

## Oliver 80 and 90 tractors

### Important Notice

This document has been put together using motor trader service data sheets produced in 1941 and other information of unknown origin saved by my father as a reference.

All the information below is produced from information which was designed to aid skilled mechanics in a professional workshop, our aim is to make this available to people wishing to restore these vehicles, but please be aware that this document is by no means an instruction sheet or safe working procedure and we cannot be held responsible for any injury or damage whatever the cause.

We have added comments in red from time to time, where we think safety should be considered but this is by no means conclusive,

The models 80 and 90 are similar in principle though differing in construction. Both have four- cylinder engines of similar design. Model 80 is available in standard and row crop types' the chief difference being in the front wheel assembly and differential gear.

No special tools are required other than a set of S.A.E. spanners.

### Engine.

#### **Mounting and removal.**

On the Model 80, there is no chassis as such, the sump and lower crankcase is heavy casting which is the main strength, it is split at front of gear box, it forms the base on which cylinder block and top half of crank-case carrying crankshaft rests. There is a large opening in bottom of mainframe casting below engine, this is covered by a pressed steel sump plate. To remove engine, detach the radiator, bonnet and fuel tank. Remove the steering gear and the top half of the bell housing. Slit flange coupling on the clutch shaft. This allows the engine-clutch unit to be lifted off.

On the model 90, the engine unit complete with sump is mounted in cradle-shaped frame casting. Removal is otherwise similar to Model 80.

#### **Cylinder liners.**

Both types of engine have wet liners which are a push fit into the cylinder block with a rubber sealing ring in a groove at bottom of the block. To remove a liner, use a drawbar or drive up from below. Once the liner is clear of the seal it should come out easily. When refitting a liner always use a fresh ring in the groove and smear the liner with soft soap or grease. See that when the liner is home, it stands just proud of the cylinder block.

#### **Crankshaft**

There are three main bearings, each one has bronze-backed white metal-lined shells located by dowels. They have a running clearance of 0.003in. The end float is controlled by the rear bearing which is flanged both sides with a 0.003in.-0.005in. clearance on the model 80, and 0.004in.-0.007in. on the model 90, wear should be taken up by removing shims, replacements may need to be scraped to fit. The flywheel is bolted to rear flange of the crankshaft, it has a shrunk-on starter ring gear. There is a cork oil seal round rear end of crankshaft located in groove. On model 90 the lower half of seal is in a detachable housing, which also forms a half-round seal for the pressed steel sump. To renew the seal detach the lower half and push the top half of

the cork round, inserting a new piece in the same way. On the Model 80 the engine must be removed to renew this seal. The fan pulley is keyed to front end of shaft along with the timing gear, there is an oil thrower trapped between, the assembly being held by large nut. Before removing the nut drive out the starting handle pin. The pulley boss passes through a felt oil seal in timing cover.

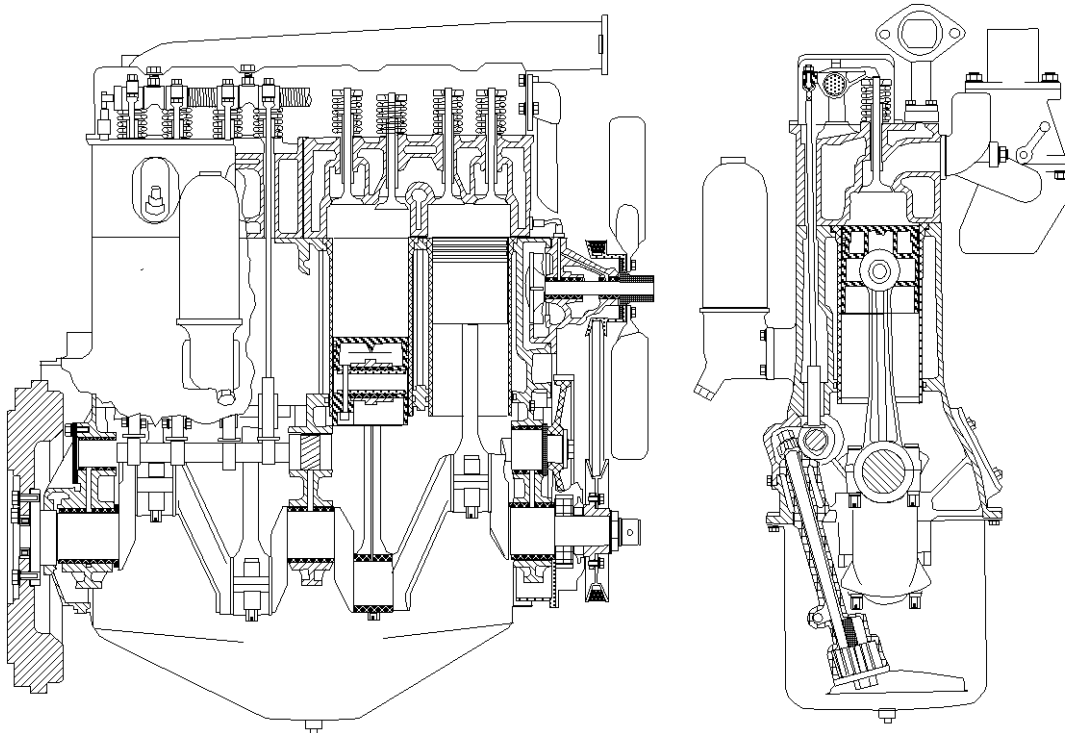
### **Connecting Rods.**

The big end bearings are direct white-metalled (not removable shells) with a running clearance of 0.003in, and a side clearance of 0.008in.-0.012in, take up any wear by removing shims. Replacement bearings should be scraped to fit. Small ends are bronze- bushed and fed with oil through drilled con-rods.

The gudgeon pins should be an easy fit.

### **Pistons.**

Are cast iron, with a skirt clearance of 0.004in.- 0.006in. each has four rings, three compression, one oil control., the oil ring must be assembled on piston with its bevelled edge upwards, the gudgeon pin is located in piston by a locking screw inserted from below, it should be a light press fit in the piston. The pistons will not pass the crankshaft, but the big ends will pass through bores, remove the piston and con-rod assembly upwards.



### **Camshaft.**

Has a skew gear drive, the camshaft gear is keyed and secured by a setscrew and large washer. End thrust is taken by a plate trapped between gear and shoulder on shaft. There are three bearings, these are bronze bushes, the front and rear are dowelled. The camshaft can be removed with the engine in place if radiator, fan pulley, timing cover and camshaft gear are removed and the push rods are extracted. The tappets may

be stuck up with thick grease, as there is no access through the side of the block. Valve and ignition timing marks are on the timing wheels.

### **Valves.**

There are overhead type, the inlet and exhaust valves are interchangeable on the model 90 but not on the model 80. They are slit cone cotter fixing, with single springs, the valve guides renewable, they have no shoulder, make sure when pressing them in that there is ample working clearance at both ends of the guides. The exhaust valves have renewable inserted seats pressed into the cylinder head.

### **Tappets and Rockers**

Mushroom- type tappets in separate guides pressed into the block from below. Tappets can only be removed after the camshaft has been withdrawn. The rockers are not bushed, they are carried on a single shaft supported on four pillars each secured by single stud passing through the shaft. There is an oil feed connection at the rear end. The rockers are interchangeable. All but the end rockers can be pushed aside against the spring to allow the push rods to be withdrawn. The shaft layout is long spring between the centre pair of rockers, and short springs between outer pairs. Adjustments by grub screw and locknut on the push-rod ends of rockers.

### **Lubrication.**

Is by a gear-type oil pump in the sump, it has spigotted drive and is flange-bolted, remove complete with drive gear, there is a gauze suction filter attached to the bottom plate of the pump. There is a bypass filter on pressure side bolted to the off side of the crankcase, this should be cleaned each time the sump is drained (every 40 hours) To clean it remove nut at top of filter and lift off cover, remove the felt pack by slackening the locknut at the bottom of the central tube and screwing the element out of base, the sediment can be scraped off the outside of the felt, old documents suggest that the felt filter should be washed in petrol, (we should think twice as to whether this is the safest method – there may be a less risky alternative – brake cleaner comes to mind)

### **Carburettor.**

The model 80 is fitted with a Schebler model TTX-18, with adjustable main jet for high-speed mixture control. The adjusting screw is a bent rod projecting at an angle from below the carburettor, not to be confused with float chamber drain cock, which is butterfly nut. Usual setting 2 3/4-3 turns open with engine running on paraffin at correct operating temperature (gauge near red). The slow-running mixture is adjusted by the knurled spring-loaded screw above float chamber. To check the float level remove the carburettor and detach the float chamber, turn the top part, with float assembly, upside down, the distance from face of casting to bottom of float should be 2 in.

The Model 90 has an Ensign type carburettor, the main jet adjustment is by a knurled screw on top of carburettor, usual setting is 1 - 1 1/4 turns open.

It has an oil bath air cleaner, remove oil bowl daily, pour the oil into a clean container and clean sediment out of bowl, the used oil can then be poured back and fresh engine oil added to level marked. See that the gauze screen in upper part of cleaner is not clogged.

The manifold heat control flap is set by a lever with a grub screw and lock nut. Heat is on when the lever is in the lowest position, which is the usual setting.

### **Governor.**

Is a centrifugal type, driven from the front of timing gear. Before adjusting the governor check that the linkage to the carburettor is correctly set.

To do this disconnect the linkage and screw out throttle stop screw so that butterfly can be closed completely, remove the governor housing oil filter cap, it seems it is possible to put your finger through the hole and lift one of the flyweights (**I assume this must only be done when everything is stopped!**) This will bring the governor fork lever to the closed position, with the cross-shaft lever pulled forward to close the throttle adjust the linkage to the proper length. (I assume at this stage the tractor would now be started) To set maximum the idle speed (1,265 rpm. on model 80, 1,250 rpm. on model 90) screw out the bumper spring clear of the fork lever. Pull out control rod to notch which produces speed nearest to correct speed. Slacken two set screws holding control bracket support to steering column and move support backwards or forwards to correct speed. Tighten bracket set screws and screw in bumper spring just enough to remove any running by throttle stop screw.

### **Ignition.**

Is by an American Bosch magneto with impulse coupling, it has fixed timing. The magneto is spigotted and flange-bolted to timing case with-slotted holes to allow for timing adjustment, Timing mark is on flywheel housing off side on model 80, on the model 90 remove clutch housing cover on the off side. If two marks are visible use the 'oil ign' mark.

**The method of checking the timing as described in the 1941 motor trader supplement is as follows – I quote** “To check timing disconnect no. 1 plug lead and hold it near timing mark hole. Start engine and run at governed speed. Hold end of lead so that it sparks against edge of hole at v-shaped notch on 80, edge of casting on 90. If light is shielded spark will light up flywheel instantaneously and timing mark will appear stationary. Ad-just magneto so that timing mark appears opposite to notch.”

**Thankfully this task has been made so much safer by the Guy who invented the timing light !**

For access to the contact breaker and distributor remove the rotor cover (distributor cap) See that the inside of cover is free from carbon dust. The contact breaker points are adjusted by an eccentric screw.

While the engine is running with a plug lead detached see that end of lead is earthed unless it is actually sparking for test purposes. If allowed to hang in air it places great strain on magneto coil. **(not to mention you heart if you grab hold of it !)**

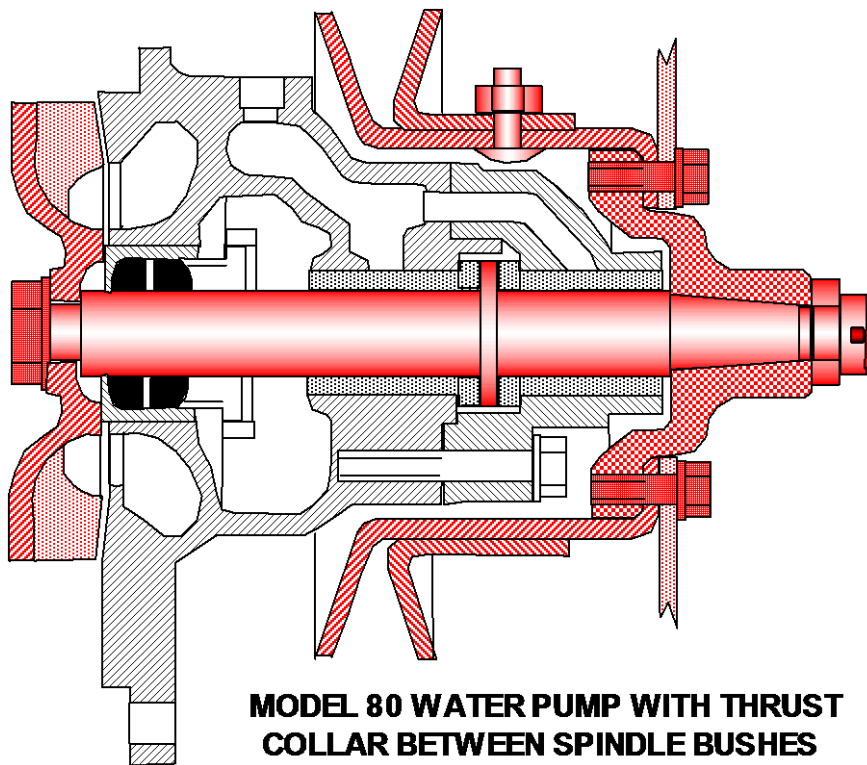
### **Cooling system.**

Basically a pump, fan and hand-controlled radiator blind.

#### **The model 80 pump**

This has an adjustable gland with split packing which can be replaced without removing or dismantling the pump, by screwing the gland nut right out, see that the two packing pieces are replaced with flat sides together and bevelled sides outwards.

**(remember that in some cases old gland packing and gaskets may contain asbestos)** The spindle runs in two porous bronze bushes, impeller end being supported by gland. Oil is fed to the bushes through drilled housing and pipe from rocker supply in the cylinder head. Do not forget to disconnect pipe before removing cylinder head or pump.



**MODEL 80 WATER PUMP WITH THRUST COLLAR BETWEEN SPINDLE BUSHES**

To dismantle the pump, remove the fan and pulley and draw off the pulley hub which is a tapered shaft and key fit. Remove the front part of the pump body with front bush and thrust washer, remove the impeller which is held by a nut and pin, the spindle with the thrust collar pinned to it can then be taken out the front. When it comes to rebuilding it, unscrew the gland nut and remove the packing, replacing them when the shaft is in place. The fan belt adjustment is by a loose pulley flange which is locked by two studs in helical slots, adjust to give about 1 ½" of movement on the belt. Some model 80 tractors are fitted with a different type of pump that is a lot like the one used on the model 90 (see details of 90 pump below)

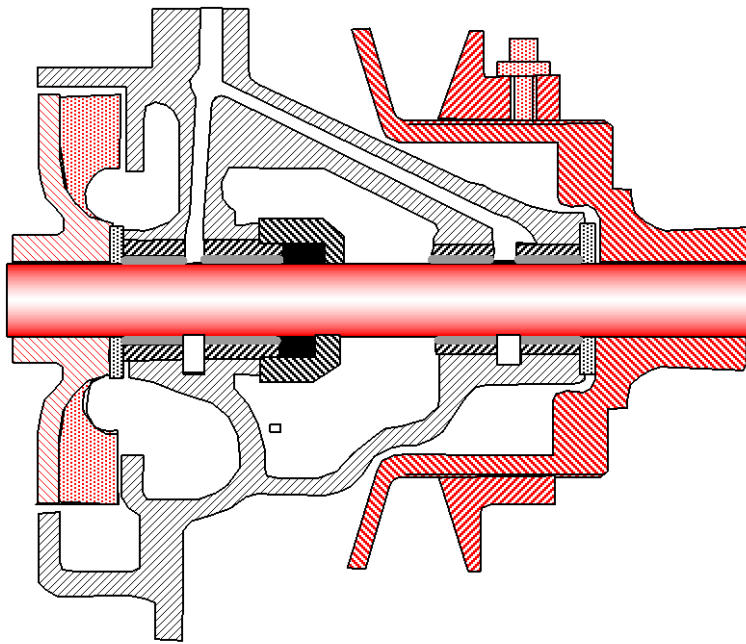
Water should be drained in frosty weather unless antifreeze is used, drain taps are fitted on the radiator bottom tank (off side) and on the near side of the cylinder block.

### **The model 90 pump.**

This also has an adjustable gland with split packing which can be replaced without removing or dismantling the pump by screwing the gland nut right out and removing the old packing, **(remember that in some cases old gland packing and gaskets may contain asbestos)** the new packing should be fitted with the bevelled side to the rear. The pump spindle runs in two porous bushes pressed into sleeves in a one piece housing the packing gland nut screws on to the extended forward section of the rear bearing sleeve, the rear bush is flanged towards the impellor, it is fed with oil from the rocker gear supply.

To dismantle the pump, first remove the fan, the drive out the pin through the hub, draw off the hub, then push out the spindle and impellor through the rear, note that there are thrust washers behind the pulley hub and in front of the impellor, this is pinned to the spindle.

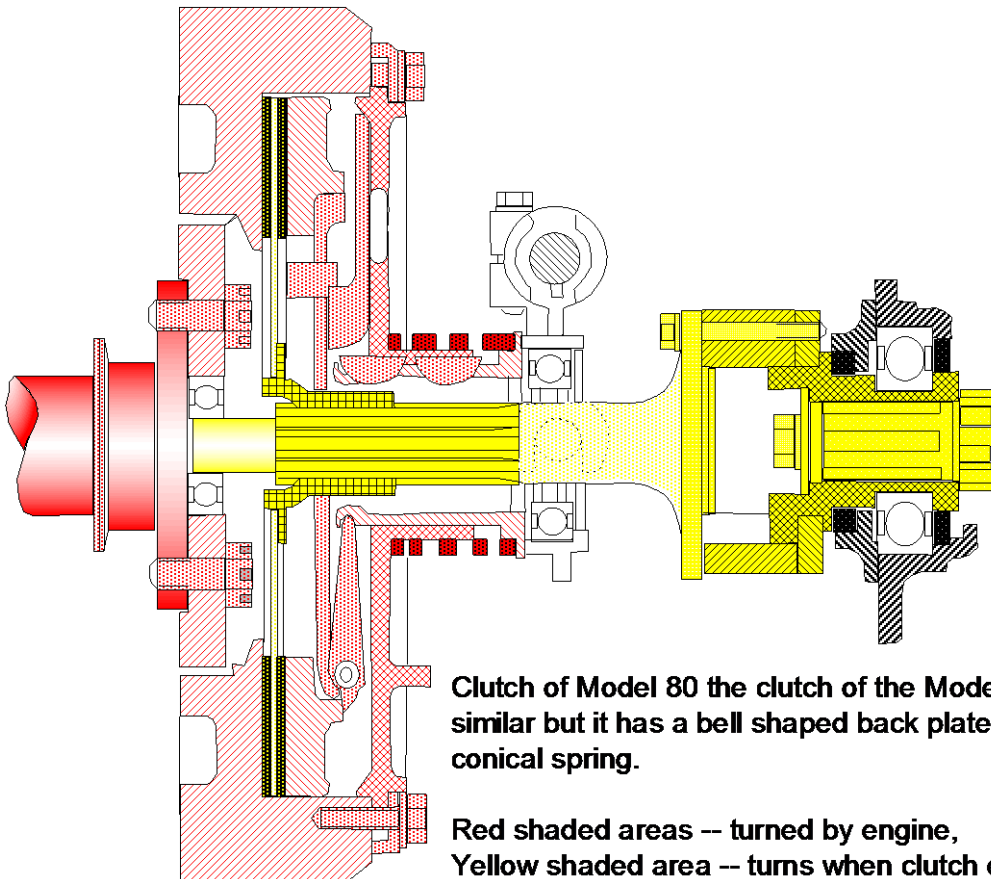
The fan belt tension is adjusted by a loose pulley flange arrangement, the loose section is screwed onto the fixed section and locked by a grub screw, the belt should be adjusted to have about 1 ½" of movement.



**MODEL 90 WATER PUMP WITH THRUST WASHERS OUTSIDE OF SPINDLE BUSHES**

The water drain toap on the model 90 are both on the near side, one on the radiator outlet elbow and the other on the cylinder block.

**Clutch**



Clutch of Model 80 the clutch of the Model 90 is similar but it has a bell shaped back plate and conical spring.

Red shaded areas -- turned by engine,  
Yellow shaded area -- turns when clutch engaged

The clutch is a Borg and Beck single dry plate type with a ball thrust release bearing and a single central spring, this spring acts on a sliding sleeve keyed to the cover plate, which carries toggle arms each of which engage in a groove in the sleeve, the other end of the toggles press on inclines machined on the pressure plate.

If there is not enough free movement on the clutch peddle, it is designed so you can remove the cover on the side of the bell housing, slacken the screws holding the clutch cover clamps allowing you to turn the clutch cover clockwise, this moves the toggles further up the inclined surface and draws the sleeve into the clutch.

The distance between the rear face of the sleeve and the clutch cover 1 & 11/16" on the 90 and 2 & 3/8" on the 80.

The clutch assembly can be removed for replacement of parts by dismantling the coupling and withdrawing the clutch shaft, dismantling the clutch release mechanism and releasing the clutch assembly from the flywheel.

### **Gear Box.**

There were three or four speed options, indirect drive through sliding gears on the primary shaft to fixed gears on the bevel pinion shaft. The primary shaft runs on ball bearings at both ends. The bevel pinion shaft is supported in large roller bearing at bevel end. Thrust taken on double row ball bearing at the front end, in a separate housing with shims behind for mesh adjustment. To dismantle the gearbox, remove the steering gear and any connections to the front half of the tractor. Remove the gearbox cover with belt pulley drive if fitted. Remove bell-housing cover and disconnect clutch shaft coupling. Jack-up the front of the tractor and support the rear half under the front of gear box so that it can be moved clear. Split tractor at the front of the gearbox and separate the two halves. Remove the selector rods and forks, and remove set screws round flange of gearbox front plate. Both shafts with gears can then be drawn out to front as an assembly. Bevel pinion shaft gears are built up on a splined shaft, assembly being held by nut at front of shaft, which also retains the ball bearing.

### **Final Drive.**

On the model 90 and model 80 standard, the crown wheel is bolted to a flange on the final drive spur pinion (or 'Bull' pinion) shaft, this is mounted in taper roller bearings in housings flange-bolted to the outside of the main casting with shims for bearing and mesh adjustment, the brake drum is splined on the shaft, the 'Bull' gear ring is shrunk and pinned on the wheel and bolted to the split differential cage with four-pinion differential bevels carried in taper roller bearings in axle, the housings are flange-bolted to the main casting.

On the model 80 Row Crop, the crown wheel is bolted to the three-pinion differential cage, the differential bevels are integral with the 'Bull' pinions running on ball bearings on a floating shaft which carries the differential spider, with pinion sleeves extended outwards and splined to the brake drums, this assembly is carried in taper roller bearings in housings flange bolted to the outside of the main casting behind the brake drums, with shims behind for bearing and mesh adjustment. "Bull" gear rings are shrunk and pinned onto wheels splined on the axle shafts, these run in taper roller bearings. The inner bearing is carried in a web of casting between "bull" gears.

### **Brakes**

On the model 90 and Model 80 standard, the braking system is by a contracting band which acts on a drum on the 'Bull' pinion shaft inside casting. To adjust it, remove the final drive cover and screw up the adjusting nut on the rod. Adjust so that brake lever

moves three notches on its ratchet before the band makes contact with drum, the brake should be fully applied when lever is pulled up to fourth or fifth notch.

On the model 80 Row Crop tractor is by contracting bands on drums carried on extensions of 'Bull' pinion sleeves, they are interconnected with the steering, and operate independently by separate pedals for each side. Adjustment is by a bolt on the end of each brake band projects through the brake housing at the front and is locked by a split pin, this should be set up so that each pedal can just be pushed to the third notch of its ratchet.

### **Front Axle.**

The model 90 and model 80 Standard tractors are fitted with a beam axle which swivels on a trunnion pin projecting rearwards from lower front casting.

The assembly is stabilised by a 'U' shaped radius rod (or wishbone which is bolted through outer ends of the axle beam and located in a central ball joint bolted below bell- housing.

Steering is by king pins cottered in the beam. The stub axles have plain bronze bushes, closed at top and bottom by Welch plugs, they have thrust washers below the beam. To remove the king pin extract the cotter, drill out the top Welch plug and drive the pin downwards. The steering ball joints (track rod ends) are screwed end-plug type, toe-in 1/4", adjusted by track-rod with left and right-hand threads in ball socket ends.

The model 80 Row Crop, has two front wheels mounted close together, the stub axles are part of a vertical pillar which turns in taper roller bearings to steer, these bearings are carried in a detachable front casting. The pillar assembly is turned by a spur gear mounted in it which meshes with sector on the steering arm vertical shaft. To adjust the steering pillar bearing, remove the starting handle and bearing cover, straighten the locking tab washer and remove the nut from the top of the pillar, lift off the thrust washer and remove enough shims so that when nut is tightened pillar turns freely without shake.

The steering sector shaft is carried in bearing that are eccentrically spigotted in the casting and retained by four set screws. To take up backlash in the gears remove the set screws and turn the bearing until the backlash disappears. Jack up the front of the tractor and test lock to locks to make sure that binding does not occur in any spot, replace the set screws in nearest holes.

To dismantle assembly jack up and support the front of the tractor, remove front casting. Draw off steering arm (spined to sector shaft) and remove the bearing, the sector can then be extracted through bottom after the top nut has been removed. The pinion is pinned to the pillar, there is a felt oil seal below the lower bearing.

On all models of the tractor the hubs run on taper roller bearings adjusted by lamped nuts, tighten the nut until considerable drag is felt, back off until the split pin can be inserted. Check the adjustment after clamping and pinning nut. The wheel should be free to spin without play.

### **Steering Gear.**

This is via a worm and wheel mounted on gear box cover. On the model 80 the worm is at the lower end of the column and is carried on a taper roller bearing, the upper bearing is housed in the end of the column tube, this is flange-bolted to gear housing. End play in the column is taken up by removing shims from below the flange. On the model 90 the worm is carried in plain bearings with ball thrust bearings above and below, adjustment is similar to model 80. The worm wheel and drop arm shaft are carried in an eccentric bearing set up on the side cover of gear housing. To take up backlash between the worm and wheel, remove the six set screws and turn the cover



until the backlash disappears, always test for binding on locks after replacing the set screws in the nearest holes.

### **Belt Pulley Drive.**

The model 80 power take-off and bevel shaft is above the gearbox primary shaft, the driving gear is in constant mesh with the primary shaft pinion, which runs on bronze bush with thrust washers, locked up by a large nut. The gear is engaged by a sliding dog set up, the shaft is mounted on a roller bearing at front (bevel) end; the thrust is taken by a double-row ball bearing in a separate housing at the rear end, the bevel mesh adjustment is by shims behind the housing flange, the driven bevel is splined to the pulley shaft, which runs in taper roller bearing.

The model 90 Power take-off and bevel shaft is driven from the gearbox primary shaft by a sliding gear, the shaft runs in a ball bearing at the front (bevel) end, it is located by a ring nut, the thrust taken by a double-row ball race in separate housing at the rear end, bevel mesh adjustment by the rear end, adjustment by shims behind the housing flange. The pulley shaft is carried in a double row ball bearing at the bevel end, in a separate housing with shims for mesh adjustment, and in a roller bearing at the pulley end.

### **Electrical (General).**

Equipment is simple. Magneto ignition is used. Battery-supplied lamps with constant current dynamo and starter except on model 80 row crop tractor, which has permanent field generator (low-tension magneto type) feeding lamps direct. Battery six-volt, with earthed positive.

Equipment

### **Dynamo circuit.**

The dynamo has a carcass-mounted cut out to which the live negative lead from ammeter is connected. The field terminal on carcass is also wired to the lighting switch, being connected to earth via a resistance controlled by the switch.

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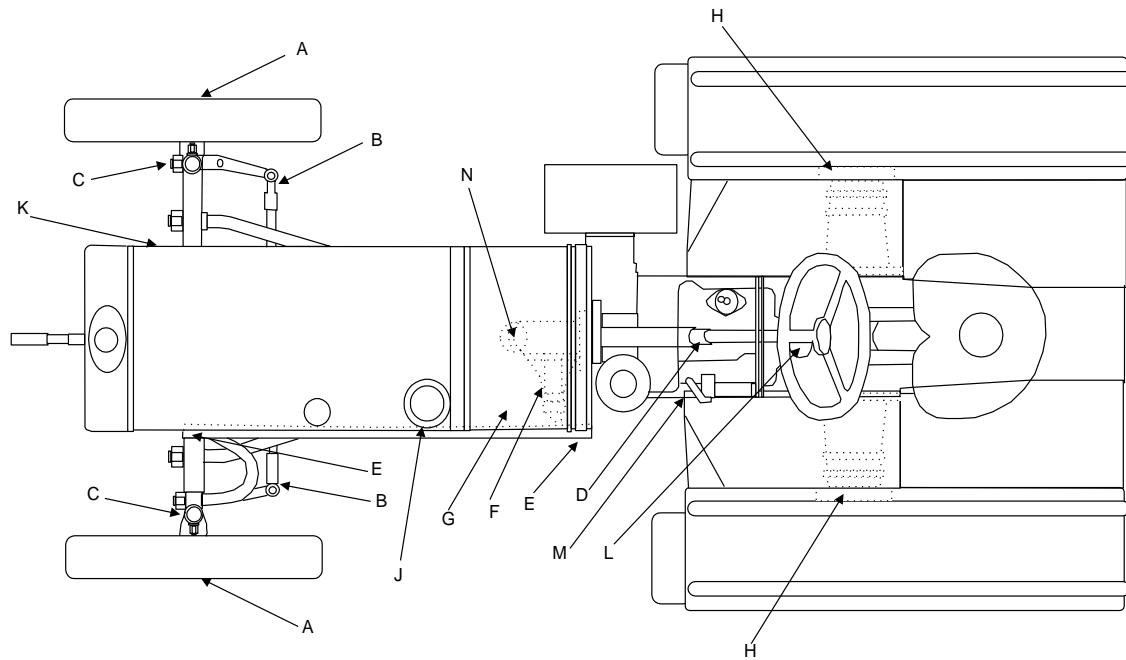
### **Lighting Layout.**

Two forward lamps and one rear lamp may be fitted, all equipped with 32w. pre-focused bulbs.

### **Starter.**

This is operated by a direct switch, the starter is fitted with a standard Bendix drive. See that cable mountings and grummets are secure against vibration. Inspect flywheel gear teeth if drive is damaged or shaft bent. Hand starting advisable in cold weather especially when the tractor left in a field. The battery should be maintained fully charged as precaution against frost.

OLIVER 80 TRACTOR LUBRICATION POINTS DIAGRAM



- A, Front wheel bearings --- grease
- B, Track rod joints --- grease
- C, King pins --- grease
- D, Steering column --- grease
- E, Drag link joints --- grease
- F, Steering gear drop arm shaft bearing --- grease
- G, Clutch release bearing --- grease
- H, Rear axle wheel bearing --- grease
- J, Air cleaner --- engine oil
- K, Sump – drain and refill with engine oil – also clean filter – every 40 hours
- L, Gearbox filler – check level at plug every 30 days drain and refill yearly
- M, Gearbox level plug
- N, Steering box --- holds ½ pint of gear oil