Torque Values

During reassembly of the unit, refer to the torque requirements given in the reassembly procedures.

Reassembly

1. Coat the counterbores of the bearing caps with sealant (Steiger part number 19-880) and install new oil seals. Press in only until completely seated. As a precaution, check the fit of the oil seal to its drive yoke.

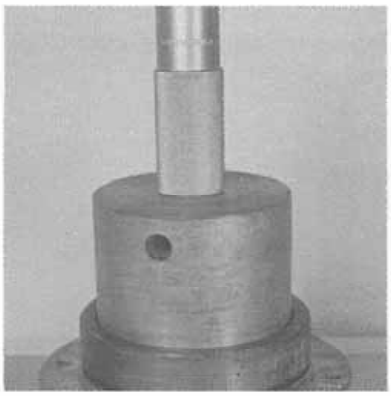

Figure 1:

2. Install the bearing cups into the counterbores of the bearing caps (Fig. 1) and the brake plate/ bearing cap assembly.

NOTE: *Bearing cups and cones are all identical in part number and size, except on the rear of the center shaft of the Model E and Model F transfer cases, in which case they are larger.*

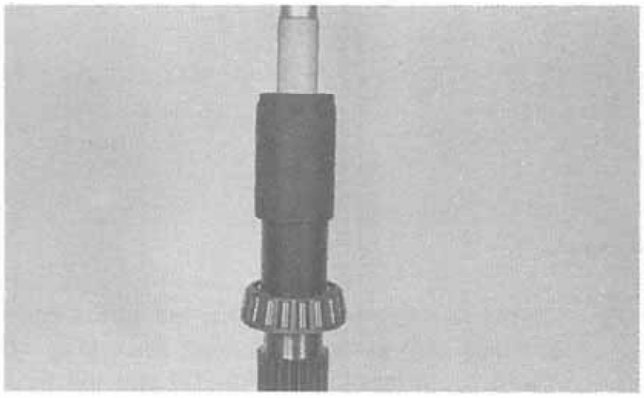

Figure 2:

3. Install the bearing cone located near the center of the center shaft (Fig. 2).

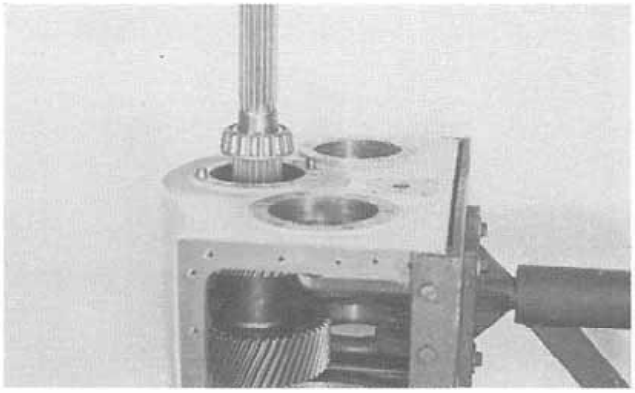

Figure 3:

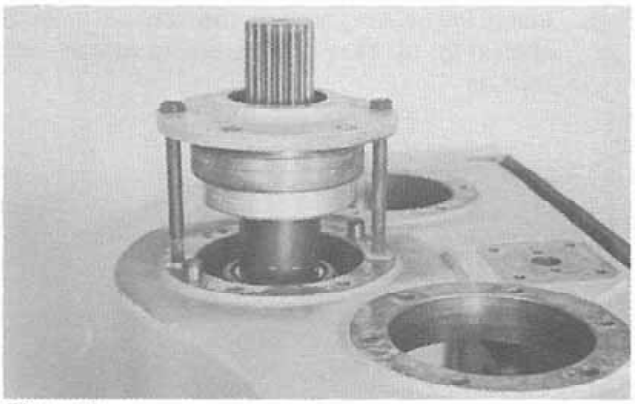

Figure 4:

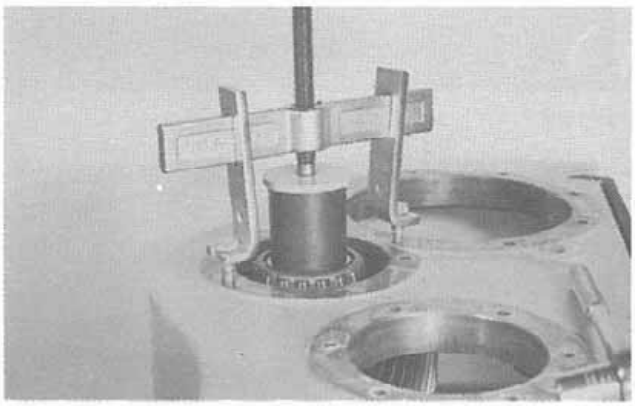

Figure 5:

4. With the 50 tooth gear in the rear position, stack the remaining center shaft gear and spacer in the housing and install the center shaft through them (Fig. 3). Using a bearing cup, transmission mainshaft alignment tool (Steiger part number 58-035), and a spacer sleeve (Steiger part number 58-061 can be used if bored out .010 inches), support the center shaft at the bearing already installed (Fig. 4). Rotate the housing in the stand and install the bearing on the rear of the center shaft (Fig. 5), ensuring that it is completely seated.

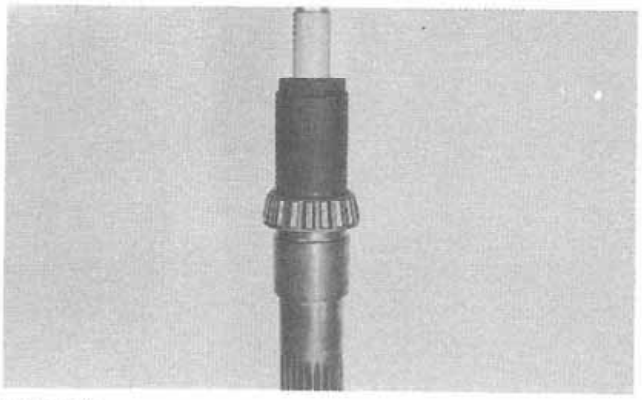

Figure 6:

5. Install the bearing cone on the front of the output shaft (Fig. 6). Take care as not to damage shaft threads.

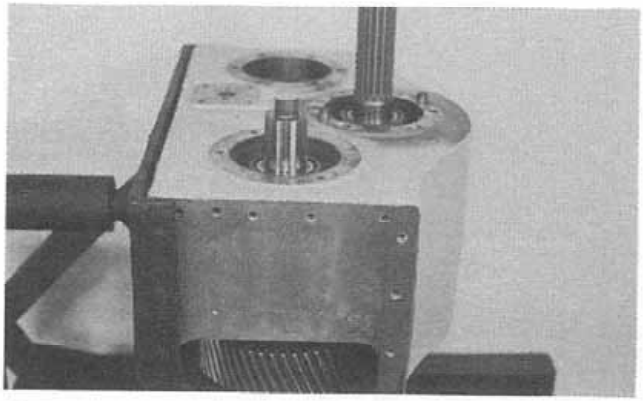

Figure 7:

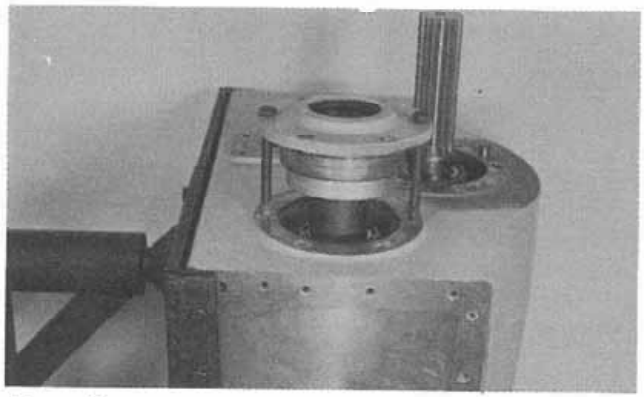

Figure 8:

6. With the housing positioned as shown, place the output gear and spacer in the housing and install the shaft through them (Fig. 7). Support the output shaft (Fig. 8) at the bearing already installed,

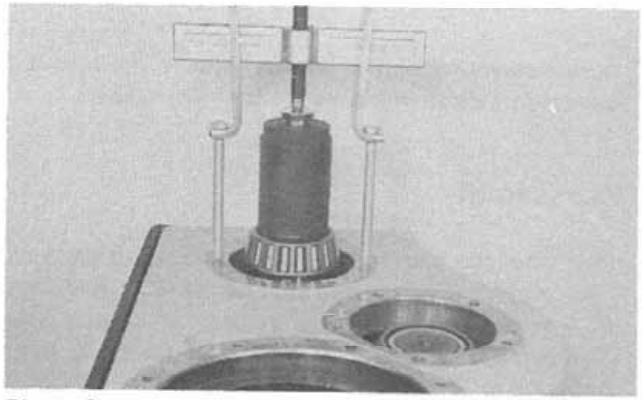

Figure 9:

rotate the housing in the stand and install the bearing on the rear of the shaft (Fig. 9) until fully seated.

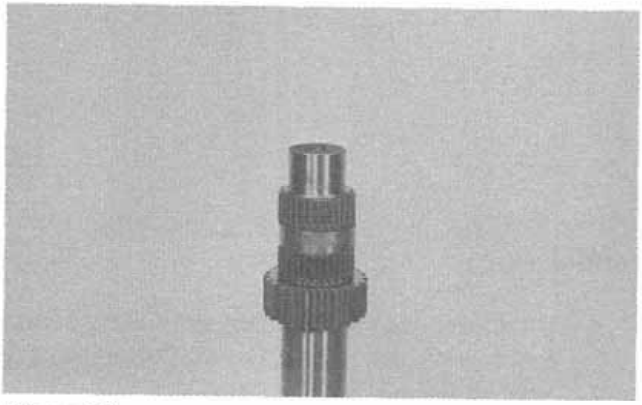

Figure 10:

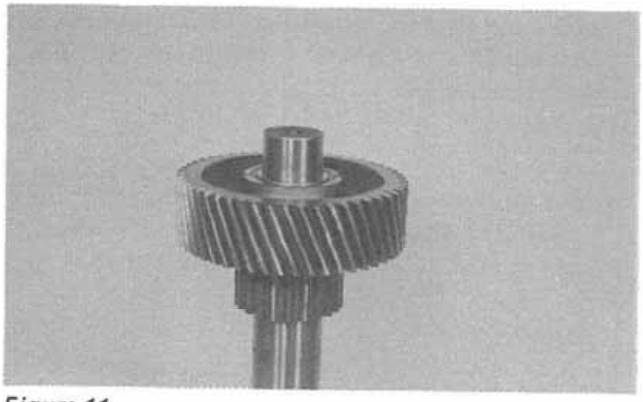

Figure 11:

7. On the rear of the input shaft, install the needle bearings with a spacer between them (Fig. 10), the 51 tooth input gear (Fig. 11) and the thrust

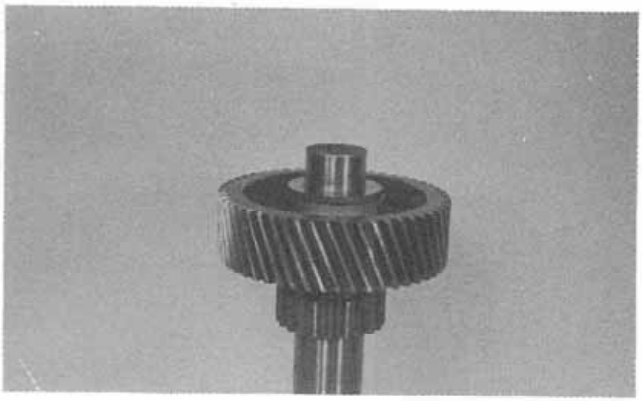

Figure 12:

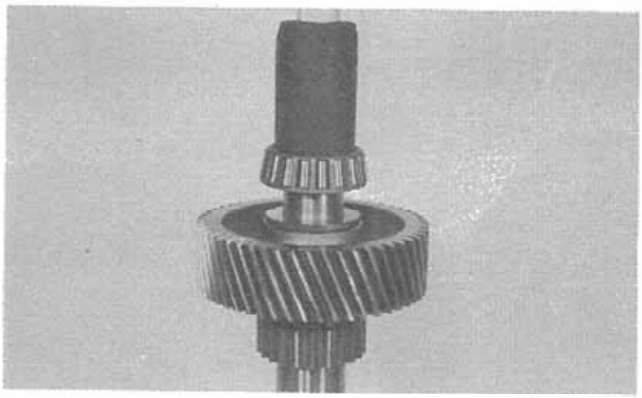

Figure 13:

washer (Fig. 12). Install the rear bearing cone. (Fig. 13). When it is seated properly, the thrust washer cannot be rotated.

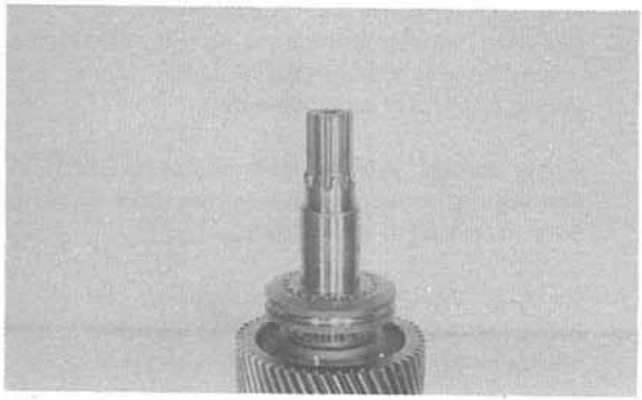

Figure 14:

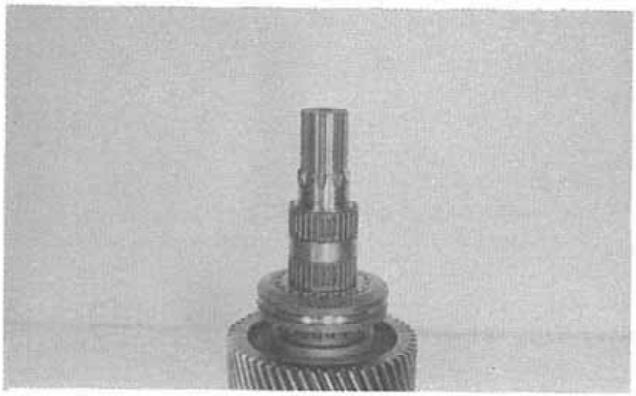

Figure 15:

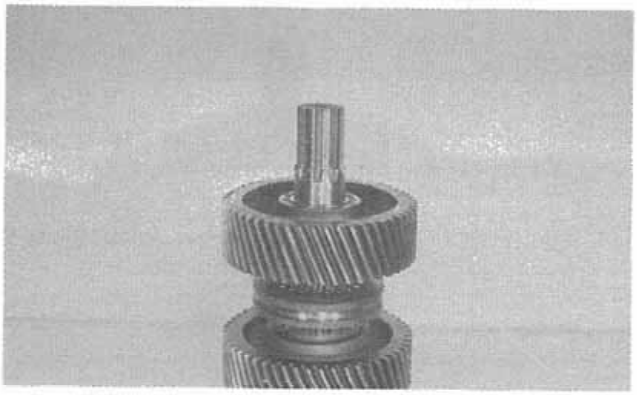

Figure 16:

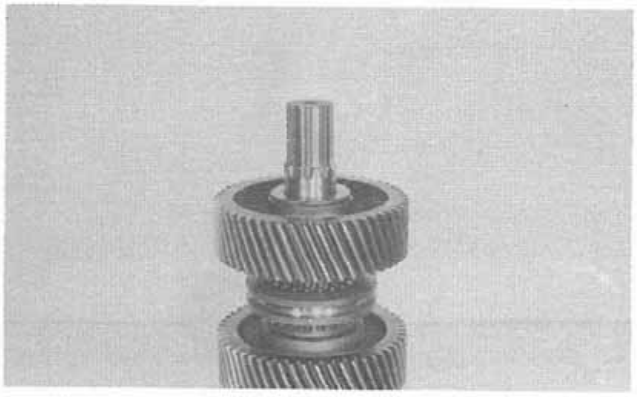

Figure 17:

8. From the front of the input shaft, install the sliding clutch (Fig. 14), needle bearings with spacers between them (Fig. 15), front input gear (Fig. 16) and the thrust washer (Fig. 17). Install the front bearing cone in the same manner as the rear (step 7), however, do not damage the splines which fit the drive yoke. Be sure that the cage of the rear bearing cone is protected.

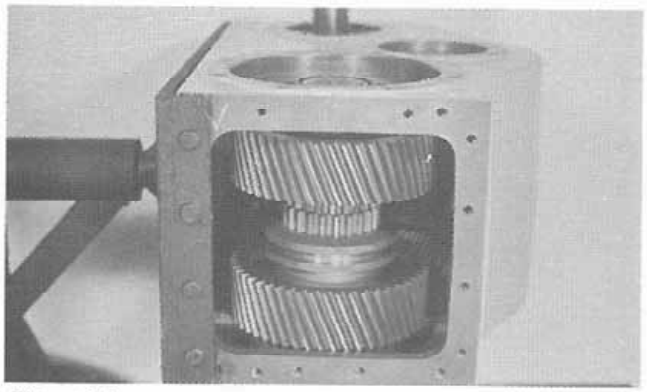

Figure 18:

9. With the housing positioned as shown, install the input shaft/gear subassembly (Fig. 18), and align the shaft center within the housing bore.

10. Place new O-rings on flanges of all bearing caps and the bearing cap/brake plate assembly.

11. Lubricate the O-rings, oil seals, bearings and housing bores with a light coat of grease.

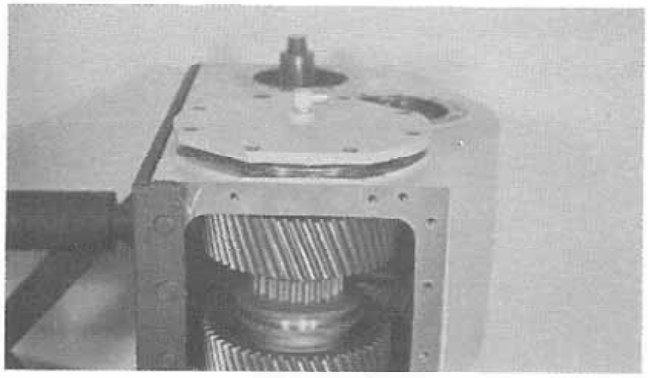

Figure 19:

12. Carefully align the input shaft rear cover and oil tube with the input shaft bore and housing bore as the cover is installed (Fig. 19). Do not bend the tube.

Figure 20:

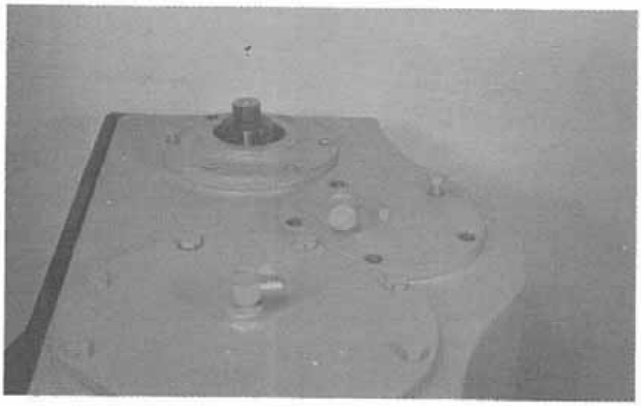

Figure 21:

13. Place shims on the remaining rear bearing caps (Fig. 20). Use at least the same thickness value as removed originally. However, if the housing, any bearing caps or bearings were replaced, add extra shims to ensure that bearings will have clearance once the unit is assembled. Align the caps and install into the housing (Fig. 21). Shims are available in thicknesses of .005, .007 and .020 inches (.127, .177 and .508 mm).

14. Apply sealant (Steiger part number 19-880) to bearing cap capscrews and torque them to 80 to 90 lb. ft. (11.06 to 12.44 Kg/M).

15. Carefully rotate the transfer case in the stand while manually supporting the input shaft/gear subassembly to prevent bending of the oil tube.

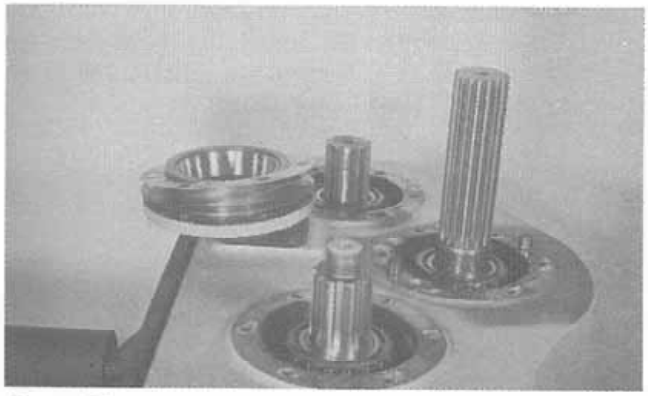

Figure 22:

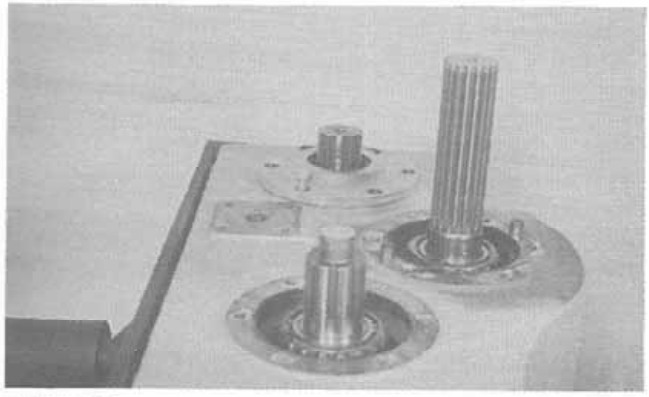

Figure 23:

16. Place shims on the input shaft front bearing cap in the same manner as step 13 (Fig. 22). Align the cap with the shaft and housing, and install completely. During installation of the cap, protect the oil seal from damage because of contact with the splined shaft (Fig. 23).

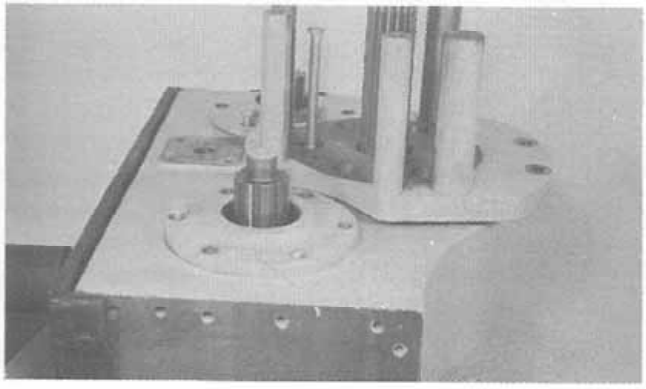

Figure 24:

17. Align and install the remaining front bearing cap and brake plate/bearing cap assembly (Fig. 24).

NOTE: *Extreme care must be used when installing the brake plate/bearing cap. Protect the seal from the protruding center shaft, and be certain that the dowel pins are correctly started before tightening the capscrews.*

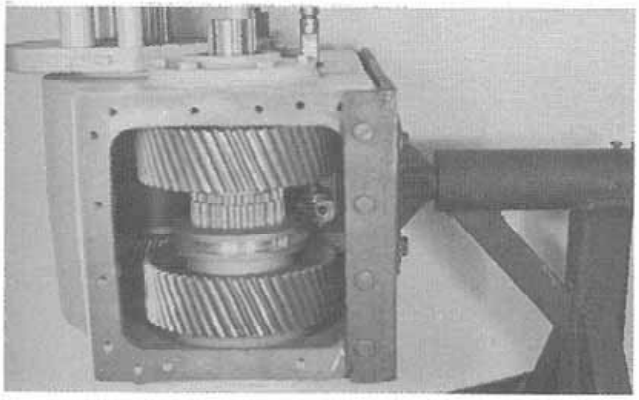

Figure 25:

18. Install the capscrews in the same manner as stated in step 14.

19. Position the shift fork in the groove of the sliding clutch and install the shift rod (Fig. 25). Torque the fork capscrew 80 to 90 lb. ft. (11.06 to 12.44 Kg/M).

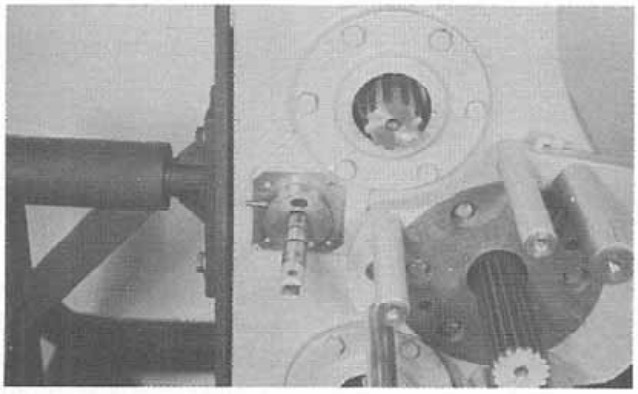

Figure 26:

20. Slide the adjusting block over the shift rod and install the dowel pin across the flat of the shift rod (Fig. 26). Apply sealant (Steiger part number 19-880) to the adjusting block capscrews. Run them in until they touch the block. Rotate the block to the right and left; find the center of rotational travel and secure the capscrews to 35 to 40 lb. ft. (4.84 to 5.53 Kg/M).

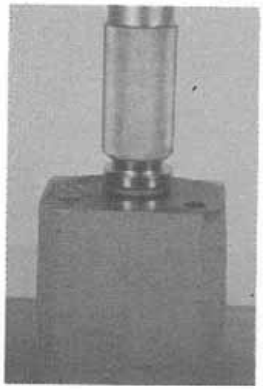

Figure 27:

21. Coat the seal counterbore of the detent block with sealant (Steiger part number 19-880) and install the seal (Fig. 27).

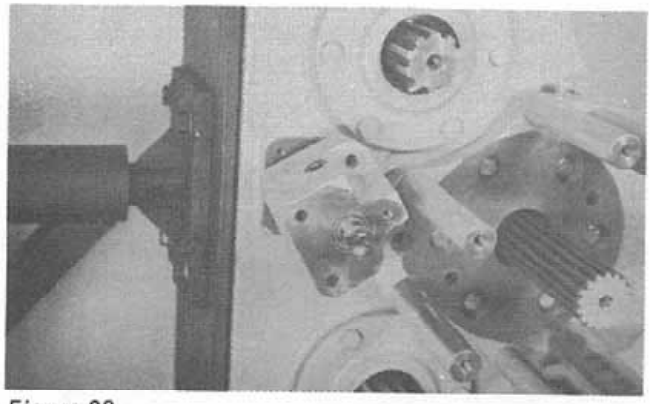

Figure 28:

22. Place a new detent block gasket over the adjusting block. Lubricate the bore of the detent block and oil seal and install the block (Fig. 28). Apply sealant to the detent block capscrews and torque them 35 to 40 lb. ft. (4.84 to 5.53 Kg/M). Install the shift cable bracket and long detent block capscrews. Apply sealant and torque them in the same manner.

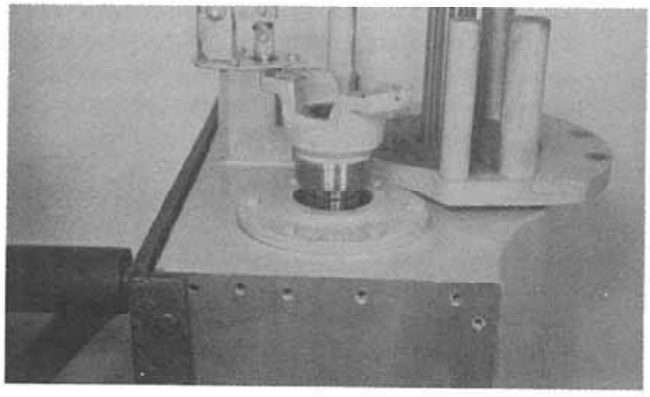

Figure 29:

23. Carefully install the output shaft drive yokes with O-ring seals (Fig. 29). Install the flatwashers and self-locking nuts. Torque the nuts to 250 to 270 lb. ft. (34.57 to 37.34 Kg/M).

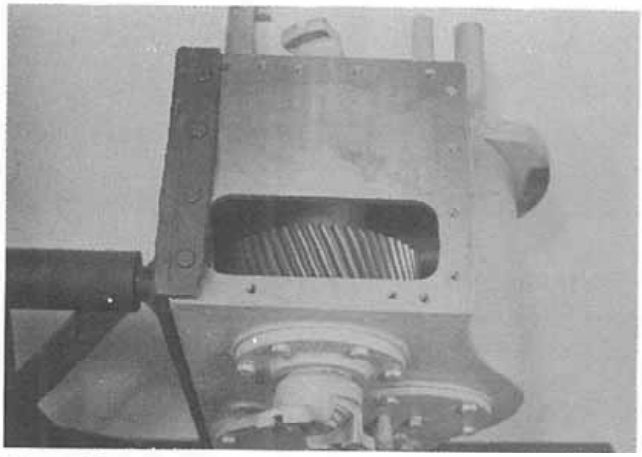

Figure 30:

NOTE: *Keyways of the output drive yokes must be parallel from front to rear (Fig. 30).*

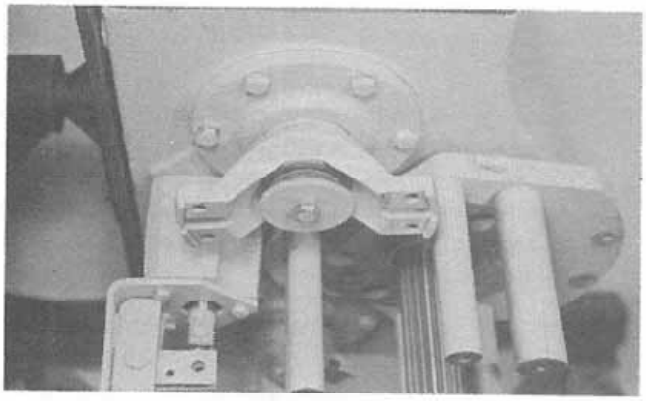

Figure 31:

24. Install the drive yoke on the input shaft splines. If servicing the Model C transfer case, secure the yoke by installing the gasket, flat washer and capscrew (Fig. 31). Torque the capscrew to 80 to 90 lb. ft. (11.06 to 12.44 Kg/M).

25. Apply new gaskets and install the upper and lower covers (or upper cover and oil reservoir if servicing the Model E or Model F transfer case).

Adjustment of the Detent Block

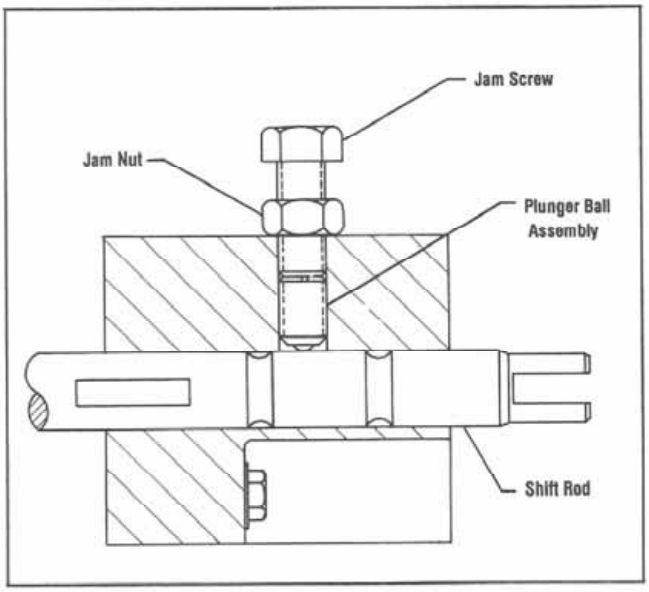

Figure 1:

1. With the shift rod in the neutral position (Fig. 1), screw the plunger/ball assembly in until it bottoms.
2. Loosen the plunger/ball assembly one-fourth (1/4) of a turn.
3. Tighten the jam screw (Fig. 1) finger tight against the plunger.
4. Torque the jam nut (Fig. D) to 60 to 80 lb. ft. (8.29 to 11.06 Kg/M).

Bearing Clearance

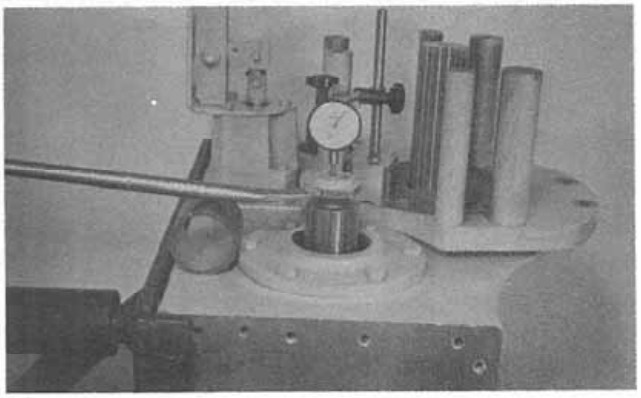

Figure 2:

End play on shafts should be .005 to .008 inches (.127 to .203 mm). Use a dial indicator on exposed shaft ends to determine bearing clearance (Fig. 2).

Add or remove shims if required to adjust shaft end play to specifications.

Model C, ST220, 250, 251, 270, 310, 320, 325

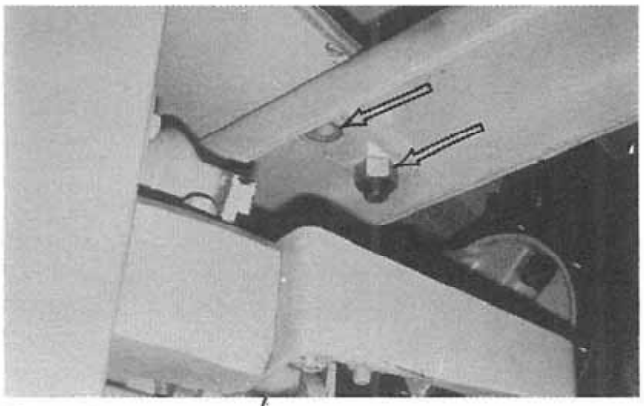

Figure 1:

1. Support the transfer case assembly with a forklift or hoist, and position it at the original mounting holes (Fig. 1).

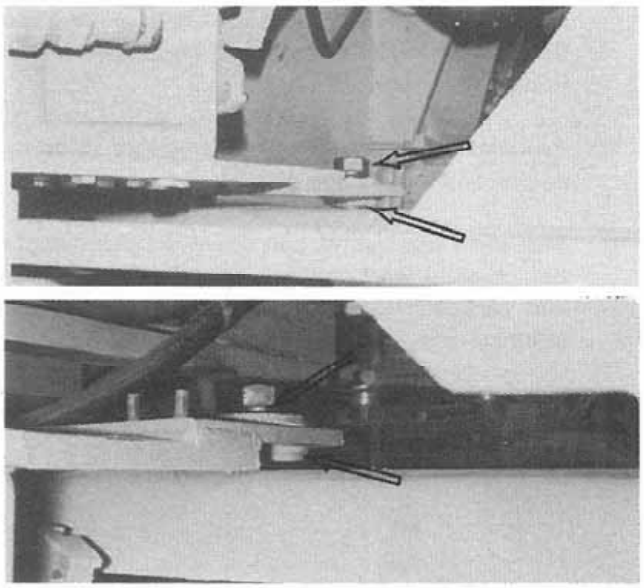

Figure 2:

2. Place the uniball retainers on each side of the uniball bushings as shown (Fig. 2). If a gap exists at either the upper or lower crossmember, use a flatwasher as a shim.

IMPORTANT: *During installation procedures, torque all fasteners. Refer to the General Chassis section of the Steiger Service Manual for the correct torque for the type of fastener used.*

3. If the brake assembly was left off prior to reinstallation of the transfer case, install and adjust at this time. After installing the outside brake plate and brake lever bracket, adjust the actuator linkage if necessary to give a minimum disc clearance of .090 inches (2.28 mm), with the brake in OFF position (Fig. 3). If the actuator cap exceeds .200 inches (5.08 mm), with the BRAKE APPLIED (Fig. 4), either replace worn brake discs or remove shims between the outer brake plate and brake support pins (Fig. 5). When new discs are installed, also add the shims required.

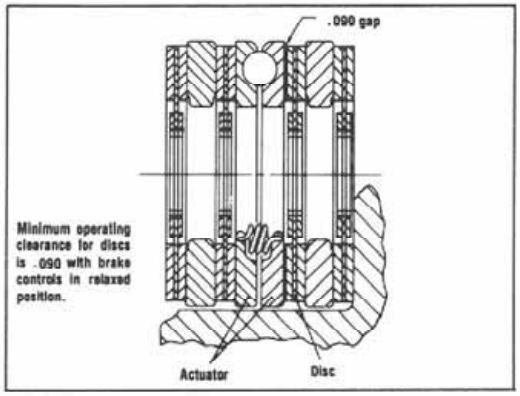

Figure 3:

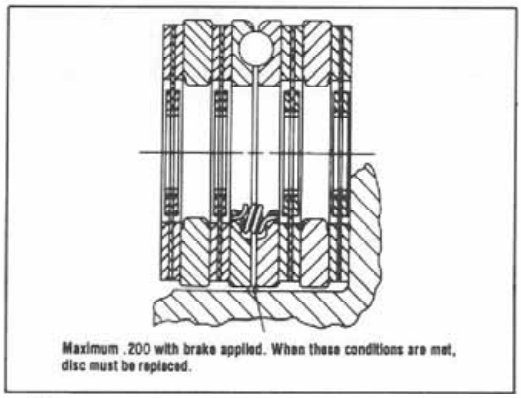

Figure 4:

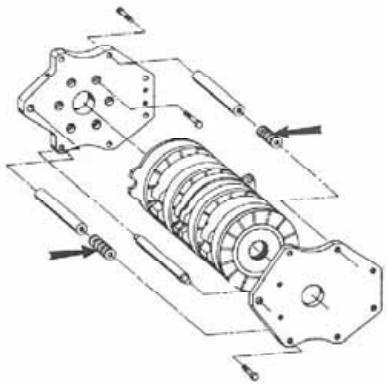

Figure 5:

IMPORTANT: *When using shims on the brake support pins, they must be of equal total thickness on ALL pins.*

4. Remove the capscrews as required on the upper and lower front bearing caps, and outer brake plate. Reinstall the upper and lower brake shields. Use torque values given in Reassembly Procedures when tightening capscrews on bearing caps.

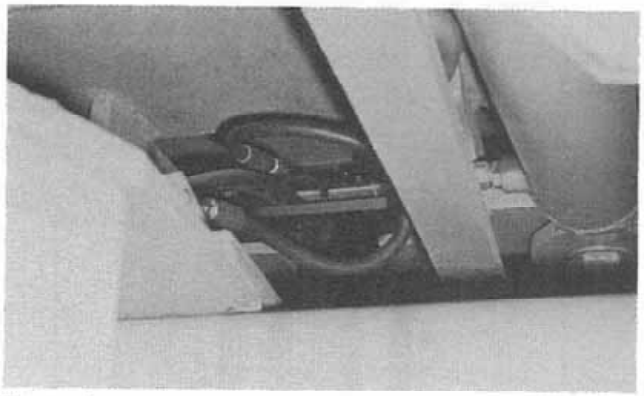

Figure 6:

5. Reinstall the brake line and bracket, then quickly connect the brake hose (Fig. 6). Fill the master cylinder fluid reservoir and bleed the brake system. Add fluid again if needed.

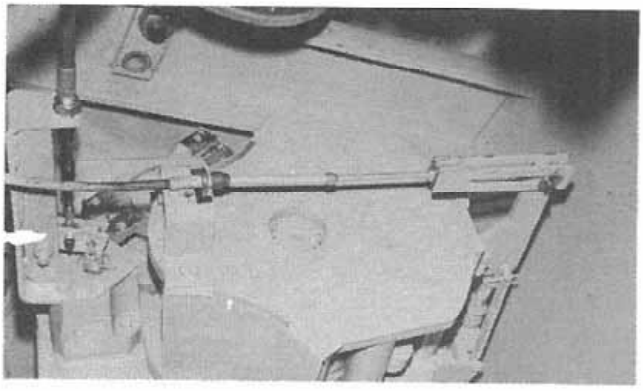

Figure 7:

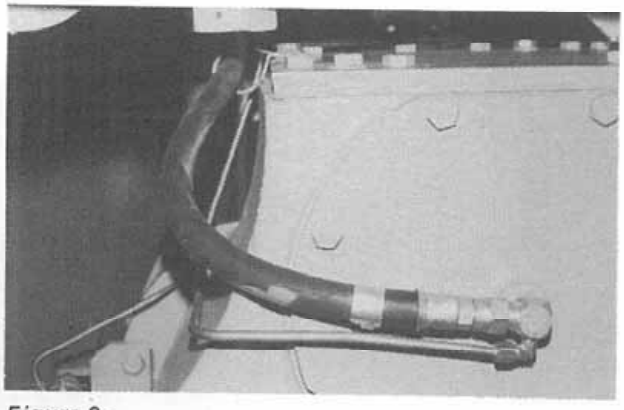

Figure 8:

6. Connect the shift cable/yoke and the park brake cable/yoke to their linkages (Fig. 7). Connect the oil feed hose (Fig. 8) in the rear of the unit.

7. Install the tailpiece, drivelines and oil return tube.

8. Install the drain plugs previously removed, and refill the central sump with lubricants per instructions given in the Service and Maintenance section of the Operator's Manual.

9. Articulate the tractor in small amounts. Stop the engine and inspect for interference.

10. Test drive the tractor and observe proper operation, braking and shifting; readjust if necessary and recheck the central sump lubricant level before returning the tractor to normal service.

Model E and Model F, PT225 and PT270

1. With the lifting fixture fastened to the top, lay the transfer case assembly in a horizontal position under the tractor.

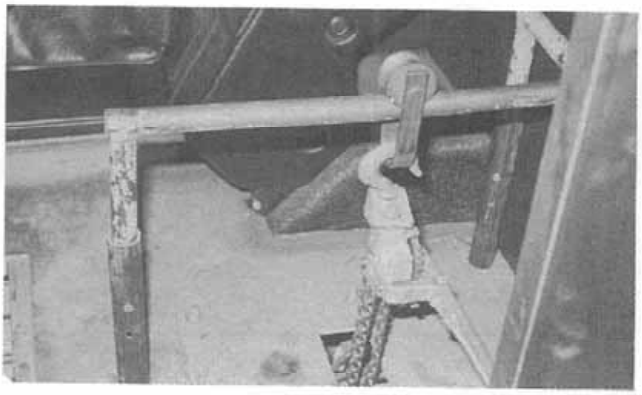

Figure 1:

2. Position a lift stand (with extensions), roller/yoke assembly and hoist over the transfer cable lift opening of the cab (Fig. 1).

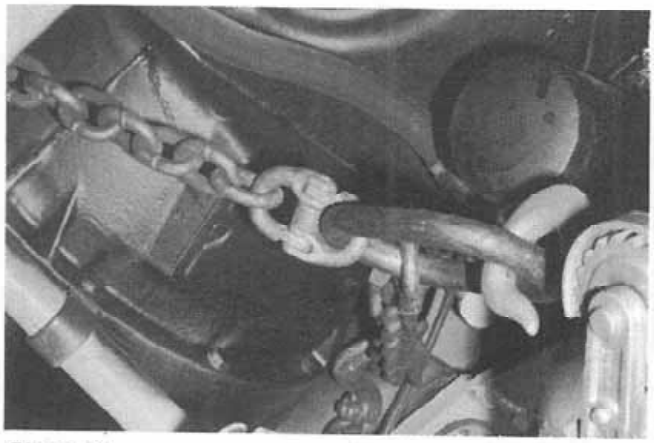

Figure 2:

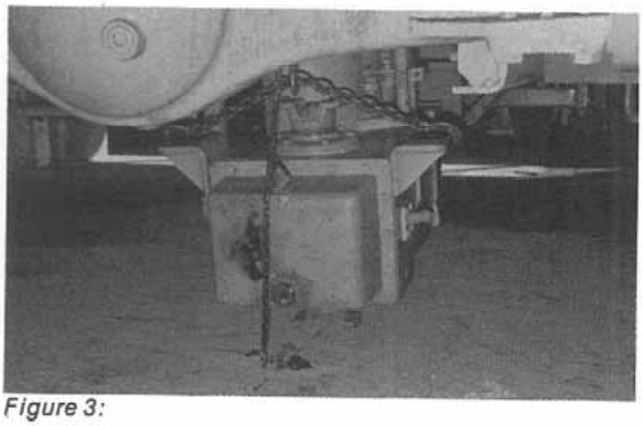

Figure 3:

3. Hook a chain to each of the rear engine mount brackets. This will be the forward lifting point (Fig. 2). Use a short chain between the lower transfer case mount brackets. Hook the front hoist to the short chain and remove all slack (Fig. 3).

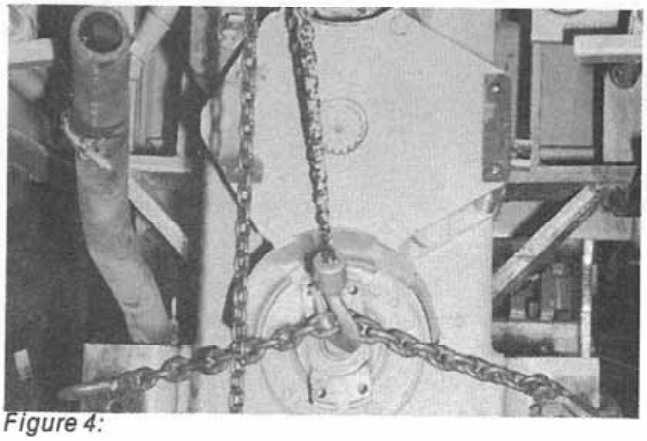

Figure 4:

4. Continue to lift the transfer case with the rear hoist and lower the unit with the front hoist to gradually bring it into a vertical position (Fig. 4).

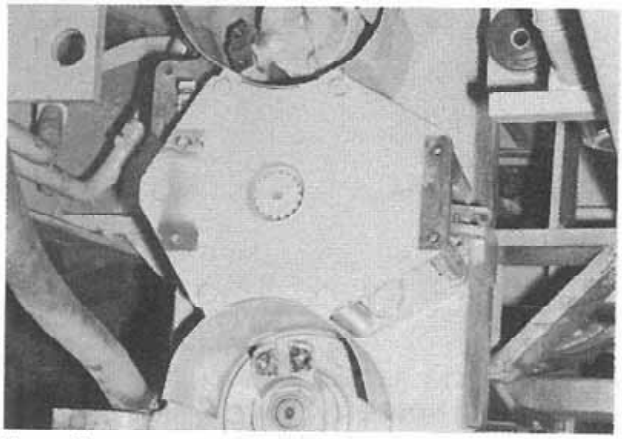

Figure 5:

5. As the unit is completely vertical (Fig. 5) and the rear hoist is supporting the whole unit, the front hoist and chains may be removed.

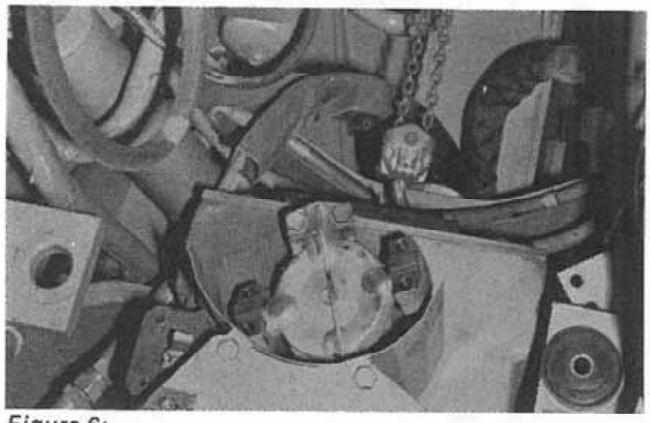

Figure 6:

6. Carefully raise the transfer case (Fig. 6), while ensuring alignment and proper relation of the unit with mounting brackets of the frame. To avoid damage, lift in steps and check for interference of lines, hoses and cables while lifting.

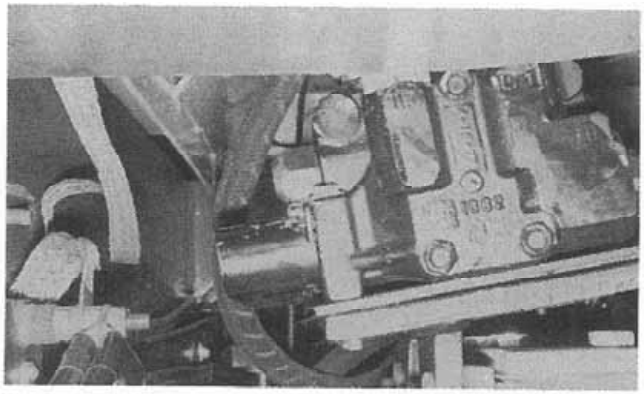

Figure 7:

7. With the transfer case housing and bracket holes aligned, start several capscrews on each side of unit to support it, and mount the hydraulic control valve bracket at the same time (Fig. 7).

IMPORTANT: *During installation of the transfer case, torque all fasteners per General Chassis section of the Steiger Service Manual. Note the type of fastener used.*

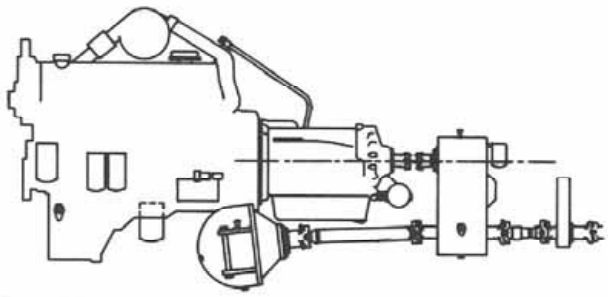

Figure 8:

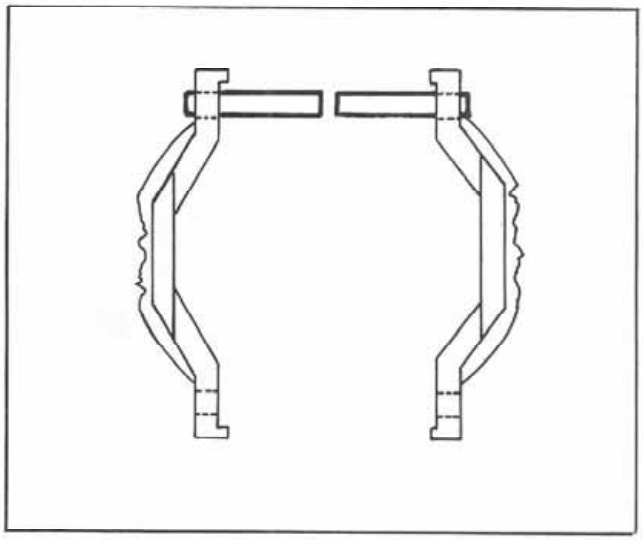

Figure 9:

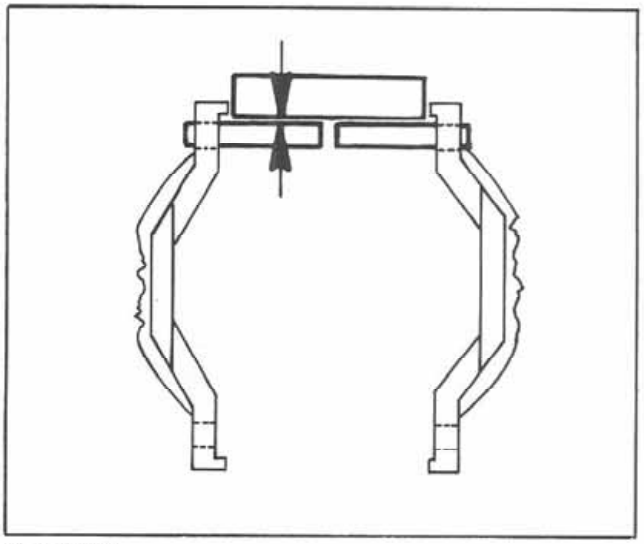

Figure 10:

8. After installation and torquing of all the transfer case mountings, check alignment of the transmission output shaft to the transfer case input shaft (Fig. 8). Do this check by removing the u-joints if still on the yokes, and install threaded studs into the yoke flanges (Fig. 9). Place a straight edge or gauge block on the studs (Fig. 10) and rotate both yokes slowly in the same direction while keeping them aligned. The gap between either stud and block must not exceed .060 inches (1.52 mm) throughout one full revolution of both yokes.

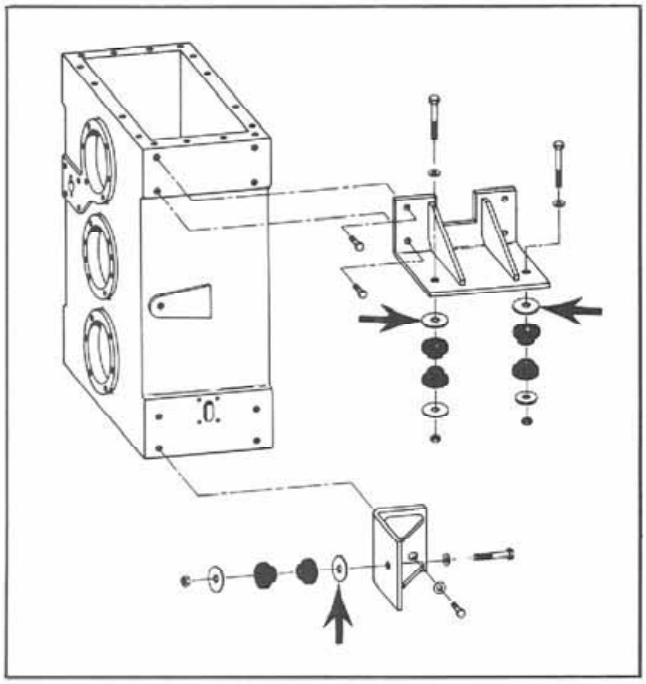

Figure 11:

9. If the measurement limits are exceeded, shim the transfer case mount brackets at any of the points shown (Fig. 11) on either side of the transfer case assembly, until the measurement falls below the maximum limit. Flatwashers may be used for shims.

IMPORTANT: *The transfer case mountings must be retorqued after shimming before rechecking yoke alignment.*

10. Remove the lifting fixture from the top of the transfer case and replace the capscrews previously removed. Carefully connect and secure the oil line, ensuring that it is open and clean. Fasten the oil line clamp bands.

    If any hoses were removed from the flow divider, reconnect and tighten them. Also, if the hydraulic oil filter element has been removed, replace with a new element and seal.

11. Connect the intermediate driveline to the rear output yoke of the transfer case.

12. Connect the overflow tube from the transmission. Rotate the clamps so they are accessible for tightening with a deep socket.

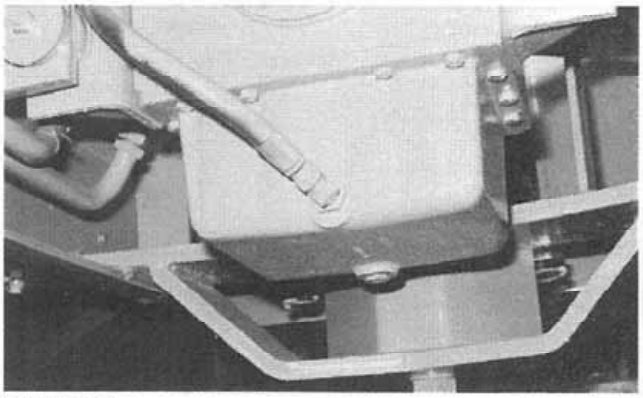

Figure 12:

13. Replace the oil suction hose at the front of the transfer case oil reservoir. After tightening, be sure it is not twisted or otherwise reduces the flow of oil (Fig. 12).

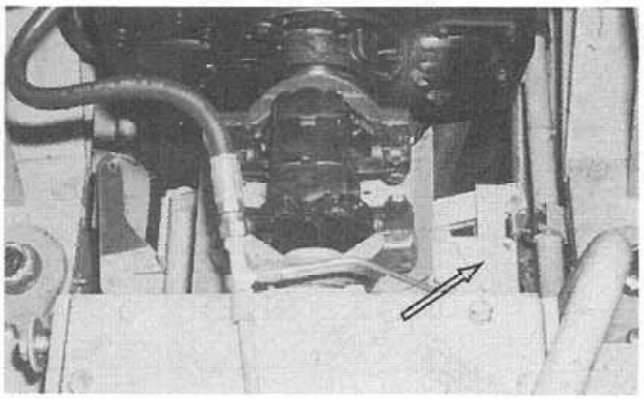

Figure 13:

14. Mount the shift cable and bracket assembly on the detent block and connect the linkage to the shift rod (Fig. 13). Ensure correct shift cable adjustment and operation so that the sliding clutch and selective gears mesh fully in each range.

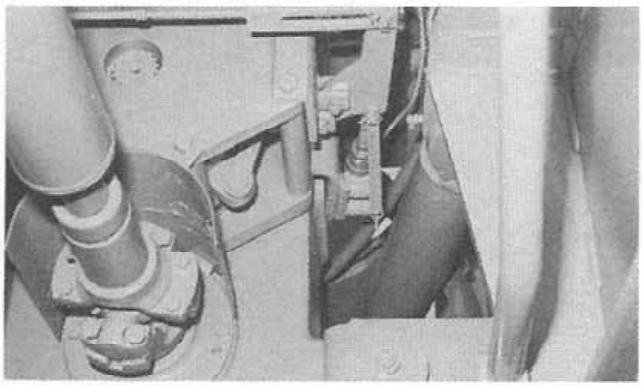

Figure 14:

15. Install the slave cylinder and mount bracket on the inner brake plate/bearing cap (Fig. 14).

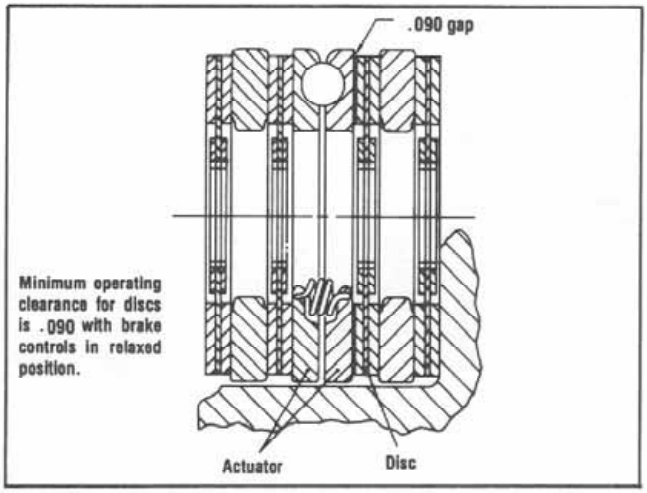

Figure 15:

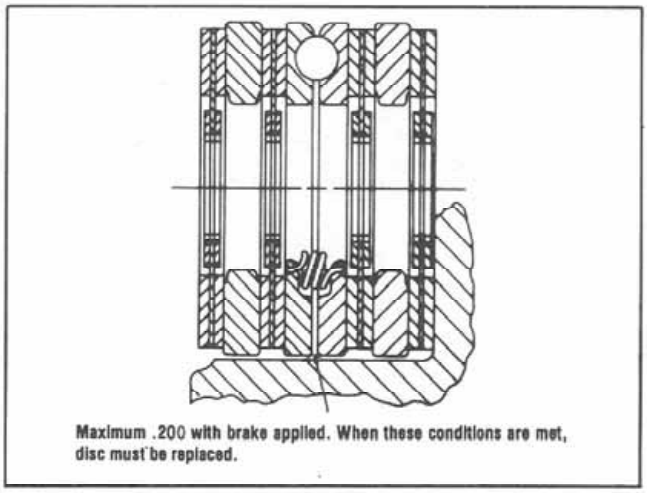

Figure 16:

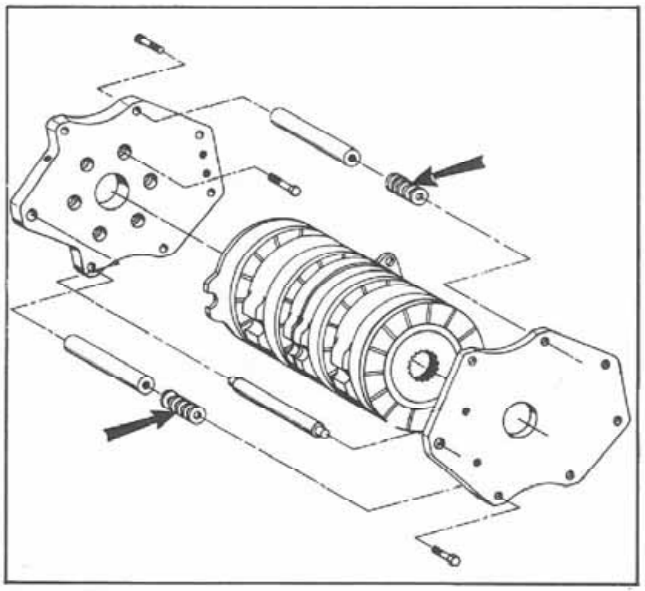

Figure 17:

16. If the brake assembly were left off prior to reinstallation of the transfer case, install and adjust it at this time. After installing the outside brake plate and brake lever bracket, adjust the actuator linkage if necessary to give a minimum disc clearance of .090 inches (2.28 mm), with the brake in the OFF position (Fig. 15). If the actuator cap exceeds .200 inches (5.08 mm), with the BRAKE APPLIED (Fig. 16), either replace worn brake discs or remove shims between the outer brake plate and brake support pins (Fig. 17). When new discs are installed, also add the shims required.

IMPORTANT: *When using shims on the brake support pins, they must be of equal total thickness on ALL pins.*

17. Remove the capscrews as required on the upper and lower front bearing caps, and outer brake plate. Reinstall the upper and lower brake shields. Use torque values given in Reassembly Procedures when tightening capscrews on bearing caps.

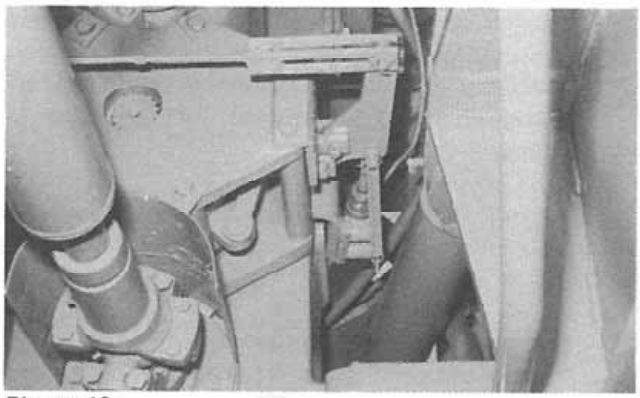

Figure 18:

18. Reinstall the park brake cable with bracket and yoke (Fig. 18). Ensure that full brake application and retraction are permitted after installation.

19. To reinstall the front lower driveline, raising one wheel off the ground may be required to allow u-joint and drive yoke alignment on both ends of the driveshaft.

20. On the transfer case, slide the input yoke fully rearward on its shaft and install the upper driveline. To aid in torquing capscrews, apply the park brake and shift the transfer case into gear as desired for various rotational positions.

21. Reinstall the floorboard, floor mat, shift lever boot/ring and shift lever knob.

22. If necessary, loosen the instrument panel/dash assembly to install the instrument skirts.

23. Fasten the seat pedestal weldment to the floor and hoist the seat assembly into the cab. While fitting the seat to the pedestal, be careful not to damage the swivel or fore/aft control levers.

24. Refill the transfer case oil reservoir using the procedures in the Service and Maintenance section of the Operator's Manual.

25. Test drive the tractor and observe proper operation, braking and shifting. Readjust if necessary and recheck the oil level of the reservoir before returning the tractor to normal service.

Installation Procedures

Model E and Model F, PT350

1. Place the transfer case assembly under the tractor while it's positioned horizontally. The lifting fixture should be attached.

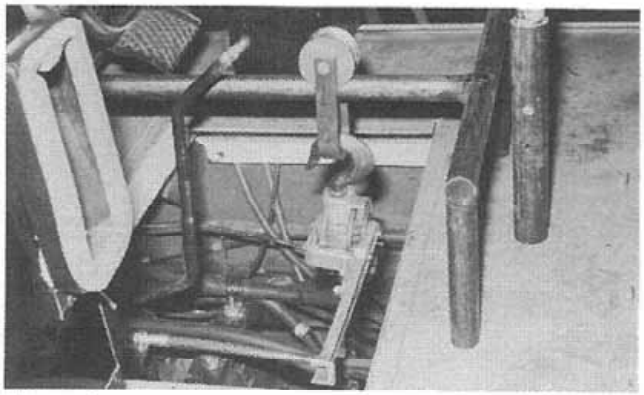

Figure 1:

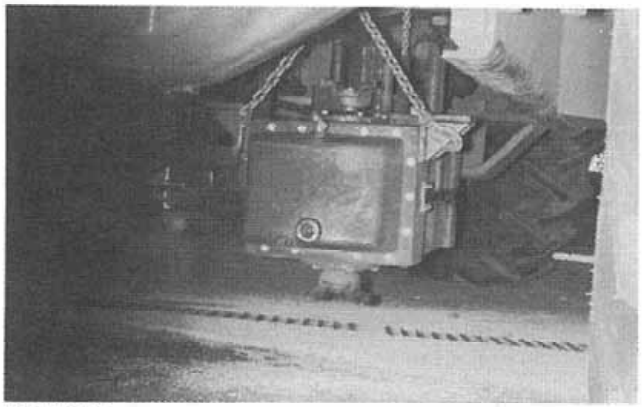

Figure 2:

2. Position the two lift stands, roller/yoke assemblies and hoists over the cab openings (Fig. 1). Attach a short chain to the lower transfer case mount brackets. Hook the front hoist to the short chain and remove all slack. Attach the rear hoist to the lifting fixture. Now lift the assembly with both hoists (Fig. 2).

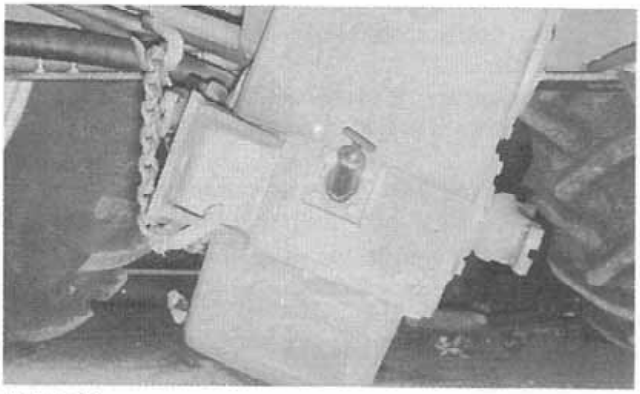

Figure 3:

3. Continue to lift the transfer case with the rear hoist and lower the unit with the front hoist to gradually bring it into a vertical position (Fig. 3).

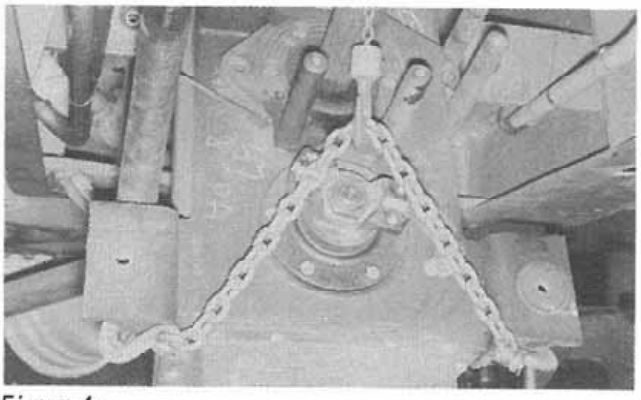

Figure 4:

4. As the unit is completely vertical (Fig. 4) and the rear hoist is supporting the whole unit, the short chain, front hoist, roller/yoke assembly and lift stand may be removed.

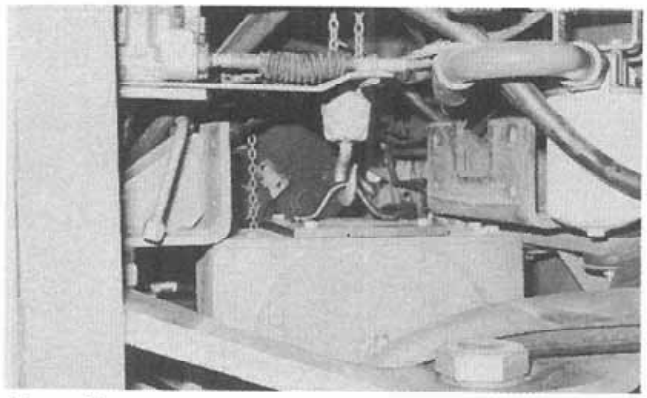

Figure 5:

5. Carefully raise the transfer case (Fig. 5), while ensuring alignment and proper relation of the unit with mounting brackets of the frame. To avoid damage, lift in steps and check for interference of lines, hoses and cables while lifting.

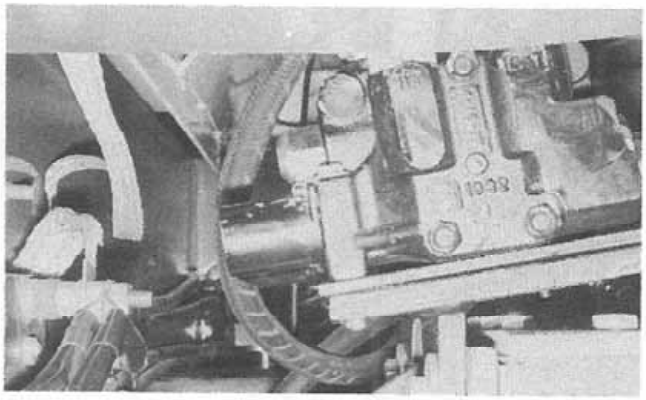

Figure 6:

6. With the transfer case housing and bracket holes aligned, start several capscrews on both sides of the unit to support it, and mount the hydraulic control valve bracket at the same time (Fig. 6). Connect the battery ground cables at the terminal block inside the frame.

IMPORTANT: *During installation of the transfer case, torque all fasteners per General Chassis section of the Steiger Service Manual. Note the type of fastener used.*

7. Remove the lifting fixture from the top of the transfer case and replace the capscrews previously removed. Carefully connect and secure the oil line, ensuring that it is open and clean. Fasten the oil line clamp bands.

   If any hoses were removed from the flow divider, reconnect and tighten them. Also, if the hydraulic oil filter element has been removed, replace it with a new element and seal.

8. Connect the intermediate driveline to the rear output yoke of the transfer case.

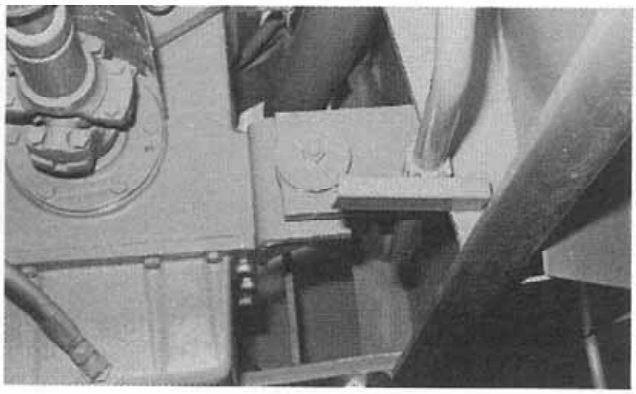

Figure 7:

9. Install the rubber mounts and through-bolts at the lower transfer case mount brackets (Fig. 7).

10. Connect the overflow tube from the transmission. Rotate the clamps so they are accessible for tightening with a deep socket.

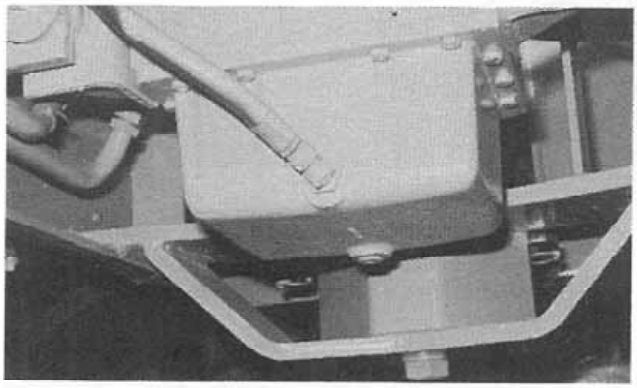

Figure 8:

11. Replace the oil suction hose at the front of the transfer case oil reservoir (Fig. 8). After tightening, be sure it is not twisted or otherwise reduces the flow of oil.

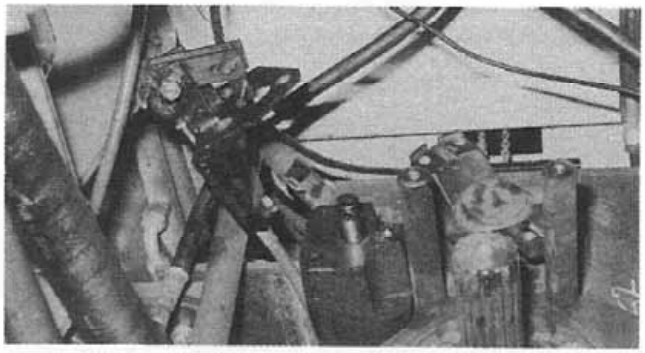

Figure 9:

12. Mount the shift cable and bracket assembly on the detent block and connect the linkage to the shift rod (Fig. 9). Ensure correct shift cable adjustment and operation so that the sliding clutch and selective gears mesh fully in each range.

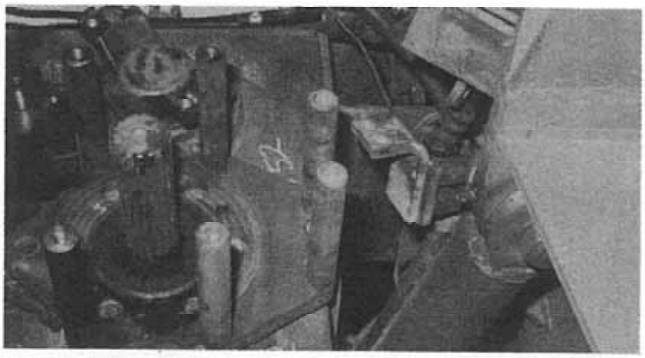

Figure 10:

13. Install the slave cylinder and mount bracket on the inner brake plate/bearing cap (Fig. 10).

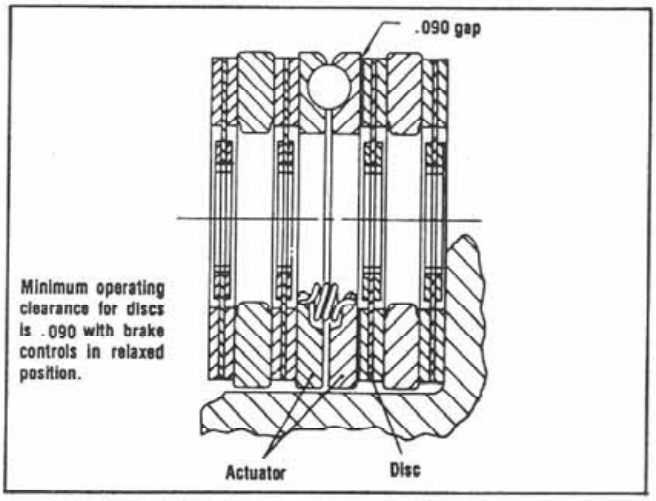

Figure 11:

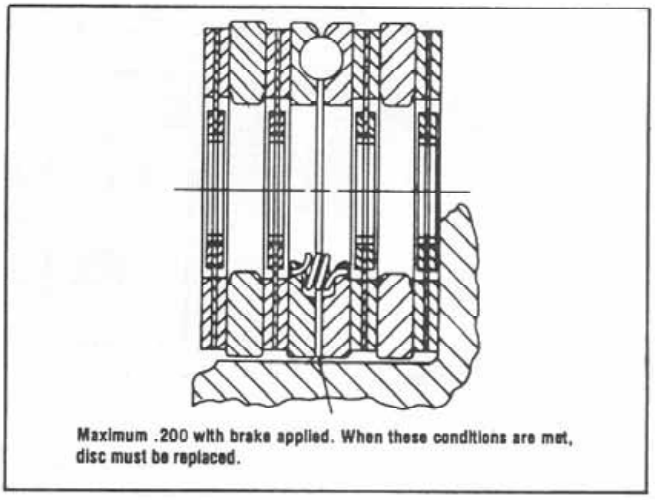

Figure 12:

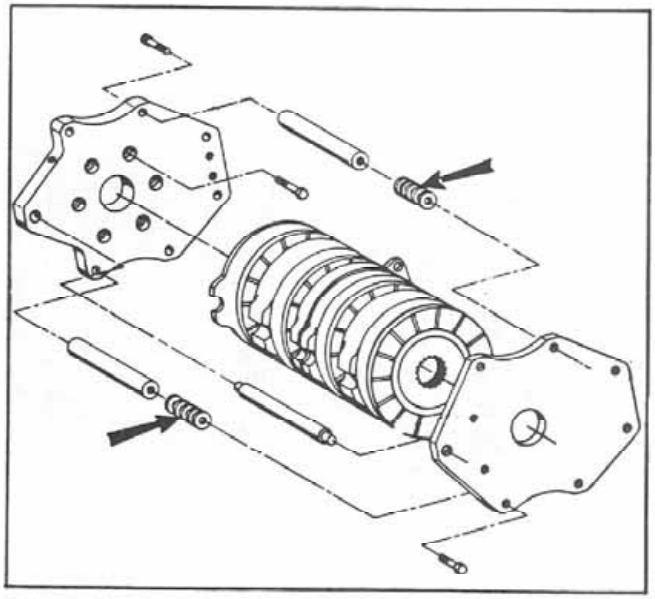

Figure 13:

14. After the brake inner wear plate is installed (with the grooved side facing the transfer case), install the rotating and stationary brake discs.

15. After installing the outside brake plate and brake lever bracket, adjust the actuator linkage if necessary to give a minimum disc clearance of .090 inches (2.28 mm), with the brake in the OFF position (Fig. 11). If the actuator cap exceeds .200 inches (5.08 mm), with the BRAKE APPLIED (Fig. 12), either replace worn brake discs or remove shims between the outer brake plate and brake support pins (Fig. 13). When new discs are installed, also add the shims required.

IMPORTANT: *When using shims on the brake support pins, they must be of equal total thickness on ALL pins.*

16. Remove the capscrews as required on the upper and lower front bearing caps, and outer brake plate. Reinstall the upper and lower brake shields. Use torque values given in Reassembly Procedures when tightening capscrews on bearing caps.

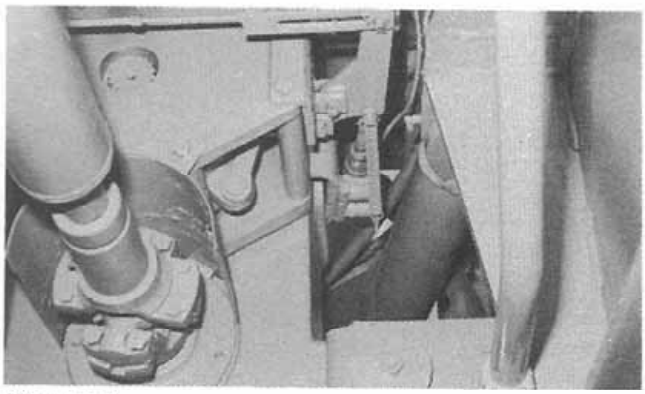

Figure 14:

17. Reinstall the park brake cable with bracket and yoke (Fig. 14). Ensure that full brake application and retraction are permitted after installation.

18. To reinstall the front lower driveline, raising one wheel off the ground may be required to allow u-joint and drive yoke alignment on both ends of the driveshaft.

19. On the transfer case, slide the input yoke fully rearward on its shaft and install the upper driveline. To aid in torquing capscrews, apply the park brake and shift the transfer case into gear as desired for various rotational positions.

20. Reinstall the floorboard, floor mat, shift lever boot/ring and shift lever knob.

21. If necessary, loosen the instrument panel/dash assembly to install the instrument skirts.

22. Fasten the seat pedestal weldment to the floor and hoist the seat assembly into the cab. While fitting the seat to the pedestal, be careful not to damage the swivel or fore/aft control levers.

23. Refill the transfer case oil reservoir using the procedures in the Service and Maintenance section of the Operator's Manual.

24. Test drive the tractor and observe proper operation, braking and shifting. Readjust if necessary and recheck the oil level of the reservoir before returning the tractor to normal service.

Symptom	Possible Cause	Remedy
1. Unit jumps out of gear.	A. Misadjusted linkage and/or cables.	Adjust linkage to provide full engagement.
	B. Severely worn or stretched cable, worn or damaged linkage parts.	Replace cable or faulty linkage parts and adjust.
	C. Damaged input shaft, sliding clutch, selective gear clutch teeth or needle bearings.	Overhaul input shaft/gear subassembly.
	D. Inoperative detent assembly.	Repair or adjust as required.
2. Unit is hard to shift.	A. Shift cable dragging while under pressure.	Replace with new cable assembly.
	B. Misadjusted or faulty detent assembly.	Adjust to correct specification, repair or replace as required.
	C. Scored or damaged shift rod binding in bores of housing or detent block.	Replace shift rod; determine cause of damage.
3. Unit makes excessive noise.	A. Drive yokes on output shaft out of phase.	Install yoke with keyways parallel.
	B. Shaft support bearings adjusted too loose, worn or damaged.	Adjust, inspect or replace bearings as required.
	C. Damaged gear teeth.	Replace damaged gears and determine cause of damage.
	D. Improper fit of gear hubs on splined shafts or worn needle bearings within selective input gears.	Restore proper fits by part replacement. Ensure correct fit at assembly.
4. Oil leakage.	A. Clogged breather vent building pressure and forcing oil past seals.	Clean, inspect or replace breather assembly.
	B. Aeration of oil caused by wrong type of oil or air suction leak between pump and reservoir.	Use correct type of oil as prescribed in Operator's Manual. Secure fittings to eliminate air suction leaks.
	C. Damaged inner output yoke seal (O-ring), loose drive yoke.	Replace inner O-ring seal, ensure correct size is used. Torque the drive yoke nut.
	D. Worn oil seals or grooved drive yoke journals.	Replace yokes and/or seals.
5. Overheating.	A. Clogged oil cooler fins.	Clean with compressed air or water pressure.
	B. Clogged oil filter.	Replace filter element.
	C. Brake applied or misadjusted.	Ensure proper operation of brake.
	D. Lack of lubrication.	Fill and inspect cooling circuit.