

## AUTOMATIC PICK-UP HITCH

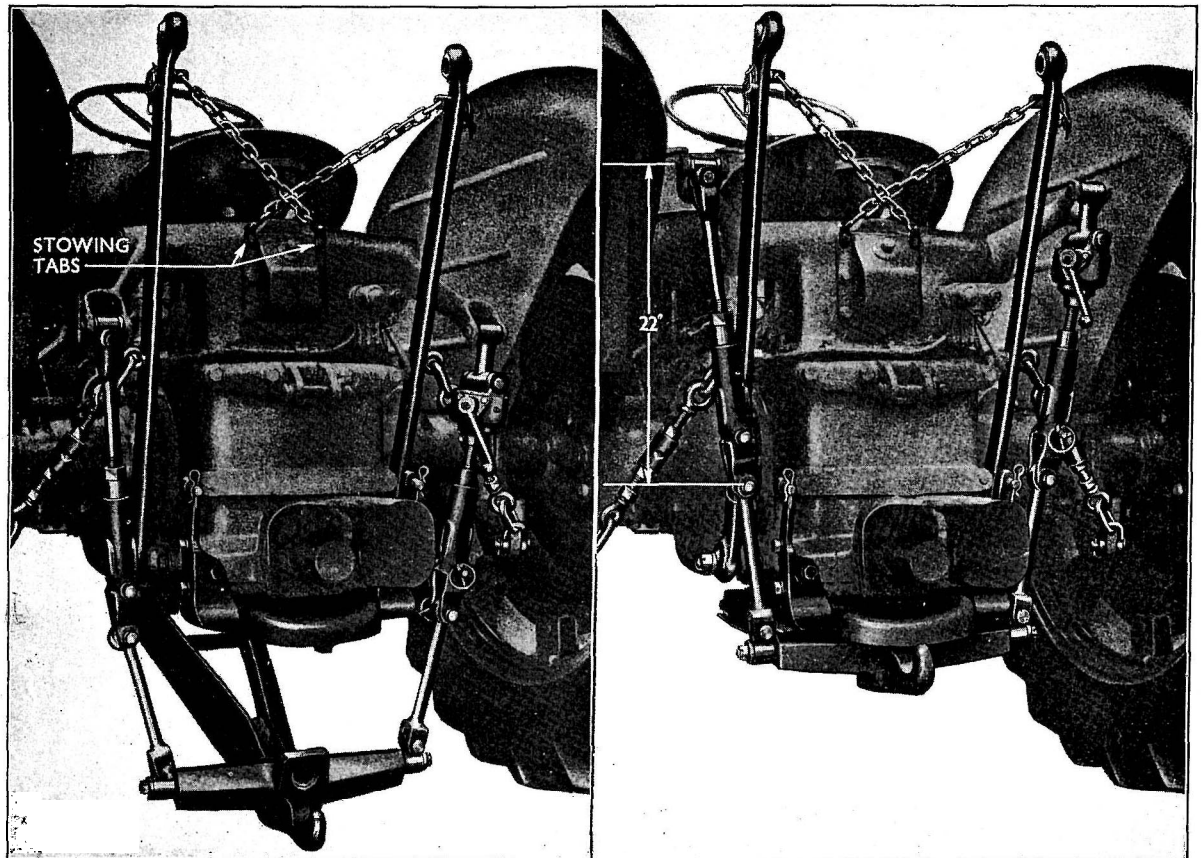


Fig. 1  
Hitch in Lowered Position

A hydraulically-operated pick-up hitch installation is available as optional equipment on current production Power Major Tractors with H.P.L. (hydraulic power lift) and may also be fitted as an accessory to earlier 4 cyl. O.H.V. Fordson Major tractors.

The existing drawbar and upper link must be removed before the hitch can be fitted, but all other equipment remains on the tractor, provision being made for stowage of the H.P.L. lower links. If so desired the P.T.O. (power take-off) or raised P.T.O. may still be used, although a new P.T.O. idler gear shifter lever will be required for the

Fig. 2  
Hitch Locked in Raised Position

raised P.T.O. if the pick-up hitch is fitted to early models.

In the operating position (i.e. with trailer attached) the hitch hook is retained in position by a spring-loaded plunger which is connected by suitable linkage to a foot pedal, the operation of which withdraws the plunger when it is desired to uncouple the trailer.

### COMPONENT PARTS

The pick-up hitch installation consists of three sub-assemblies. (See Fig. 6.)

1. The hitch housing and supporting bracket sub-assembly:—right- and left-hand supporting brackets are used which are dowelled to the hitch housing and bolted to the rear lower corners of the transmission housing. The hitch housing contains the spring-loaded locking plunger.

2. The hitch frame and hook sub-assembly:—the frame is of triangulated construction and is bolted to the hitch hook. The assembly is connected through the medium of hitch lift rods to the normal H.P.L. lift rods, and is pivoted at the front end on the existing drawbar anchor bracket.

3. The foot pedal and operating linkage assembly:—the pedal is fitted on the right-hand side of the tractor at the foot brake locking control location and is connected by a long rod to a pivoted lever, which in turn is attached to the spring-loaded locking plunger.

## FITTING INSTRUCTIONS

### To build up the sub-assemblies

#### Hitch Housing and Supporting Bracket Sub-Assembly

1. Locate the two supporting brackets with their locating dowels in the appropriate drillings in the hitch housing assembly.

**Note—**The brackets are “handed” and must be assembled with the hitch lift rod stowing pins facing away from the plunger locking device. (See Fig. 4.)

#### Hitch Frame and Hook Sub-Assembly

1. Bolt the frame assembly to the hook assembly using two bolts (45812-S), two spring washers (34813-S) and two nuts (34674-S), ensuring the hook assembly is fitted the correct way round. (See Fig. 6.)

2. Assemble the lift rod knuckles to the link pins at either end of the hook assembly and secure with flat washers (118326-ES7) and slotted nuts (33987-S). Fully tighten nuts and retain with split pin ( $\frac{1}{8}$  in. by  $1\frac{3}{8}$  in.).

3. Fix the hitch lift rods to each of these knuckles using clevis pins (74039-S7/S8), retained by split pins ( $\frac{1}{8}$  in. by 1 in.).

#### Hitch Foot Pedal and Operating Linkage Assembly

1. Assemble the foot pedal to its bracket, using the swivel pin. (See Fig. 6.) Retain the pedal to the swivel pin with groove pin (72275-S).

2. Attach the fixed clevis of the rod and yoke assembly to the foot pedal with clevis pin (73919-S). Secure with a split pin ( $\frac{1}{8}$  in. by  $\frac{3}{8}$  in.).

3. Adjust the length of the rod and yoke assembly, by loosening the locknut and turning the clevis to give a measurement of  $22\frac{1}{2}$  ins. between the centres of the clevis eyes.

4. Tighten up the locknut.

#### Fitting Pick-up Hitch

1. Disconnect upper link of three-point linkage, by removing the linch pin.

2. Adjust H.P.L. lift rods to equal lengths (22 ins.) ensuring that the lift rods are in the fixed position.

3. Fix the two lower link stowing tabs (Fig. 1) under the two top bolts of the H.P.L. ram cylinder rear cover, making sure that the tabs are vertical.

4. Remove the linch pins retaining the H.P.L. lifting rods to the lower links of the three-point linkage.

5. Cross the two lower link safety chains and attach them to the stowing tabs. (See Fig. 1.) Adjust the check chains so that the safety chains hold the lower links tightly in position, and provide clearance for the H.P.L. lift arms to operate.

Where heavy duty check chains are fitted it will be necessary to move the inner ends of the check chains from the outer to the inner holes in the lower links.

6. Remove the screw and retaining plate holding the drawbar fulcrum pin to the drawbar front anchor bracket.

7. Support drawbar, and drive out fulcrum pin.

8. Lower front of drawbar to the ground.

9. Remove the drawbar guide bracket linch pins, and lower the drawbar to the ground.

10. Remove the drawbar guide brackets, by withdrawing the four securing bolts.

11. Extract the blanking plugs that protect the two threaded holes, at the bottom rear face of the rear transmission housing.

12. Fix the hitch housing and supporting bracket sub-assembly to the rear transmission housing, locating four bolts (21062-S) in the tapped holes used for the drawbar guide brackets, and two larger bolts (45754-S) in the two tapped holes previously protected by the blanking plugs.

13. Offer up the hitch frame and hook sub-assembly to the tractor, and secure the open end of the frame to the drawbar anchor bracket, using the same fulcrum pin as was previously used on the drawbar.

Fit the fulcrum pin retaining plate, securing screw and spring washer.

**Note.**—In a case where the drawbar attachment has not been fitted as original equipment, it will be necessary to fit a drawbar anchor bracket. Enter the drawbar anchor bracket dowel in its location at the bottom of the rear transmission housing. Locate the drawbar anchor bracket on this dowel and secure with four bolts (21062-S) and spring washers (34810-S).

14. Lift the hook assembly, and secure the lift rods to their appropriate H.P.L. lift rods with the two lynch pins normally used to hold the lower links in position on the H.P.L. lift rods.

15. Remove the nut that secures the brake pedal locking control to the transmission case. To remove the securing bolts it will be necessary to disconnect the brake pedal locking control from the brake pedal pawl by removing the retaining split pin. If a transmission hand-brake is fitted, the hand-brake sector will also have to be removed.

16. Install the pick-up hitch release pedal and operating linkage assembly as shown in Fig. 3, using a long bolt (20547-S) in the top locating hole and a shorter bolt (20543-S) in the lower.

Roth bolts must be entered from the front, to ensure that they do not foul the foot pedal locking control, and are secured by the same size nuts (34671-ES).

17. Attach the rod and yoke assembly to the locking plunger release lever, using clevis pin (73919-S).

18. Secure the clevis pin with an appropriate size split pin.

#### To Change from Automatic Pick-up Hitch to Three-Point Linkage

1. With the hook assembly locked to the housing assembly, i.e. fully raised position, remove the hitch lifting rod lynch pins and disconnect the rods. Stow the rods on their appropriate pegs on the hitch housing bracket assemblies using the "hair pin" clips provided to retain them in position. (See Fig. 4.)

2. Loosen the lower link check chains, and remove the safety chains from their stowing tabs.

3. Attach the lower links to the H.P.L. lift rods with the lynch pins previously used to retain the pick-up hitch lift rods. Where heavy duty check chains are fitted move the inner end to the outer holes in the lower links.

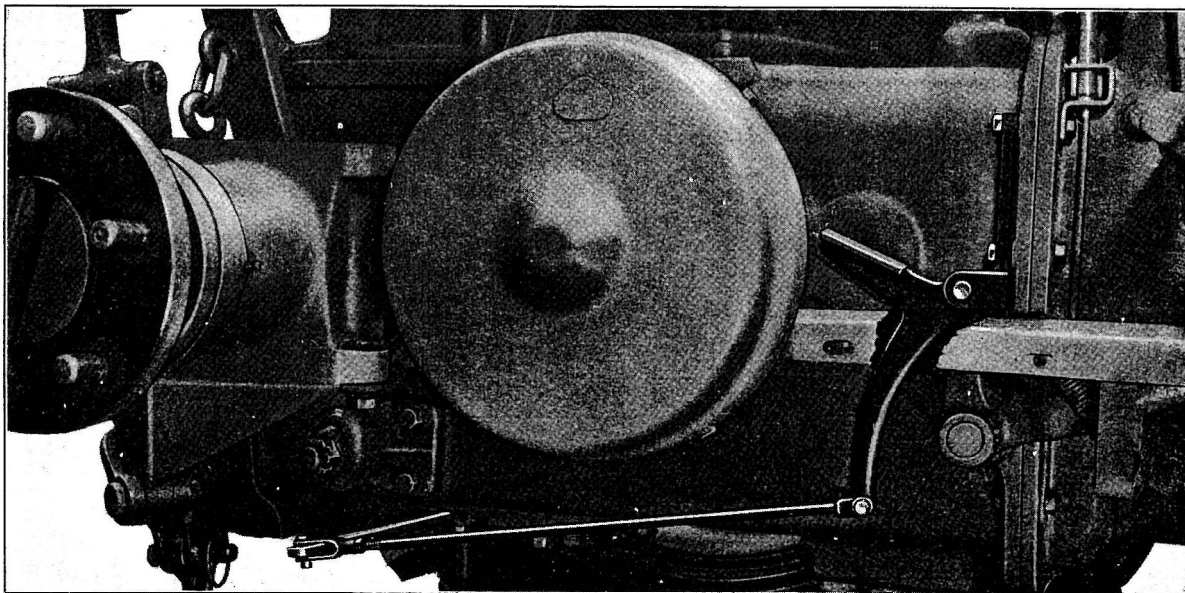


Fig. 3  
Hitch Foot Pedal, Bracket and Operating Linkage

HITCH HOUSING

Dismantling the Locking Plunger (see Fig. 5)

1. Insert a suitable wedge in front of the plunger to relieve the spring load on the clevis pin (release lever to plunger).

Remove the clevis pin and release the wedge.

2. Unscrew the two retaining screws (20345-S) and lift off plunger sleeve retaining plate.

3. The plunger sleeve, plunger and spring can now be removed from the housing assembly.

4. Thoroughly clean all the component parts and renew if necessary.

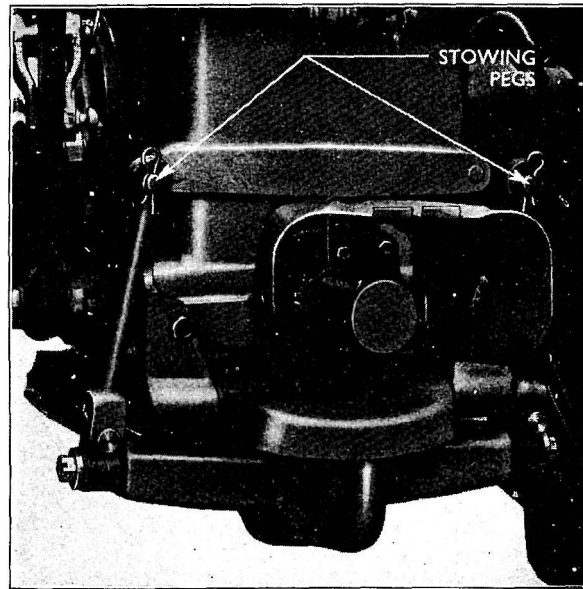


Fig. 4  
Lift Rods in Stowed Position

Assembling the Locking Plunger

1. Fit the locking plunger and spring in the bore, and pack with grease.

2. Press in the plunger sleeve and fit the retaining plate. Secure with two screws and spring washers.

3. Compress the plunger spring, place the release

lever in the plunger slot and insert the clevis pin. Retain the clevis pin with a split pin.

Maintenance

There is a grease nipple on the underside of the plunger housing assembly through which grease should be added every 200 hours.

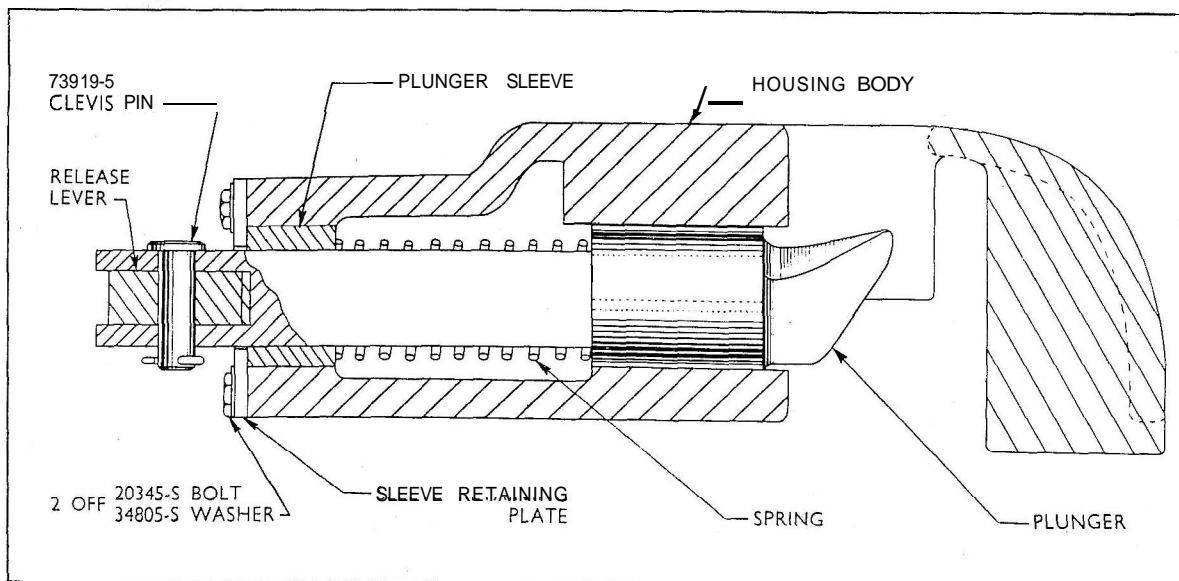


Fig. 5  
Sectioned View of Locking Plunger

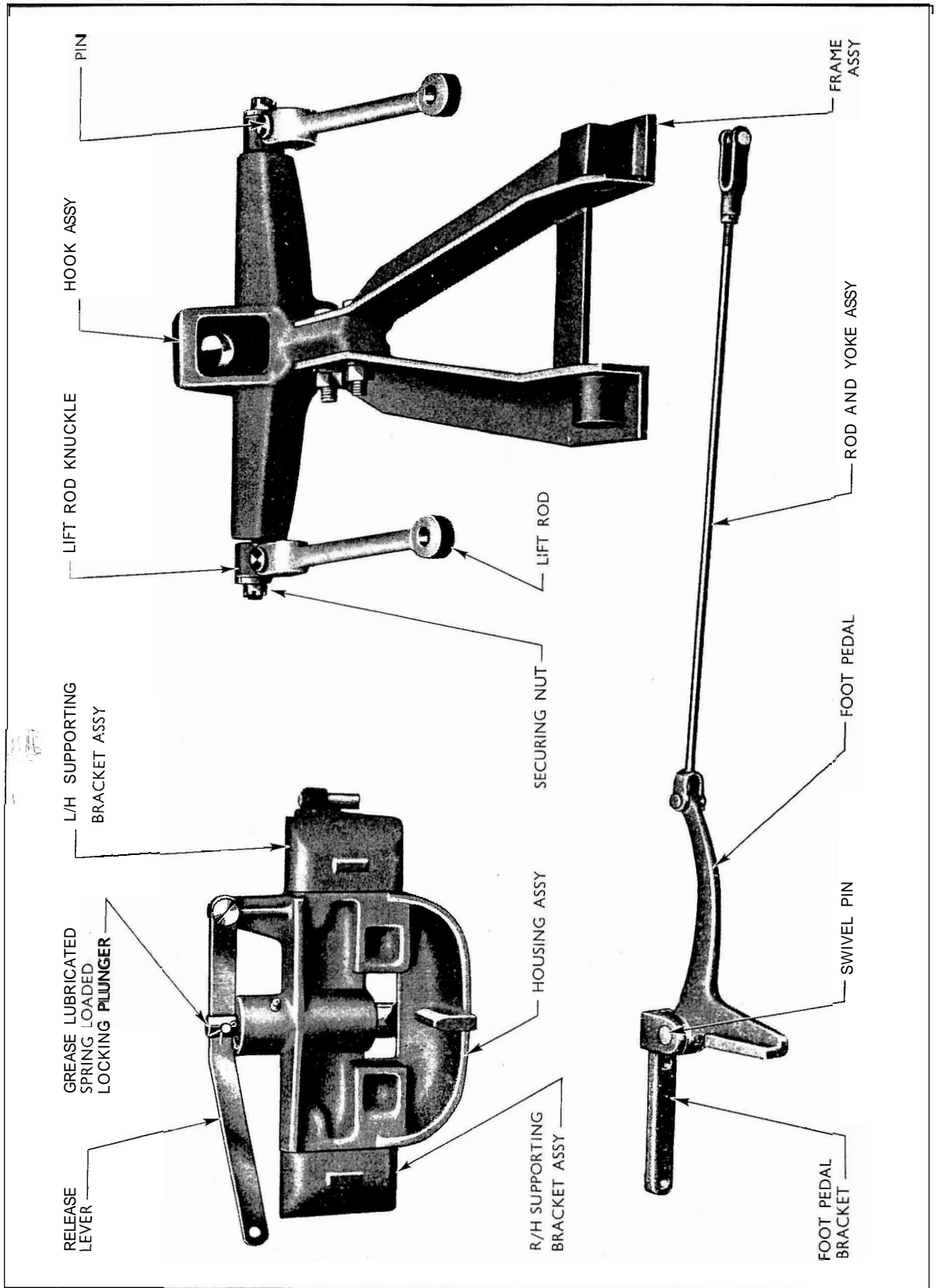


Fig. 6  
View of Main Components

## SUPER MAJOR AUTOMATIC PICK-UP HITCH

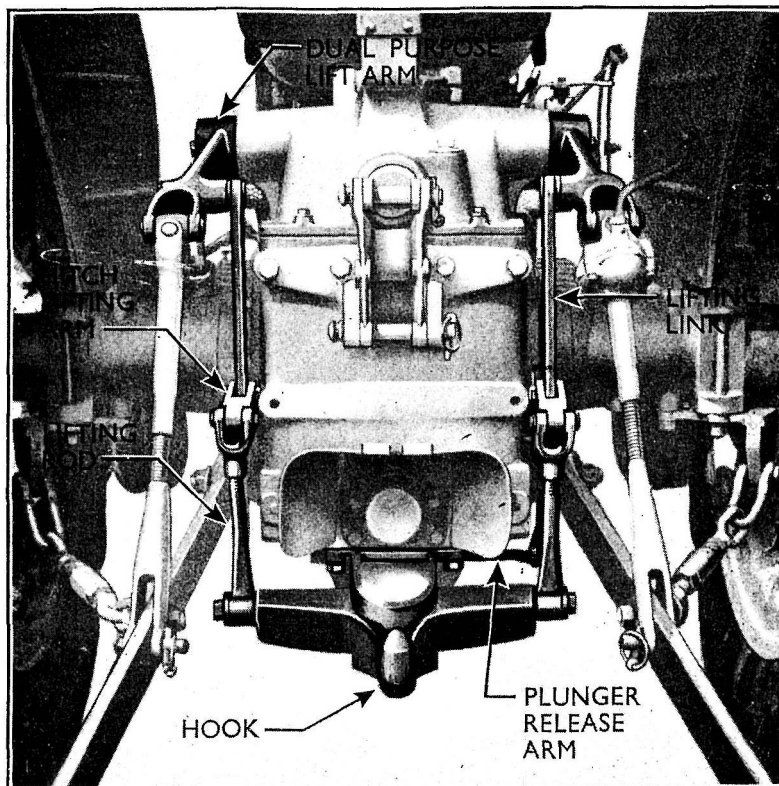


Fig. 1

A hydraulically-operated pick-up hitch is available as a production option or as an accessory for the Super Major tractor and may be fitted in place of the swinging drawbar for use with trailed equipment which incorporate a "ring" type hitch in the equipment drawbar.

The design of the installation is such that once fitted there is no necessity to remove any part of the hitch in order to use the normal three-point linkage.

Special dual purpose hydraulic lift arms replace those normally fitted and these raise and lower both the hook of the hitch and the three point linkage but a spring-loaded plunger locks the hook in the "hitched" position when the three point linkage only is required.

The hook is attached to a triangulated frame which pivots on the standard swinging drawbar anchor bracket and the whole is connected through lifting rods, pivoting hitch lifting arms and slotted links with the dual purpose hydraulic lift arms. The locking plunger is connected through suitable linkage with a foot-operated release pedal situated between the right-hand foot plate and the rear transmission housing (see Fig. 2).

### OPERATION

When the hitch is to be used after Category I implements have been fitted, care must be taken to tighten the lower link check chains sufficiently to prevent the lower links from contacting the hitch lifting rods.

It is recommended that "Position Control" is used when operating the pick-up hitch to facilitate accurate control of the position of the hook.

Assuming that the hook is initially being held by the locking plunger in the raised position, first lift the main hydraulic control lever to the top of the quadrant in order to raise the hydraulic lift arms and take the weight off the hitch locking plunger, then depress the hitch release pedal and lower the hook by moving the hydraulic main control lever down the quadrant. Release the pedal immediately the hook is free of the locking plunger.

Position the tractor so that the hook is directly below the drawbar eye of the trailed equipment then slowly move the hydraulic main control lever up the quadrant until the hook rises sufficiently to engage the eye of the drawbar on the equipment.

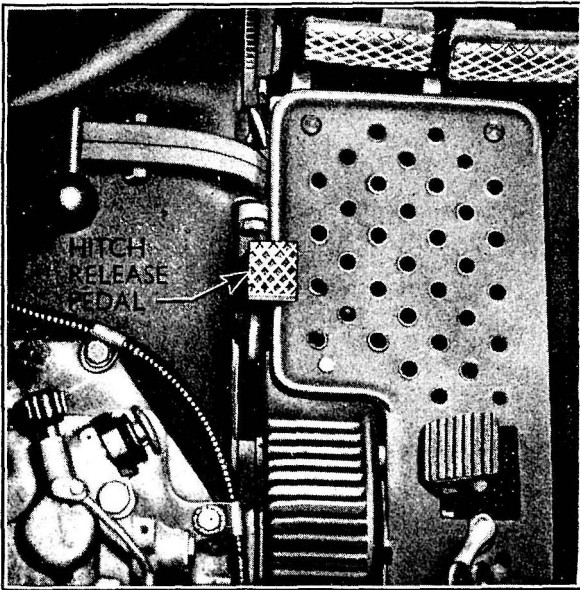


Fig. 2  
Hitch Release Pedal

Continue moving the hydraulic main control lever up the quadrant until it reaches the fixed stop i.e. to the fully raised position. The hook will then rise until it engages with the spring loaded locking plunger.

After engagement of the plunger, drop the hydraulic main control lever slightly so as to enable the trailed load to be mechanically held by the plunger. **The load should not be supported by the hydraulic system.**

**LUBRICATION AND MAINTENANCE**

All sliding or pivoting points should be kept clean and regular application of lubricating oil at these points will ensure freedom of operation.

A grease nipple is located in the underside of the locking plunger housing as shown in Fig. 3 and a good quality grease should be applied at this point at 50-hour intervals.

**FITTING INSTRUCTIONS**

The following instructions apply to the fitting of a pick-up hitch when it is supplied as an accessory for fitting to a Super Major tractor not originally so equipped.

1. Remove the hydraulic linkage lifting rods and the hydraulic lift arms from the tractor. Fit the special dual purpose lift arms to the hydraulic lift cross-shaft, with the boss for the hitch linkage on each lift arm facing inwards. Place the hydraulic main control lever at the bottom of the quadrant and force the lift arms down to exhaust oil from the ram cylinder. Fully tighten one lift arm retaining screw then back off one turn. Tighten the screw on the other lift arm then back off until the arms will just drop under their own weight after being lifted by hand.

2. Remove the hydraulic lift lower links and mounting brackets and install the special mounting brackets and pin assemblies onto the rear transmission housing. A lug on each of these mounting brackets is drilled to accommodate pivot pins for the hitch lifting arms and the brackets, which are "handed," must be assembled with these lugs facing upwards and to the rear. Replace the lower links of the three point linkage on the mounting bracket pins and secure with the original washers, castellated nuts and new split pins.

3. Remove the pins securing the drawbar platform to the guide brackets and lower the rear of the swinging drawbar to the ground. Remove the drawbar fulcrum pin retainer and withdraw the pin. Remove the drawbar assembly leaving the drawbar anchor bracket in position.

4. Remove the drawbar guide brackets and suitably blank off the screw holes to prevent ingress of dirt.

5. If the plunger housing assembly requires building up, apply a liberal application of grease to the spring chamber in the housing and to the plunger and spring. Insert the plunger in the housing, forked end to the front, then assemble the spring followed by the sleeve and end plate as shown in Fig. j. Retain this assembly with three bolts and spring washers.

Insert the plunger release arm in the fork of the plunger and retain with a clevis pin and split pin. Insert the special shouldered fulcrum bolt to connect the end of the lever to the fulcrum boss on the plunger housing and retain with the appropriate nut and lockwasher.

6. Remove the blanking plugs from the four holes in the base of the rear transmission housing. Locate the locking plunger and housing assembly in position under the housing, with the release arm to the front, and secure with four screws and spring washers (see Fig. 3).

7. Build up the foot pedal and bracket assembly in the following manner :—

Position the foot pedal in the fork of the foot pedal mounting bracket with the arm of the pedal curving

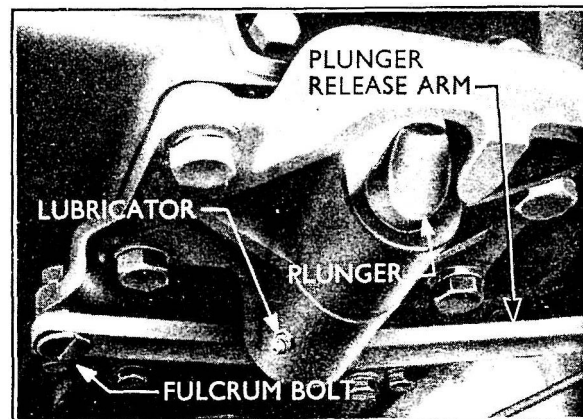


Fig. 3  
Locking Plunger and Linkage



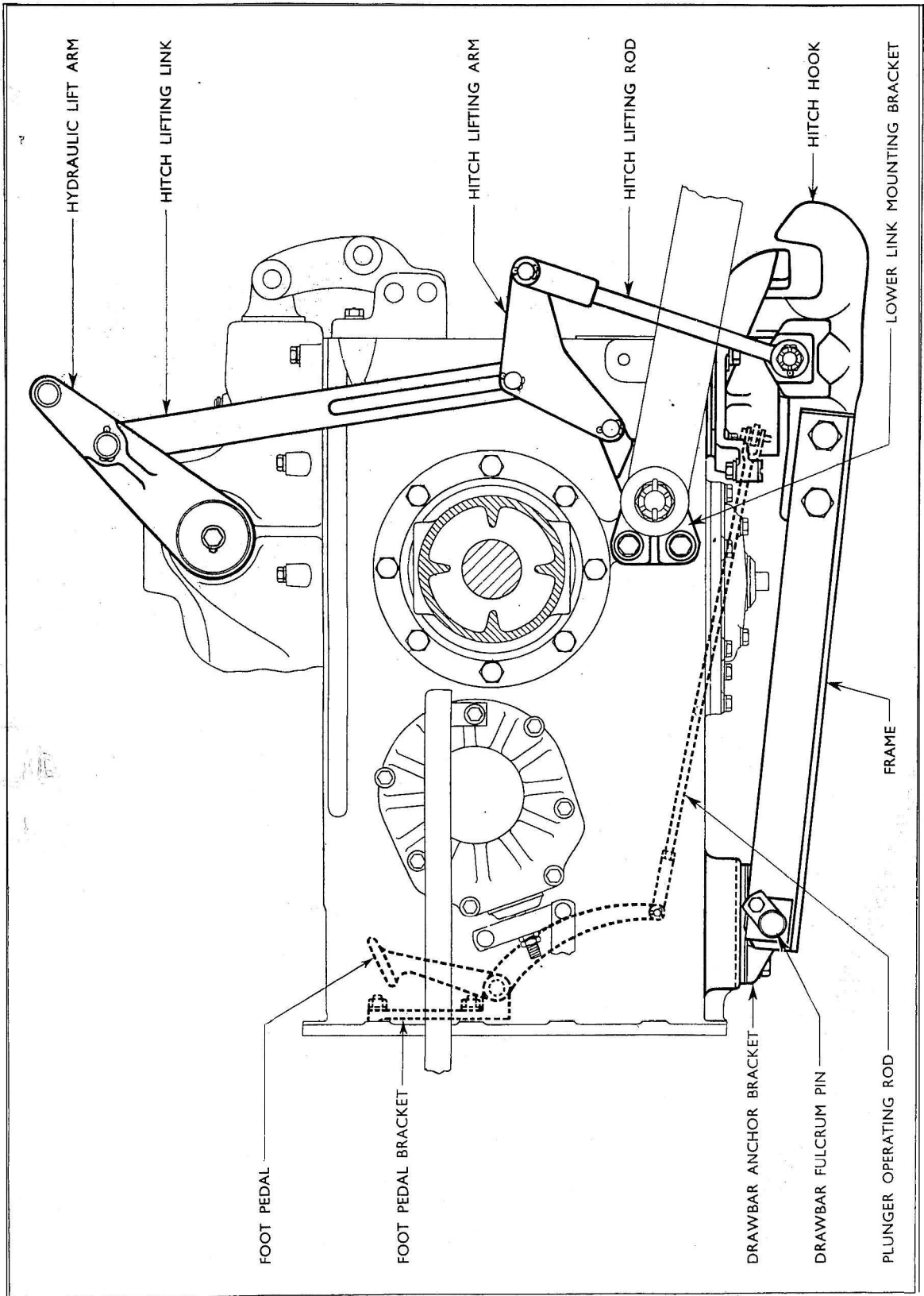


Fig. 4  
General Arrangement of Automatic Pick-Up Hitch



to the rear, insert the pivot pin through the bracket and pedal and retain the pivot pin in position with a groove pin through the cross-drilling in the pedal.

8. Remove, and discard, the two top right-hand bolts from the gearbox/rear transmission housing flange and position the foot pedal and release linkage assembly so that the pedal mounting bracket may be secured to the rear of the transmission housing flange at this location as shown in Fig. 4. Secure the bracket with the two special long bolts supplied, remembering that the top bolt also retains the footbrake locking device bracket to the front of the gearbox flange.

g. Connect the adjustable clevis of the locking plunger operating rod to the lower end of the foot pedal arm and the rear end of the rod to the locking plunger release arm, using appropriate clevis pins and split pins. The rod should be adjusted to such a length that full release of the plunger is effected when the pedal is depressed.

10. Assemble the hook to the triangular shaped hitch frame, angle section of frame facing upwards, and secure with two bolts, lockwashers and nuts.

11. Position the frame and hook assembly below the rear transmission housing and lift the hook end into engagement with the locking plunger. Secure the open end of the frame and hook assembly to the existing drawbar anchor bracket, which will not have been removed from the tractor, using the same fulcrum pin and retainers as were used with the swinging drawbar.

12. Fit the triangular shaped hitch lifting arms to the lugs on the lower link mounting brackets with the apex of the triangle pointing upwards as shown in Fig. 4.

13. Install the lifting links, connecting the slotted ends of each link with the appropriate pin to the central hole in the corresponding triangular shaped hitch lifting arm and the opposite end of each link

to the boss on the inside of the corresponding hydraulic lift arm.

14. Attach the hitch lifting rods to the pins of the hook assembly, using the special flat washers between the lifting rods and the castellated nuts. Fully tighten the nuts and secure with split pins.

15. Before connecting the top end of the lifting rods to the rear holes in the triangular shaped hitch lifting arms, their lengths should be carefully adjusted in the following manner :—

- (a) Ensure that the hook assembly is locked in the raised position and is supported by the plunger.
- (b) Start the engine and, with the P.T.O. and clutch engaged, move the hydraulic main control lever to the top stop on the quadrant so moving the hydraulic lift arms to the fully raised position.
- (c) Adjust the lengths of the hitch lifting rods so that the clevis pins will just pass through the yoke and lift arm without taking any weight from the plunger.

Shorten the lifting rods by approximately  $3\frac{1}{2}$  turns. The adjustment of both rods should be carried out before connecting either to its corresponding lifting arm as if one shortened rod is connected before the other is adjusted, the hook will be lifted slightly and the adjustment of the second rod will be incorrect.

- (d) After adjustment connect the hitch lifting rods to the hitch lifting arms and check the operation of the hydraulics. Ensure that the hydraulic system neutralises itself when the lift arms reach the fully raised position i.e., when the hook is raised past the "locked" position. If it does not do so the relief valve will be heard to blow-off and it will be necessary to lengthen the hitch lifting rods slightly to overcome this condition.

16. Connect the three point linkage lifting rods between the main hydraulic lift arms and the lower links.

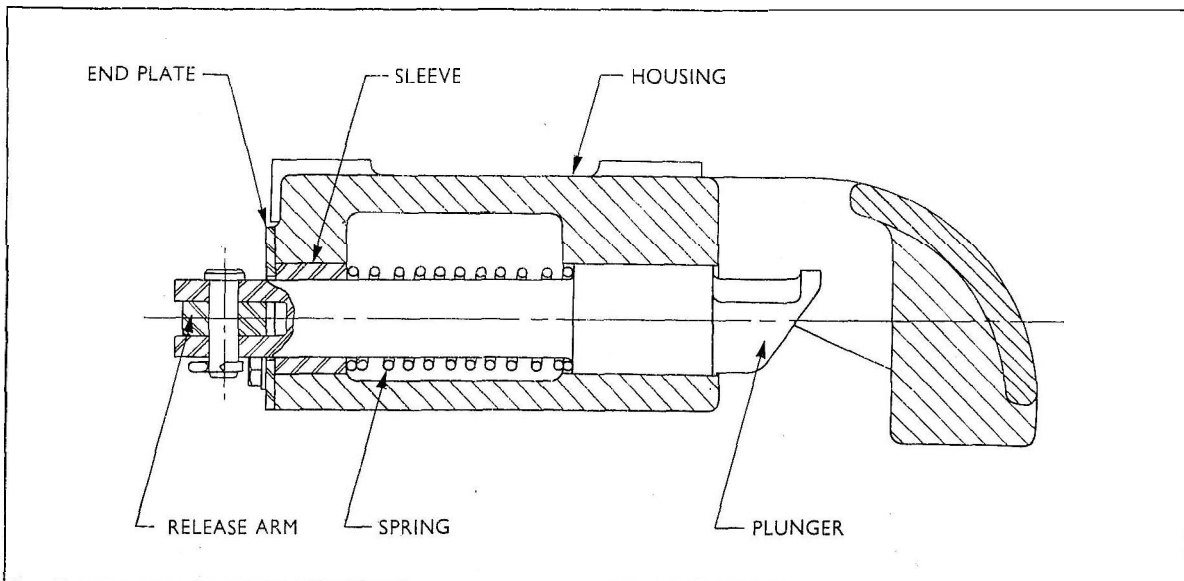


Fig. 5  
Hitch Locking Plunger Assembly

## POWER TAKE-OFF

<sup>2</sup> In standard form the power take-off, available as optional equipment on current tractors, is fitted in conjunction with either an 11 inch or a 13 inch single clutch and standard gearbox. Alternatively, it may be supplied as a "live" unit, in which case a 12 inch double clutch and special "live" gearbox is fitted (see Section 4).

Basically the P.T.O. consists of an auxiliary gearbox assembly (P.T.O. gearbox) which is located under, and is driven by the gears of, the tractor front transmission. An extension shaft carries the drive through the rear transmission and provides an output "take-off" point at the rear of the tractor.

When a single clutch is fitted the P.T.O. drive is taken from the tractor gearbox main drive shaft, through the primary lower gear and P.T.O. idler gear to the P.T.O. driven gear which is splined to the P.T.O. shaft (see Fig. 1). The P.T.O. driven gear is free to slide on the splines of the P.T.O. shaft and is connected via a selector fork and shifter shaft to a lever mounted on the main gearbox selector plate. Rearward movement of this lever engages the drive to the P.T.O. extension shaft. Since the hydraulic pump drive gear is keyed to the extension shaft, the hydraulic pump is activated whenever the P.T.O. is in operation.

When the tractor is fitted with a "Live P.T.O." the drive is taken from the P.T.O. clutch of the double clutch assembly through a P.T.O. input shaft, which fits over the gearbox main drive shaft, to the primary lower gear and hence to the P.T.O. extension shaft in the same manner as with the standard P.T.O.

After tractor serial number 08C 960337 changes were made to the gear ratios of the P.T.O. drive line. The British Standard Specification speed of 540 r.p.m. at the P.T.O. is now provided at an engine speed of 1,473 r.p.m. giving a power output at the shaft of 42.5 h.p. A similar shaft speed on previous Major tractors was provided at an engine speed of 1,200 r.p.m. and the maximum power output at the shaft was 32 h.p. On tractors prior to engine number 08C 960337, it is recommended that maximum power output be utilised only under steady load conditions.

### TO FIT A POWER TAKE-OFF INSTALLATION

*The P.T.O. installation for tractors after Serial No. 08C 960337 differ from that used on tractors prior to this number and they are not interchangeable.*

1. Drain the oil from the gearbox and rear transmission housings.
2. Remove the P.T.O. opening cover plate from the underside of the gearbox housing.

3. Fit the P.T.O. housing, drive gear and idler gear assembly, with a new gasket and rubber oil sealing ring, to the underside of the gearbox housing ensuring that the idler gear meshes correctly with the primary lower gear in the tractor gearbox. Enter first the two dowel bolts in the left- and right-hand centre holes, then fit the other four bolts and tighten up evenly.

4. If it is required to equip the tractor with H.P.L. it will be necessary to fit a hydraulic pump drive gear to the P.T.O. extension shaft. The gear should be secured by means of a circlip at front and rear.

*Prior to engine' number 08C g60337 a 33 tooth hydraulic pump drive gear was used in production together with a 21 tooth pump driven gear. These gears have now been replaced by a 34 tooth drive gear and an 18 tooth driven gear, to compensate for the reduced shaft speed resulting from the current gear ratios.*

Remove the P.T.O. shaft rear cover, mount the extension shaft assembly in position in the rear transmission and fit, with a gasket, the extension shaft retainer. Secure with four bolts and lockwashers.

5. Fit the master guard and shaft cover and refill the gearbox and rear transmission housings with the correct quantity and grade of lubricant.

6. Mount the P.T.O. operating lever and bush on the lower rear bolt securing the main gear change plate to the left-hand side of the gearbox housing. A special bolt with an overall length of approximately 2 $\frac{3}{4}$  in. (69.85 mm.) is provided for use at this location.

*As a result of an increase in size of the P.T.O. gearbox housing it was necessary to introduce a new P.T.O. selector lever. The offset on the lower half of the lever was decreased in size from 1.56 in. (39.62 mm.) to 0.94 in. (23.8 mm.) to mate with the P.T.O. shifter shaft. The current and previous levers are not interchangeable.*

Fit the shifter shaft connecting link, attaching one end to the P.T.O. shifter shaft and the other end to the P.T.O. operating lever. Secure at each end with a clevis pin and split pin.

### REMOVING THE POWER TAKE-OFF GEARBOX

1. Drain the oil from the gearbox and rear transmission housings.
2. Remove the P.T.O. extension shaft master guard and cover. Unscrew the four shaft oil seal retainer bolts and pull the extension shaft and bearing retainer assembly out of engagement with the P.T.O. shaft.

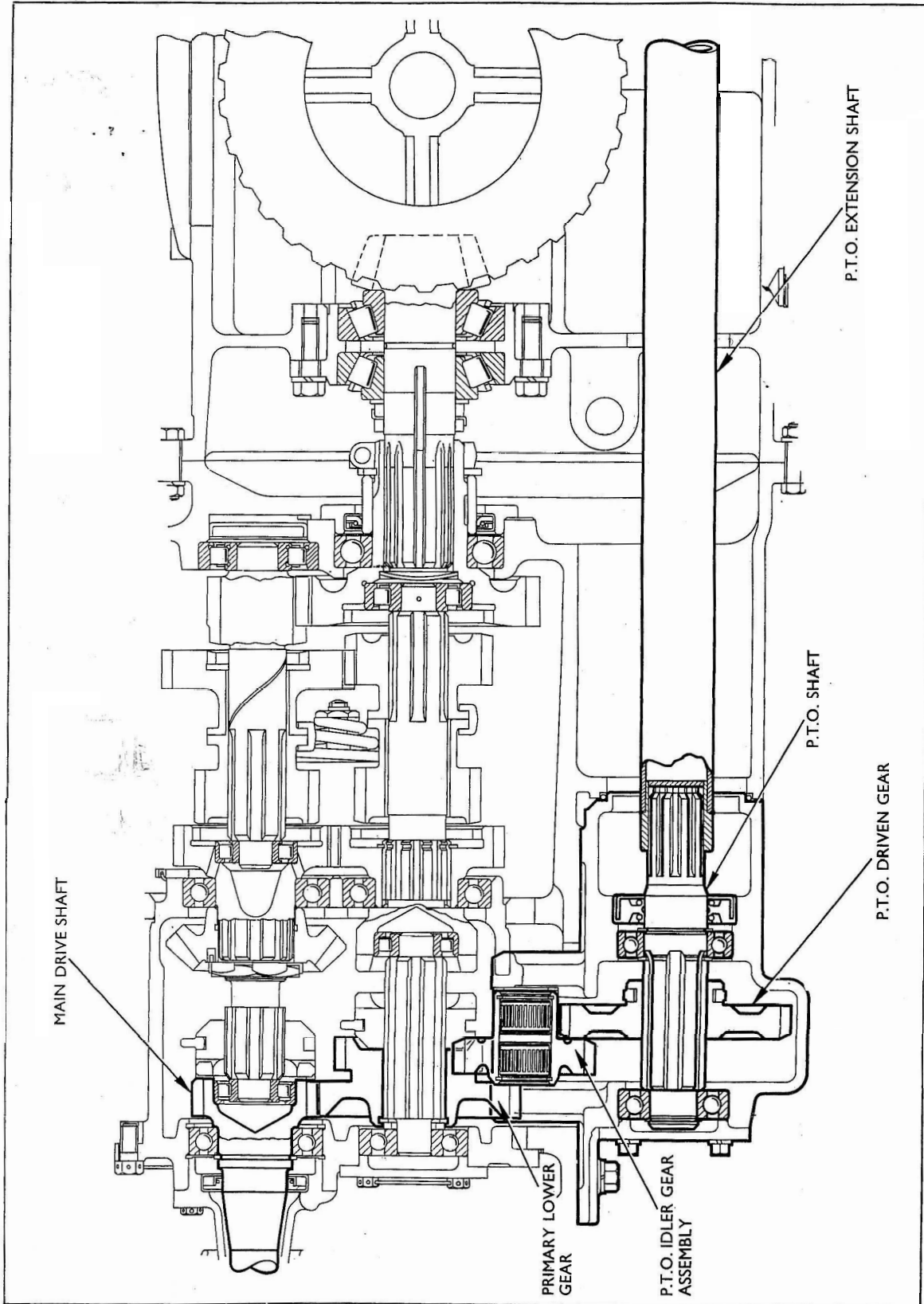


Fig. I

3. Disconnect the shifter shaft connecting link.
4. Unscrew the six bolts securing the P.T.O. to the base of the gearbox housing and remove the P.T.O. Remove the rubber oil sealing ring from the rear of the housing.

#### REMOVING THE POWER TAKE-OFF EXTENSION SHAFT

1. Drain the oil from the gearbox and rear transmission housings.
2. Remove the P.T.O. extension shaft master guard and cover. Unscrew the four shaft oil seal retainer bolts and pull the shaft and bearing retainer assembly out of the housing.

#### DISMANTLING THE POWER TAKE-OFF EXTENSION SHAFT

1. Remove the circlip from the front of the bearing retainer and tap the retainer off towards the splined end of the extension shaft. Remove the oil seal from the retainer.
2. The bearing is retained to the shaft by a collar that is shrunk in position and this collar must be removed if it is desired to withdraw the bearing. The collar may be removed by splitting with a chisel after first drilling or grinding to reduce the thickness of the collar. (Care should be taken not to damage the P.T.O. extension shaft.)
3. Remove the hydraulic pump drive gear front circlip and draw the gear off the key and shaft.

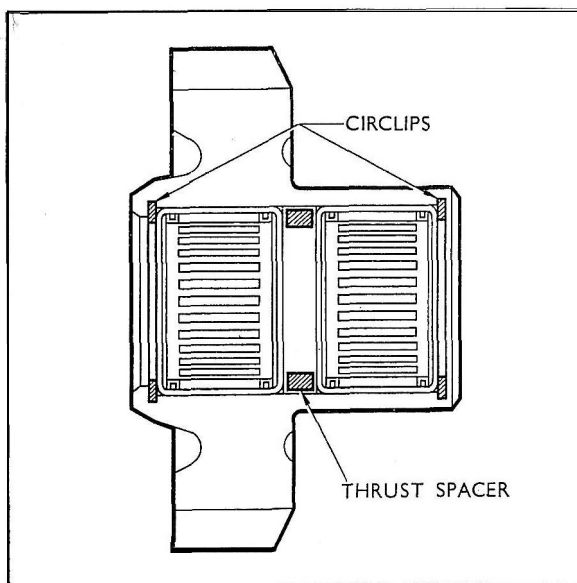


Fig. 2  
P.T.O. Idler Gear Assembly

#### TO DISMANTLE THE POWER TAKE-OFF

1. Remove the split pin retaining the idler gear shaft in the lugs of the housing and push out the shaft which will release the idler gear assembly and thrust washers.

The needle roller bearings and thrust spacer (or bronze bushes) may be removed from the idler gear by driving them out with a suitable size drift, after first removing the circlip at each end of the gear bore.

2. Detach the front bearing end plate and remove the front bearing retaining circlip. Support the P.T.O. driven gear and tap the shaft into the housing from the rear to expose the front bearing. Fit the two adaptors (T-7020-1) behind the front bearing so that the spring loaded plungers locate in the end plate bolt holes (See Fig. 3). Using a suitable sized drift, drive the shaft, bearing and oil seal out through the rear of the housing. Care should be taken when driving out the rear bearing not to damage the bearing surfaces. Lift out the P.T.O. driven gear.

3. Remove the oil seal from the shaft in the normal manner and, after detaching the circlips on either side of the bearing (a single circlip on previous assemblies), push off the bearing, using Tool No. T-7000.

4. Disconnect the operating lever and unscrew the four selector housing retaining bolts and lockwashers. Remove the selector fork and housing.

5. Cut the selector fork retaining screw locking wire, remove the screw and withdraw the shaft to release the fork. Remove the selector ball and spring.

6. Remove the oil seal from the rear of the selector housing.

#### TO REASSEMBLE THE POWER TAKE-OFF

From engine number 08C 960337 the P.T.O. components have been strengthened and this, together with the change in ratios has necessitated the introduction of a new P.T.O. gearbox housing which is larger and stronger than that previously used. This housing is not interchangeable with the previous type and therefore previous housings will be retained for service.

1. Locate the front bearing in the housing.

On Major tractors built prior to engine number 08C 960337 a circlip was fitted in the groove at the rear of the bearing to retain it in position. The bearing now locates against a shoulder in the housing.

Place the dummy end plate (T-7026) in front of the bearing and stand the housing on the plate.

2. Press the rear bearing onto the P.T.O. gearbox shaft, using Tool No. T-7000 with suitable adaptors, and retain in position with two circlips in the grooves, one either side of the bearing (a single circlip on previous assemblies). Position the P.T.O. driven gear in the housing and enter the drive shaft into the gear splines. Tap the shaft into position in the front bearing.

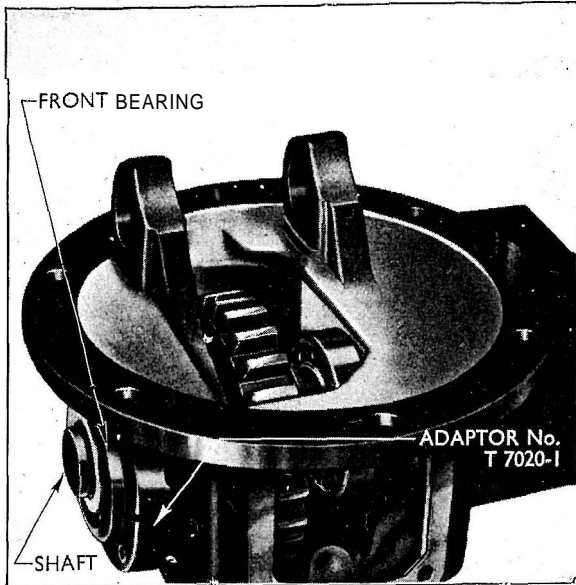


Fig. 3  
Adaptors T-7020-1 in Position

The location and retention of the rear bearing on the shaft is now by two circlips, one being fitted on each side of the bearing. Prior to engine number 08C 960337 the bearing located against a shoulder on the shaft and a single circlip retained the bearing in position.

An improved P.T.O. driven gear is being jitted to all Major tractors built after engine number 08C960337. This gear is receiving an improved form of heat treatment and in addition the number of teeth have been increased from 26 to 32. As the new gear is not interchangeable with that used previously the 26 tooth gear will continue to be serviced for previous tractors.

3. Fit the tapered sleeve (T-7021-3) over the splines of the P.T.O. gearbox shaft, locate the new oil seal on to the tapered sleeve and drive firmly into position with the adaptor (T-7021-3) on the tool as shown in Fig. 4.

To permit the fitting of a larger, improved type of oil seal the portion of the shaft immediately behind the bearing location has been decreased in diameter.

For service, the new P.T.O. shaft and oil seal together replace the shaft and seal fitted to tractors built prior to engine number 08C 960337 and they must be fitted as a pair when replacing a shaft in a previous type P.T.O. gearbox. The previous oil seal, but not the shaft, will be retained for servicing previous Major tractors.

4. Remove the dummy end plate and fit the original plate and a new gasket.

When the P.T.O. idler gear is assembled to the new type P.T.O. housing a special "D" shaped thrust washer is located between each side of the gear and the adjacent

lugs of the housing. Both the new type primary lower gear and new type P.T.O. idler gear assembly may be jitted as direct replacements for the equivalent previous type gears in service. It should be noted, however, that when this is done it is not possible to fit the idler gear thrust washers to a previous type P.T.O. housing.

5. Enter the idler gear shaft in the rear lug of the housing, locate the thrust washers and idler gear with the long shoulder of the gear to the rear of the housing, push the idler shaft into position, and fit a new split pin.

Since the introduction of the Major tractor a number of changes have been made to the P.T.O. idler gear assembly (See Fig. 2). Listed below are the engine numbers for the introduction of these various changes.

Type	Engine No.
Needle roller bearings .. ..	1481091
Improved caged needle roller bearings .. ..	1545996
Caged needle roller bearings and circlips .. ..	1606449
Caged needle roller bearing, circlips and thrust spacer .. ..	08C 960337

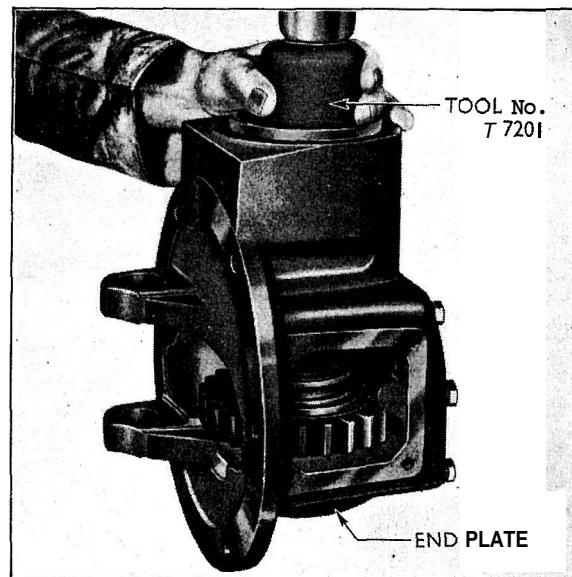


Fig. 4  
Replacing the Oil Seal in the Power Take-Off Housing

(NOTE.—Prior to engine number 1481091, plain bronze bushes were used in the idler gear bore. When servicing a P.T.O. gearbox of this type it should be noted that the P.T.O. housing, idler gear shaft, gear and bearings used on the Power Major can only be fitted to Fordson Major tractors as an assembly and Fordson Major parts may not be used on the Power Major.)

*In addition to the above changes it should be noted that the current idler gear is being given an improved form of heat treatment and can be identified by its silver appearance as compared to the black appearance of the previous gears. This gear may be used as an individual replacement in all Major tractors built after engine number 1481091.*

6. Fit a new oil seal at the rear of the selector housing with the metal face to the rear.
7. Position the selector fork, in the selector groove of the driven gear, with the boss to the front. Enter the shifter shaft in the fork.

*A new P.T.O. selector fork approx. 5 $\frac{7}{8}$  in. (149.23 mm.) long, is being fitted to current production Major tractors. As the new fork is not interchangeable with the previous one used on tractors built prior to engine number 08C 960337, the old type fork will be retained for service.*

Locate the spring and ball in the shifter shaft and push the shaft into position. Turn the shaft so that the ball registers in the indentations and then secure the selector fork by means of the retaining screw and lock with a piece of wire. Fit the selector housing with a new gasket, and secure with four bolts and lockwashers.

#### **TO REPLACE THE POWER TAKE-OFF**

1. Locate a new rubber oil sealing ring at the rear

of the housing, position a gasket on the upper face and enter the P.T.O. into position.

2. Enter the first two dowel bolts in the left- and right-hand centre holes, then fit the other four bolts and tighten up evenly.
3. Fit the selector housing and couple up the operating lever.

#### **TO REPLACE THE POWER TAKE-OFF EXTENSION SHAFT**

*On tractors prior to engine number 08C 960337 a P.T.O. extension shaft with a 2 in. (50.80 mm.) dia. centre tube was fitted. On current models an improved extension shaft with a 2 $\frac{1}{8}$  in. (53.98 mm.) dia. centre tube is being fitted to enable the greater torque now available from the P.T.O. to be transmitted. The new shaft completely supersedes the previous shaft for service on Major tractors.*

1. Locate the hydraulic pump gear to the shaft and key ; fit the front circlip to secure in position.
2. If the extension shaft bearing and collar have been removed it will be necessary, when refitting the bearing, to shrink a new collar on to the shaft to retain the bearing in position. It is recommended that the collar be heated to approximately 800°F. (dull red) for this operation.
3. Assemble a new oil seal in the retainer. Position the oil seal and retainer on the shaft and secure by means of a circlip in the groove at the front of the retainer.
4. Mount the extension shaft assembly in position in the rear transmission housing and, using a new gasket at the retainer, secure with four bolts and lockwashers.
5. Replace the master guard and shaft cover, and refill the gearbox and rear transmission housings with the correct quantity and grade of lubricant.