follow the procedures below to properly adjust the return to neutral mechanism on the transaxle:

mode (bypass disengaged). Raise the vehicle's drive tires off the ground to allow free rotation.



2. Remove the Original Equipment Manufacturer's (OEM's) control linkage at the control arm.

3. Start the engine and increase the throttle to full engine speed.
4. Check for axle rotation. If the axle does not rotate, go to Step 5. If the axle rotates, go to Step 6.
5. Stop the vehicle's engine. Reattach and adjust the vehicle's linkage according to the vehicle owner's manual.
6. Note the axle directional movement. Stop the vehicle engine. Loosen the RTN adjustment screw until the control arm can be rotated. Rotate the control arm in the opposite direction of the axle rotation in 5 degree increments. Tighten the RTN adjustment screw. Recheck according to steps 3 and 4. Refer to Figure 7.

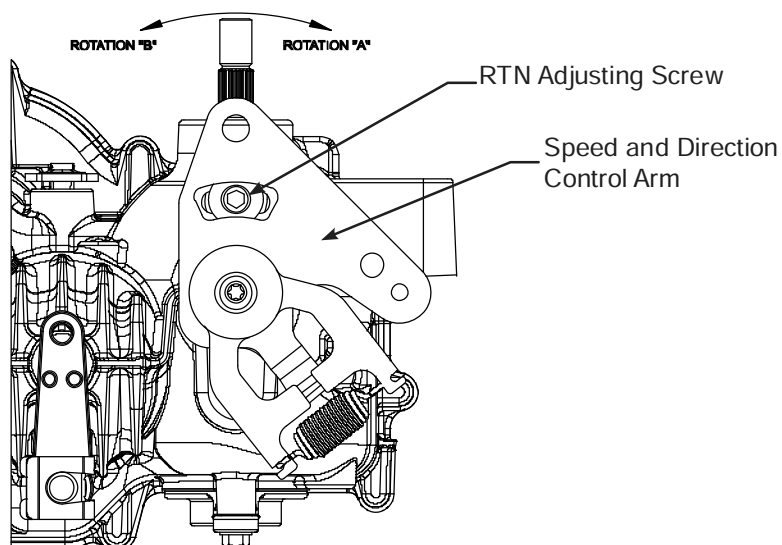


Figure 7, Return to Neutral Setting

RETURN TO NEUTRAL ASSEMBLY

Disassembly

1. Remove all items previously discussed in their recommended order.
2. Remove the RTN control arm kit (211) by loosening the Allen head screw (46). The remaining members of the assembly can be removed as a single item – washer (146), unidirectional scissor arm kit (145), and the control arm (44).
3. Remove the Allen head screw (142), washer (45), neutral arm (141) and spacer (140).

NOTE:

When removing the RTN control arm kit (211), be sure to keep the control arm (44) and the unidirectional scissor arm kit (145) together. The control arm (44) and the unidirectional scissor arm kit (145) are a single item and should be removed together.

Assembly

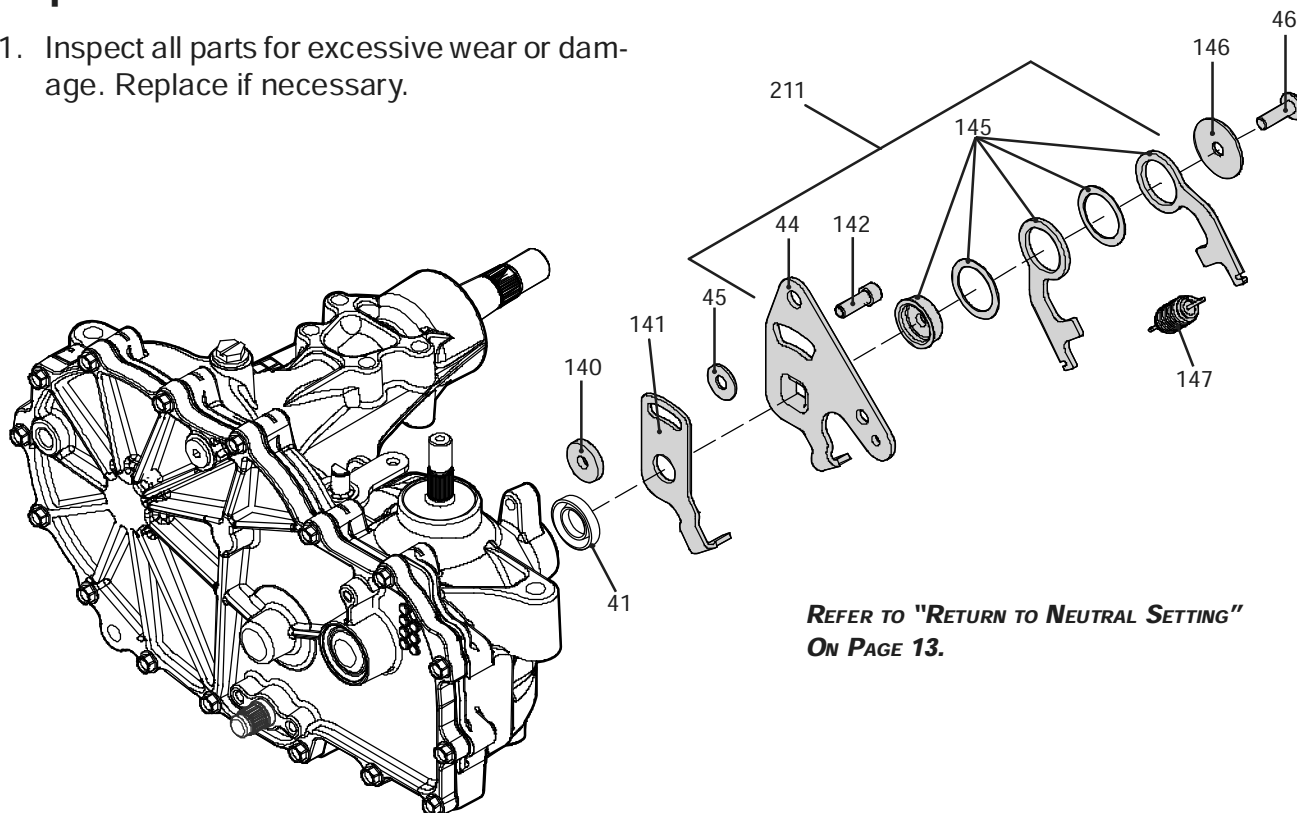
1. Reassemble all parts in the reverse order of disassembly.
2. When tightening the fasteners, refer to the table on page 21 for the required torque values.
3. Refer to the RTN adjustments on page 13.

NOTE:

When reassembling the RTN control arm kit (211), be sure to install the control arm (44) and the unidirectional scissor arm kit (145) together. The control arm (44) and the unidirectional scissor arm kit (145) are a single item and should be installed together.

Inspection

1. Inspect all parts for excessive wear or damage. Replace if necessary.



REFER TO "RETURN TO NEUTRAL SETTING"
ON PAGE 13.

Figure 8, Return to Neutral Assembly

CONTROL ARM ASSEMBLY

Disassembly

1. Remove all items previously discussed in their recommended order.
2. Remove the lock nut (47), and the washer (45). Discard both items.
3. Remove the Torx head screw (46).
4. Remove the control arm (44), the washer (43) and the stud (42).

NOTE:

Do not reuse the control arm (44) if it has been removed. The control arm (44) is a one-time use part and must be replaced if removed.

Assembly

1. Reassemble all parts in the reverse order of disassembly with the exception of the washer (45) and the lock nut (47).

NOTE: Discard the washer (45) and the lock nut (47).

2. When tightening the fasteners, refer to the table on page 21 for the required torque values.

NOTE:

Do not reuse the control arm (44) if it has been removed. The control arm (44) is a one-time use part and must be replaced if removed.

Inspection

1. Inspect all parts for excessive wear or damage. Replace if necessary.

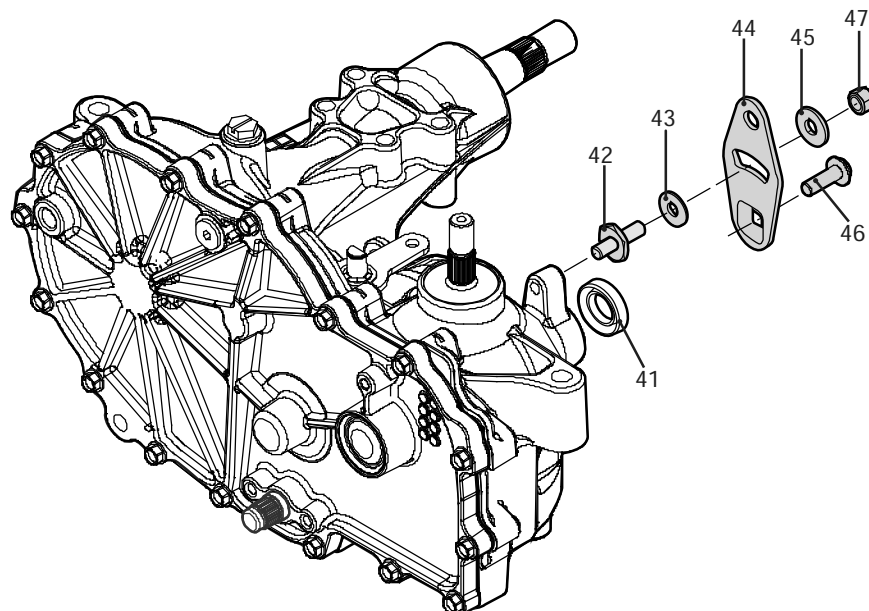


Figure 9, Control Arm Assembly

ZT-2800/ZT-3100 PARKING BRAKE ADJUSTMENT (Code 1 or 2)

Example: ZX-XXXX-1XXX-XXXX



WARNING

POTENTIAL FOR SERIOUS INJURY

When servicing the parking brake on unlevel terrain, it is essential to chock the vehicle wheels to prevent vehicle movement.

It should not be necessary to adjust the transaxle parking brake over the life of the vehicle. In the event that the transaxle parking brake does not function properly, the parking brake can be adjusted by rotating the handle (102).

1. Note orientation of the vehicle parking brake and linkage in the activated (locked) position.
2. Disengage the brake.
3. Detach the vehicle parking brake linkage from the parking brake handle (102).

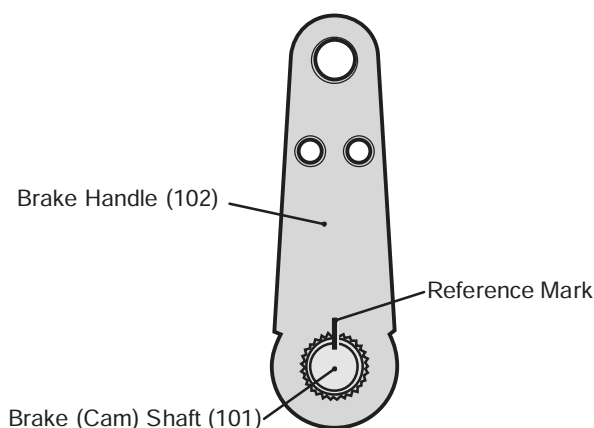


Figure 10, Brake Handle Orientation

4. While holding the parking brake handle (102) scribe a reference mark between the handle and shaft tip (101).
5. Before removing the parking brake handle (102) scribe a reference mark between the handle and shaft tip (101).
6. Remove the brake handle (102) far enough to rotate the handle one tooth in the angular direction opposite the brake handle's actuated position.
7. Attach the retaining clip (103) to the brake cam shaft.
8. Connect the vehicle parking brake linkage to the brake handle (102).
9. Test the parking brake to assure it meets specifications.
10. It is also important to assure that the parking brake is not partially engaged while the vehicle is in the normal drive mode. This can be tested by placing the vehicle on level ground, turning the engine off, disengaging the brake, engaging the bypass and assuring that the vehicle can be moved by pushing with reasonable effort.

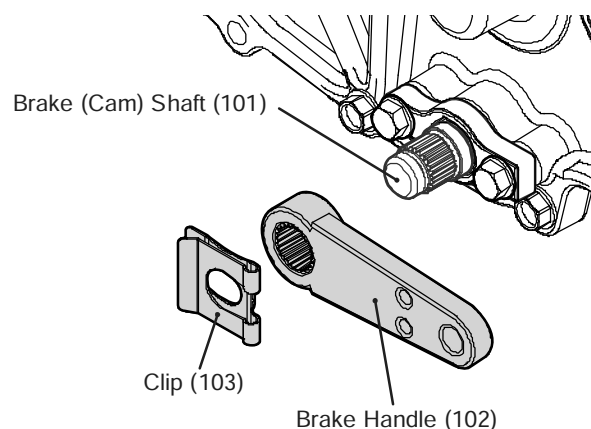
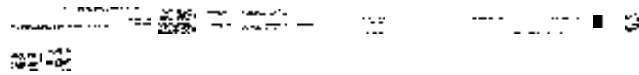
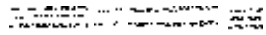


Figure 11, Brake Handle Removal

ZT-2800/ZT-3100 PARKING BRAKE ASSEMBLY (Code 1 or 2)



Example: ZX-XXXX-1XXX-XXXX



Disassembly

1. Mark the position of the cam stop retainer (104) in relation to the side cover (2).



2. Remove the retaining clip (103).
3. Mark the position of the brake (cam) shaft (101) in relation to the brake handle (102).
4. Remove the brake handle (102).
5. Remove the hex head screws (105) and the cam stop retainer (104).

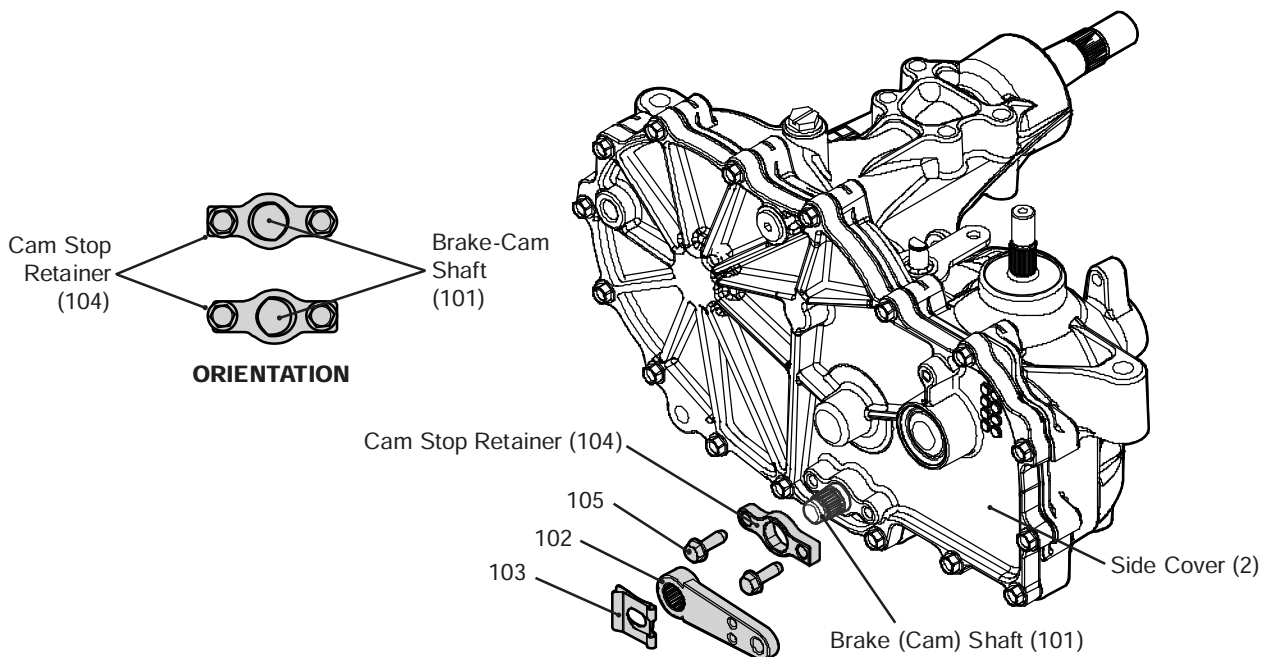


Figure 12, Parking Brake

Inspection

1. Inspect all parts for excessive wear or damage. Replace if necessary.
2. Inspect the splines on the handle and brake cam shaft.

Assembly

1. Reassemble all parts in the reverse order of disassembly.
2. When tightening the fasteners, refer to the table on page 21 for the required torque values.



BRAKE ARM ASSEMBLY (Code 3)

Example: ZX-XXXX-3XXX-XXXX

Disassembly

1. Mark the position of the brake arm (102) in relation to the brake shaft (101).

NOTE: When removing the brake arm, be careful not to damage the brake shaft or the brake arm. The brake arm should be removed from the brake shaft by pulling it out from the bottom.

2. Remove the retaining clip (103).
3. Remove the brake arm (102).

Inspection

1. Inspect all parts for excessive wear or damage. Replace if necessary.
2. Inspect the splines on the brake arm and brake shaft.

Assembly

1. Reassemble all parts in the reverse order of disassembly.

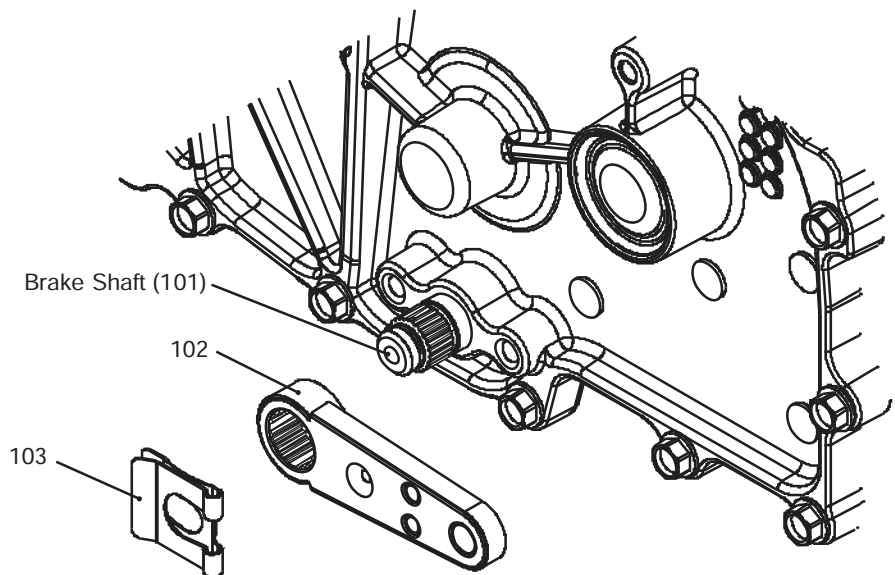
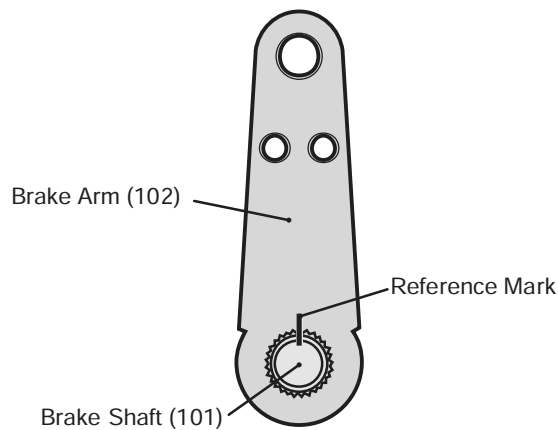


Figure 13, Parking Brake

HUB REMOVAL

Do not use this procedure to remove the drive wheel from the transaxle. Remove the drive wheel by removing the lug nuts.

DESCRIPTION: Follow the directions below shafts to facilitate maintenance to bearings, bushings and seals externally.

Note:



WARNING

POTENTIAL FOR SERIOUS INJURY

Inattention to proper safety, operation, or maintenance procedures could result in personal injury, or damage to the equipment. Before servicing or repairing the transaxle, fully read and understand the safety precautions described in the transaxle Service and Repair manual that repaired.

Note:

1. With the vehicle engine placed in the "OFF" position, chock the front wheels, engage the parking brake. Raise the vehicle drive tires off the ground and remove the lug nuts from the vehicles' drive wheel/hub studs.
2. Remove the hex retaining nut (3/4-16) from the center of the axle hub and discard.
3. Back out the hub removal tool bolt with a 1-1/8" socket before installing the hub removal tool to the axle hub.

wheel hub studs. Install lug nuts and secure evenly. Torque to 100 lb-in. (11.3 Nm).

5. Tighten the 1-1/8" socket head center bolt evenly and slowly. Note: This pressure will separate the hub from the tapered axle.
6. Remove the lug nuts and separate the hub
7. Refer to the appropriate manual / schematics for parts, repair procedures and proper to the tapered axle.
8. Install wheel and rim and torque lug nuts. Reference applicable vehicle service manual for proper lug nut torque.
9. Lower the vehicle to the ground, remove chocks. Note: Brake will still be in engaged mode.

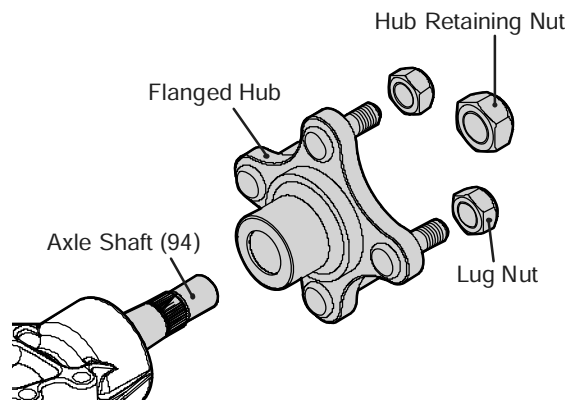


Figure 14, Hub Assembly

TEAR DOWN AND REASSEMBLY

How to Use This Manual

Each subassembly illustrated in this manual is illustrated with an exploded view showing the parts involved. The **item reference numbers in each illustration are for assembly instructions only**. See pages 42-45 for part names and descriptions. A complete exploded view and item list of the transaxle is provided at the end of the repair section.

General Instructions

Cleanliness is a primary means of assuring satisfactory life on repaired units. Thoroughly clean all exposed surfaces prior to any type of maintenance. Cleaning of all parts by using a solvent wash and air drying is usually adequate. As with any precision equipment, all parts must be kept free of foreign material and chemicals.

Protect all exposed sealing surfaces and open cavities from damage and foreign material. The external surfaces should be cleaned before beginning any repairs. **Do not use a pressure washer to clean the transaxle.**

Upon removal, it is recommended that all seals, O-rings, and gaskets be replaced. During installation lightly lubricate all seals, O-rings and gaskets with a clean petroleum jelly prior to assembly. Also protect the inner diameter of seals during installation by covering the shaft with a cellophane or plastic wrap material. Be sure all remnants of this covering are removed after servicing.

Parts requiring replacement must be replaced

Listing, found at the end of this manual. Use only original Hydro-Gear replacement parts found at www.hydro-gear.com or at your Hydro-Gear Central Service Distributor.

IMPORTANT: When internal repair is performed, the following parts must be replaced.

TOOLS

REQUIRED TOOLS	
Miscellaneous	Sockets
Hub Puller	1/2"-3/8" Adapter
Flat Blade Screw Driver (2)	3/8" Deep
Torque Wrench	1-1/8" Deep
Air Impact Wrench	1/4" Allen
Rubber or Neoprene Mallet	3/4" Deep
Breaker Bar	9/16" Deep
Side Cutters/Snips	T-40 Torx Head
Needle Nose Pliers	7/8" Deep
Large External Snap Ring Pliers	
Small Internal Snap Ring Pliers	

TORQUES

REQUIRED TORQUE VALUES			
Item	Description	Torque	Operation
5	Plug 9/16-18 (Metal)	110 – 150 lb-in (12.4 - 16.9 Nm)	Oil Input Port
7	Screw, Hex head 1/4-20 x 1.25"	105 – 155 lb-in (11.8 - 17.5 Nm)	Side Cover Screws
11	Plug, 9/16-18 (Metal)	180 – 240 lb-in (20.3 - 27.1 Nm)	Side Cover, Oil Level Port
23	Filter	110 – 130 lb-in (12.4 - 14.7 Nm)	Oil Filter
24	Check Plug or Shock Valve	280 – 400 lb-in (31.6 - 45.2 Nm)	Center Section
25	Check Plug or Shock Valve	280 – 400 lb-in (31.6 - 45.2 Nm)	Center Section
27	Screw, Hex Head 3/8-16 x1.5	450 – 550 lb-in (50.8 - 62.1 Nm)	Center Section Screws
42	Stud, Short 5/16-24	125 - 160 lb-in (14.1 - 18.1 Nm)	Control Arm
46	Torx Head Screw 5/16-24 x 1.00	230 – 310 lb-in (25.9 - 35.0 Nm)	RTN/FR Control Arm
99	Nut, Patch Lock 3/4-16	240 - 260 lb-ft (325.4-352.5 Nm)	Hub Nut
105	Screw, Hex Head 1/4-20 x .75	100 – 130 lb-in (11.3 - 14.7 Nm)	Filter Guard Screws
111	Fitting, STR 9/16-18 SAE	180 – 240 lb-in (20.3 - 27.1 Nm)	Breather Fitting
122	Nut, Hex Locking 1/2-20 Nylon	540 – 660 lb-in (61.0 - 74.5 Nm)	Fan to Input Shaft Nut
123	Screw, Hex Head	50 – 80 lb-in (5.6 - 9.0 Nm)	Fan to Pulley Assembly
134	HFHCS 1/4-20 x .75	100 – 130 lb-in (11.3 - 14.7 Nm)	Charge Plate Screws
142	SHCS 5/16-24 x 1 Patch	175 – 200 lb-in (19.7 - 22.6 Nm)	Neutral Arm Screw
142	Stud, 5/16-24 Friction Pack	50 – 65 lb-in (5.6 - 7.3 Nm)	Friction Pack Stud
162	Nut, Hex 8-32 (Nylon insert)	30 – 36 lb-in (3.4 - 4.0 Nm)	Brake Spring Nut

As a general rule, use the low end of the torque spec on fasteners when reassembling the unit.

TRANSAXLE REMOVAL

NOTE:

Do not remove the axle/hub nut unless replacing the hub, the axle seal or removing the axle shaft.

FAN AND PULLEY

Disassembly

FAN AND PULLEY KIT (207) CONFIGURATION "A"

1. Remove the locknut (122), slotted washer (123), fan (120) and the pulley (121) from the input shaft.

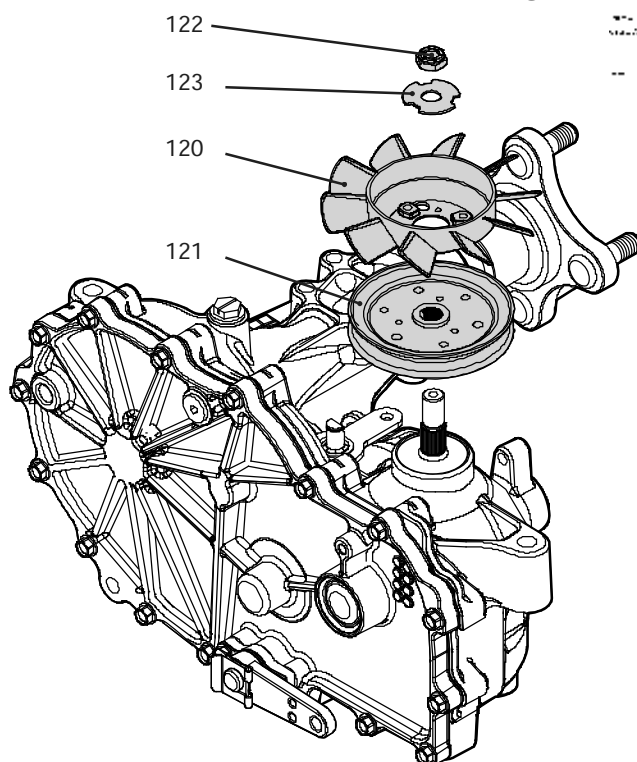
Inspection

1. Check all components for excessive wear or damage. Replace if necessary.
2. Inspect input shaft splines for wear or damage.

Assembly

1. Reassemble all parts in the reverse order of disassembly.
2. When tightening the fasteners, refer to the table on page 21 for the required torque values.

NOTE:



FAN AND PULLEY (Continued)

FAN AND PULLEY KIT (207) CONFIGURATION "B"

1. Remove the locknut (122), and detach the fan and pulley assembly from the input shaft.
2. Separate the assembly by removing the screws (123), fan (120) and the pulley (121).

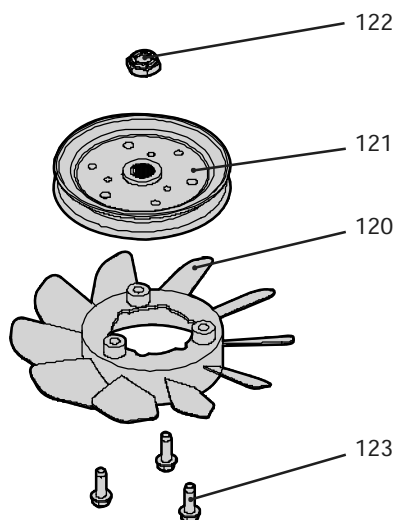
Inspection

1. Check all components for excessive wear or damage. Replace if necessary.

Assembly

1. Reassemble all parts in the reverse order of disassembly.
2. When tightening the fasteners, refer to the table on page 21 for the required torque values.

NOTE: The fan and pulley assembly must be removed from the input shaft before the locknut (122) is removed.



FAN AND PULLEY KIT (207) CONFIGURATION "C"

1. Remove the locknut (122) and detach the fan and pulley assembly from the input shaft.
2. Remove the hex head screws (123) to separate the fan (120) and pulley (121) assembly.

Inspection

1. Check all components for excessive wear or damage. Replace if necessary.

Assembly

1. Reassemble all parts in the reverse order of disassembly.
2. When tightening the fasteners, refer to the table on page 21 for the required torque values.

