Hustler® 3500/3700 Service Manual

•••••
200 South Ridge Road
•••
Hesston, Kansas
•
67062-2097

WARNING

The engine exhaust from this product contains chemicals known to the state of California to cause cancer, birth defects or other reproductive harm.

NOTICE OF REQUIREMENT OF SPARK ARRESTER MUFFLER

This equipment may create sparks that can start fires around dry vegetation. California Public Resources Code Section 4442.6 provides that it is unlawful to use or operate an internal combustion engine on any forest-covered, brush-covered, or grass-covered land unless the engine is equipped with a spark arrester maintained in effective working order. A spark arrester is a device constructed of nonflammable materials specifically for the purpose of removing and retaining carbon and other flammable particles over 0.0232 of an inch in size from the exhaust flow of an internal combustion engine that uses hydrocarbon fuels or which is qualified and rated by the United States Forest Service. Other states or federal areas may have similar laws. The Operator Should Contact Local Fire Agencies For Laws or Regulations Relating to Fire Prevention Requirements. THIS EQUIPMENT DOES NOT HAVE A SPARK ARRESTER AND YOU SHOULD CONTACT YOUR AUTHORIZED DEALER FOR THE PURCHASE OF A SPARK ARRESTER.

Inspect spark arrester daily; replace every 500 hours or as needed.

The Engine Owner's Manual provides information regarding the U.S. Environmental Protection Agency (EPA) and the California Emission Control Regulation of emission systems, maintenance and warranty.

Keep Engine Owner's Manual with your unit. Should the Engine Owner's Manual become damaged or illegible, replace immediately. Replacements may be ordered per the information found in the Product Information section of the owner's manual.

Federal law and California State law prohibit the following acts or the causing thereof:

1. The removal or rendering inoperative by any person other than for purposes of maintenance, repair, replacement, of any device or element of design incorporated into any equipment for the purposes of emissions control prior to or after its sales or delivery to the ultimate purchaser or while it is in use, or
2. The use of the equipment after such device or element of design has been removed or rendered inoperative by any person.

Table of Contents

CHAPTER 1

GENERAL INFORMATION

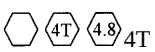
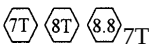
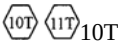
Specifications and Performances

	Model		3500	3700
Engine	Model		N843	N843L
	Type		Water-Cooled 4-Cycle Vertical Diesel Engine	
	Number of Cylinders		3	
	Total Stroke Volume		91.3 cu. in. (1496 cc)	101.42 cu. in. (1662 cc)
	Maximum Output		30 HP (22.4 kW)/2700 rpm	35 HP (26 kW)/2700 rpm
	Compression Ratio		22.5 : 1	
	Fuel		Ultra Low Sulpher #2 Diesel Fuel	
	Starting Method		12 Volt Gear Drive Solenoid Shift Starter	
Maine Body	Overall Length		95.0 in. (2415 mm0	
	Overall Height		54.7 in. (1390 mm)	
	Overall Width		Narrow – 48.0 in. (1220 mm), Wide – 53.9 in. (1370 mm)	
	Weight		1609 lbs. (730 kg)	1653 lbs. (750 kg)
	Tire	Front Wheel	23 × 10.5 – 12	
		Rear Wheel	20 × 8.00 – 10	
	No. of Running Speeds		2 Forward Speeds, 2 Reverse Speeds (Continuously variable speed)	
	Transmission System		L/H Switching, All Hydraulic Continuously Variable Speed (HST)	
	Brake		Wet Disc Brake	
	Lift Control Valve Relief Set Pressure		1421 psi (9.8 MPa}	
	Relief Set Pressure/ Steering		852.8 – 951.4 psi (5.88 – 6.56 MPa}/ Full Hydraulic Power Steering	
	Running Speed	Forward: L	0 – 6.0 mph (0 – 9.6 km/h)	
		Forward: H	0 – 15.0 mph (0 – 24.0 km/h)	
		Reverse: L	0 – 4.0 mph (0 – 6.4 km/h)	
		Reverse: H	0 – 9.0 mph (0 – 14.4 km/h)	
Capacity	Fuel Tank		13.3 gal. (50.5 ℓ)	
	Engine Oil		5.9 qts. (5.6 ℓ) (Including oil filter)	
	Transmission Gear Oil		Front 21.13 qts. (20 ℓ), Rear 2.4 qts. (2.3 ℓ)	
	Cooling Water		5.4 qts. (5.1 ℓ)	5.6 qts. (5.3 ℓ)
Electric Units	Battery		BCI group 35, 12-volt battery (min. cold cranking ability of 490 amps)	
	Starting Motor		12 V – 1.7 kW	12 V – 2.0 kW
	Alternator		12 V – 40 A	
	Head Light		23 W	
	Monitor Lamp		3 W	
	Dash Panel Lamp		2 W	
	Light Switch Lamp		1.4 W	

General Metric Bolt Torque Specification Table

Use the following torques when special torques are not given

NOTE: These values apply to fasteners as received from supplier, dry, or when lubricated with normal engine oil. They do not apply if special graphited or molly disulphide grasses or other extreme pressure lubricants are used.

		Coarse Thread		Fine Thread	
Bolt Size	**Grade No.**	**Pitch (inches)**	**Ft.-Lbs. (N-m)**	**Pitch (inches) (mm)**	**Ft.-Lbs. (N-m)**
M6	 4T	.039 (1.0)	3.61 – 5.09 (4.9 – 6.9)	–	–
	 7T		6.12 – 8.33 (8.3 – 11.3)		
	 10T		8.63 – 11.58 (11.7 – 15.7)		
M8	4T	.049 (1.25)	9.37 – 12.32 (12.7 – 16.7)	.039 (1.0)	11.21 – 14.82 (15.2 – 20.1)
	7T		16.67 – 20.95 (22.6 – 28.4)		19.55 – 25.30 (26.5 – 34.3)
	10T		21.02 – 26.77 (28.5 – 36.3)		22.42 – 29.65 (30.4 – 40.2)
M10	4T	.059 (1.5)	18.81 – 24.56 (25.5 – 33.3)	.049 (1.25)	20.95 – 26.70 (28.4 – 36.2)
	7T		32.53 – 41.23 (44.1 – 55.9)		36.14 – 46.32 (49.0 – 62.8)
	10T		39.83 – 51.33 (54.0 – 69.6)		42.70 – 54.21 (57.9 – 73.5)
M12	4T	.069 (1.75)	27.51 – 34.74 (37.3 – 47.1)	.049 (1.25)	31.79 – 40.49 (43.1 – 54.9)
	7T		48.46 – 61.51 (65.7 – 83.4)		54.95 – 69.40 (74.5 – 94.1)
	10T		68.00 – 85.56 (92.2 – 116)		73.02 – 93.67 (99.0 – 127)
M14	4T	.079 (2.0)	46.32 – 59.30 (62.8 – 80.4)	.059 (1.5)	51.33 – 64.39 (69.6 – 87.3)
	7T		76.71 – 96.62 (104 – 131)		86.29 – 109.2 (117 – 148)
	11T		102.5 – 129.1 (139 – 175)		108.4 – 137.2 (147 – 186)
M16	4T	.079 (2.0)	63.65 – 81.13 (86.3 – 110)	.059 (1.5)	67.27 – 84.82 (91.2 – 115)
	7T		109.9 – 135.7 (149 – 184)		115.8 – 141.6 (157 – 192)
	11T		151.9 – 188.1 (206 – 255)		163.0 – 199.1 (221 – 270)
M18	4T	.079 (2.0)	84.08 – 104 (114 – 141)	.059 (1.5)	96.62 – 120.2 (131 – 163)
	7T		144.6 – 173.3 (196 – 235)		169.6 – 205.89 (230 – 279)
	11T		202.8 – 245.6 (275 – 333)		220.5 – 271.4 (299 – 368)
M20	4T	.098 (2.5)	106.2 – 132.(144 – 179)	.059 (1.5)	126.9 – 155.6 (172 – 211)
	7T		177.0 – 213.2 (240 – 289)		202.8 – 245.6 (275 – 333)
	11T		267.7 – 325.3 (363 – 441)		292.8 – 357.7 (397 – 485)

Precautions Before Servicing

Have the power unit washed clean and have the oil, fuel, and cooling water drained out as would be required by the work to be performed.

Service shop should always be kept clean to prevent dust from rising and should be well lighted.

The disassembled parts shall have the oil and grease washed off and arranged on a stand separated by groups.

Clothing, service tools and equipment shall be checked to ensure safety in performing the operations.

Basic Understanding Of Servicing

Engine, transmission, and hydraulic apparatus have been specially manufactured to high accuracy so that care shall be exercised to maintain them in clean state and not to do any unnecessary disassembly.

Defective parts due to wear and other causes shall be discarded and new parts ordered with the power unit model, Serial No., Code No., and part name clearly defined. (Keep the defective parts on hand to enable showing it to the customer.)

When assembling, it is essential to have oil applied to all moving parts so that they will be provided with initial oil film until normal lubrication takes place.

Unless specially instructed, bolts and nuts shall be tightened by proper tools to the proper tightening torque.

This safety alert symbol is used to call attention to a message intended to provide a reasonable degree of PERSONAL SAFETY for operators and other persons during the normal operation and servicing of this equipment.

DANGER

– denotes immediate hazards which WILL result in severe personal injury or death.

WARNING

– denotes a hazard or unsafe practice which COULD result in severe personal injury or death.

Safe Servicing Practices

This product is capable of amputating hands and feet and throwing objects. Always follow all safety instructions to avoid serious injury or death.

Understand Correct Service

- ▲ Be sure you understand a service procedure before you work on the machine.
- ▲ Unauthorized modifications to the machine may impair the function and/or safety and affect machine life.
- ▲ If it is necessary to make checks with the engine running, always use two people - with the operator at the controls, able to see the person doing the checking.

Pre-Operation Precautions

Fuel Handling

- ▲ To avoid personal injury or property damage, use extreme care in handling fuel. Fuel is extremely flammable and the vapors are explosive.
- ▲ Observe usual fuel handling precautions:
  - Do not smoke while refueling. Extinguish all cigarettes, cigars, pipes and other sources of ignition.
  - **Do not remove fuel cap or fill tank with engine running or while engine is hot. Clean up any fuel spills.**
  - Allow engine to cool before storing machine inside a building.
  - Keep fuel away from open flame or spark and store machine away from open flame or spark or pilot light such as on a water heater or appliances.
  - Use extreme care when handling gasoline and other fuels. They are extremely flammable and vapors are explosive. A fire or explosion from fuel can burn you and others and can damage property.
  - Refuel outdoors. Never refuel or drain the fuel from the machine indoors.
  - Never attempt to start engine when there is a strong odor of gasoline or diesel fuel fumes present. Locate and correct cause.
  - Store fuel in an approved container and keep it out of the reach of children. Never buy more than a 30 day supply of fuel.
  - Do not fill fuel containers inside a vehicle or on a truck or trailer bed with interior carpets or plastic truck bed liners. Always place fuel containers on the ground away from your vehicle before filling.
  - When practical, remove gas or diesel fuel powered equipment from the truck or trailer and refuel the equipment with its wheels on the ground. If this is not possible, then refuel such equipment on the truck or trailer using a portable container and not a fuel dispenser nozzle. If a fuel dispenser nozzle must be used, keep the nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete. Do not use a nozzle lock-open device.
  - Never use gasoline or diesel fuel for cleaning parts.
  - Read and observe safety precautions elsewhere in this manual.
- ▲ Gasoline and diesel fuel is harmful or fatal if swallowed.
  - Long-term exposure to vapors can cause serious injury and illness.
  - Avoid prolonged breathing of vapors.

- Keep face away from nozzle and gas tank or fuel container opening.
- Keep fuel away from eyes and skin.
- If fuel is spilled on clothing, change clothing immediately.

Understand Machine Operation

▲ Only qualified and trained personnel should operate the equipment.

▲ Carefully read the operator's manual and all manuals furnished with the attachments. Learn the location and purpose of all controls, instruments, indicators and labels.

Wear Protective Clothing

▲ Do not operate or service the equipment while wearing sandals, tennis shoes, sneakers, shorts or any type of loose fitting clothing. Long hair, loose clothing or jewelry may get tangled in moving parts. Always wear long pants, safety glasses, ear protection and safety shoes when operating or servicing this machine.

▲ Always wear adequate eye protection when servicing the hydraulic system and battery, or when grinding mower blades and removing accumulated debris.

▲ Prolonged exposure to loud noise can cause impairment or loss of hearing.
- Always wear adequate ear protection, such as earplugs, when operating this equipment as prolonged exposure to uncomfortable or loud noises can cause impairment or loss of hearing.
- Do not wear radios or music headphones while operating the machinery. Safe operation requires your full attention.

Operation Precautions

Avoid Fire Hazards

▲ **Clean flammable material from machine. Prevent fires by keeping engine compartment, top of deck, exhaust area, battery, hydraulic lines, fuel line, fuel tank and operator's station clean of accumulated trash, grass clippings, and other debris. Always clean up spilled fuel and oil.**

Start Engine Safely

▲ Avoid possible injury or death from machine runaway.

▲ Do not start engine by shorting across starter terminals.

▲ Before you start the engine:
- Sit on the operator's seat.
- Move control levers to the neutral/brake position.

Operate Machine Safely

▲ Refer to the unit's operator's manual for complete safety information on safe machine operation.

▲ Always maintain a safe distance from people and pets when mowing

▲ Always be aware of what is behind the machine before backing up.

▲ Never leave machine unattended with ignition key in switch, especially with children present.

▲ Follow daily and weekly checklists, making sure hoses are tightly secured and bolts are tightened.

▲ Always keep engine and machine clean, removing accumulated dirt, trash and other material from machine.

▲ Never put hands or feet under any part of the machine while it is running.

▲ Never attempt to start engine when there is a strong odor of gasoline fumes present. Locate and correct cause.

▲ Keep all safety shields and covers in place, except for servicing.

▲ Do not touch hot parts of machine.

General Maintenance Precautions

▲ **Repairs or maintenance requiring engine power should be performed by trained maintenance personnel only.**

▲ Never run the engine in an enclosed area unless exhaust is vented to the outside. Exhaust gases contain carbon monoxide which is an odorless and deadly poison.

▲ Unless specifically required, **DO NOT** have engine running when servicing or making adjustments to mower. Park the machine on level ground. Place steering control levers in the park brake position, disengage deck clutch, lower deck, remove ignition switch key and disconnect negative battery cable before doing any maintenance. Wait for all movement to stop before

adjusting, cleaning or repairing. To prevent carbon monoxide poisoning, be sure proper ventilation is available when engine must be operated in an enclosed area.

- ▲ Before working on or under the deck, make certain engine cannot be accidentally started. Shut engine off, remove ignition switch key and disconnect negative battery cable for maximum safety.
- ▲ Except when changing or checking belt, **always** keep belt covers on mower deck for safety as well as cleanliness.
- ▲ Use a stick or similar instrument to clean under the mower making sure that no part of the body, especially arms and hands are under mower.
- ▲ Keep your machine clean and remove any deposits of trash and clippings, which can cause engine fires and hydraulic overheating as well as excessive belt wear. Clean up oil or fuel spillage. Allow machine to cool before storing.
- ▲ Always wear adequate eye protection when servicing the hydraulic system and battery, or when grinding mower blades and removing accumulated debris.
- ▲ Never attempt to make any adjustments or repairs to the mower drive system, mower deck or any attachment while the engine is running or deck clutch is engaged.
- ▲ Never work under the machine or attachment unless it is safely supported with jack stands. Make certain machine is secure when it is raised and placed on the jack stands. The jack stands should not allow the machine to move when the engine is running and the drive wheels are rotating. **Use only certified jack stands.** Use only appropriate jack stands, with a minimum weight rating of 2000 pounds to block the unit up. Use in pairs only. Follow the instructions supplied with the vehicle stands.
- ▲ Keep nuts and bolts tight, especially the blade attachment bolts. Keep equipment in good working condition.
- ▲ Never tamper with safety devices. Check their proper operation regularly.
- ▲ Exercise caution when working under the deck as the mower blades are extremely sharp. Wrap the blade(s) or wear gloves and use extra caution when servicing them.
- ▲ Use only genuine Hustler® replacement parts to ensure that original standards are maintained.

Maintenance Precautions

Avoid Fire Hazards

- ▲ Be prepared if an accident or fire should occur. Know where the first aid kit and the fire extinguishers are located and how to use them.
- ▲ Provide adequate ventilation when charging batteries.
- ▲ Do not smoke near battery.
- ▲ Never check fuel level with an open flame.
- ▲ Never use an open flame to look for leaks anywhere on the equipment.
- ▲ Never use an open flame as light anywhere on or around the equipment.
- ▲ When preparing engine for storage, remember that fuel stabilizer is volatile and therefore dangerous. Seal and tape openings after adding the inhibitor. Keep container tightly closed when not in use.
- ▲ Inspect electrical wiring for worn or frayed insulation. Install new wiring if wires are damaged.

Prepare For Emergencies

- ▲ Be prepared if a fire starts.
- ▲ Keep a first aid kit and fire extinguishers available.
- ▲ Keep emergency numbers for doctor, ambulance service, hospital, and fire department near the telephone.

Prevent Battery Explosions

- ▲ Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling.
- ▲ Charge batteries in an open well-ventilated area, away from sparks and flames. Unplug charger before connecting or disconnecting from battery. Wear protective clothing and use insulated tools.
- ▲ Avoid skin and clothing contact with battery acid.
  - Always wear eye protection when checking the battery, acid can cause serious injury to skin and eyes. If contact occurs, flush area with clean water and call physician immediately. Acid will also damage clothing.
  - Do not drink the battery electrolyte.
  - Do not allow open flame near the battery when charging.
  - Hydrogen gas forms inside the battery. This gas is both toxic and flammable and may cause an explosion if exposed to flame. Always **disconnect** the negative (black) battery cable(s) before disconnecting the positive (red) cable(s). Always **connect** the positive (red) battery cable(s) before connecting the negative (black) cable(s).
  - Do not overfill battery.
  - Electrolyte may overflow and damage paint, wiring or structure. When cleaning the battery, use soap and water. Be careful not to get soap and water into the battery. Clean the battery terminals with a solution of four parts water and one part baking soda when they become corroded.

▲ Shorts caused by battery terminals or metal tools touching metal mower components can cause sparks. Sparks can cause a battery gas explosion which will result in personal injury.
- Prevent the battery terminals from touching any metal mower parts when removing or installing the battery.
- Do not allow metal tools to short between the battery terminals and metal mower parts.

▲ Incorrect battery cable routing could cause damage to the mower and battery cables. This can cause sparks which can cause a battery gas explosion which will result in personal injury. Always **disconnect** the negative (black) battery cable(s) before disconnecting the positive (red) cable(s). Always **connect** the positive (red) battery cable(s) before connecting the negative (black) cable(s).

Avoid Acid Burns

▲ Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing and cause blindness if splashed in eyes.

Avoid the hazard by:
- Filling batteries in a well-ventilated area.
- Wearing eye protection and rubber gloves.
- Avoiding breathing fumes when electrolyte is added.
- Avoiding spilling or dripped electrolyte.

If you spill acid on yourself:
- Flush your skin with water.
- Apply baking soda or lime to help neutralize the acid.
- Flush your eyes with water for 10-15 minutes. Get medical attention immediately.

If acid is swallowed:
- Drink large amounts of water or milk.
- Then drink milk of magnesia, beaten eggs or vegetable oil.
- Get medical attention immediately.

Hydraulic Oil Pressure

▲ Hydraulic fluid escaping under pressure may have sufficient force to penetrate skin and cause serious injury. Foreign fluid injected into the skin must be surgically removed within a few hours by a doctor, familiar with this form of injury, or gangrene may result.

▲ Before applying pressure to hydraulic system, make sure all connections are tight and all hoses and lines are in good condition. To find a leak under pressure, use a piece of cardboard or wood — never use your hands. Relieve all pressure in the system before disconnecting or working on hydraulic lines. To relieve pressure, lower all attachments and shut off engine.

Chapter 2

TRANSMISSION & BRAKE

Description and Operation

A. Removal

The transaxle assembly consists of a two-speed gearbox, a differential assembly, PTO clutch assembly, PTO shaft and inboard brake.

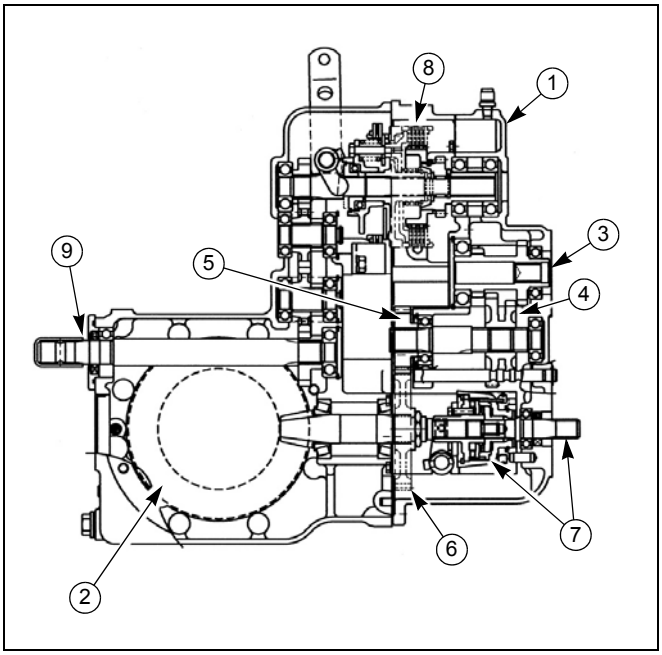


Figure 2-1

Transaxle Assembly	
1. Transmission Gearbox (2-speed)	6. Pinion Drive Gear
2. Differential assembly	7. Rear Wheel Drive Output Shaft and Two Way Clutch
3. Input Gear Cluster	8. PTO Clutch Assembly
4. Sliding Gears	9. PTO Shaft
5. Fixed Gears	

The front axle consists of differential lock, axles, and brakes.

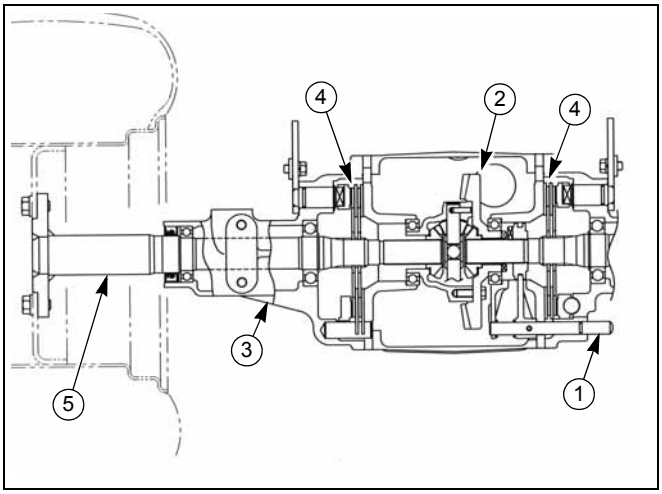


Figure 2-2

Transaxle Assembly	
1. Differential Lock	4. Inboard Brake
2. Differential assembly	5. Drive Axle
3. Axle Housing	

The range gearbox housing also supports the differential assembly, Figure 2-2. The two-speed transmission gearbox consists of constant mesh spur gears and sliding gears. The range gearbox also contains a four wheel drive output shaft and two way clutch.

The range selector lever is located on the left-hand panel adjacent to the operator's seat. The range selector (Hi/Lo) cannot be shifted while the unit is in motion. The range selector lever and Four-Wheel-Drive (FWD) selector lever are activated by the same lever.

The range selector lever has three positions; back (high range) mid-position (neutral) and forward (Low range). In High Forward "H" forward speed ranges from 0 – 15.0 mph (0 – 24.0 km/h) and Low Forward from 0 – 6.0 mph (0 – 9.6 km/h). In Reverse High speed ranges from 0 – 9.0 mph (0 – 14.4 km/h) and in Reverse Low from 0 – 4.0 mph (0 – 6.4 km/h).

The differential assembly consists of a differential lock coupler, pinion differential and two bevel side gears splined directly to the axle shafts.

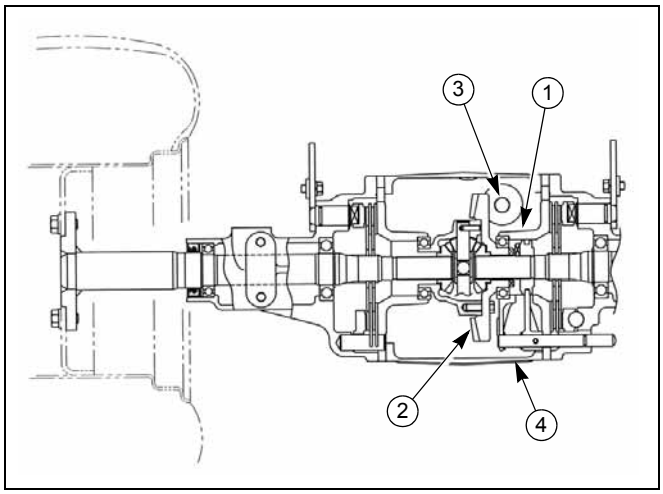


Figure 2-3

Range Gear & Differential Housing	
1. Differential Lock Coupler	3. PTO Shaft
2. Differential	4. Gearbox Housing

B. Brakes

The brakes are located in the front axle housing. The brakes are disc brakes and consist of a stator, disc, steel ball, spring, actuate plate and brake lever. The brakes are mechanically applied by individual pedals located on the left side of the steering column (optional).

A master brake pedal, located on the right side, applies both brakes evenly.

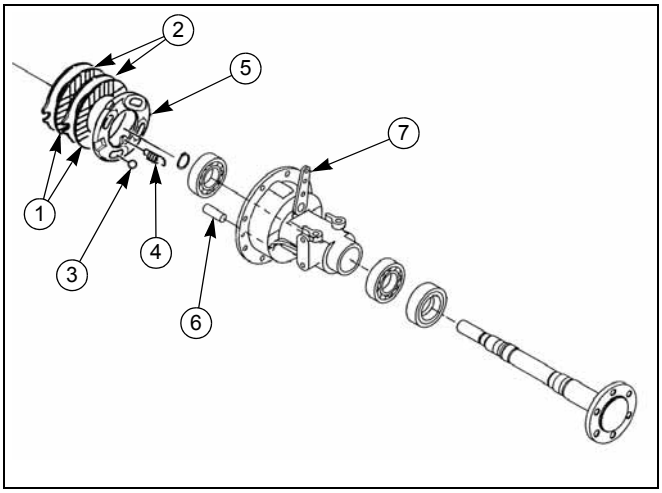


Figure 2-4

Brakes	
1. Brake Disc	4. Spring
2. Stator	5. Actuator Plate
3. Steel Ball	6. Pin
	7. Brake Lever

C. Differential Lock

A differential lock is provided to lock the differential so that both front wheels rotate when power is provided by the transmission even though one wheel may lose traction. The differential lock control pedal is foot operated and is located on the left side of the steering column.

D. Power Flow (Range Gear)

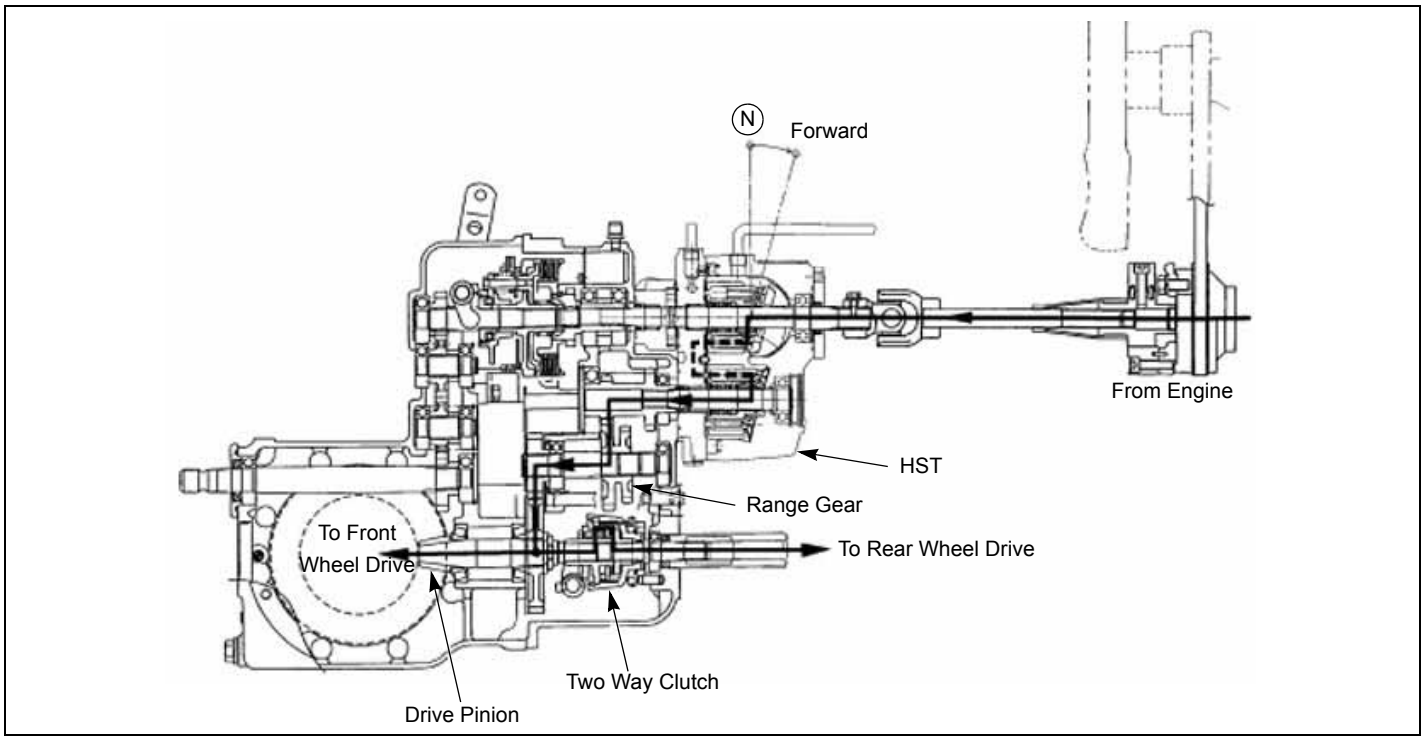


Figure 2-5

Range Change lever: L Position

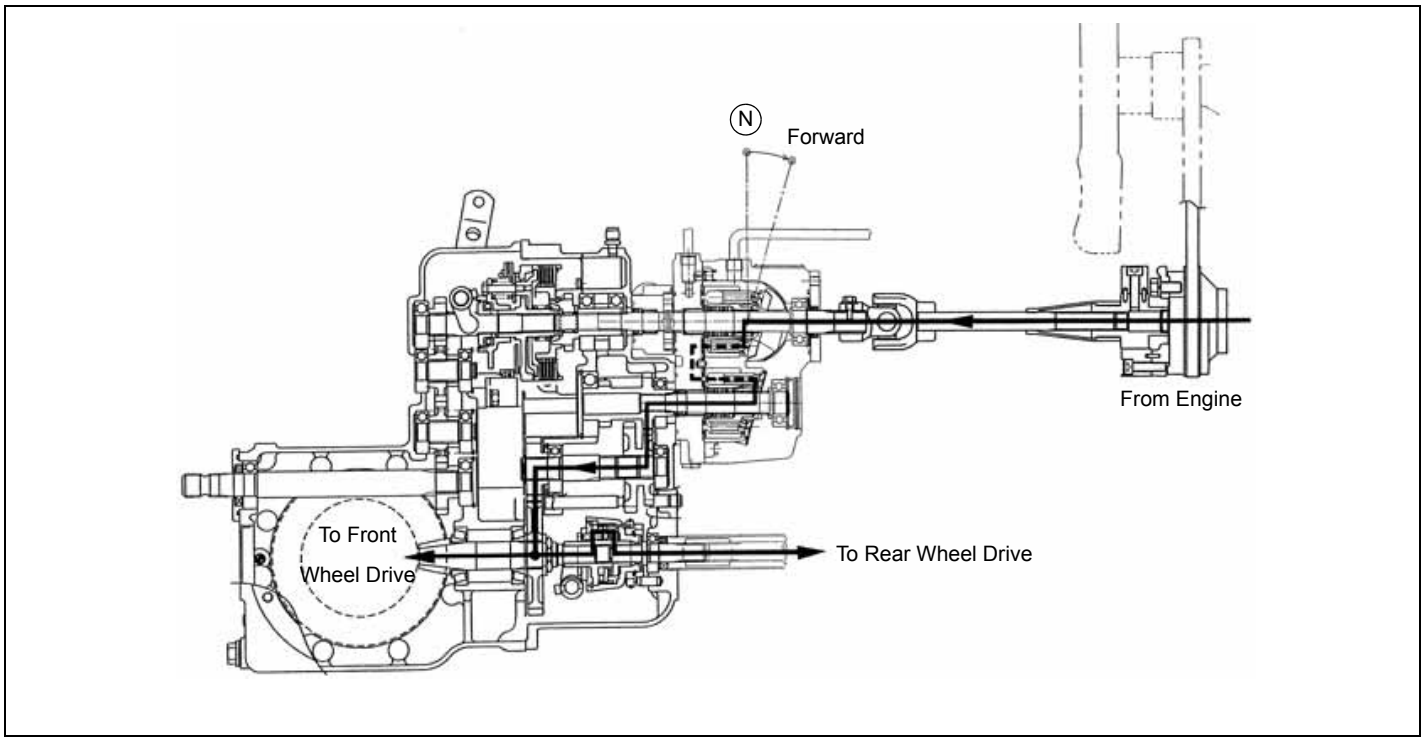


Figure 2-6

Range Change lever : H Position

E. Power Flow (PTO)

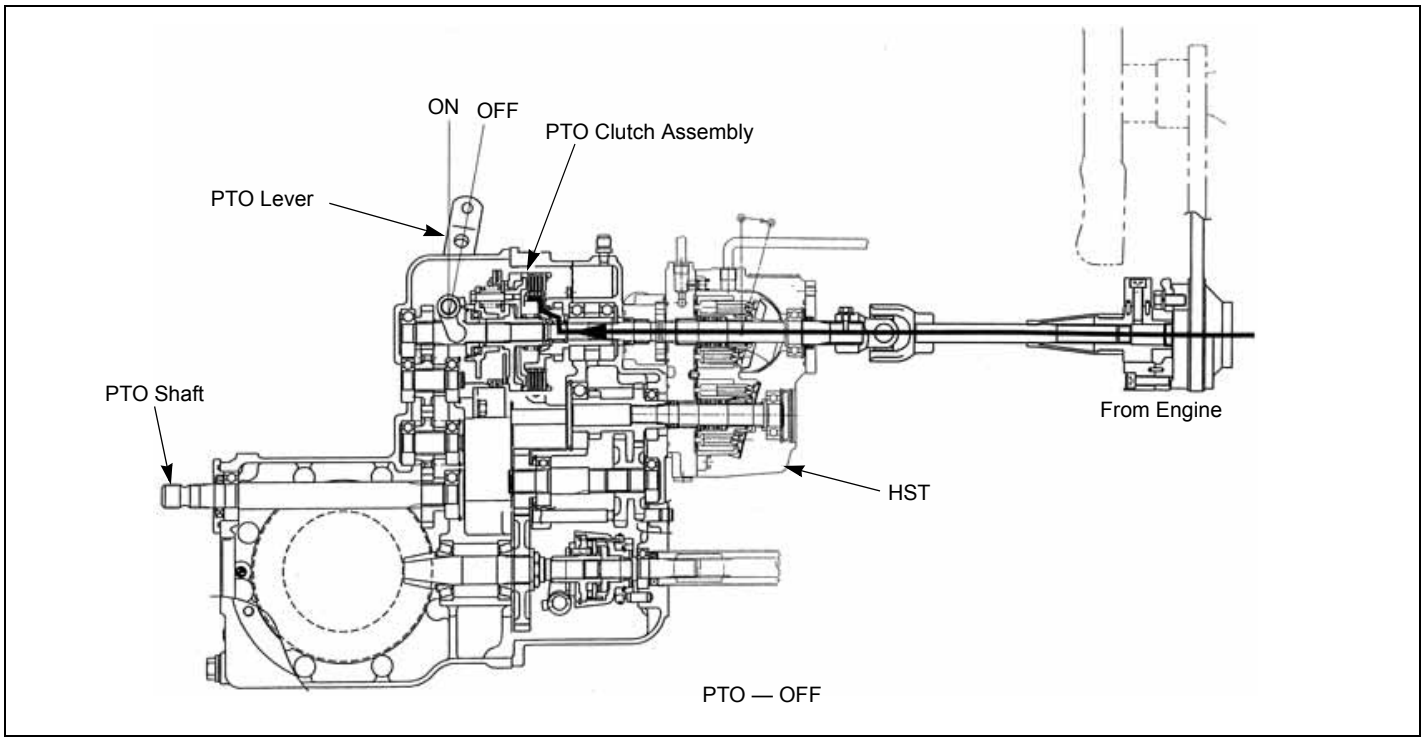


Figure 2-7

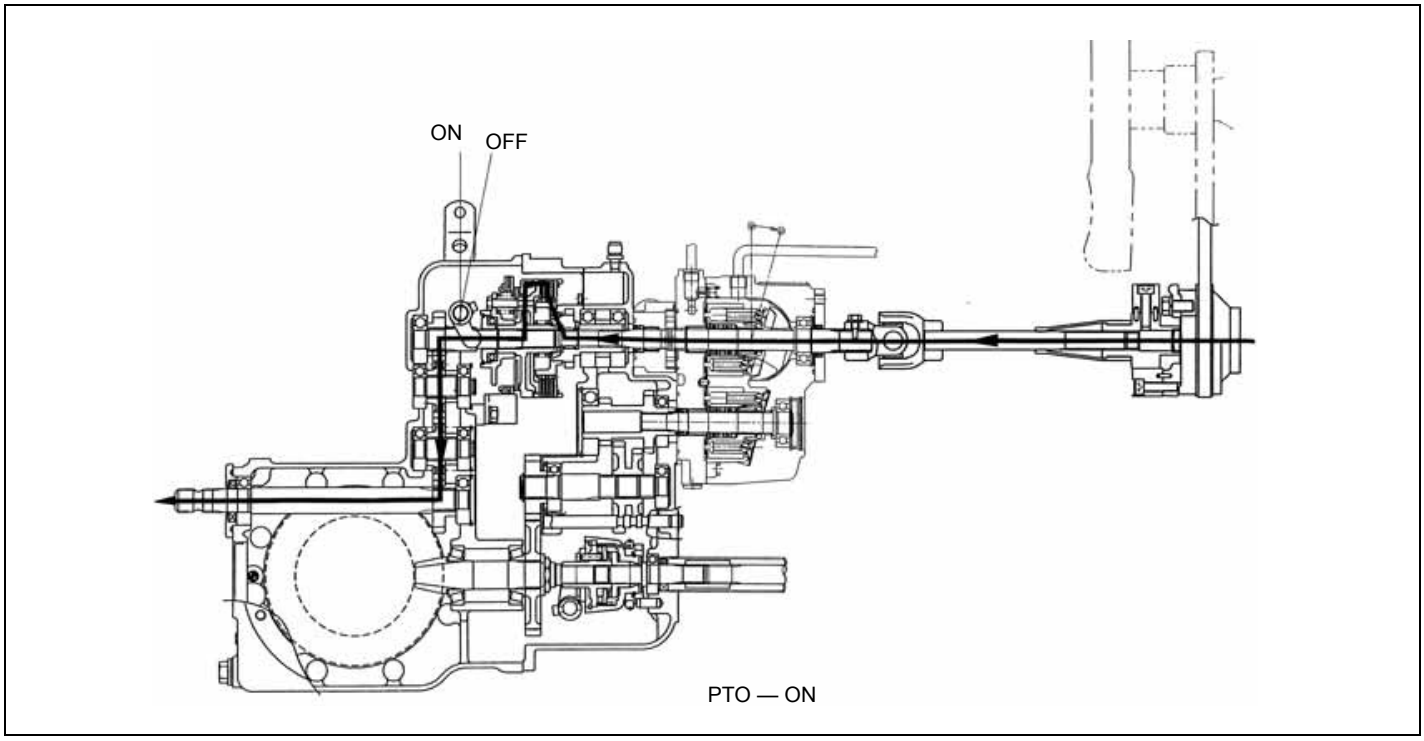


Figure 2-8

Transmission Unit

The transaxle assembly must be removed from the commercial mower to perform service work on the HST, transmission gearbox, four wheel drive output shaft differential.

A. Removal

1. Disconnect the negative battery cable.
2. Remove the various control handle grips ①, side cover ②, and fenders ③ and ④. Figure 2-9
3. Drain the hydraulic fluid from the axle assembly via the drain plug ⑤ located at the front center bottom of the front axle housing. Figure 2-9

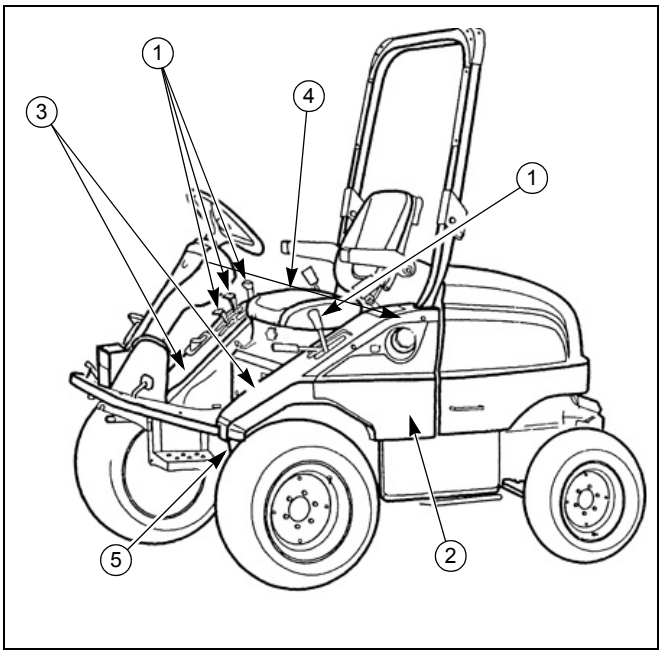


Figure 2-9

4. Release the seat pan latch, pivot the seat ② and seat pan up ① and over. Disconnect the mower harness from the seat switch ③. Unbolt the seat assembly from the seat pan and remove it. Figure 2-10

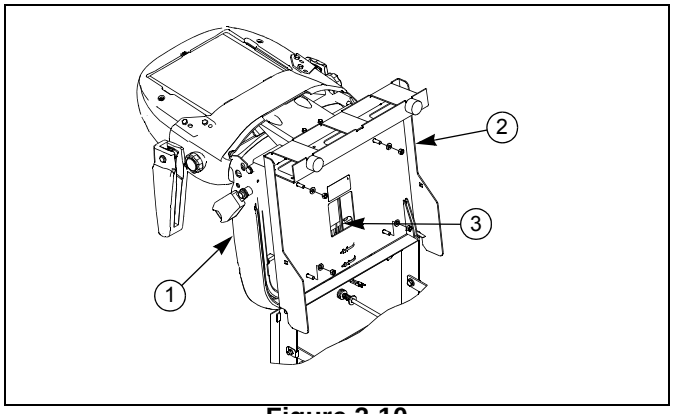
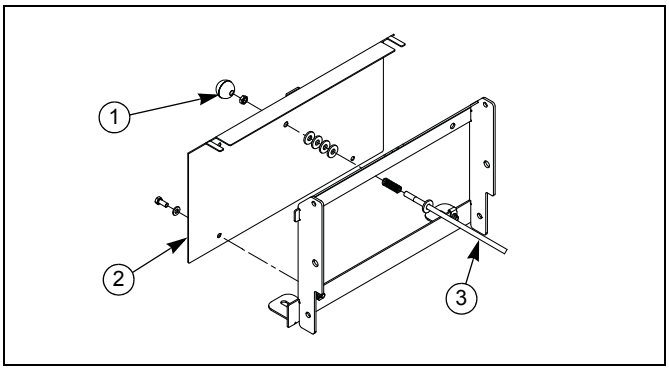


Figure 2-10

5. If the mower has the seat latch knob ① in the front cover ② you will need to disconnect the seat latch rod ③ from the latch plate ④. Figure 2-11
   NOTE: If the mower has the seat latch lever located behind the seat proceed to Step 7.



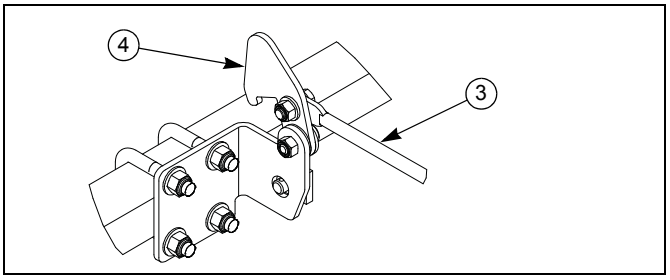


Figure 2-11

6. If the mower has a dampener ① connected to the seat pan ② it will need to be disconnected from the seat pan. Figure 2-12
7. Remove the seat pan ② from the front cover ③ by removing the pivot bolts ④. Figure 2-12
8. Remove the front cover ③. Figure 2-12

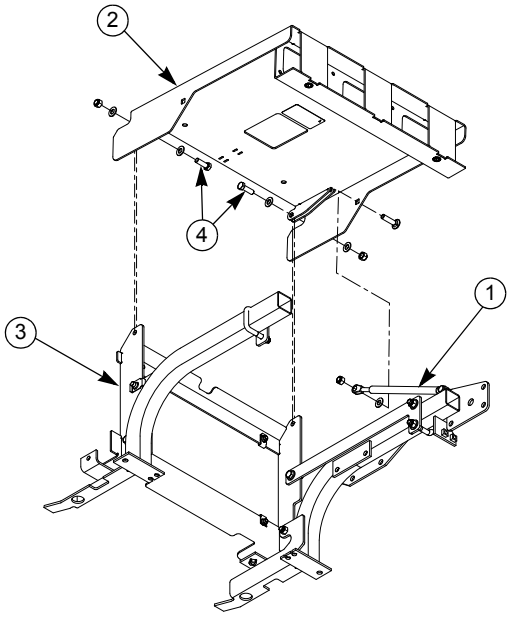


Figure 2-12

9. Disconnect the parking brake wire ④ from both brake levers. Figure 2-13
10. Remove the split pin, washer and pin, and disconnect the brake rod ① from both brake levers. Figure 2-13
11. Remove the split pin, pin, and disconnect the differential lock control rod ② from the differential lock lever. Figure 2-13 .

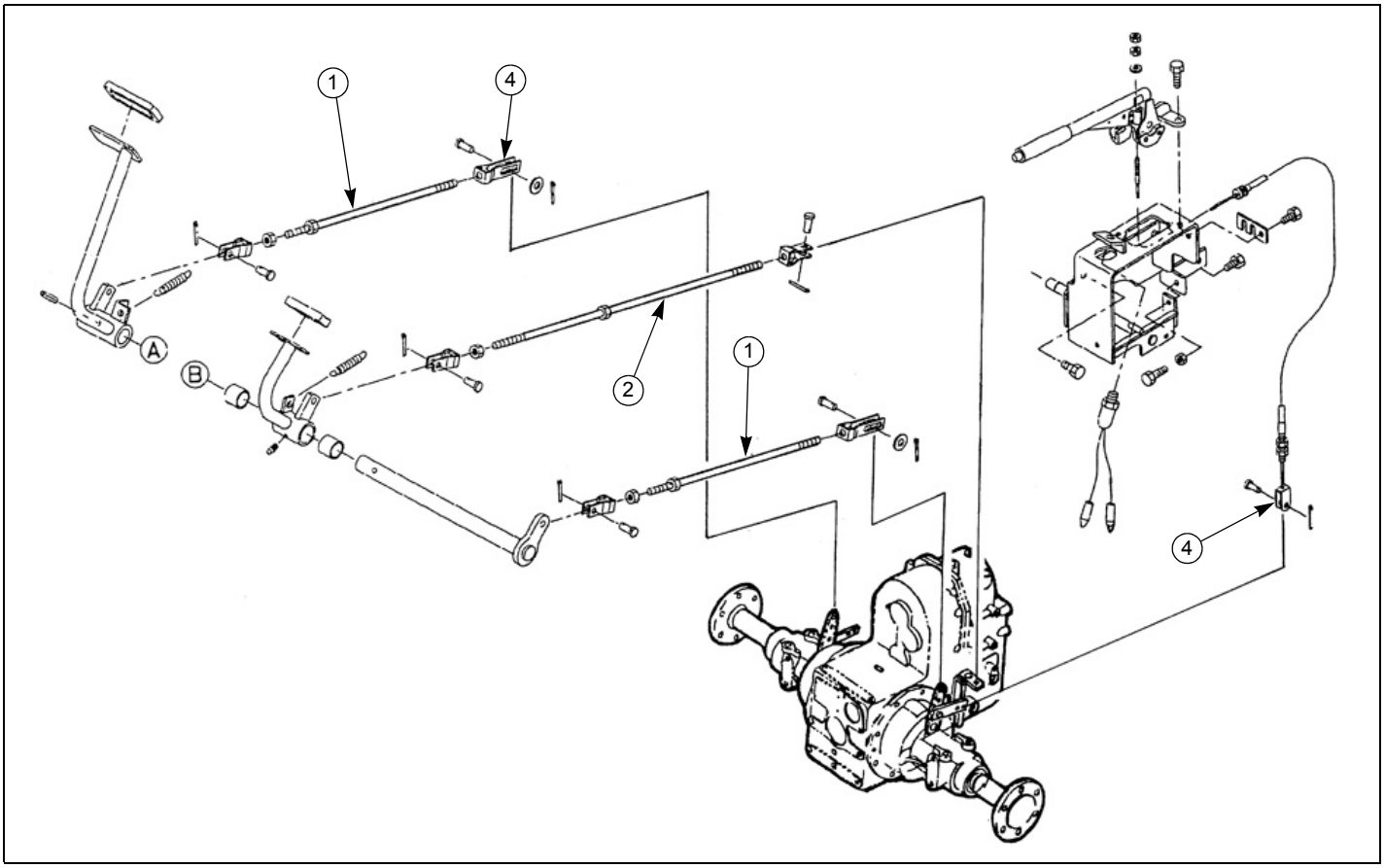


Figure 2-13

12. Disconnect the power steering lines ① from the power steering cylinder, located on the rear axle. Figure 2-14
13. Place four (4) safety stands under the main frame.
14. Remove the rear axle bearing holders ② from the frame and remove the rear axle assembly ③, pipe, drive shaft and coupling from the power unit. Figure 2-14

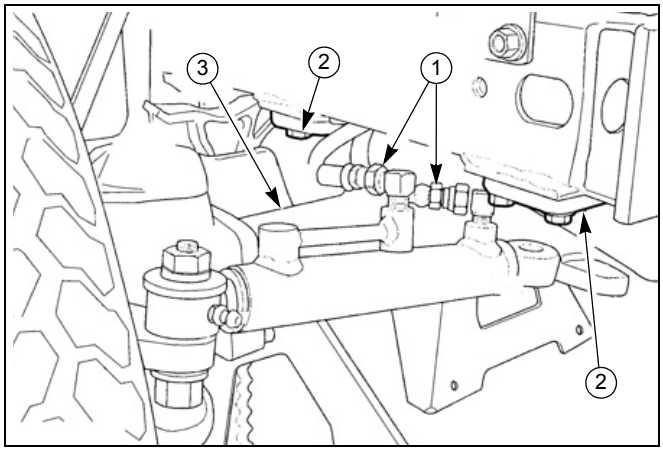


Figure 2-14

15. Remove the bolt ① from the universal joint ② and disconnect the joint from the HST input shaft by sliding the joint towards the engine. Figure 2-15

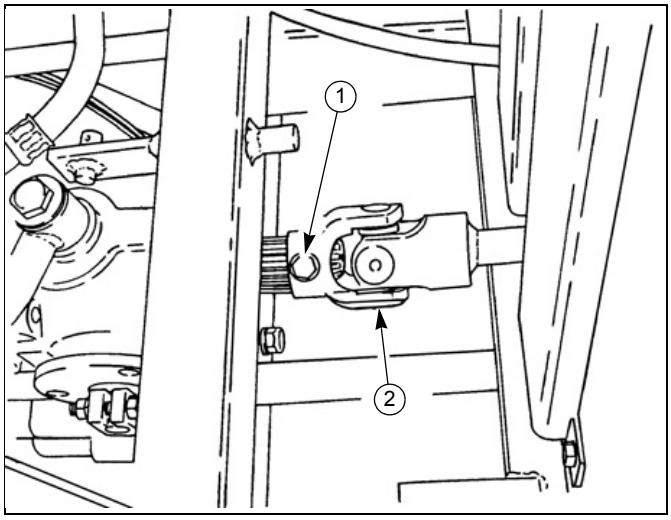


Figure 2-15

16. Disconnect the wire connector from the HST neutral switch ①. Figure 2-16

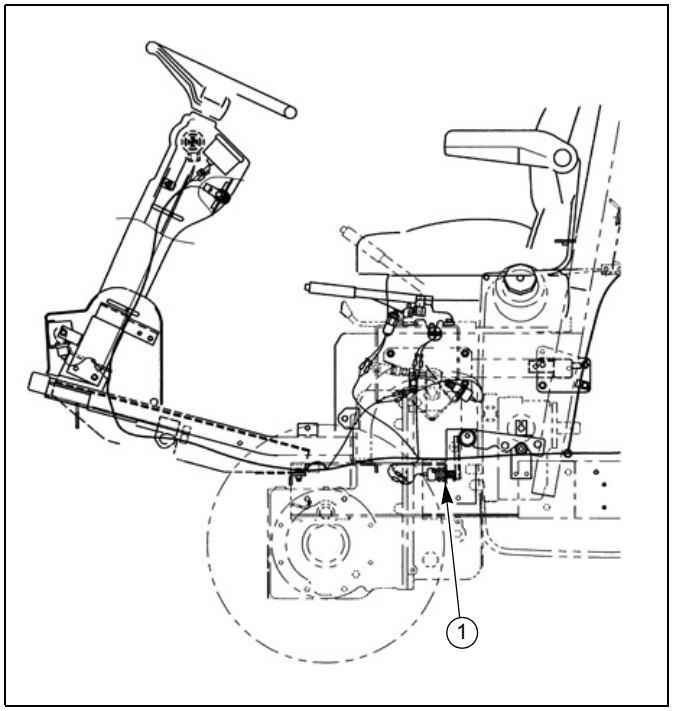


Figure 2-16

17. Remove the split pin ① and washer. Disconnect the PTO safety stop wire ② from the R.H. lift arm.
18. Remove the bolt ③ and pin ④ and separate the hydraulic cylinders ⑤ from the right and left lift arms.

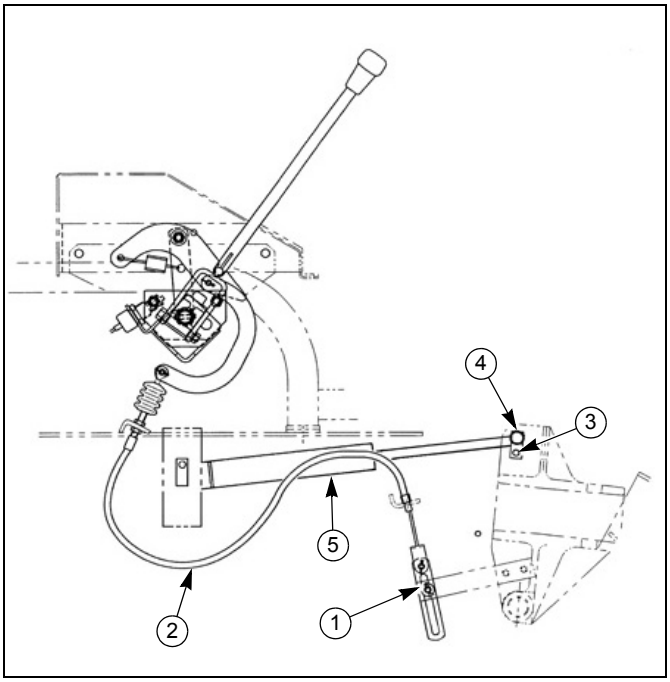


Figure 2-17

19. Loosen the hose clamps ① and disconnect the return hose ② from the vent hose on the transmission housing.
20. Disconnect the fork joint ③ by removing the pins from the PTO clutch control lever ④.
21. Remove the spring ⑤ from the PTO clutch control lever ④.

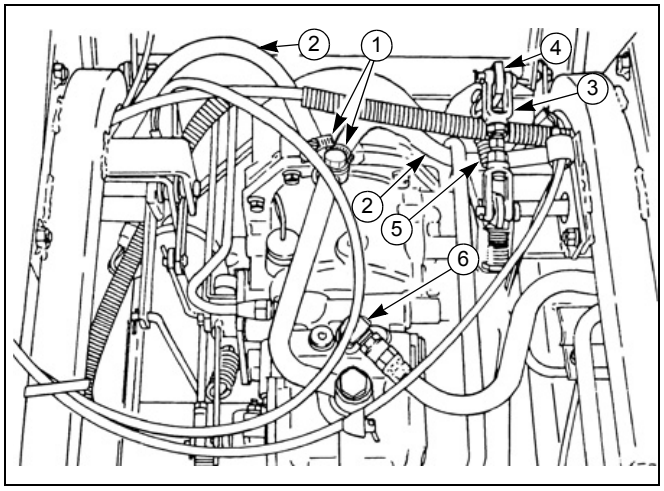


Figure 2-18

22. Disconnect the oil line ① from the HST charge pump.

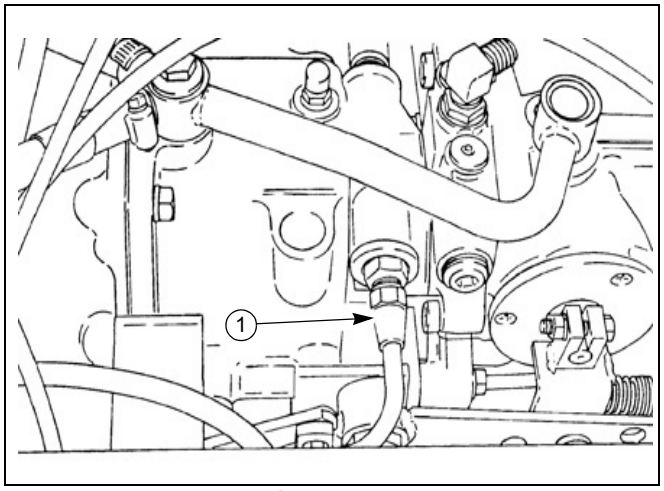


Figure 2-19

23. Loosen the hose clamp ① and disconnect the suction hose ② from the hydraulic oil pump.

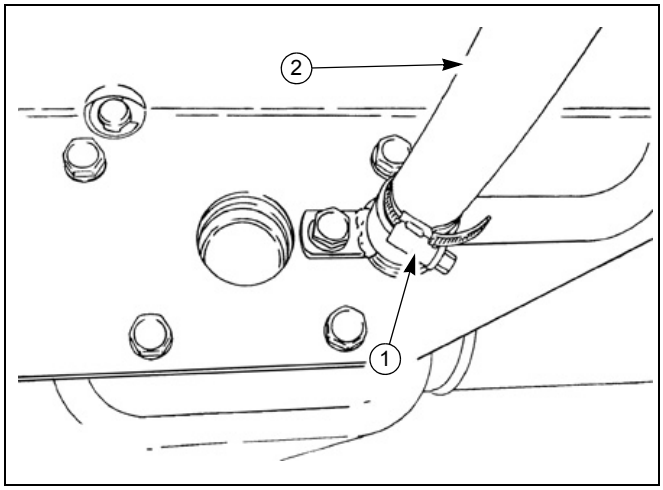


Figure 2-20

24. Remove the split pin, washer and disconnect the HST speed control rod ① from the HST control lever.
25. Remove the u-nut and the damper ② from the HST control lever.
26. Unhook the spring ③ from under the HST speed control lever.

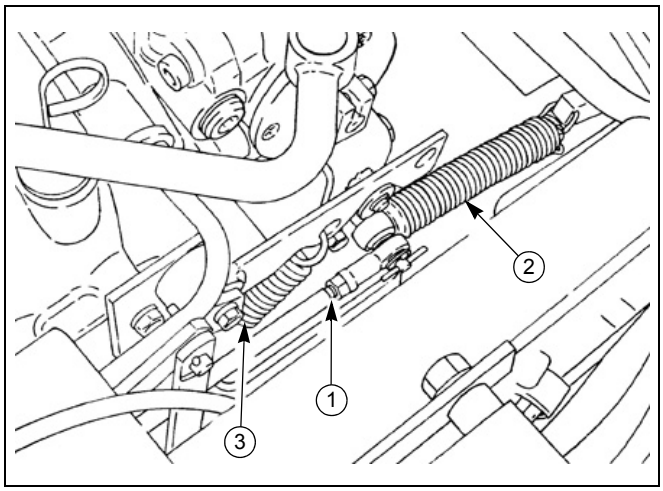


Figure 2-21

27. Remove the split pin, washer and disconnect the four-wheel drive control rod ① and range gear control rod ② from the change lever.

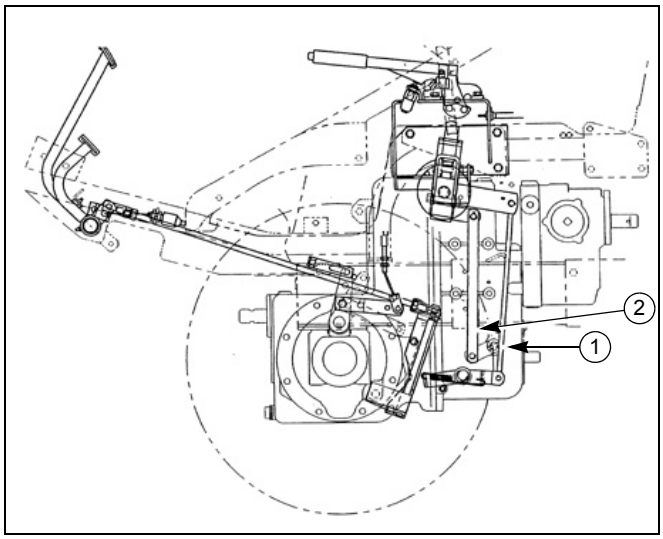


Figure 2-22

28. Remove the banjo bolt and clamp ① from the oil cooler return line. Disconnect the return line ②, from the oil cooler.
29. Use two wrenches (to prevent twisting, a backup wrench must be used) and disconnect the feed line ⑥, for the HST on the top of the HST unit, Figure 2-18.

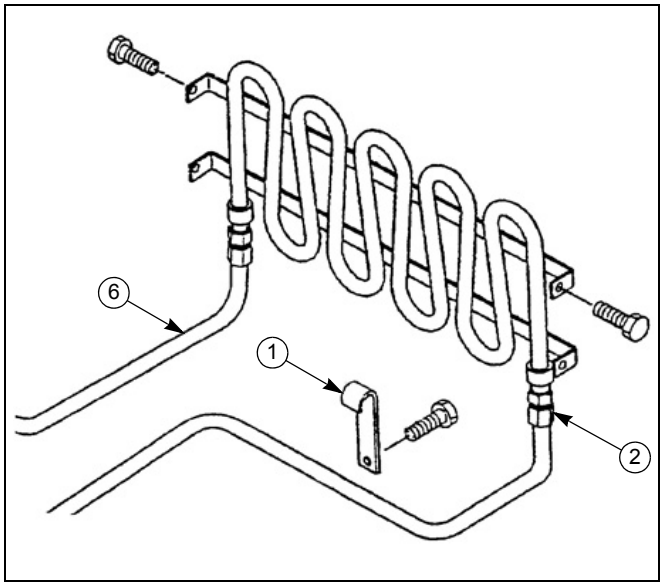


Figure 2-23

30. Hold the front frame up with the chain block.
31. Remove the rear frame ①, attaching bolts ②, and nuts ③.

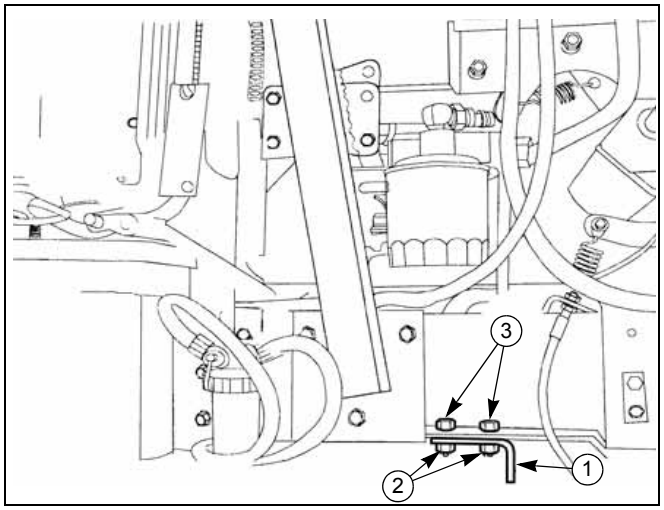


Figure 2-24

32. Remove the bolts ① from the front axle housing.
33. Lower the front axle and transmission housing assembly ②, from the main frame.

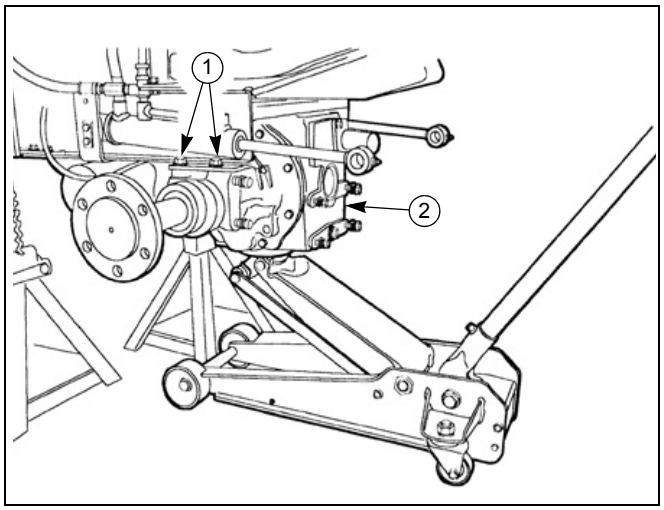


Figure 2-25

34. Remove the rear frame ① from the rear transmission housing.

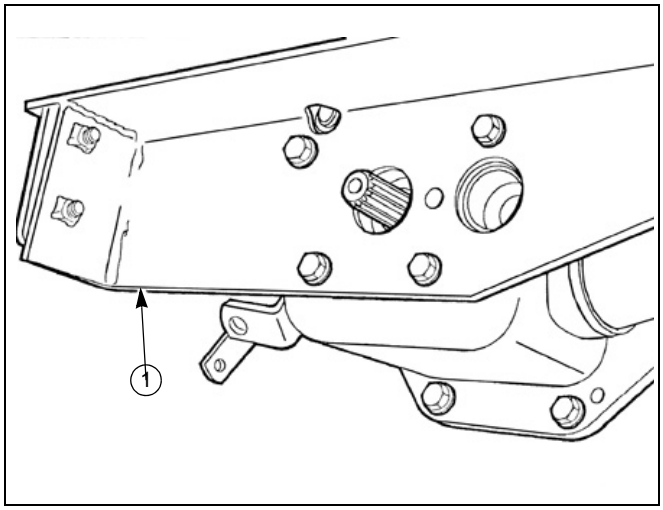


Figure 2-26

35. Unhook the spring ④, remove the shift arm ① and shift guide ② as a set from the transmission.
If necessary, remove the control lever ③ from the HST unit.

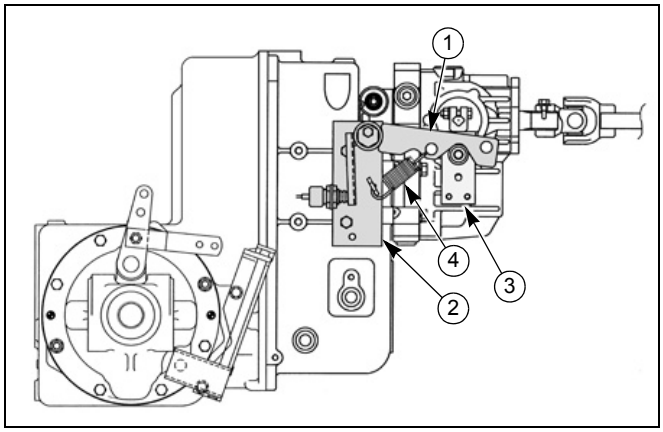


Figure 2-27

Front Transmission Unit

A. Disassembly

1. Remove the side PTO unit from the transmission housing and HST unit.
NOTE: The Side PTO is not used on Hustler® models.

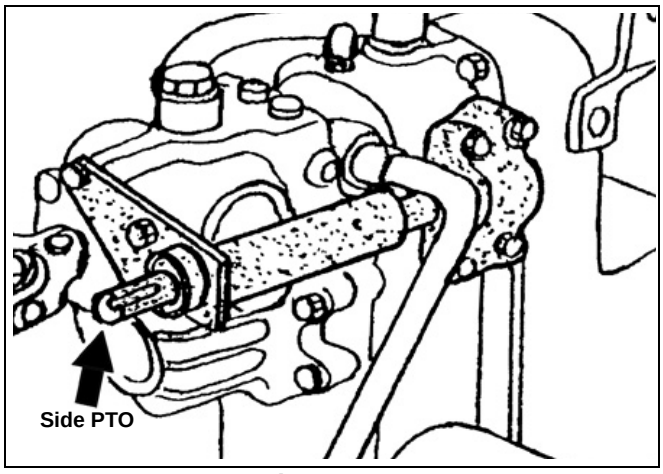


Figure 2-28

2. Remove the HST unit ① from the transmission assembly.

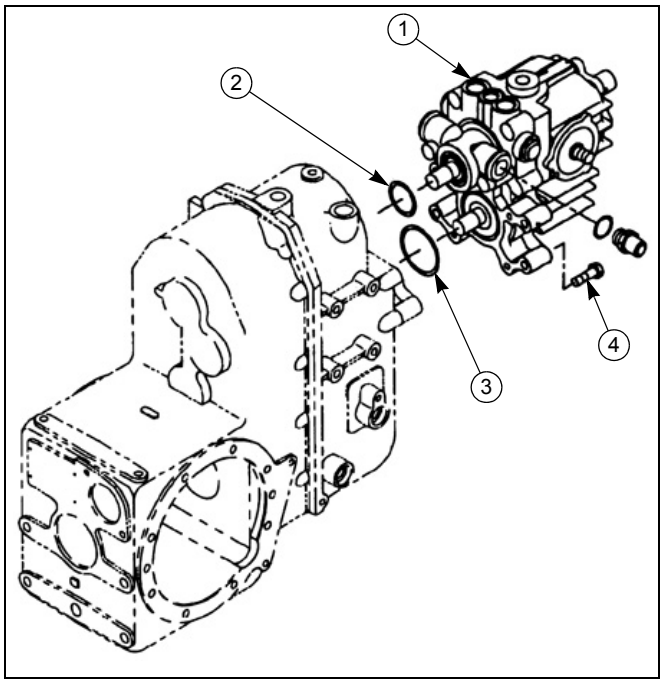


Figure 2-29

1. HST Unit	3. O-Ring
2. O-Ring	4. Bolt

3. Remove the L.H. wheel shaft housing ① and bearing holder ②.

NOTE: Note the total amount of shims and thickness used between differential bearing and bearing holder.

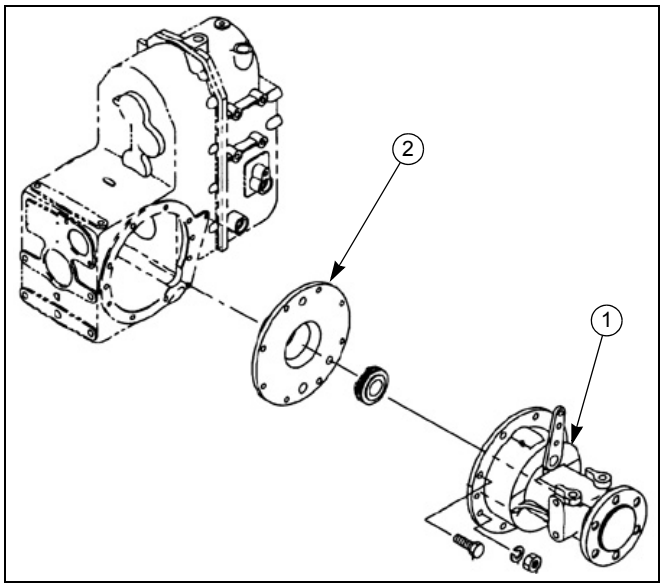


Figure 2-30

4. Remove the L.H. wheel shaft housing ②, the bearing holder ③, and differential assembly ①.

NOTE: Note the total amount of shims and thickness used between differential bearing and bearing holder.

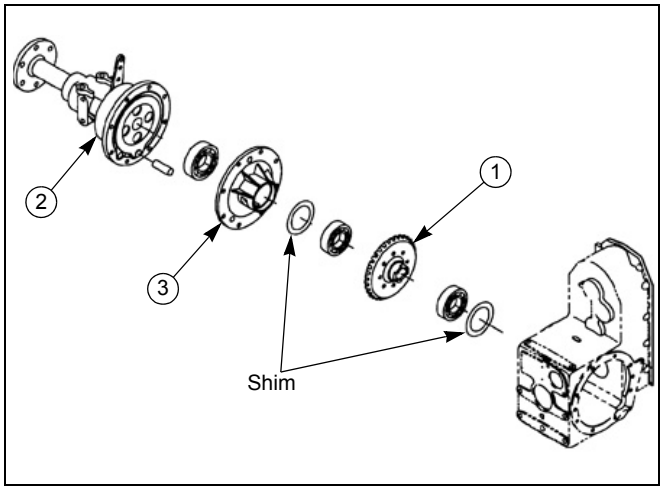


Figure 2-31

5. Separate the rear transmission housing ① from the front transmission housing ②.

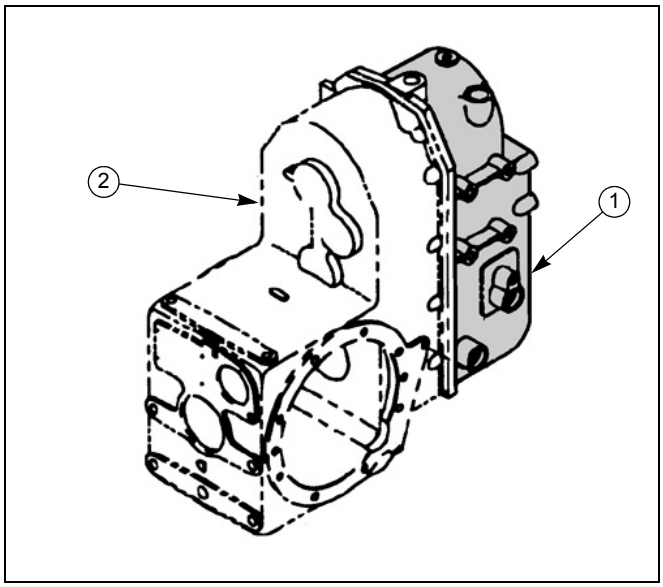


Figure 2-32

6. Remove the seal cover ①, with oil seal ②, and O-Ring ⑧ from the transmission housing.
7. Drive out the PTO shaft ③ and remove the fixed gear ④, snap ring ⑤, bearings ⑥ and ⑦ from the transmission housing.

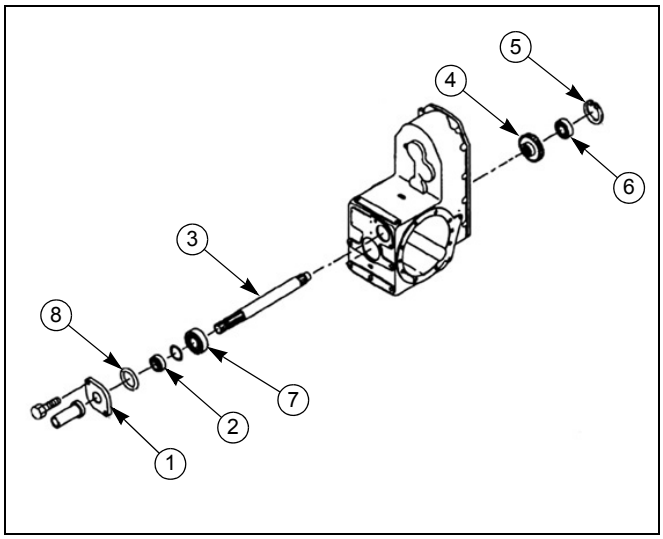


Figure 2-33

8. Remove the PTO clutch assembly ① and thrust bearing ②.
9. If necessary, remove the plate ③ from the transmission housing.

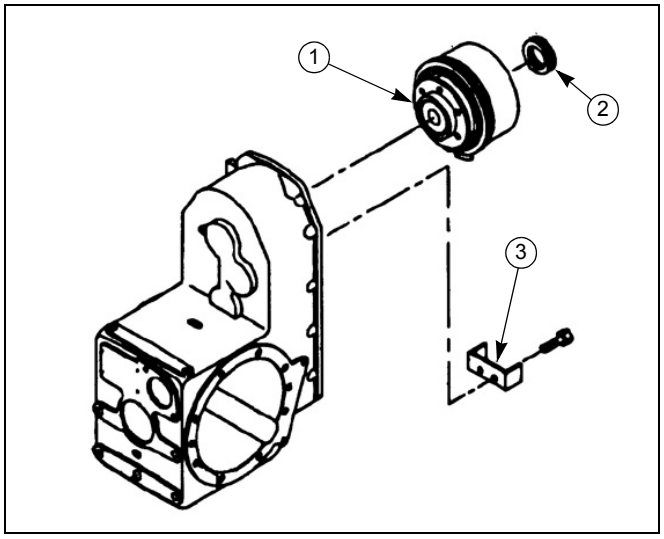


Figure 2-34

10. Loosen the lock nut ① on the drive pinion shaft ②.
11. Remove the washer ⑤ and fixed gear ④ from the drive pinion shaft ②.

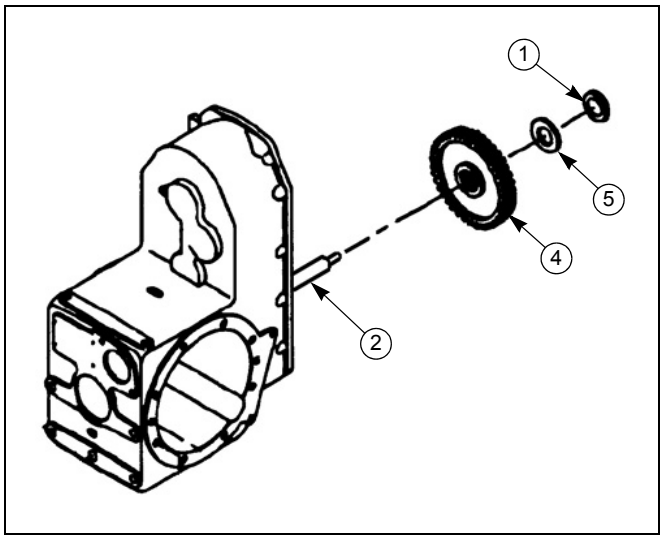


Figure 2-35

12. Pull out the drive pinion shaft ①, thrust washer ②, and shims ⑤ from the front of the transmission housing.
13. Remove bearings ② and ③ from the housing.
14. If necessary, drive out the seal cover ⑥ to inspect the ring gear backlash.

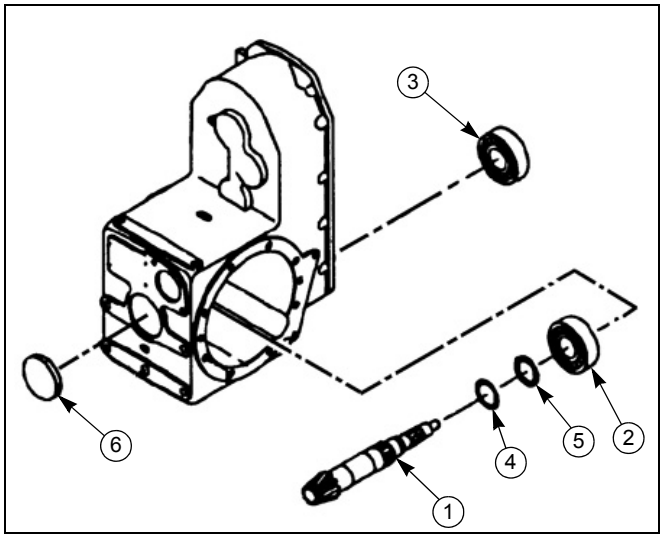


Figure 2-36

15. Remove the snap ring ① and pull out the counter shaft ② with bearing ③, and collar ④.
16. Take out the fixed gear ⑤ and bearing ⑥ from the housing.

NOTE: Put an identifying mark on the fixed gear ⑤ using paint.

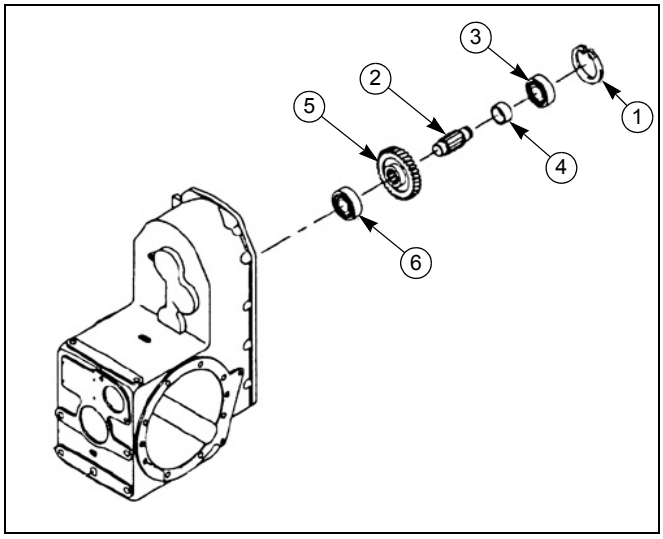


Figure 2-37

17. Remove the snap ring ① and pull the counter shaft ② with bearing ③ out.
18. Remove the collar ④, fixed gear ⑤, and bearing ⑥ from the housing.

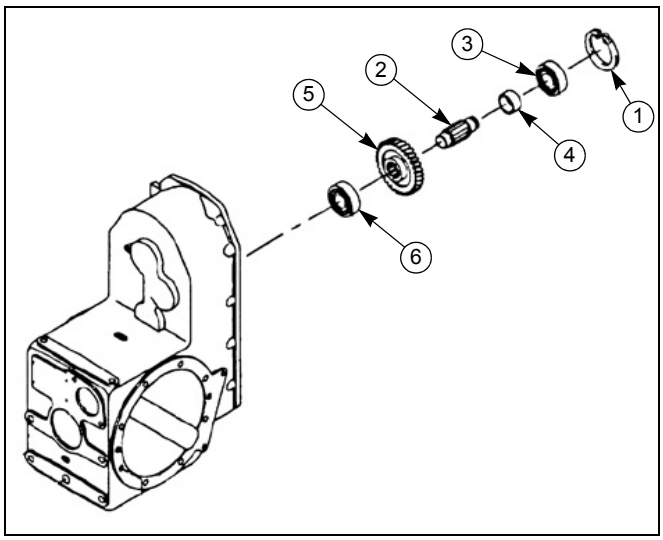


Figure 2-38

19. Heat the two bolts ①, with a torch, and remove them. Then, pull the PTO clutch shaft ② out. Heat must be applied to break the Loctite bond on the bolts.
20. Remove the clutch fork ③ from the housing.
21. Remove the drive shaft ④ with snap ring ⑤.
22. Remove the fixed gear ⑥ and bearing ⑦.

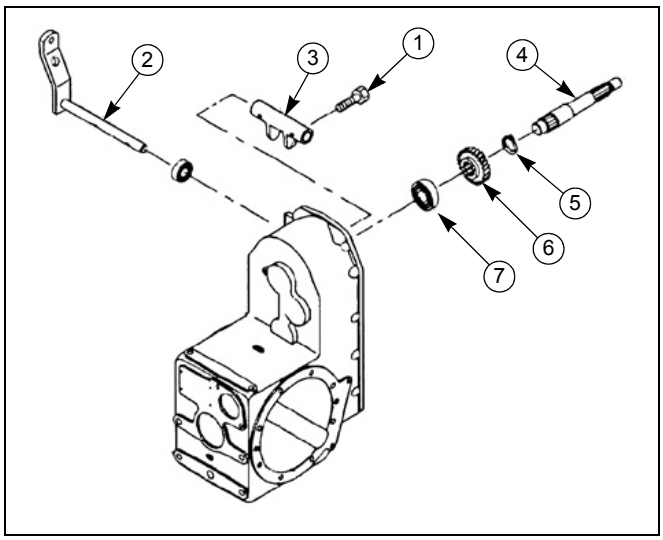


Figure 2-39

B. Inspection

1. Wash all components with a suitable cleaning solvent and air dry.
2. Inspect all bearings for excess wear, score marks, discoloration from overheating, or other damage. Rotate the bearings by hand and check for roughness while slowly rotating the inner and outer races.
3. Lubricate all bearings with a clean lubricant before installation.
4. Inspect the transmission case for cracks, worn bearing bores or other damage.
5. Inspect all parts for excess wear, chipped teeth, or other damage.
6. Inspect the shift forks for excess wear, bends or other damage.

C. Assembly

Reassembly generally follows the disassembly procedure in reverse.

Be sure all components are free of dirt and foreign matter and lubricate all components with clean hydraulic oil on assembly.

During assembly observe the followings:

1. Use solvent to remove debris and oil from bolt threads ① and thread holes in the clutch shaft. Apply Loc-tite 242 to bolt threads when installing the clutch fork ③.

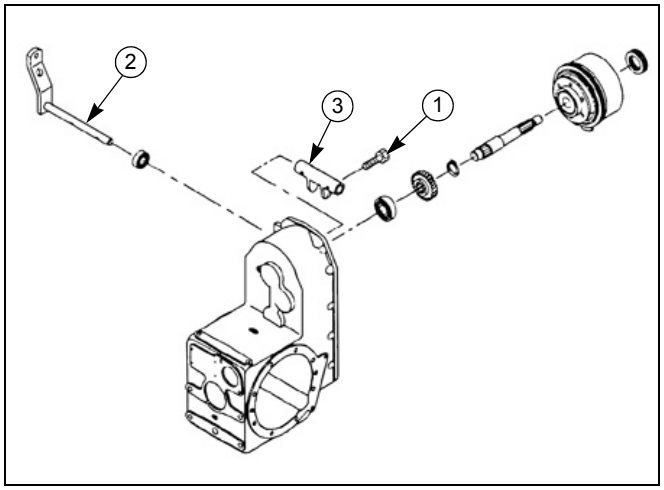


Figure 2-40

2. **IMPORTANT:** Position the clutch shaft lever ① as shown before installing the PTO clutch assembly.

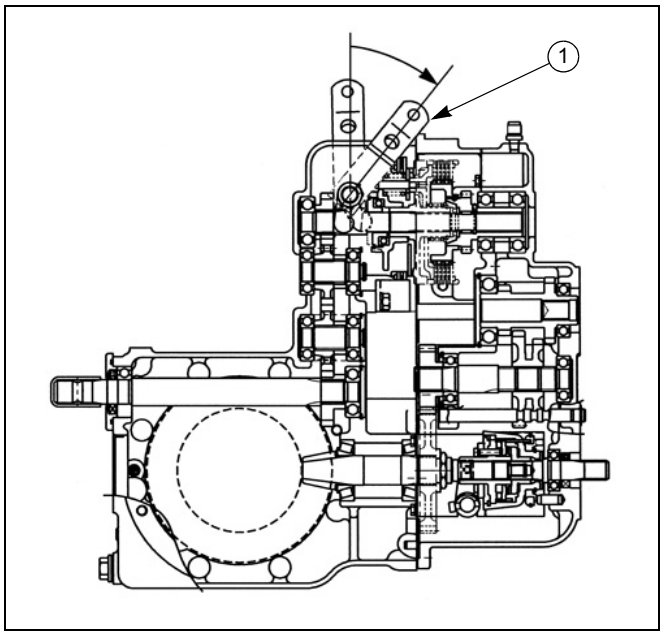


Figure 2-41

3. The fixed gear ① (with identity mark) when it is removed is installed in position A.

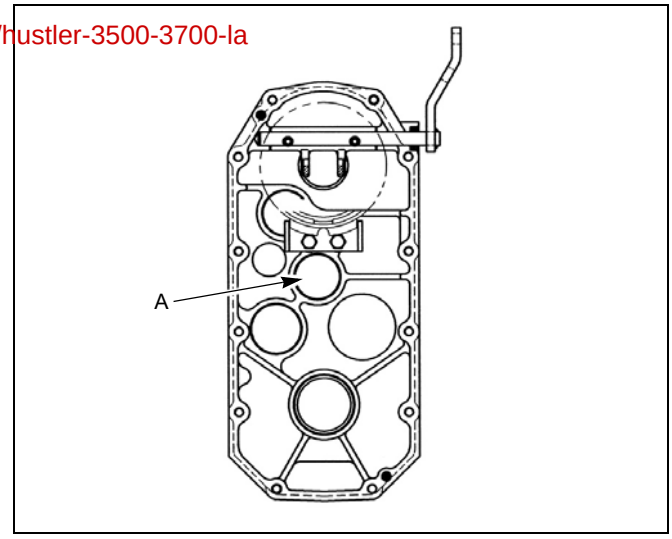


Figure 2-42

4. The shims ① are installed between thrust washer ② and bearing ③ on the drive pinion ④.
5. Adjust the pinion bearing pre-load using a strong cord wrapped around the pinion shaft spline and a pull scale. Tighten the pinion nut to obtain the specified pounds of constant pull to rotate the pinion assembly.

   Pinion Bearing Pre-Load Constant Pull 44 lbf (196 N)

   NOTE: Turn drive pinion several times by hand before performing pull scale test.

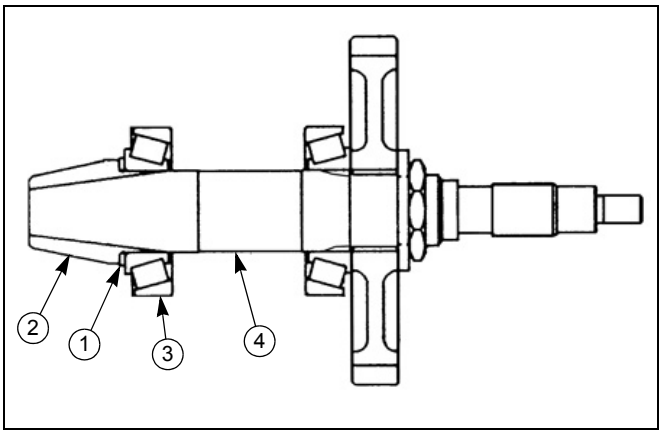


Figure 2-43

6. Bend the lock nut flange with a chisel at the notch in the pinion shaft after adjusting the pre-load.

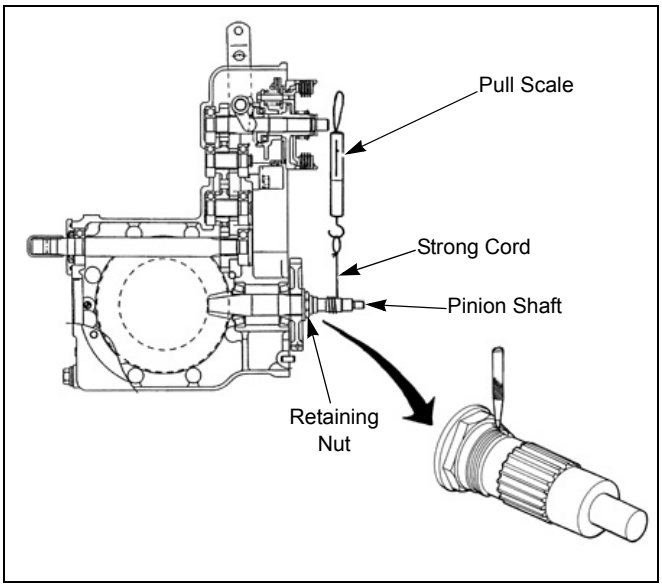


Figure 2-44