

Inspect the hose connection on air inlet frequently and keep it tight and in good condition.

BREATHER

The crankcase breather cap, located on top of the cylinder head cover, should be inspected daily. It must not be allowed to become clogged with dirt as pressure will be created in crankcase, causing oil leaks at main bearings, magneto shaft and other points. Wash breather cap in gasoline, dip in lubricating oil and replace after throwing off excess oil.

OIL FILTER

The oil filter is a highly efficient unit for the purpose of filtering abrasive particles from the engine crankcase oil supply. This naturally adds life to the many moving parts that are dependent upon this supply for lubrication.

The filtering element consists of a metal can packed with a special long thread filtering yarn. The oil is forced through a tube to the top of the oil filter element and is filtered as it passes down through the filtering yarn.

When gasoline is being used for fuel it is necessary to replace the filtering element and its container, after each 200 to 400 hours of operation, but if low grade fuel is being used, it is necessary to replace this element after each 100 to 200 hours of operation.

The replacement container is supplied, packed with the necessary quantity of filtering yarn and has a wood stick in the center to keep the hole in filtering yarn open so that the oil tube which extends up in the element can enter freely. This wood stick should be removed with a twisting motion before attempting to install the element.

A new element can be purchased from any Allis-Chalmers dealer for a few cents.

It is very important to replace the above element as directed as this unit will aid in keeping the crankcase oil clean and add many hours of carefree service to the life of the motor.

CAUTION: Do not attempt to remove and wash the filtering yarn or use any material in container except that as furnished as regular equipment.

Install only new container, packed, as is supplied by the Allis-Chalmers Mfg. Co. for the protection of the motor.

OIL PUMP

The oil pump requires very little attention. It is of the geared type driven by a gear which meshes with the crankshaft timing

gear. It is considered good practice to clean the oil pump screen each season. This can be done by removing the oil sump bottom cover.

GOVERNOR

The governor is of the variable speed fly weight type, mounted on the magneto shaft and is completely sealed from dust and dirt.

To adjust engine governed speed, remove cylinder block side cover, located on right hand side of engine block, loosen lock nut and turn adjusting nut on governor rod to right to increase and left to decrease speed. The normal governed fullload engine speed is 1200 R.P.M.

MAIN BEARING ADJUSTMENT

The main bearings are of the bronze back type, and due to the large size of the bearings and to the type of lubrication used, they seldom need adjusting. However, shims are provided so that adjustment can be made if it becomes necessary.

Never adjust a bearing too tight. They must have .002 inch diametrical clearance. The maximum end play for crankshaft is 1/32 inch. When adjusting the bearings, always remove the same number of shims from each side. Always replace the bearing cap in its original position so that crank shaft will not be forced out of alignment.

CONNECTING ROD ADJUSTMENT

Shims are provided in the connecting rods for bearing adjustment. The connecting rod bearings should have not less than .002 inch diametrical clearance. End play should not exceed .010 inch.

When adjusting rod bearings, remove the same number of shims from each side and replace the cap on its original rod and in its original position.

When coupling up the rods, be sure the nuts are drawn tight and are locked with the proper size cotter keys.

CYLINDER LINERS, PISTONS AND RINGS

The engine has renewable cylinder liners which makes reboring unnecessary.

Oversize pistons and rings are not supplied. If wear on the cylinder liners is sufficient to require oversize pistons and rings, a new motor assembly, consisting of liners, pistons, rings, etc. should be installed.

The old liners can be readily removed from the top of the engine block by the use of a suitable puller.

When installing new liners, they should be forced straight down in the bore of the

block to prevent possible damage to the rubber packing rings.

Always use new packing rings when installing liners, as the danger of a water leak at this point is too great to risk their use the second time.

VALVE CLEARANCE AND VALVES

Correct clearance between the valve stems and rocker arms should be maintained at all times.

To adjust clearance, turn engine with crank until valve closes and push rod is at its lowest position. Loosen valve adjusting screw lock nut and turn screw until there is .010" clearance between inlet valve stems and rocker arms and .012 inch clearance for exhaust valves with engine at normal operating temperature. Use a thickness gauge for making this measurement. Tighten lock nut and recheck.

Lack of compression because of leaky valves may be caused by either insufficient clearance between rocker arms and valve stems, by the collection of carbon at the valve seats or by carbon or a gummy substance on the valve stems preventing the closing of the valves.

If, when cranking the motor over, there is a lack of resistance on one or more cylinders at the compression stroke, the pistons and rings being in good condition and there is sufficient clearance between the rocker arms and valve stems, it indicates that the valves need re-grinding.

Because of the hardened steel exhaust valve seat inserts in the exhaust valve positions, it is recommended that the valves be refaced on a machine made for this purpose and the seats be reground with a high speed valve seat grinder.

As a final operation, the valves and seats may be polished by lapping them in with a small amount of valve grinding compound. In this manner a perfect seat can be obtained which will give many hours of satisfactory service.

RADIATOR AND COOLING SYSTEM

Only rain or soft water should be used in the radiator if available. Hard or alkaline water will form a scale which will impair radiation if allowed to build up in the cooling system. The use of washing soda will help to dissolve this scale; and where only hard or alkaline water is available, the washing soda should be used at regular intervals and before the accumulation of scale becomes heavy enough to scale off and stop up the radiator passages.

In cold weather an anti-freeze solution can be used in the radiator. However, alcohol cannot be used when burning low grade fuel, because of its low boiling point. If low grade fuel is being used, Prestone or some similar cooling solution should be used.

Do not run engine without water or some cooling solution in radiator.

Never pour cold water in a hot motor when the water is low.

There are two points to drain on the cooling system. One is the drain cock under the radiator and the other is the drain cock at the rear, right hand side of engine block. Drain both places. Make sure that all water drains out before you leave the tractor. Do not take chances on opening drains and leaving before you are sure all water has drained out.

CLUTCH

The clutch is of the spring loaded single plate dry disc type. The release engagement is by movement of the clutch shifter and the throwout bearing contacting the 3 release levers.

Each release lever has an adjusting screw which is for the purpose of regulating the lever contact with the throwout bearing. As the clutch facings wear, the release levers move nearer to the throwout bearing and the only clutch adjustment necessary is to provide clearance at this point.

To adjust: Turn adjusting screws to allow a clearance of 1/4 inch between the ends of each of the three levers and the throwout bearing.

FAN BELT ADJUSTMENT

Loosen the three nuts on fan belt pulley and turn the front section to the left.

Do not tighten fan belt more or oftener than necessary to prevent slippage.

FRONT WHEEL BEARING ADJUSTMENT

The front wheels are mounted on taper roller bearings. At frequent intervals remove the weight from the wheels and examine for side play. If side play exists it will be necessary to adjust the bearings.

To adjust the bearings, remove the hub cap and tighten the nut on end of the spindle until all play is removed but with no binding. The inside of the wheel hub is provided with a felt washer to protect the bearings from dirt and to retain the grease in the hub. This felt washer should be replaced each season.

REAR WHEELS

The rear wheel hubs with ring gears are mounted on taper roller bearings which are adjusted by tightening the large castelled nut on end of rear axle and is made accessible by removing rear hub cap.

Keep the end play out of these bearings but do not tighten enough to cause binding.

BRAKES

Hand operated brakes, to aid in turning, act on pulleys installed on final drive axles.

To adjust, remove cover from top of brake housing and tighten adjusting nut on end of brake band to allow for about six inches of travel at upper end of hand lever before the band contacts brake pulley.

BELT PULLEY

The belt pulley assembly is attached to the right hand side of the transmission case. A ten inch pulley is provided running 1095 R.P.M. at normal engine speed. The motor should always be run at normal speed where constant power is needed and heavy belt load is encountered.

To figure the speed of driven units, and determine the size of the necessary pulley, multiply the diameter of the driving or engine pulley by its revolutions per minute, and divide by the R.P.M. of the driven unit.

Example: 10 inch diameter x 1095 = 10950 ÷ 1000 R.P.M. of the driven unit = 10.9. In this case use an 11 inch pulley as it is the nearest regular size.

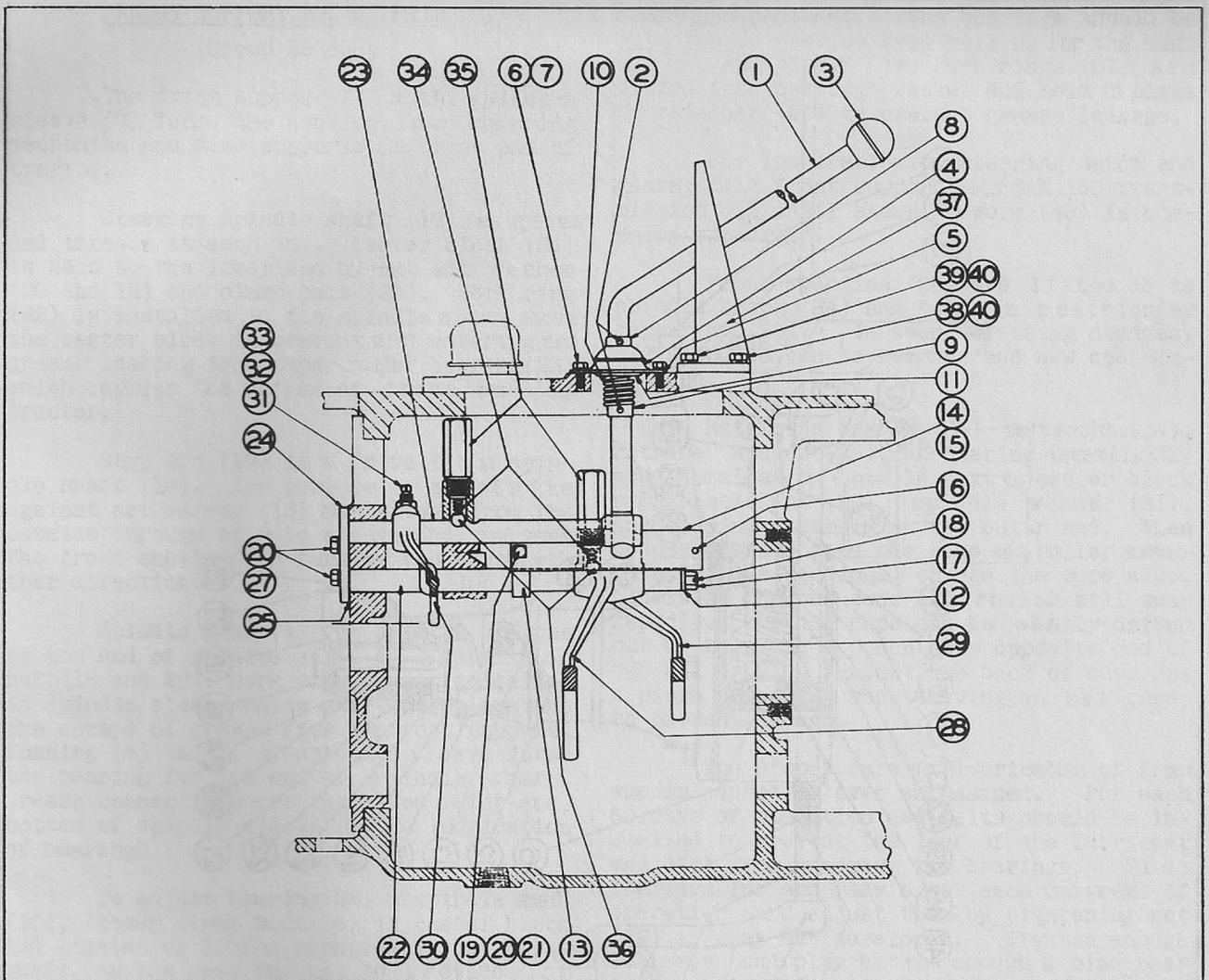
We cannot over emphasize the importance of having the proper size pulley on the driven unit. Much power is lost and an unnecessary load put on the motor unless the proper pulleys are used. The pulley furnished with the tractor is the correct size.

GENERAL

All tractors are thoroughly tested before leaving the factory. Nevertheless they require some attention on the part of the owners. The amount of attention required is negligible but IMPORTANT.

In the foregoing instructions an effort has been made to cover the points necessary to help you in the care and operation of your tractor in an understandable manner.

For further advice or information, see your local Allis-Chalmers dealer.



GEAR SHIFT
(Group 280675)

The gear shift hand lever (1) is installed in the transmission case cover, and held in position by gear shift socket (4), cap screws (6) and spring (10).

Gear shifter fork shafts (22) are held stationary in transmission case by setscrews located in the rear of front transmission case head. Gear shifter forks (28) and (29) work on shifter shafts and are held in position by retainers (35), springs (34) and balls (36) which engages in grooves in shafts.

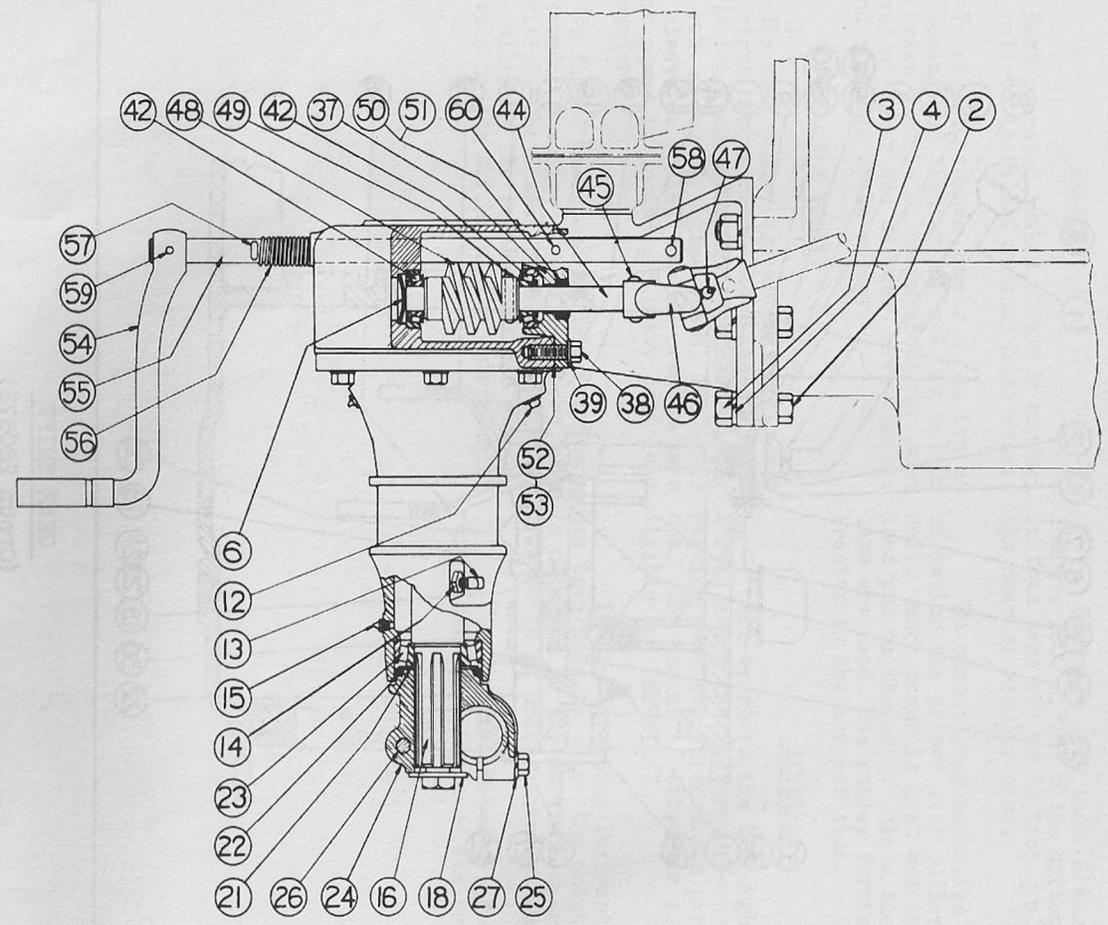
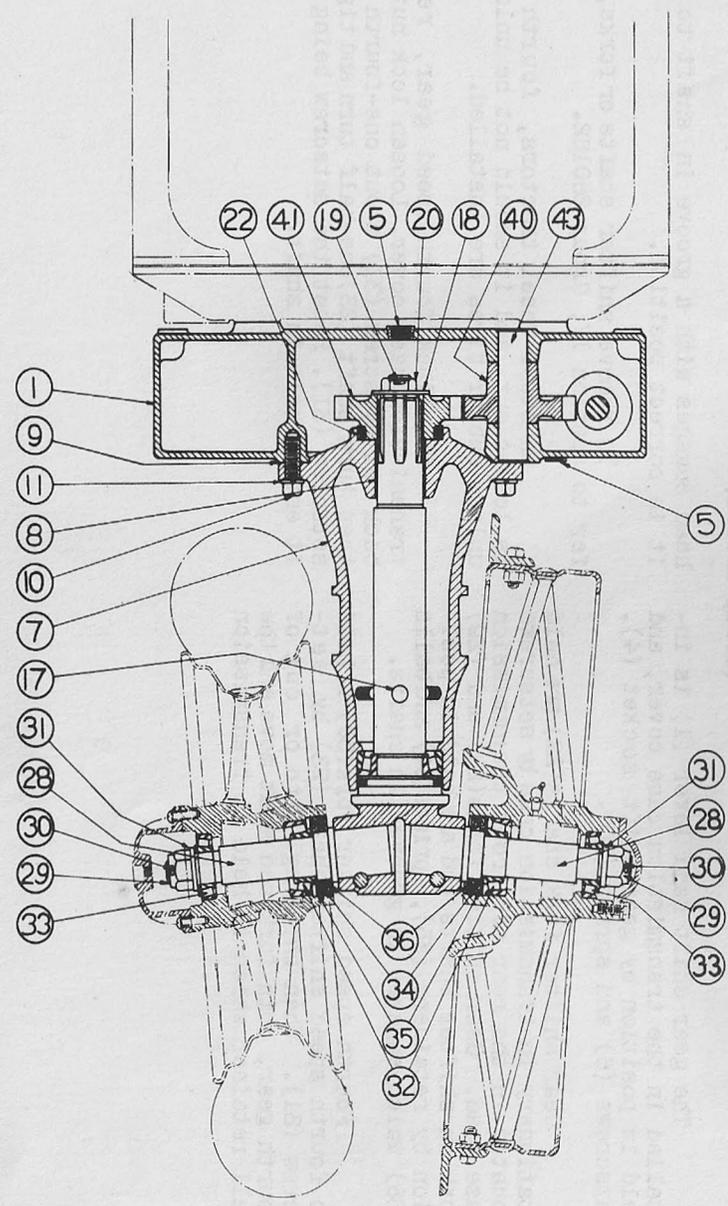
Fourth speed shifter fork (30) is held to fourth speed shifter shaft (23) by setscrew (31). When shifting into or out of fourth gear, both fork and shaft move and the ball retainer which is held in transmission

head engages with a groove in shaft to hold it in correct position.

To remove shifter shafts or forks, refer to section IV, Group 280182.

On steel wheel tractors, fourth gear is locked out, and it should not be unlocked unless rubber tires are installed.

To unlock fourth speed gear, remove transmission case cover. Loosen lock nut and back out setscrew (31) about one-fourth inch, then turn shaft (23) one-half turn and tighten setscrew (31). Reset the setscrew being sure it enters hole in shaft.



FRONT SUPPORT AND SPINDLE

(Group 280665)

The front support (1) with spindle sleeve (7) forms the housing for steering mechanism and also supports the front end of tractor.

Steering spindle shaft (16) has splines and threads at each end. Caster block (24) is held to the lower end by nut and washer (20 and 18) and clamp bolt (26). Cork ring (22) is installed in the spindle sleeve above the caster block to prevent dirt entering and grease leaking from taper roller bearing (23) which carries the weight of front end of tractor.

Stop pin (17) is a drive fit in spindle shaft (16). Its purpose is to strike against set screws (13) that extend from the outside through spindle sleeve and prevent the front wheels from turning too far in either direction.

Spindle gear (41) is held on splines at top end of spindle shaft by washer and nut (18 and 20). Cork ring (22) is installed in spindle sleeve below gear (41) to prevent the escape of grease from the front support. Bushing (8) in top of spindle sleeve forms the bearing for top end of spindle shaft. Grease connections are installed at top and bottom of spindle sleeve (7) for lubrication of bearings.

To adjust bearing (23) on spindle shaft (16), loosen clamp bolt (26) in caster block and tighten or loosen capscrew in bottom of shaft, as the need may be, to provide for free rolling of shaft with no binding. If the adjustment is too tight it will tend to make hard steering and if too loose the bearing will be damaged.

For replacement of shaft (16), bearings or oil seals, block up front end of tractor, remove capscrews (10), sleeve (7), nut (20), washer (18), and gear (41). The shaft can then be removed from sleeve (7) and the various parts made accessible. Caster block (24) can be removed by loosening clamp bolt (26) and removing capscrew from bottom of spindle shaft.

Worm gear (40) on shaft (43) is an idler gear between steering worm (48) and spindle gear (41). To replace, remove spindle sleeve (7) and drive out pin (43). If excessive wear should occur on worm gear (40), remove spindle sleeve assembly (7), turn gear one fourth turn and reassemble. This will provide for a different point of contact between worm and gear.

The steering worm (48) is attached to shaft (44) by pin (49) and the assembly is carried on taper roller bearings (42). The assembly is installed from the rear of front support and held in position by bearing bracket (37). Shims are placed between the bearing bracket and support to provide for

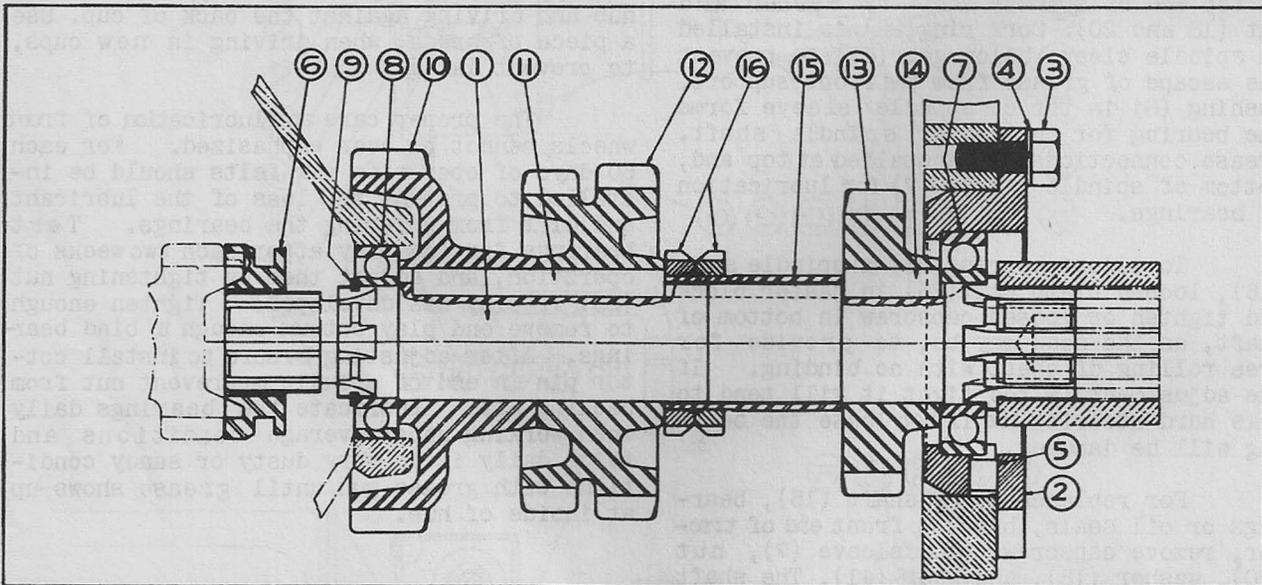
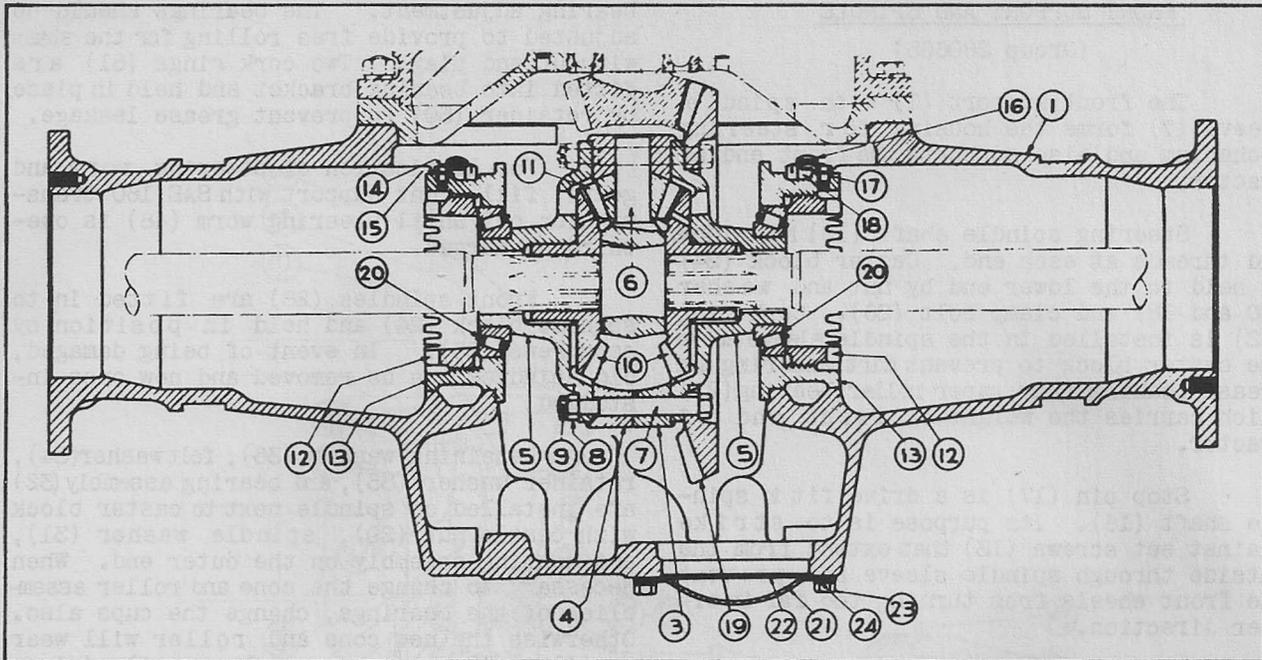
bearing adjustment. The bearings should be adjusted to provide free rolling for the shaft without end play. Two cork rings (51) are fitted into bearing bracket and held in place by retainer (50) to prevent grease leakage.

For lubrication of steering worm and gears, fill front support with SAE 160 transmission oil until steering worm (48) is one-third submerged.

Front spindles (28) are fitted in to spindle block (24) and held in position by capscrews (25). In event of being damaged, old spindles can be removed and new ones installed.

Retaining washer (36), felt washer (34), retainer washer (35), and bearing assembly (32) are installed on spindle next to caster block with castle nut (29), spindle washer (31), and bearing assembly on the outer end. When necessary to change the cone and roller assemblies of the bearings, change the cups also. Otherwise the new cone and roller will wear rapidly. The old cups can be easily driven out by entering a punch from opposite end of hub and driving against the back of cup. Use a piece of brass, when driving in new cups, to prevent damage.

The proper care and lubrication of front wheels cannot be over emphasized. For each 60 days of operation new felts should be installed to prevent the loss of the lubricant and dirt from entering the bearings. Test bearings for end play after each two weeks of operation, and adjust them by tightening nut (29) if play has developed. Tighten enough to remove end play but not enough to bind bearings. After adjusting be sure to install cotter pin in end of spindle to prevent nut from backing off. Lubricate the bearings daily when working under average conditions and twice daily if in very dusty or sandy conditions with grease gun until grease shows up at inside of hub.

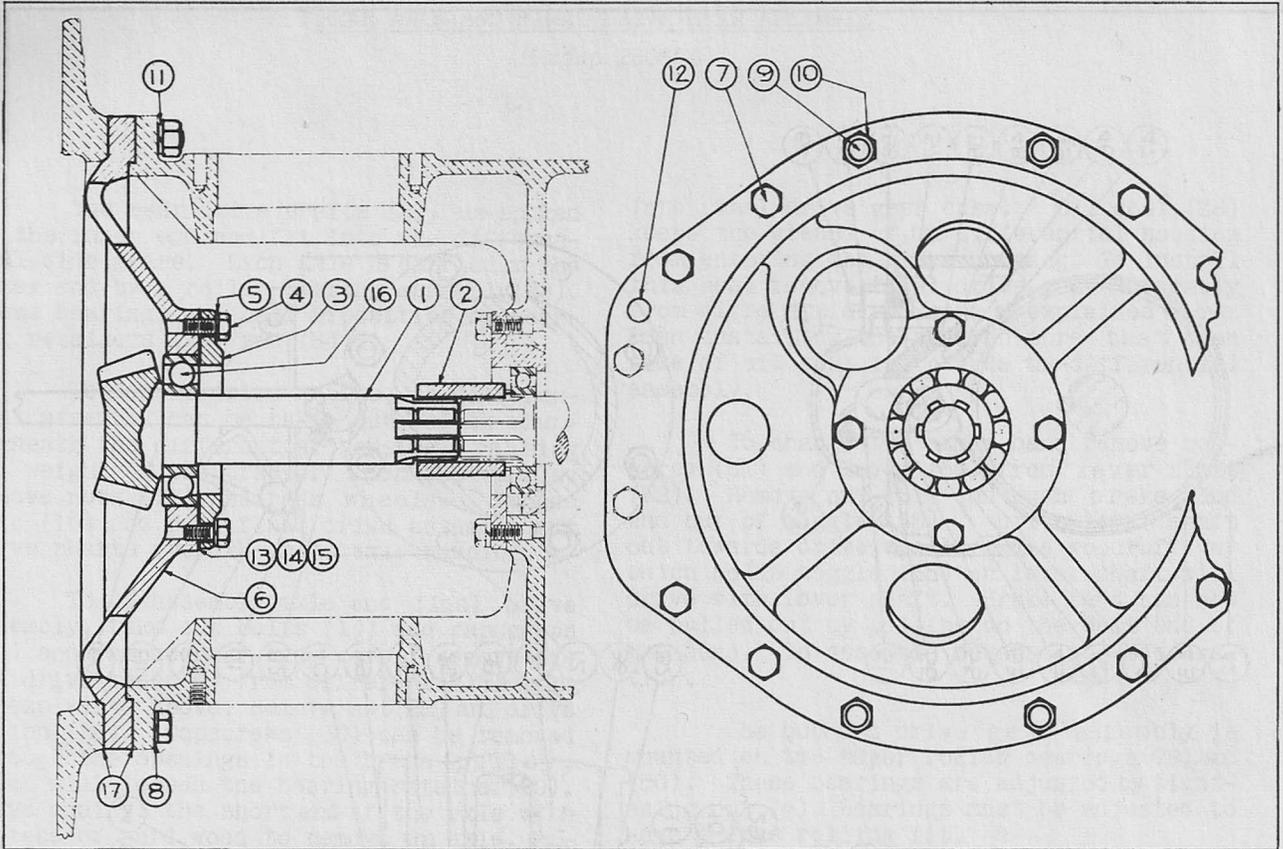


BEVEL PINION AND SHAFT

(Group 280336)

To remove pinion and shaft, separate differential housing from the transmission case as explained under Differential Group 280339. The bevel pinion support (6) is attached between the differential housing and transmission case. Support (6) carries ball bearing (16) and shaft (1). Bearing (16) is held in position from the rear by the forward

pressure of the ring gear and pinion, from the front by bearing cover (3). Under bearing cover (3) are shims (13), (14), (15) which can be removed or added to get the proper pinion contact on the ring gear. Pinion shaft (1) is splined in front and is driven by coupling (2) which fits on the rear end of the intermediate shaft.



DIFFERENTIAL
(Group 280339)

To remove the differential, separate rear axle housing from transmission case. Remove rear wheels and axles as explained under Group 280674. Remove stud nuts (18) and differential bearing cases (13). The assembly can now be removed from the housing.

The two differential pinions (11) are carried on spider (6) with a differential bevel gear on either side.

The entire differential assembly is held together by eight bolts that pass through the case ends and differential center. The nuts on these bolts must be tightened securely and locked with cotter pins.

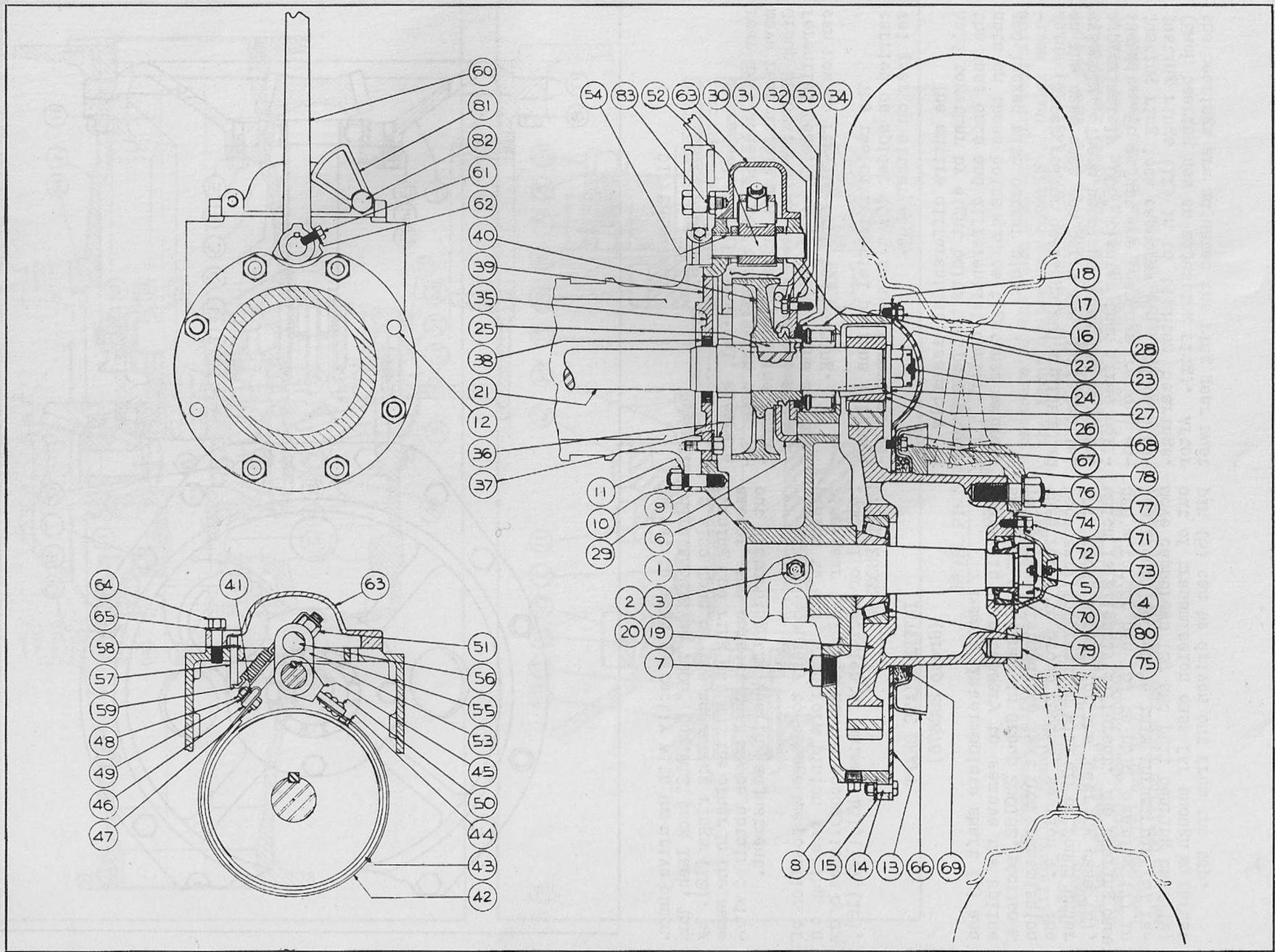
Taper roller bearings (20) are installed on the case ends and carry the differential assembly. These bearings must be adjusted approximately .005" tighter than a free rolling fit. To adjust the bearings remove adjusting ring lock cap screw (14) and turn adjusting rings (12) in to tighten bearings. (Each bearing has an adjusting ring). After the bearings are adjusted the ring gear must

be set to mesh correctly with the drive pinion. There should be .008" to .012" back lash. This is also done by the adjusting rings (12). By turning one ring out and the other in the same amount, the correct mesh may be obtained without disturbing the bearing adjustment.

If necessary to change the position of pinion to obtain uniform pinion bearing on ring gear teeth, it can be accomplished by the removal or addition of shims (13), (14), (15), Group 280336.

INTERMEDIATE SHAFT
(Group 280676)

To remove intermediate shaft (1) and gears, it is necessary to remove the spline shaft as explained in Group 280182, section 4. To remove intermediate shaft from transmission case refer to Group 280183, section 4. The necessary information will all be found under this group except for the bearing case (2), which is slightly different. The bearing case has a thrust pin (5) to hold bearing (7) in position. To remove this thrust pin (5) remove cap screws (3) and pull bearing case (2) out of transmission case far enough so thrust pin (5) can be driven out from the top.



REAR AXLE AND FINAL DRIVE GEAR ASSEMBLY

(Group 280674)

The rear drive shafts (21) are splined on the inner end and fit into the differential side gears. Each axle is carried on the outer end by a roller bearing assembly (28). These bearings are held in position by bearing retainers (29) and (34).

To remove drive shafts, so differential assembly can be taken out, block up underneath the differential housing, raising the weight of the tractor from the wheels. Remove nuts (77) and rear wheels. Remove nuts (10) and pull final drive assembly with drive shafts from the rear axle housing.

To disassemble axle and final drive assembly, take out bolts (14) and capscrews (16) and remove gear case cover. Remove final drive assembly from differential housing as explained above. Remove nut (22) and drive pinion (26). Capscrews (30) can be removed through the openings in the brake pulley, which will loosen the bearing retainer (29). Drive against the short end of the axle with a piece of hard wood to remove the axle. Pulley (40) bearing retainer (29) and bearing (28) come out of housing with the axle and can be pressed off when axle is out. Bearing retainer (29) carries cork oil seal (33) to stop grease in final drive from entering into the brake housing. The above operation must be followed to change cork seal (33); always renew cork seal when axle is removed for any reason. Note when assembling axle to final drive housing be sure to install bearing retainer (29) and gasket (32) with oil passage in lower position to drain surplus oil back

into final drive gear case. Oil seal (38) keeps the grease of the differential housing from entering the brake housing. To install this seal remove final drive gear assembly from differential housing as explained above. When installing the seal be sure that open side of oil seal is towards the differential assembly.

To change the brake band remove cap-screw (61) and lever (60) from lever shaft (52). Remove nut (51) and push brake band end out of toggle (55). Drive lever shaft out towards drive wheel. The woodruff key which holds toggle (55) on lever shaft will drive with lever shaft. Brake band can now be pulled out by pulling on the bolt end of the band. To assemble reverse above operation.

The hub and drive gear assembly is mounted on two taper roller bearings (79) and (80). These bearings are adjusted by tightening nut (4). Bearings must be adjusted to have a free rolling fit.

Cork oil seals (69) are installed around the hub of drive gears (19 and 20) and is held in place by retainers (66). To change seal, remove drive wheel and capscrews (67) which hold retainer (66) in place. Grease cork ring thoroughly before installing. Reverse threads are cut around hubs (19 and 20) to aid in keeping the grease from leaking out by the cork ring (69). Be sure not to install a right hand hub on the left side of the tractor or vice versa.