

The Cub Cadet logo is displayed in a stylized, italicized white font on a blue rectangular background.

Service Manual



4x2 Utility Vehicle Poly Bed and Steel Bed

NOTE: These materials are prepared for use by trained technicians who are experienced in the service and repair of equipment of the kind described in this publication, and are not intended for use by untrained or inexperienced individuals. Such individuals should seek the assistance of an authorized service technician or dealer. Read, understand, and follow all directions when working on this equipment. This includes the contents of the Operators Manual, which came with your equipment. No liability can be accepted for any inaccuracies or omission in this publication, although every care has been taken to make it as complete and accurate as possible. The right is reserved to make changes at any time to this document without prior notice and without incurring an obligation to make such changes to previously published documents. All information contained in this publication is based on product information available at the time of publication. Photographs and illustrations used in this publication are for reference use only and may not depict actual model and component parts.

MTD Products Inc. - Product Training and Education Department

FORM NUMBER - 769-01635

12/2004

TABLE OF CONTENTS

Poly Bed 4 X 2 Drive System	
Customer Responsibilities	1
Gear Lube	1
Diagnosis: Confirming Transaxle Fault	3
Transmission Linkages	3
Diagnosis and Service: Drive Belt and Clutches (CVT or Continuously Variable Transmission)	11
Transaxle Removal and Replacement	20
Transaxle Installation Notes:	24
Link Assembly	25
Transaxle Repairs	26
Poly Bed 4 X 2 Brake System	
Maintenance and Description of the Brake System	39
Complete Inspection (Drum and Shoe Removal)	40
Brake Adjustment (under the hood)	43
4 X 2 Drive System - (Steel Bed)	
Customer Responsibilities	47
Gear Lube	47
Diagnosis: Confirming Transaxle Fault	48
Diagnosis and Service: Drive Belt and Clutches (CVT or Continuously Variable Transmission)	49
CVT Removal: Driven Pulley	52
CVT Removal: Driving Pulley	53
Transaxle Removal and Replacement	55
Transaxle Installation Notes:	59
Link Assembly	60
Transaxle Orientation	61
Transaxle Disassembly: Axle tube Removal and Case Separation	62
Transaxle Disassembly: Gear Set Removal and Disassembly	64
Transaxle Disassembly: Differential	68
Transaxle: Axle Tubes	70
In-cradle Engine Service	74

Poly Bed 4 X 2 Drive System

ABOUT THIS SECTION:

This section covers the drive system and transaxle used in the Big Country utility vehicle model series 414 (37AN414J710). This model is distinguished from the 420 and 430 series by a polymer bed and the use of a different drive system. The 420 and 430 series use a Honda 18 hp. V-twin engine and a Dana transaxle. The 414 uses a drive system manufactured by Kawasaki.

1. CUSTOMER RESPONSIBILITIES

- Housing, axle, bearing, or axle tube damage caused by impact or over-loading constitutes customer abuse, and is not covered under the warranty. The poly bed Big Country has a lower load rating than the steel bed version: 900 Lb. (410 KG) including bed load, operator, and passenger.
- Damaged caused by shock-loading the transmission is not covered under the warranty. Shock-loading is primarily caused by shifting between forward and reverse gears without allowing the vehicle to come to a full stop. This is possible if the vehicle is operated abusively
- Damage caused by a lubrication failure is not covered under the warranty.
- It is the customer's responsibility to have any leaks repaired in a timely fashion.
- The lug nuts should be inspected for looseness after the first ten hours of operation. Lug nuts should be tightened to a torque of 55-60 ft.-lbs.
- The brakes are not self-adjusting. It is the customer's responsibility to maintain them in good working order and proper adjustment, whether directly or through an authorized Cub Cadet Servicing Dealer.
- It is the customer's responsibility to maintain the vehicle in accordance with the Operator's Manual. This includes an initial gear lube change after 50 hours of operation, and changes every 500 hours of operation (or 2 years) thereafter.
- The gear lube level should be checked every 100 hours of operation. At this time a visual inspection should be made for leaks or damage.

2. GEAR LUBE

- 2.1. **Service intervals:** Initial change: 50 hours
Subsequent changes: 500 hours or 2 years
Check level: every 100 hours.
- 2.2. The transaxle should contain 68 fluid ounces (2.0 L) API "GL-5" hypoid gear lube.
 - SAE 90 weight above 41deg. f. (5 deg. C.)
 - SAE 80 weight below 41 deg. f. (5 deg. C.)
- 2.3. To **check the gear lube** level, park the vehicle on a flat level surface.
- 2.4. Clean the area around the oil fill cap/dipstick near the back of the transaxle housing and remove the dipstick.
- 2.5. Wipe the dipstick clean, insert it back into the threaded hole, but do not thread it in.
- 2.6. Withdraw the dipstick and check the oil level. It should be between the upper and lower level lines. The area between the lines is marked with cross-hatch. See Figure 2.6.



Figure 2.6

- 2.7. If additional lube is needed, confirm the current contents of the transaxle, and add more of the same to reach the specified level.
- 2.8. If additional fluid is needed, inspect the transaxle for leaks or damage. If leakage is found, make any necessary repairs before returning the vehicle to service.

Poly Bed 4 X 2 Drive System

- 2.9. A blocked vent can provoke oil leaks. The vent is located at the top of the transaxle housing. See Figure 2.9.

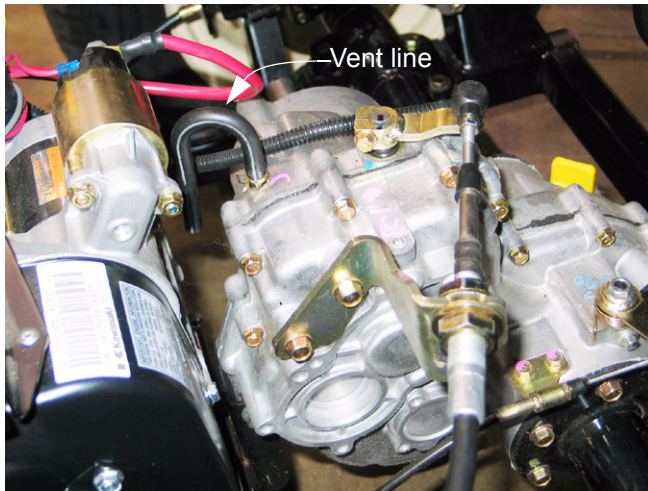


Figure 2.9

- 2.10. To **change the gear lube**: Clean the area around the fill and drain plugs before removing either.
- 2.11. Place a drain pan under the transaxle. See Figure 2.11.

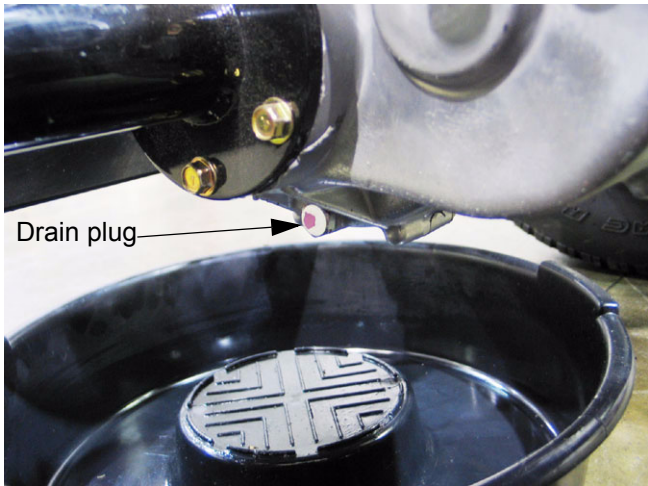


Figure 2.11

- 2.12. Remove the drain plug at the lower left corner of the transaxle using a 12mm wrench.

NOTE: 80 and 90 weight gear lubes are very thick at low temperatures, and may take considerable time to drain if the ambient temperature is below 41 deg. f. (5 deg. C.)

- 2.13. Remove the oil fill cap/dipstick. This will allow air to enter the transaxle faster, which will allow the gear lube to drain faster.
- 2.14. Install the drain plug and tighten it to a torque of 132 in.-lb. (15 N-m).
- 2.15. Add 68 fluid ounces (2.0 L) API "GL-5" hypoid gear lube, and install the oil fill cap/dipstick.
- SAE 90 weight above 41deg. f. (5 deg. C.)
 - SAE 80 weight below 41 deg. f. (5 deg. C.)
- 2.16. Confirm the correct fluid level by by inserting (but not threading-in) the fill cap/dipstick, and withdrawing it to read the level.

3. DIAGNOSIS: CONFIRMING TRANSAXLE FAULT

- 3.1. Get as much information as possible from the customer regarding symptoms and circumstances.
- 3.1. Inspect the vehicle for physical damage and clues regarding the nature and cause of failure.
- 3.2. Carefully operate the vehicle if possible, to confirm noises and symptoms.
- 3.3. Confirm whether the problem is internal, in the shift linkage, brake system, or the belt drive system (CVT):
 - If a drive gear (forward or reverse) or the differential lock fail to engage or disengage by manually overriding the shift mechanism.
 - Shift mechanism issues can be isolated from internal issues by disconnecting the cables at the transaxle end, and operating the transaxle directly.
 - Performance problems such as failure to reach full speed are likely to be caused by engine, brake, or belt/clutch issues.
 - Complaints of “lurchy” operation are an indication that the brakes may be dragging or adjusted too tight.
 - It is easy to check for dragging brakes by pushing the vehicle with the parking brake released, or by jacking-up the back of the vehicle and checking the wheels for ease-of rotation.
 - Refer to the “Brake” section of this manual for service and adjustment information.
 - Gear clash can result from drive being applied to the input shaft during shifting. Refer to the “CVT” section of this manual for performance information.
 - Gear “spit-out” or gear clash when the gear selector is in Neutral can result from a mis-adjusted shift linkage. Refer to the “Transmission Linkage” section of this manual.
 - Under-steer (vehicle is less responsive to steering wheel in-puts) accompanied by rear wheel squeal during turning maneuvers indicates that the differential lock is engaged. If this condition exists when the differential lock lever is released, refer to the “Transmission Linkages” section of this manual.

4. TRANSMISSION LINKAGES

Shift Control Cable

- 4.1. It is possible to remove the gear shift control cable and gear shift control independently or together.
- 4.2. To gain access to the gear shift control, tilt both seats forward, and remove the console/cup holder using a 7/16” wrench. See Figure 4.2.

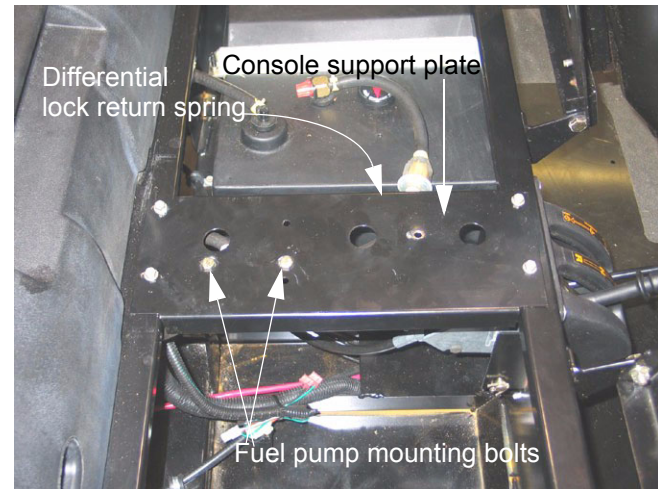


Figure 4.2

- 4.3. Unbolt the console support plate from the frame using a 7/16” wrench.

NOTE: The vacuum driven fuel pump is mounted to the bottom of the console support plate. It may be unbolted from the plate using a pair of 7/16” wrenches so that the plate may be completely removed. It is not absolutely necessary to unbolt the fuel pump if the support plate is only moved aside for access.
- 4.4. Un-hook the differential lock return spring from the console support plate, and move (or remove) the plate.

Poly Bed 4 X 2 Drive System

- 4.5. There is a black plastic cover on the gearshift control. Slide it rearward, then lift it away from the gear shift control to expose the cable attachment. See Figure 4.5.

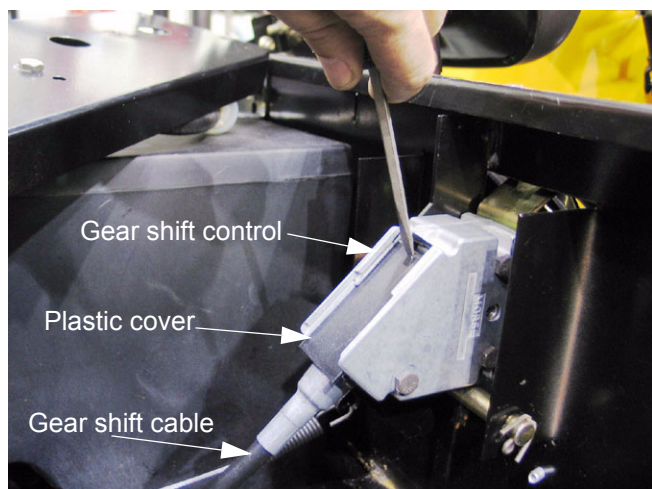


Figure 4.5

NOTE: There is a lip at the front edge of the cover that will provide sufficient purchase to slide the cover back.

- 4.6. With the cover removed, lift the shift control cable housing end out of the recess that locates it in the shift control housing. See Figure 4.6.

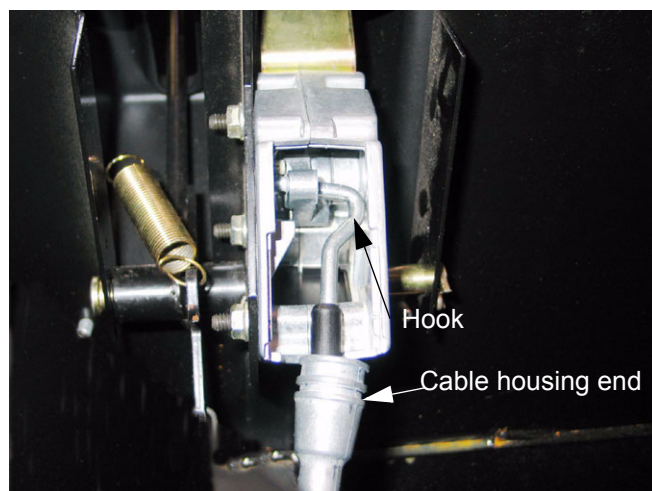


Figure 4.6

- 4.7. Disengage the hooked end of the cable from the shift control and lift the cable out of the shift control housing.

Shift Control

- 4.8. If the shift control is to be removed, the knob must be taken off the shift lever. It threads off. See Figure 4.8.

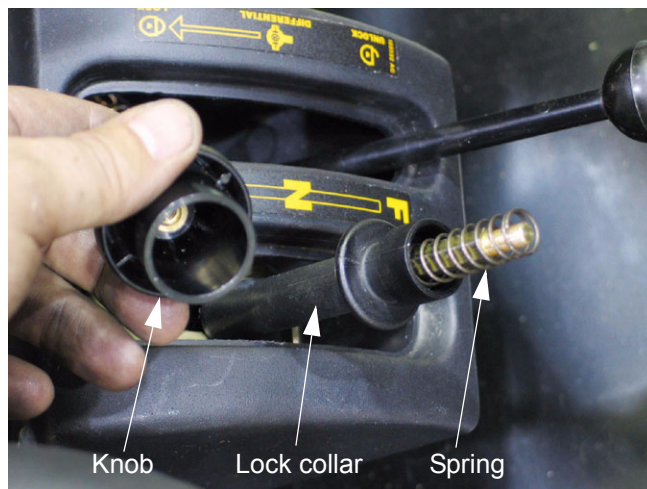


Figure 4.8

- 4.9. The knob retains a spring and a lock collar. Both can be removed after the knob is taken off. See Figure 4.9.



Figure 4.9

- 4.10. Three nuts and bolts secure the shifter control to the frame. The nuts may be removed with a pair of 7/16" wrenches. The shifter control may then be removed.
- 4.11. There are no internal replacement parts available through Cub Cadet for the shifter control. It is to be replaced as an assembly.

Poly Bed 4 X 2 Drive System

- 4.12. Within the housing for the shifter control there is a torsion spring that returns the shift lever to the center of its travel. There is not a detent mechanism in the shifter control. See Figure 4.12.

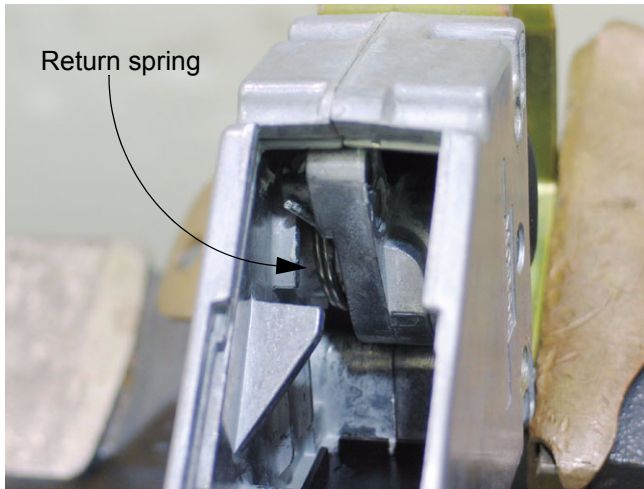


Figure 4.12

- 4.13. On installation of the shifter control:
- Position the bolts in the shifter control housing prior to installation. There is insufficient lateral clearance to install them all in-situ.
 - Tighten the nut to 96 in-lb. (10.848 Nm). If the nuts are too tight, the housing will distort, and operating effort will increase.
- 4.14. If the cable is to be replaced, the front end of the cable can be disconnected as described in the procedure for removal of the shifter control.
- 4.15. The back end of the cable is permanently attached to the shifter arm. See Figure 4.15.

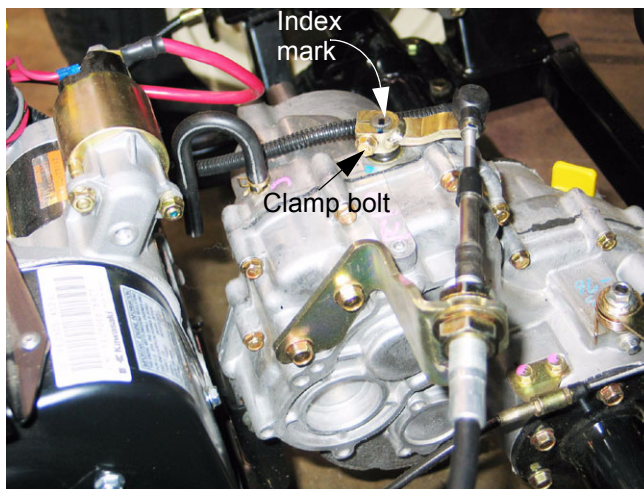


Figure 4.15

- 4.16. Match-mark the shifter arm to the splined end of the shift arm shaft, then remove the clamp bolt using a 10 mm wrench.

NOTE: The clamp bolt engages a groove in the shift shaft. It must be removed.

- 4.17. Use a pair of 7/8" wrenches to remove the end jam nut on the threaded end of the cable housing. The cable core will pass through a slot in the bracket. See Figure 4.17.

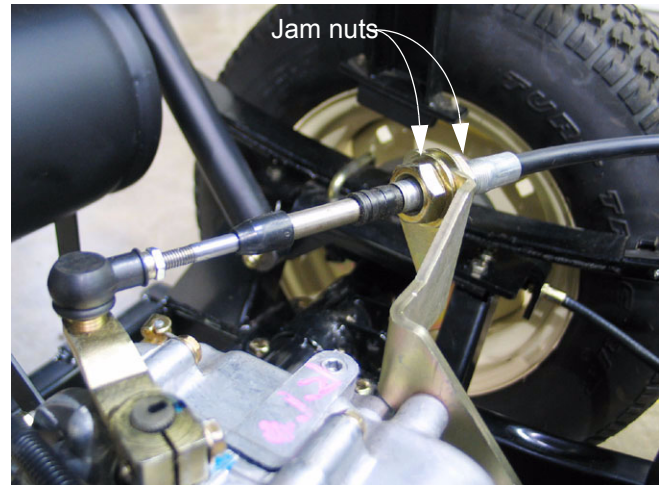


Figure 4.17

- 4.18. The cable can be withdrawn from the vehicle in either direction. See Figure 4.18.

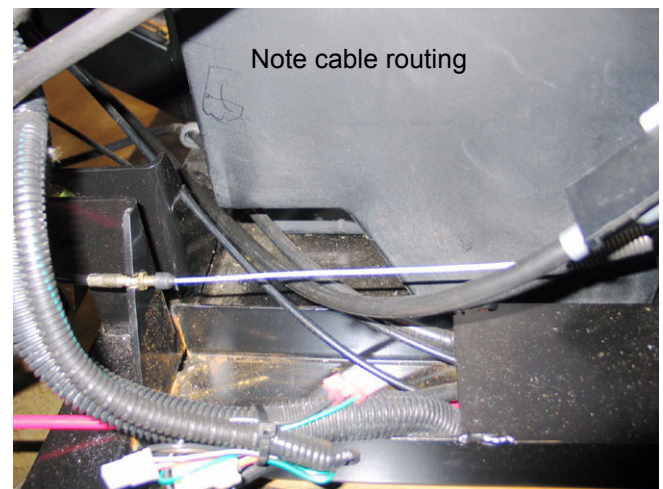


Figure 4.18

NOTE: The correct routing of the cable: through the recess in the lower front corner of the tank.

- 4.19. Confirm that the cable is correctly adjusted before returning the vehicle to service.

Poly Bed 4 X 2 Drive System

Shift Control Adjustment

- 4.20. To adjust the shift cable, use the neutral safety switch to confirm the neutral position.
See Figure 4.20.

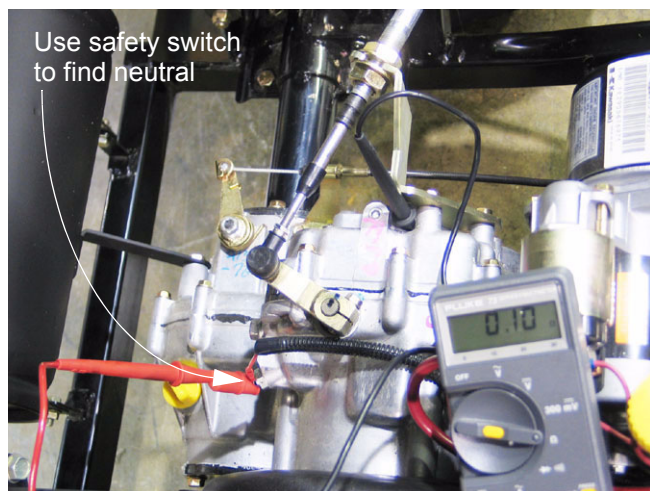


Figure 4.20

- Connect a powered continuity light or an Ohm meter between the terminal on the neutral switch and a good ground. This test works key-off.
- Otherwise, connect a test light in series between the terminal on the neutral switch and the eyelet on the wire that attaches to it. This test works key-on, engine-off.
- When the continuity or test light bulb illuminates, or the Ohm meter registers zero, the contacts within the switch are closed.
- When the neutral switch is closed, the transmission is in neutral. Move the shifter through its range of travel to confirm that the switch is working correctly.
- There is a significant range of travel around the neutral position before the contacts in the neutral switch open.

- 4.21. With the transmission confirmed to be in neutral by the meter or light connected to the switch, move the gearshift lever to the neutral position.
- 4.22. Adjust the jam nuts as necessary so that the contacts in the neutral switch open when the gearshift lever is moved an equal distance in the direction of forward and reverse gear positions. See Figure 4.22.

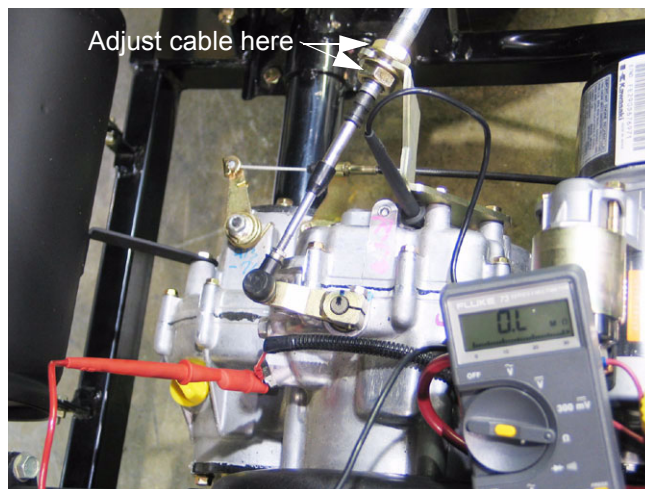


Figure 4.22

- 4.23. Tighten the jam nuts and test the operation of the shift control before returning the unit to service.
- 4.24. Inspect the cable for wear or damage. Replace it if there are any signs of fraying, binding, kinking or damage to the cable housing.
- 4.25. Lubricate the cable with light oil (penetrating oil or cable lube) any time it is removed, and at 500 hr. intervals when the gear lube is changed.
- 4.26. Depending on the type of service being done, the gear shift control cable may be removed from its sprocket on the transaxle, or the bracket may be removed from the transaxle housing using a 10 mm wrench.
- 4.27. On installation, the gear shift control bracket should be tightened to a torque of 78 in-lb. (8.8 N-m).

Poly Bed 4 X 2 Drive System

Differential Lock Control

In normal operation, a differential allows the two rear wheels to rotate at different speeds. In a turning maneuver, the wheels toward the outside of the turn follow a path that describes a greater circumference than the wheels toward the inside of the turn. Because the outside wheels must turn faster than the inside wheels, a differential is necessary.

Because it allows the rear wheels to rotate at different speeds, a standard differential can only provide drive to one wheel. One method of getting more traction is to provide a manual device that over-rides the differential feature by locking the two sides of the differential together, providing drive to both rear wheels at the same time.

It is not desirable to lock the differential together all the time because it limits the turning radius of the vehicle:

- The two wheels driving at the same speed tend to want to push the vehicle straight ahead.
- When the vehicle does turn, the two rear wheels will fight against each-other for traction. In the process they will apply exaggerated loads to the drive train.

4.28. In normal use:

- The differential lock should engage when the differential lock lever is pulled-up.
- There are five engagement dogs on the differential. The rear wheels must rotate at most 72 degrees relative to one-another before the engagement dogs align, allowing them to lock together.
- Pulling-up on the differential lock lever extends the spring at the front of the differential lock control cable. The spring applies force to the cable and the differential lock lever on the transaxle. When the engagement dogs align, the spring force will push them into engagement.
- Once engaged, the lever may be released, and the differential will remain locked until the drive load on the left and right wheels is equalized.
- When the drive load between the rear wheels is equalized, the load on the differential lock dogs is relieved. When the load is relieved, torsion spring on the differential lock lever will overcome the friction between the differential lock dogs, and cause them to disengage.

- 4.29. If the Big Country vehicle exhibits symptoms indicating that the differential lock is not engaging or disengaging properly, investigation should begin with the control cable.
- 4.30. The differential lock control lever pivots on a large clevis pin. The clevis pin is secured to the frame by a hairpin clip.
- 4.31. The spring on the end of the differential lock control cable connects to one arm of the differential lock control lever, and a return spring connects to the other arm. The other end of the return spring hooks to the console support bracket.
- 4.32. To reach the differential lock control and cable: See Figure 4.32.

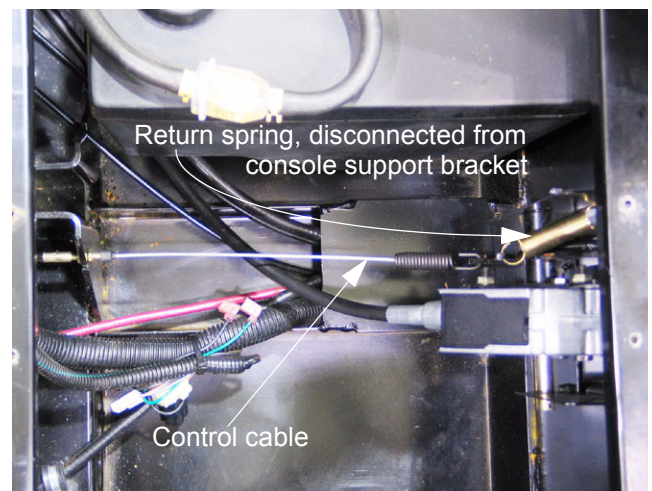


Figure 4.32

- Fold the seats forward.
 - Remove the tool box from beneath the passenger seat, if so equipped.
 - Remove the cup holder/console using a 7/16" wrench.
 - Unbolt the console support bracket using a 3/8" wrench.
 - Unhook the differential lock control return spring, and move the console support bracket aside.
- 4.33. Operate the differential lock control lever, and observe the movement of the cable and differential lock lever on the transaxle.
- NOTE:** It may be necessary to rotate one of the rear wheels to align the differential lock dogs before full engagement will occur. This is normal.

Poly Bed 4 X 2 Drive System

- 4.34. If the linkage binds, disconnect the cable to isolate the external portion of the linkage from internal transaxle components.
- 4.35. Disconnect the differential lock control cable from the differential lock control lever: Pull the cable forward to get clearance to unhook the spring at the end of the cable. See Figure 4.35.

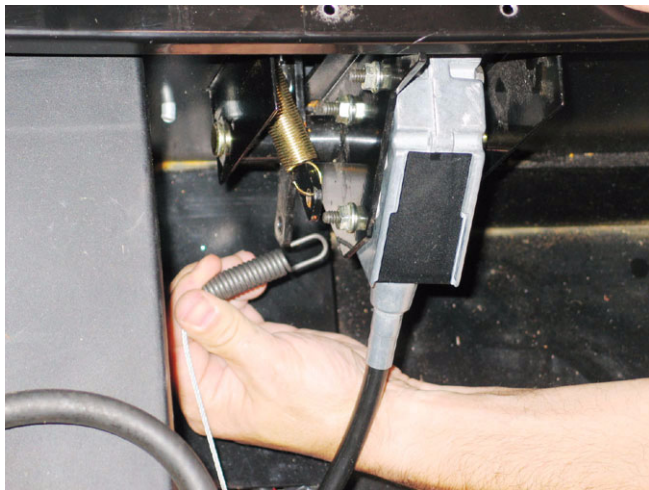


Figure 4.35

- 4.36. There is sufficient slack in the cable to disconnect the barrel on the rear end of the cable from the differential lock lever on the transaxle as well: either end may be disconnected first. See Figure 4.36.

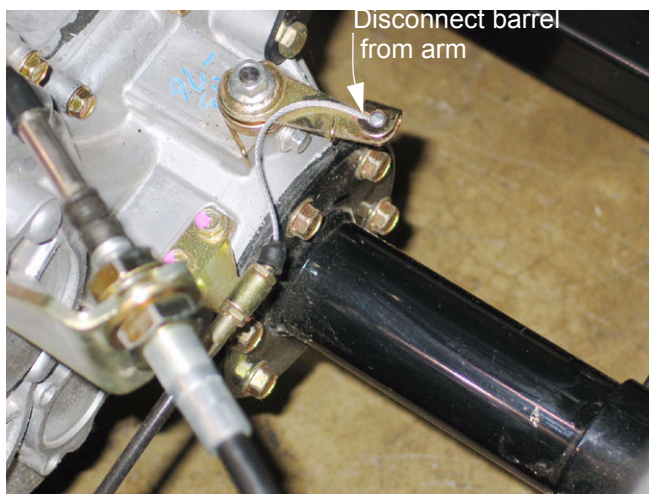


Figure 4.36

- 4.37. With the cable disconnected, check the operation of the differential lock lever, and the torsion spring that returns it to the unlocked position. See Figure 4.37.



Figure 4.37

NOTE: Confirm that the torsion spring is properly positioned. Replacement of the torsion spring with one that has a shorter leg was the subject of Service Bulletin CC-456

- 4.38. The back of the cable is secured to the cable holder by a pair of jam nuts: one on each side of the cable holder. See Figure 4.38.

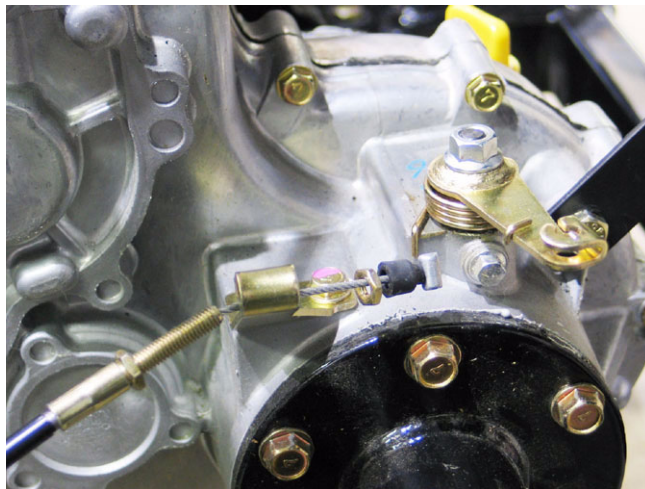


Figure 4.38

- 4.39. Depending on the nature of the repair, the cable holder can be unbolted from the transaxle housing, or the rear jam nut can be removed and the cable withdrawn from the holder. A 10mm wrench will fit the jam nuts and the cable holder bolts.

Poly Bed 4 X 2 Drive System

- 4.40. Tighten the cable bracket mounting bolts to a torque of 78 in-lb. (8.8 N-m) on installation.
- 4.41. The cable is secured to a bracket near the front mounting point of the engine and transaxle cradle. See Figure 4.41.

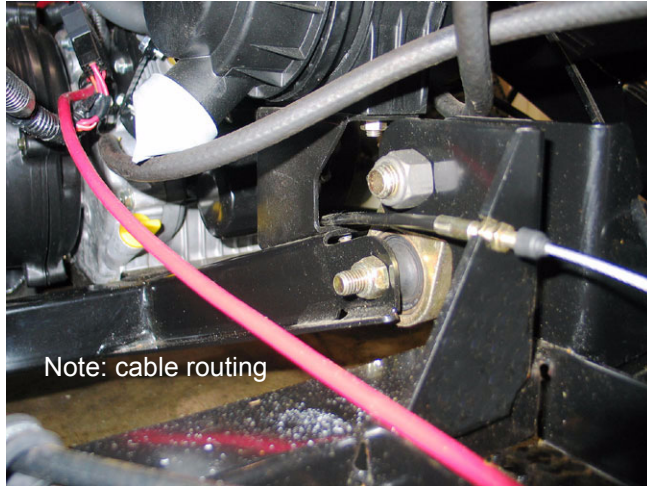


Figure 4.41

- 4.42. The cable is secured by two jam nuts that can be removed using a 10 mm wrench.
- 4.43. Correct cable routing: cable mounted to right side of bracket, then curved to the left to pass beneath the air filter bracket.
- 4.44. Inspect the cable for wear or damage. Replace it if there are any signs of fraying, binding, kinking or damage to the cable housing.
- 4.45. Lubricate the cable with light oil (penetrating oil or cable lube) any time it is removed, and at 500 hr. intervals when the gear lube is changed.

- 4.46. The clevis pin that holds the differential lock control lever to the frame cannot be removed with the fuel tank secured in position. See Figure 4.46.

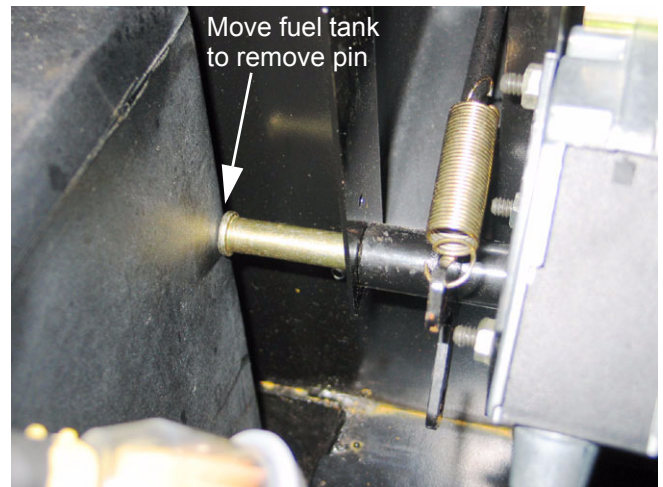


Figure 4.46

- 4.47. The fuel tank bracket assembly can be removed using 7/16" wrench. See Figure 4.47.

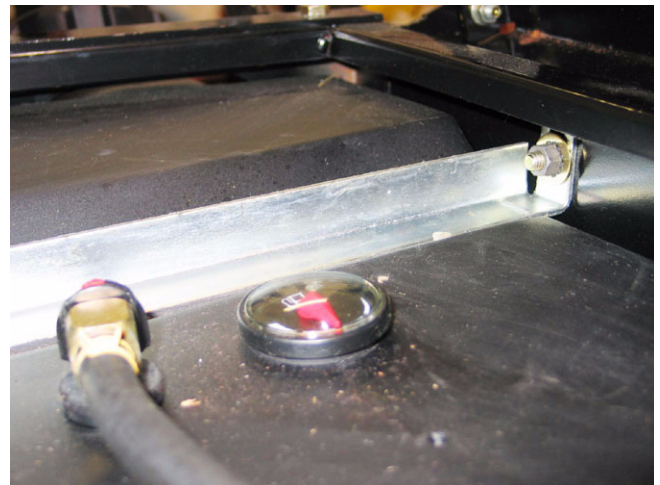


Figure 4.47

Thank you so much for reading.
Please click the “Buy Now!”
button below to download the
complete manual.



After you pay.

You can download the most
perfect and complete manual in
the world immediately.

Our support email:

ebooklibonline@outlook.com