SECTION VII
KID DRIVE SYSTEM

- **Drive Chains (figure VII-1)**

A. MAIN DRIVE CHAINS (NO. 1)

NOTE: The most efficient way to remove and replace any of the drive chains is to first remove the Main Drive Chain (triple-strand chain). This will provide free rotation of all other drive chains when the vehicle has been elevated to provide clearance between the ground and the wheels.

Removal

1. Loosen tension adjustment on idler sprocket and triple strand chain by backing off lock-nut and adjusting screw.
2. Remove Master Link closest to the idler sprocket and lift out chain.

Inspection.

1. Suspend chain vertically and apply a load of 50 lbs. to bottom end.
2. Measure the distance between 32 pitches of the chain.
3. If distance is more than 12¼ inches replaceschain (New 12").

Repair.

If a chain breaks or fails due to broken pins, side bars and/or rollers, temporary repairs may be required in order to avoid long shutdowns. Replacement of the chain, however, is recommended for the following reasons:

a. If one section of the chain has failed because of fatigue, other sections are sure to follow.
b. If the chain has been broken by a single high overload, parts other than the failed ones are usually bent or severely weakened.

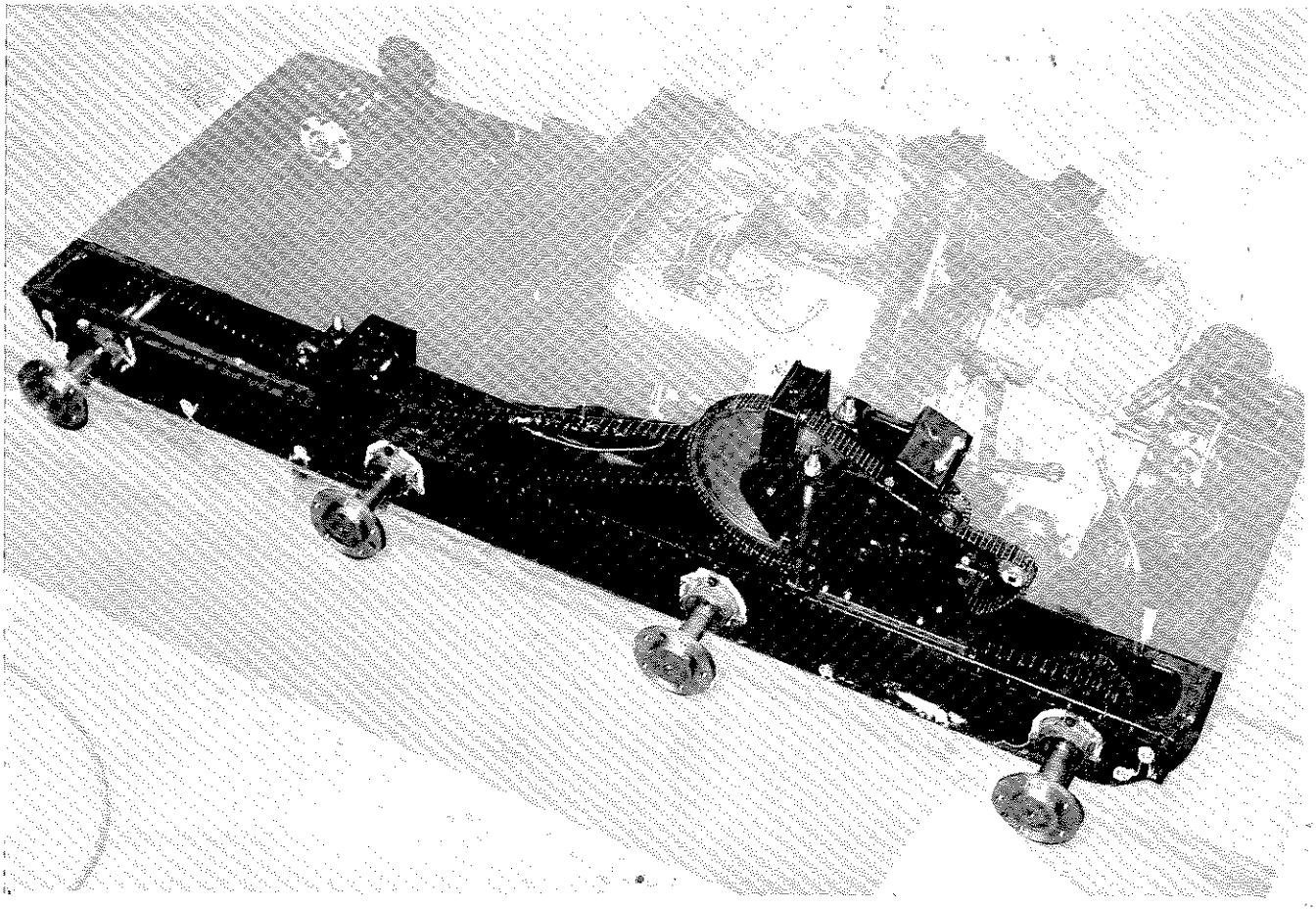


Figure VII-1 Chain Drive System

Installation.

NOTE: When installing any master link, point the pins away from any adjacent sprocket.

1. Before installing a new chain, carefully check sprocket teeth. If teeth are worn to a hooked shape, sprockets should be replaced.
2. Before installing chain loosen tension on jackshaft assembly by backing off lock nuts and adjusting screws.

IMPORTANT: In loosening jackshaft adjusting screws, back off only 5 turns at a time on each side.

3. Place triple-strand chain around transmission drive sprocket, under idler sprocket, and around triple-strand chain sprocket on jackshaft.
4. Replace master link assembly and secure with retaining clip (pins pointing outboard).
5. Readjust jackshaft adjusting screws until triple chain is almost taut.
6. Adjust chain tension by adjusting idler sprocket.

B. NO. 2 DRIVE CHAIN, L.H. AND R.H. SIDE

Removal.

1. Make sure that Master Link is close to the axle sprocket in the unloaded span of the chain. If not, and main drive chain is installed, first remove main drive chain. When main drive chain is removed, elevate the vehicle so that the wheels can be turned by hand. Manually rotate wheels to provide access to master link.
2. Loosen chain tension on jackshaft assembly by backing off locknuts and adjusting screws (not more than 5 turns at a time on each side).
3. Remove master link and lift out chain.
4. Reinstall master link in one end of the chain.

Inspection.

1. Vertically suspend the chain and apply a load of 70 lbs. to bottom end.
2. Measure the distance between 16 pitches of the chain. If distance is more than 12¼ inches, replace chain.

Repair

(See A.)

Installation.

1. Place chain around sprocket on the axle, and around corresponding sprocket on the jackshaft.

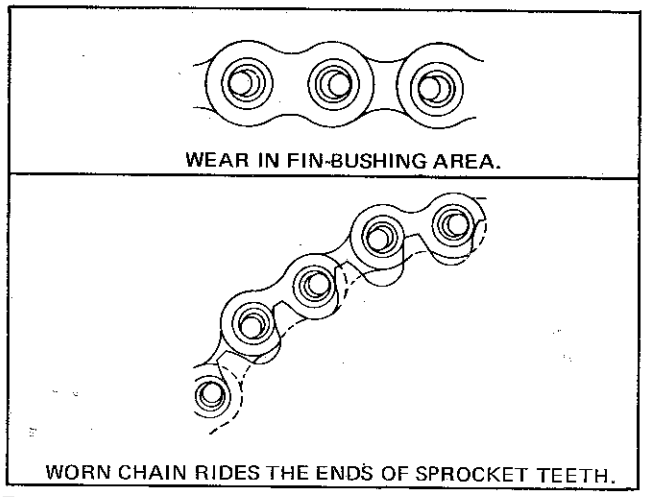


Figure VII-3. Chain Wear

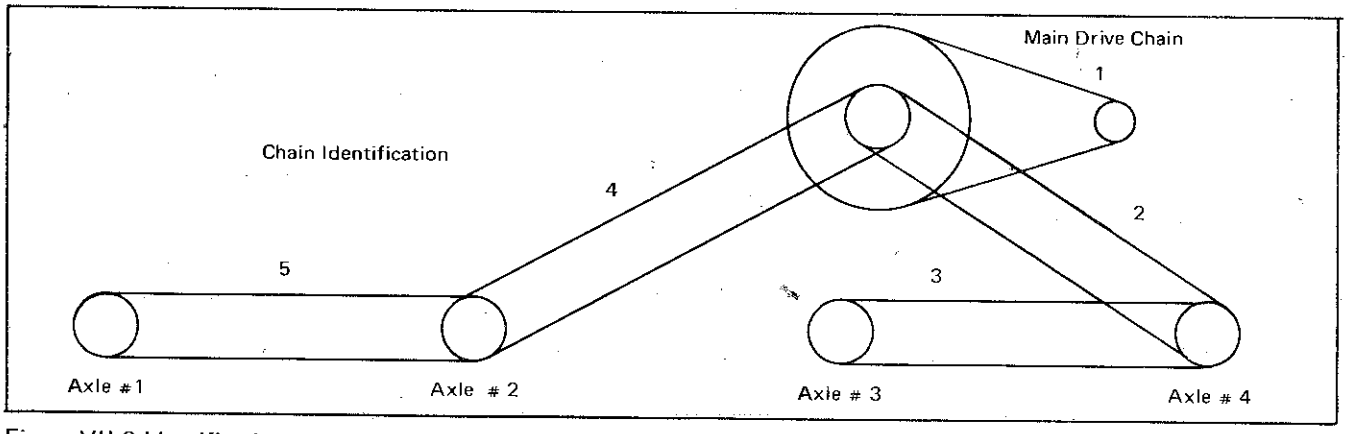


Figure VII-2 Identification of Chains & Sprockets

2. Reinstall master link and secure with retaining clip (pins pointing inboard).
3. Adjust jackshaft assembly until chain is almost taut.

C. NO. 3 DRIVE CHAIN, L.H. and R.H. SIDE

Removal

1. Make sure that master link is close to the No. 4 axle sprocket in the unloaded span of the chain. If master link is not accessible, remove main drive chain, elevate vehicle and manually rotate wheel to obtain access to the master link.
2. Loosen tension adjustment on idler sprocket located underneath jackshaft assembly.
3. Remove master link and manually rotate the No. 3 axle to remove chain from the No. 3 axle sprocket. After this, remove chain from No. 4 axle sprocket and pull chain.

Inspection.

1. Use same procedure as for the No. 2 chain.

Repair.

(See A.)

Installation.

The following procedure describes how to install the No. 3 chain when the No. 2 chain is installed:

1. Connect a length of flexible steel wire to one end of the chain.
2. Feed steel wire underneath the No. 4 axle and the No. 3 axle, starting from the No. 4 axle.
3. Feed in chain from No. 4 axle, making sure that sprocket does not interfere, and at the same time pulling chain with flex wire toward No. 3 axle sprocket.
4. When chain has reached No. 3 axle sprocket, insert free end of flex wire underneath the idler sprocket, toward the No. 4 axle.
5. Place chain around No. 3 sprocket and manually rotate No. 3 wheel (making sure that chain will locate properly on the idler sprocket by means of the flex wire) until chain end reaches almost the No. 4 axle sprocket.
6. Place other end of chain on the No. 4 axle sprocket with approximately 2" overlap over the sprocket.
7. Replace master link assembly and secure with retaining clip (pins pointing outboard).
8. Readjust idler sprocket until No. 3 chain is almost taut.

D. NO. 4 DRIVE CHAIN, R.H. and L.H. SIDE.

Removal.

1. Remove all items in the cab that interfere with access to the No. 2 axle, such as passenger seat, battery, etc.
2. With main drive chain removed and vehicle elevated from the ground, manually rotate No. 2 wheel until easy access is obtained to the master link in the unloaded span of the chain.
3. Loosen chain tension on jackshaft assembly by backing off locknuts and adjusting screws (not more than 5 turns at a time on each side).
4. Remove master link, separate chain, and remove chain from jackshaft sprocket and No. 2 axle sprocket.

Inspection.

Use same procedures as for No. 2 and 3 chains.

Installation.

1. Place one side of chain around No. 2 axle sprocket, making sure that the remainder of the chain is on the bottom of the vehicle.
2. Carefully rotate No. 2 wheel so as to feed one end of the chain around the sprocket, toward and underneath the idler sprocket.
3. Place other end of chain around jackshaft sprocket, making sure that bottom of the chain is as taut as possible.
4. Bring the two loose ends of the chain together by manually rotating the No. 2 wheel.
5. Replace master link assembly and secure with retaining clip (pins pointing outboard).
6. Adjust chain tension by readjusting jackshaft adjusting screws until chain is almost taut. Secure adjusting screws with the lock nuts.

E. NO. 5 DRIVE CHAIN, L.H. and R.H. SIDE

Removal

1. Remove screws securing foot plate to support brackets and fuel tank flange, and remove foot plate.
2. Remove screws securing plates covering chain and remove plates.
3. With main drive chain removed and vehicle elevated from the ground, manually rotate No. 1 axle until master link is accessible in the unloaded span of the chain.
4. Remove chain tension by backing off adjusting screw on idler sprocket situated near No. 2 axle.

5. Remove master link, separate chain, and remove chain by manually rotating No. 2 wheel counterclockwise.

Inspection.
Use same procedure as for No. 2 and 3 chain.

Repair
Use similar procedure as described for No. 2 or 3 chain.

Installation.
1. Place chain around sprocket on No. 2 shaft, working from the bottom up.
2. Manually rotate No. 2 wheel counterclockwise, feeding chain underneath the idler sprocket.
3. Place other end of chain around sprocket on No. 1 axle, starting at the bottom side of the sprocket, and manually rotate the No. 1 wheel clockwise so as to feed the chain toward the No. 2 axle.
4. Remove slack out of bottom of chain and join chain ends.
5. Replace master link and secure (pins pointing inboard).
6. Adjust chain tension by readjusting the idler sprocket adjusting screw situated near the No. 2 axle.
7. Replace cover plates and foot plates and secure with screws.

• Jackshaft and Jackshaft Sprocket Assemblies.

The following procedures describe the required operations and sequence to be followed to remove and install the jackshaft and sprocket assemblies, with the drive chains already removed.

A. JACKSHAFT ASSEMBLIES, L.H. AND R.H. SIDE.

Removal.
1. On left hand jackshaft assembly only, remove the two screws, nuts and lock washers securing the transmission control cable bracket to the jackshaft adjusting bracket.
   Detach cable from transmission control arm, and remove control cable from under jackshaft.
2. Remove the 8 screws and lock washers which secure the jackshaft support to the tractor body.
3. Lift jackshaft assembly out of the tractor.

Disassembly.
1. Remove cotter pin, slotted nut, and flat washer from jackshaft sprocket bolt.
2. Remove sprocket bolt. In doing so the sprocket assembly and two spacers can be removed from the adjusting bracket.
3. Remove 3 nuts, lock washers and flat washers from support bracket carriage bolts. Remove the carriage bolts and the spacers located on the bolts between the support bracket.
4. Remove the two adjusting screws securing the jackshaft bracket to the support bracket.
5. Remove ball bearings from the hub of the jackshaft sprocket.

Inspection.
1. Inspect the sprocket assembly for excessive wear on the teeth of the sprockets. The sprocket teeth can wear in three different ways:
(a) If teeth are worn to a hooked shape (an indication of over-tensioning of the chain), the sprocket should be replaced.
(b) If teeth are worn showing a ratchet type pattern (an indication of too slack a chain), the sprocket can still be used with a new chain under the proper tension.
(c) If teeth show excessive side wear (an indication of improper alignment), sprockets should be replaced.
2. Inspect the ball bearings.
   Submerge ball bearings in a cleaning solvent and soak. Use shop air to clean old grease and dirt from the ball bearings. Determination of ball bearing replacement requires a certain amount of skill and experience.
   Carefully and slowly move the outer bearing surface. Excessive wear of either the balls or wear surface can be felt.
   If in doubt, it is better and more economical to replace the bearings.
3. Inspect the adjusting bracket and the jackshaft support bracket for possible cracks.

Repair or Replace.
1. If the sprocket teeth are excessively worn, as described under inspection, repair is not possible. Replace sprocket in this case.
2. If ball bearings show the slightest amount of wear, replace rather than take a chance of future failure.

B. JACKSHAFT SPROCKET ASSEMBLY

Removal

NOTE: This procedure is for the main drive sprocket on one side of the vehicle (including No. 2 and No. 4 drive

sprockets). Installation for the other side is identical.

1. Set the control lever at neutral and raise the wheels on that side enough that they are free to turn.
2. Loosen the No. 1 chain tensioner, remove the master link, and remove the No. 1 chain (See Figure 7-4).
3. Loosen 3 jackshaft locking bolts, loosen 2 jackshaft adjusting screw locknuts, and back off the two jackshaft adjusting screws until the No. 2 and No. 4 chains are loose.

NOTE: Turn the jackshaft adjusting screws together. Do not turn one screw over 5 turns more than the other.

4. Turn No. 3 wheel until the No. 2 chain master link is accessible, remove the master link, and remove the No. 2 chain.
5. Turn No. 2 wheel until the No. 4 chain master link is accessible, remove the master link, and remove the No. 4 chain.
6. Remove 8 jackshaft assembly mounting bolts and remove jackshaft assembly. Set the jackshaft assembly on a bench and remove the jackshaft bolt, bearings, spacer, and sprocket assembly.

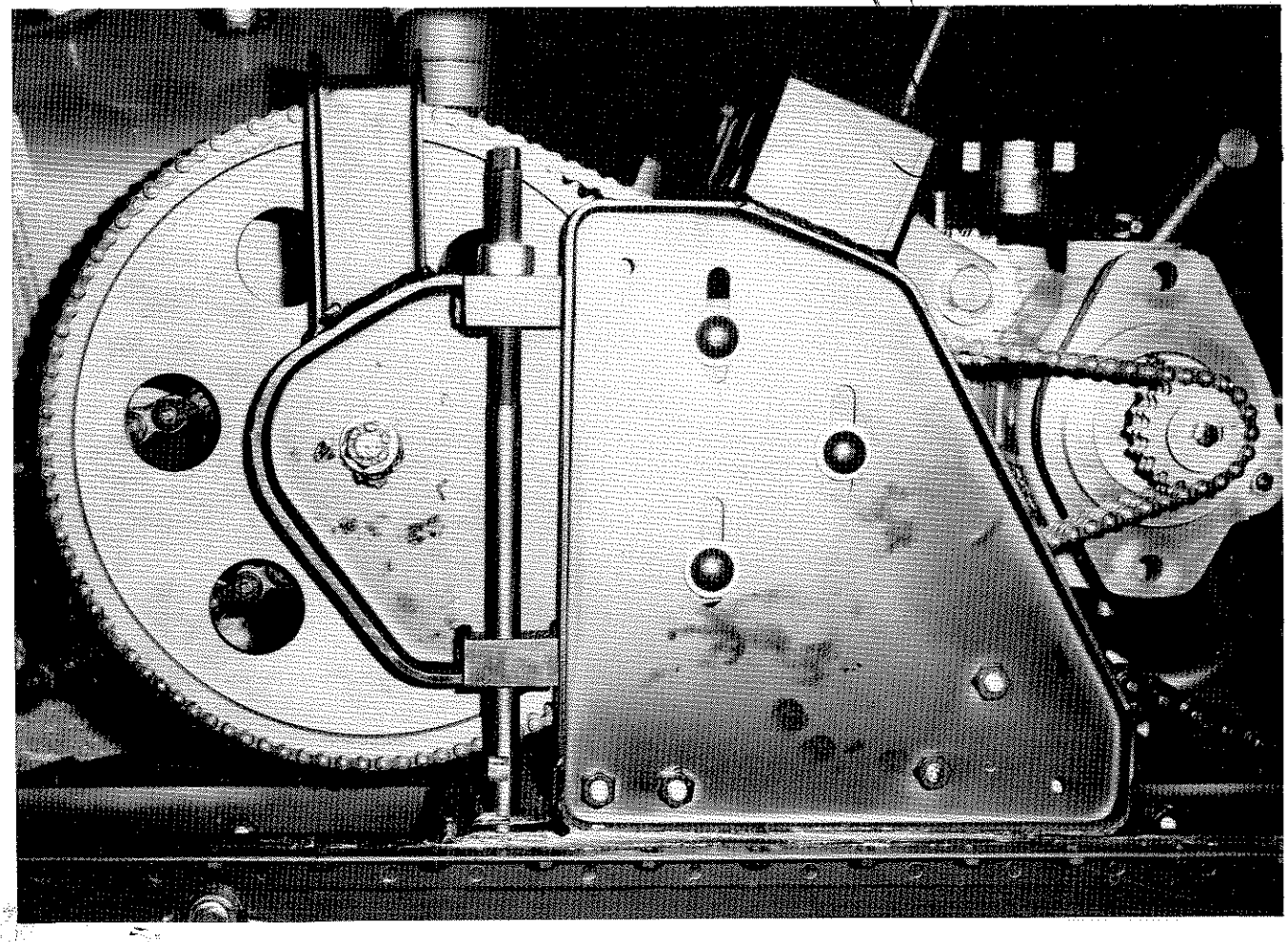


Figure VII-4. Jackshaft Assembly

Inspection

Wash the jackshaft assembly and bolt in kerosene and dry thoroughly. Inspect for twists, bends, cracks and other damage, and oil as necessary with 10W-30 oil.

Repair

Inspect the sprocket per illustration (Figure 7-5). Repair as recommended.

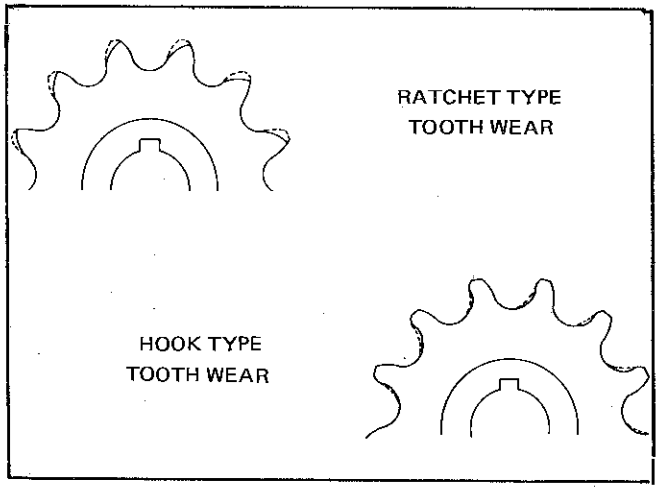


Figure VII-5. Sprocket Wear

Installation

NOTE: When installing any master link, point the pins away from any adjacent sprocket.

1. Pick up the jackshaft sprocket, races, and bearings as an assembly and hold the assembly in place between the faces of the jackshaft assembly.

NOTE: Do not in any way change the relationship of these parts during assembly.

2. Align the sprocket with the holes in the jackshaft assembly and push the jackshaft bolt into place.

NOTE: This bolt should be installed by hand, and not forced. Adjust the alignment of the sprocket by hand as necessary to allow the bolt to slide in place.

Install the large washer and castellated nut on the bolt. Tighten the nut until there is no endplay at the bearings, then back the castellated nut off two notches in the nut and install cotter pin.

3. Set the assembled jackshaft in place in the vehicle and install 8 jackshaft assembly mounting bolts.
4. Wrap the No. 2 chain around No. 4 sprocket and around the inboard jackshaft sprocket. Pull the ends together and install the master link (pins pointing inboard).
5. Wrap the No. 4 chain around the No. 2 sprocket and around the outboard jackshaft sprocket. Pull the ends together and install the master link (pins pointing outboard).
6. Clean the main drive chain thoroughly and re-oil with 10W-30 oil. Wrap the main drive chain around the jackshaft drive sprocket and around the transmission shaft sprocket. Pull the ends together and install the master link.
7. Turn the two jackshaft adjusting screws nearly the same amount (not more than 5 turns at a time on each side) until No. 2 and No. 4 chains are almost taut. Tighten the locknuts. Tighten three jackshaft locking bolts.
8. Adjust the No. 1 chain tensioner until No. 1 chain is almost taut. Tighten the locknut.
9. Lubricate all moving parts with 10W-30 oil.

• Axles and Axle Sprockets

A. NO. 1 AXLE AND AXLE SPROCKET

Removal

1. Preparation.

Prepare to remove No. 1 axle and sprocket as follows:

a. Remove the foot plate over No. 1 axle.
b. Drive the tractor slowly until the No. 5 chain master link is accessible, and stop.
c. Loosen No. 5 chain tensioners. Remove master link, and remove No. 5 chain.
d. Remove No. 1 wheel.

2. Axle and Sprocket Removal.

NOTE: The following procedure for removing an axle and sprocket is applicable to any axle and sprocket providing the associated chain or chains are removed from the sprocket and the axle is free to turn.

a. Remove the cotter pin, castellated nut, and washer from the axle.
b. Pull the axle out through both bearings and the sprocket.
c. Remove the sprocket and retain the key.

Inspection

1. Axle
   Inspect the axle for cracks, bends, evidence of twisting, or excessive pitting or corrosion at bearing surfaces.
2. Sprocket
   Inspect the sprocket for cracks, burrs, or excessive tooth wear (see Figure VII-5).
3. Bearings (Installed in Vehicle).
   Inspect the bearings for evidence of poor lubrication. If the bearings have been running with poor lubrication, they will have excessive rust particles, be pitted, and will bind or scrape when the inner race is turned by hand. Inspect the bearings for evidence of seizure. If the bearing has seized at any time it will show evidence of either the axle turning in the inner race, or the outer race turning in the housing. Either case is cause for replacement of the bearing.
   Inspect the bearing seal for dents, holes, out-of-round, or hardening of rubber seal.

NOTE: A broken, twisted or bent axle often results in damage to the seal. Do not attempt to repair the seal, but replace. (See bearing replacement).

Repair

No repair of axles or sprockets is recommended.

Installation

a. Make sure the bearings are clean and well lubricated, and the bearing housing mounting bolts are tight.
b. Hold the sprocket assembly in position between the two bearings with the sprocket inboard (See Figure VII-6).
c. Slide the axle through the outside bearing and half-way through the sprocket.
d. Turn the sprocket assembly around so the keyway is on the bottom. Reaching through the inboard bearing, set the key in the sprocket keyway. Push the axle in lightly and turn until the key engages the axle keyway. Continue to hold the sprocket and turn the shaft back and forth gently and press in until you are certain the key has engaged both axle and sprocket. Align the sprocket and inside bearing and press the axle through the inside bearing as far as it will go.
e. Install the washers and castellated nut. Tighten the nut until there is no endplay, then back off one castellation and install the cotter pin.
f. Install No. 5 chain and adjust tensioner until chain is almost taut.
g. Install No. 1 wheel and install the footplate.

B. NO. 2 AXLE AND AXLE SPROCKETS

Removal

1. Preparation.
   Prepare to remove the No. 2 axle and sprockets as follows.

a. Right-hand Side
(1) Disconnect the battery ground cable.
(2) Remove fuel pump mount bolts.

NOTE: It is not necessary to disconnect the fuel lines. Move the fuel pump out of the way and tie it there.

(3) Disconnect the two transmission control rods from the transmissions, being careful that the control adjustment is not changed.
   Loosen the jam nuts on the control linkage (one on the engine and one on the jackshaft assembly) so the linkage is free to slip through.
(4) Disconnect the throttle and choke wires at the carburetor, being careful that the control adjustment is not changed.

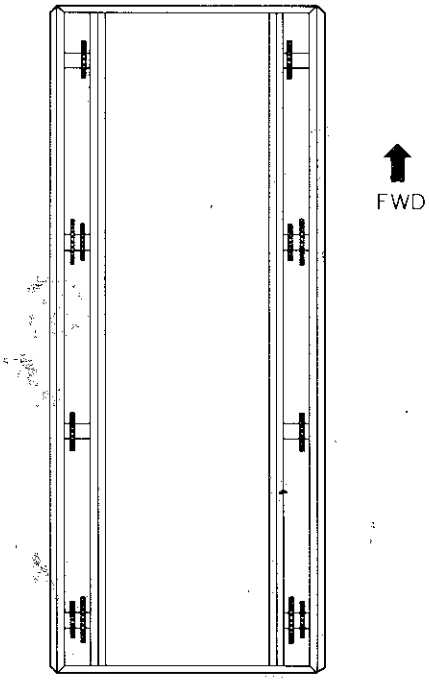


Figure VII-6 Axle Sprocket Locations

(5) Disconnect the electrical quick-disconnect in the wires leading from the control console to the engine.
(6) Remove the seat and remove the vertical support channel under the seat (4 bolts).
(7) Remove the footplate in front of the control console and the chain guard.
(8) Remove the control console mounting screws, and move the console out of the way and tie in position for easy access to sprockets.
(9) Relieve tension on the No. 1 chain, remove a master link, and remove the chain.
(10) Loosen 3 jackshaft locking bolts, loosen 2 jackshaft adjusting screw jam nuts, and lower jackshaft (both sides equally).
(11) Raise right side of vehicle so wheels are off ground.
(12) Turn No. 2 wheel until No. 4 chain master link is accessible, remove master link and remove No. 4 chain.
(13) Turn No. 2 wheel until No. 5 chain master link is accessible, relieve tension on chain, remove master link, and remove No. 5 chain.

b. Left-hand Side
(1) Remove battery and seat.
(2) Remove chain guard from under seat.
(3) Raise left side of vehicle so wheels are off ground.
(4) Release tension and remove No. 1 chain.
(5) Lower jackshaft and remove No. 4 chain.
(6) Release tension and remove No. 5 chain.

2. Removal
Remove No. 2 axle and sprockets as outlined for No. 1.

Inspection
Inspect No. 2 axle and sprockets as outlined for No. 1.

Repair
No repair is recommended.

Installation
Install No. 2 axle and sprockets in reverse order outlined in (B) removal.

C. NO. 3 AXLE AND AXLE SPROCKET
Removal
1. Preparation
Prepare to remove the No. 3 axle and sprocket as follows:
a. Release the chain tension and remove No. 1 chain.
b. Raise the side of the vehicle so the wheels are off the ground.
c. Lower the jackshaft assembly and remove No. 2 chain.
d. Remove No. 3 chain.
2. Removal
Remove No. 3 axle and sprocket as outlined for No. 1.

Inspection
Inspect No. 3 axle and sprocket as outlined for No. 1.

Repair
No repair is recommended.

Installation
Install No. 3 axle and sprocket in reverse order outlined in (C), removal.

D. NO. 4 AXLE AND AXLE SPROCKETS
Removal
1. Preparation.
Prepare to remove the No. 4 axle and sprockets as follows:
a. Release chain tension and remove No. 1 chain.
b. Raise the side of the vehicle so the wheels are off the ground.
c. Lower jackshaft assembly and remove No. 2 chain.
d. Release tension and remove No. 3 chain.
2. Removal
Remove No. 4 axle and sprockets as outlined for No. 1.

Inspection
Inspect No. 4 axle and sprockets as outlined for No. 1.

Repair
No repair is recommended.

Installation
Install No. 4 axle and sprockets in reverse order outlined in (D), removal.

- **Axle Bearings**

Removal

NOTE: The following procedure for removing axle bearings is applicable to all axle bearings providing the axle and sprocket assembly are removed (See Axle and Sprocket Removal).

1. Outer Bearings

a. Remove 3 bearing housing capscrews.

NOTE: In front or rear support structures (optional equipment) are installed, they must be removed when removing outer bearings.

b. Make a mark on the hull showing where the bearing grease fitting is so it can be replaced in the same postion.

c. Break the watertight sealant loose by twisting and pulling by hand.

NOTE: If the watertight sealant is hardened such that the bearing housing must be pried off, be careful not to scratch the sealing surface of either the bearing housing or the hull.

d. Remove the bearing and housing by pulling straight out at least 1/2 inch before tilting.

e. Press bearing and seal out of housing.

2. Inner Bearings

a. Remove 3 bearing capscrews

NOTE: If PTO shaft or 3-point hitch (optional equipment) are installed, the structural brace over No. 4 inner bearings must be removed.

b. Mark the hull to show where grease fitting was, and remove the bearing retainer.

c. Press bearing out.

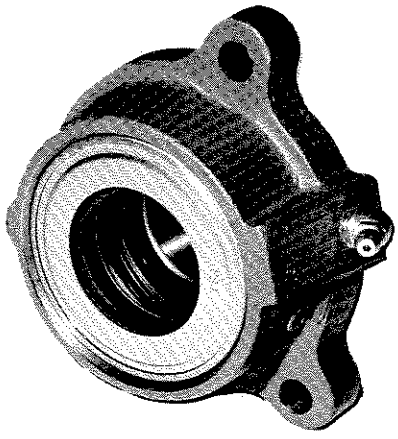
Inspection (Bearing Removed from Vehicle)

a. Wash bearings, seal, retainer, and housing in kerosene until all old grease is removed, and blow dry.

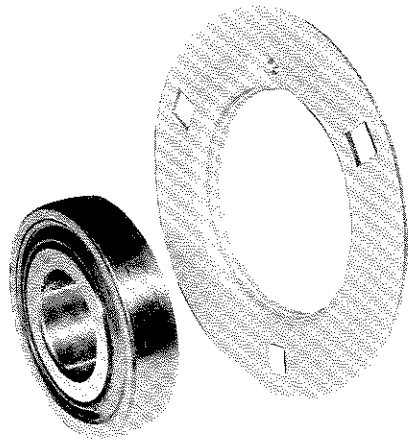
b. Inspect the bearings for evidence of poor lubrication. If the bearings have been running with poor lubrication, they will have excessive rust particles, be pitted, and will bind or scrape when the inner race is turned by hand.

c. Inspect the bearings for evidence of seizure. If the bearing has seized at any time it will show evidence of either the axle turning in the inner race, or the outer race turning in the housing. Either case is cause for replacement of the bearing.

d. Turn the bearings (dry) slowly by hand. Any roughness or flat spots are cause for replacement.



Outer Axle Bearings



Inner Axle Bearings

Figure VII-7. Axle Bearings - Inner and Outer

e. Inspect rollers and races for pitting and excessive corrosion.

f. Inspect the bearing seal for dents, holes, out-of-round, or hardening of rubber seal.

NOTE: A broken, twisted or bent axle often results in damage to the seal. Do not attempt to repair the seal, but replace.

g. Inspect the retainer and housing for cracks, warping, out-of-round, and excessive corrosion. Blow through grease fitting to make sure the passage is clear, and check the spring action of the grease fitting check ball.

Repair

No repair of bearings, races, housing, retainer or seal is recommended.

Installation

a. Pack the bearings thoroughly with a lithium based grease, and wipe a grease film over all surfaces.

b. Press the bearing in the housing and press the seal in place.

c. Install the outer bearing housing with sealant, and install inner retainer (3 bolts each), making sure the grease fittings are in the correct position.

d. Remove the exit plug from the outer bearing housing and pump grease into the fitting until it comes out the exit hole. Replace exit plug.

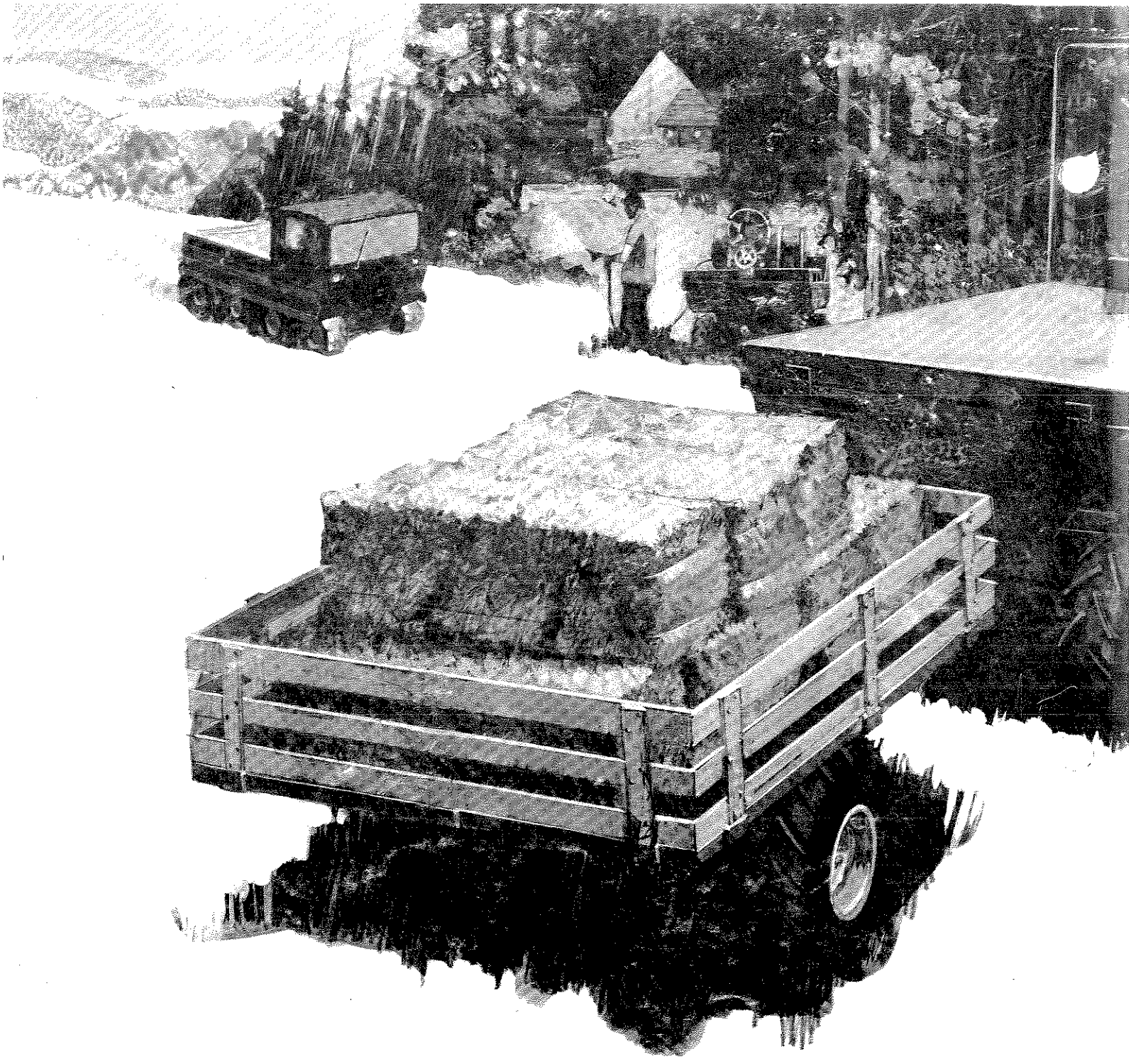
e. Pump grease into inner bearing retainer fitting until it comes out around the races.

HOW TO ORDER PARTS

When ordering parts, state Part Number, KID Serial Number, Part Name, and Quantity Required --- DO NOT ORDER BY REFERENCE NUMBER.

To assure continued successful and trouble-free operation of your KID, order all parts from your authorized KID dealer distributor.

DO NOT ACCEPT "WILL-FIT" PARTS. THEY MAY SHORTEN THE LIFE OF THE KID



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