

County

TRACTOR

MODEL 4000-FOUR

Operator's Manual

SAFETY PRECAUTIONS

1. Do not permit anyone to ride on the tractor with the driver except where a proper passenger seat is provided.
2. The operator should never leave the tractor seat whilst the tractor is in motion.
3. Care should be exercised when operating on steep gradients to maintain proper stability.
4. The tractor should always be driven at speeds slow enough to ensure safety particularly when operating over rough grounds, near ditches, or turning.
5. Always keep the tractor in gear when going downhill.
6. The engine should be stopped when leaving the tractor.
7. On tractors embodying the Select-O-Speed transmission the parking brakes should be set when parking the tractor and the transmission placed in 'Park'.
8. The tractor brakes should always be kept in proper operating condition.
9. The tractor should not be refuelled when the engine is running or overheated.
10. Do not run the tractor engine in a closed garage. Carbon monoxide fumes, from the exhaust system, which are almost odourless and thus cannot be easily detected, are extremely dangerous.
11. On those tractors fitted with a belt pulley the operator should never attempt to remove or install the belt whilst the belt pulley is in motion.
12. Loose clothing must not be worn when operating the belt pulley or power take-off.
13. Ensure that the P.T.O. safety guard is fitted at all times—this is a statutory requirement in the U.K.
14. Always pull from the drawbar as pulling from the rear axle or top link is dangerous.
15. If the front end has a tendency to rise check for proper weight distribution.
16. Make sure that the engine is stopped and the P.T.O. drive disengaged when attempting to adjust or clean P.T.O. driven implements.
17. Never work under an implement when it is in the raised position on the hydraulics without having first provided an additional support between the implement and the ground.
18. Do not travel at high speeds without previously locking the brake pedals together.

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DETACH THIS CARD AND HAND TO YOUR DRIVER

April 1973

County TRACTOR

MODEL 4000-FOUR

Operator's Manual

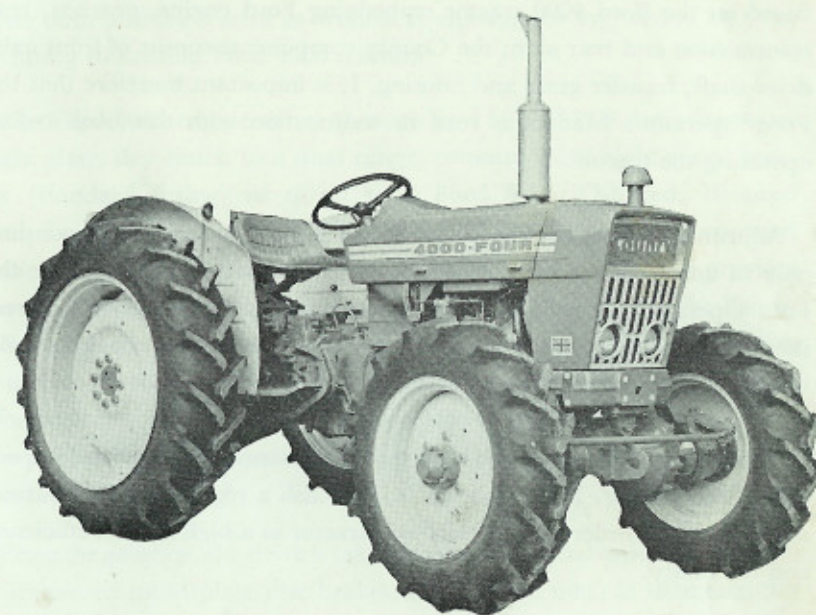
COUNTY COMMERCIAL CARS LTD.,
FLEET, ALDERSHOT, HANTS, ENGLAND

Telephone: FLEET 22111

TELEX: 85138

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County

MODEL 4000-FOUR

FOREWORD

THIS Operator's Manual has been prepared to assist you in the daily care and operation of your new County 4000-FOUR. The unit is based on the Ford 4000 tractor embodying Ford engine, gearbox, rear transmission and rear axle; the County components consist of front axle, drive shaft, transfer gears and housing. It is important therefore that the Ford Operator's Manual is read in conjunction with this book before operating the tractor.

Adjustments should only be made when strictly necessary and then only in accordance with the instructions contained in this book or the Ford Operator's Handbook. Only parts supplied by the manufacturers should be used for replacements and the more important repairs should be entrusted to your County distributor or Ford dealer.

Every care has been exercised in the manufacture and the final inspection of this tractor. It is important to establish a regular service routine, as indicated, in order to maintain your tractor in a high state of efficiency and reliability.

Certain art work and information referring to the Ford Engine and Transmission unit are reproduced by the kind permission of the Ford Motor Company.

GENERAL DESCRIPTION

THE 4000-FOUR is a four wheel drive, diesel engined tractor, based on the Ford 4000 tractor. The County developed front wheel drive system has been designed and constructed such that it can be supplied either built into the tractor as original equipment, or supplied in kit form for fitting to existing Ford 4000 tractors.

The Ford 4000 engine drives through an 11 in. (279.4 mm) diameter single plate, dry clutch to a dual range, constant mesh eight speed gearbox (standard fitting) or direct to a Ford Select-O-Speed, 10-speed transmission (optional fitting). The standard fitted gearbox is operated in the normal manner with two selector levers and a clutch, and provides four forward and one reverse gear in each of the two ranges. The Select-O-Speed gearbox is controlled by a single, quadrant lever which gives clutchless changes; ten forward and two reverse gears are available. A foot operated inching pedal is incorporated to permit close manoeuvring. The front wheel drive transfer gearbox ratio is adjusted to suit the type of transmission used.

From the gearbox, the drive is taken to the differential unit. Mechanical oil immersed multi plate disc brakes, 8 in. (203.2 mm) in diameter, are mounted on the differential output shafts.

Drive to the front wheels is taken from the output shaft of the main gearbox, by a train of spur gears incorporated in a transfer gearbox, via telescopic and universally jointed propeller shaft, to the front axle. The transfer gearbox, which is mounted rigidly onto the left-hand side of the rear transmission housing, incorporates a transmission handbrake and manually operated dog clutch for disengaging the front axle drive. The front axle is of heavy cast construction and pivots on a cast carrier assembly embodying radial and fore and aft thrust bearings. The front axle half shafts, which are driven from an offset differential, are fitted with constant velocity steering joints fully enclosed and sealed against the entry of water or dirt; they provide maximum steering angles of 33° in either way.

The front wheel drive transmission ratio is selected to suit the gearbox installation for the various wheel and tyre combinations which may be used. Correct Gear meshing as accommodated by an adjustable device, housed in the transfer gearbox. This locates and retains the final gear in the correct mesh with the fixed location gears.

The rear wheels are driven through a single differential and on adverse ground conditions, this differential can be locked to give maximum traction. The front wheels are steered in the conventional manner with hydraulic power assistance. Independent steering brakes, which operate on the rear wheels, provide for extra tight turns, or manoeuvring in confined spaces.

The standard fittings include:

Ford power-assisted steering, the hydraulic pump being mounted on the engine and driven from the timing gears.

Category II hydraulic lift linkage which provides position and depth control with flow control.

A conventional twelve-volt electrical system, with generator, battery, starting and lighting.

TECHNICAL SPECIFICATION

ENGINE

Ford three cylinder direct injection O.H.V. diesel.

Bore	4.4 in. (111.8 mm)
Stroke	4.4 in. (111.8 mm)
Cubic capacity	201 cubic in. (3,294 cc)
Compression ratio	16.5:1
Maximum power	62 b.h.p. gross at 2200 r.p.m.
Maximum torque	163 lb. ft. (22.56 kg/m) at 1300 r.p.m.
Piston speed at rated engine speed	1613 ft./min (491.7 m/min)
Rated engine speed	2200 r.p.m.
Cooling system	Centrifugal pump, thermosyphon assisted, four blade fan, radiator pressure cap, flow thermostatically controlled.

TRANSMISSION

Clutch

Single plate dry clutch embodying four ceremetalic friction segments each side of disc.

Clutch plate diameter	11 in. (279.4 mm)
Total friction area	31.86 in. ² (205.55 cm ²)

Gearbox—standard

Five position dual range constant mesh gearbox giving eight forward speeds and two reverse.

Road speeds in gears at 2200 r.p.m. rated engine speed with 12×38 rear tyres.

Gears	Gearbox	Overall	Speed	
	Ratio	Ratio	m.p.h.	k.p.h.
1	14.49	228.22	1.64	2.64
2	11.61	182.86	2.05	3.30
3	6.61	104.11	3.60	5.80
4	4.86	76.55	4.90	7.90
5	4.06	63.95	5.85	9.41
6	3.25	51.19	7.31	11.76
7	1.85	29.14	12.85	20.68
8	1.36	21.42	17.48	28.13
High reverse	2.82	44.42	8.43	13.57
Low reverse	10.08	158.76	2.36	3.80

Gearbox—optional

Ten speed constant mesh Select-O-Speed transmission giving ten forward and two reverse ratios. Gear selection hydraulically actuated by hand lever. Road speeds in gears at 2200 r.p.m. rated engine speed and fitted with 12×38 rear tyres.

Gears	Gearbox	Overall	Speed	
	Ratio	Ratio	m.p.h.	k.p.h.
1	10.38	311.40	1.20	1.93
2	7.30	219.00	1.71	2.75
3	6.99	209.70	1.78	2.86
4	4.92	147.60	2.54	4.10
5	3.08	92.40	4.05	6.52
6	2.40	72.00	5.20	8.37
7	2.08	62.40	6.00	9.66
8	1.62	48.60	7.70	12.40
9	1.00	30.00	12.48	20.10
10	0.68	20.40	18.35	29.53
High reverse	2.36	70.80	5.30	8.53
Low reverse	3.50	105.00	3.57	5.75

FINAL TRANSMISSION

Front Wheel Drive

Transfer box ratio for eight speed transmission

Tyre combinations		Tyre combinations	
Front	Rear	Front	Rear
1.800 : 1 reduction		1.866 : 1 reduction	
9.5/ 9-24	12.4/11-36	11.2/10-24	12.4/11-36
9.5/ 9-24	13.6/12-36	11.2/10-24	13.6/12-36
9.5/ 9-24	18.4/15-30	11.2/10-24	18.4/15-30
9.5/ 9-24	12.4/11-38	11.2/10-24	12.4/11-38
9.5/ 9-24	16.9/14-30		
11.2/10-24	13.6/12-38		
11.2/10-24	16.9/14-34		

Transfer box ratio for ten speed transmission

Tyre combinations		Tyre combinations	
Front	Rear	Front	Rear
3.400 : 1 reduction		3.600 : 1 reduction	
9.5/ 9-24	13.6/12-36	11.2/10-24	12.4/11-36
9.5/ 9-24	18.4/15-30	11.2/10-24	16.9/14-30
11.2/10-24	13.6/12-38		
11.2/10-24	16.9/14-34		

The ratio appropriate to the selected tyre equipment is accommodated in the transfer gearbox by an eccentrically adjustable device that locates and retains the final gear in the correct mesh with the fixed location gears.

FRONT AXLE

Four pinion differential.

Crown wheel/pinion ratio 6.166:1.

Constant velocity steering universal joints providing maximum steering angles of 33° either way.

FINAL TRANSMISSION

Rear Wheel Drive

Primary reduction

Crown wheel/pinion ratio (eight speed transmission) 3.50:1.

Crown wheel/pinion ratio (ten speed transmission) 6.66:1.

Crown wheel mounted on four pinion differential incorporating foot operated diff-lock.

Secondary reduction

Epicyclic reduction mounted in axle housing.

Reduction ratio 4.50:1.

BRAKES

Steering brakes

Multiplate, mechanical, oil immersed disc brakes. Enclosed in rear axle housing sealed against water, and dust and mounted on differential output shafts. Operation by independent pedals, with interlocking lever.

External adjustment.

Diameter of discs 8 in. (203.2 mm).

Transmission handbrake

Multi-disc, dry type, mounted on shaft of gear engaged in gear train of transfer gearbox.

Diameter of discs 4 in. (101.6 mm).

Alternative handbrake

Hand lever operated handbrake inter-connected with footbrake operating linkage to apply steering brakes.

STEERING

Recirculatory ball steering box with external hydraulic power assistance.

Hydraulic pump engine mounted, gear driven from engine timing gears.

Pump output 3.55 U.K. gall/min (16.1 l/min) at 2200 engine r.p.m.

Operating pressure 800/900 lb./sq. in. (56.2/63.3 kg/sq. cm.)

Steering box ratio 24.2:1

Number of turns of steering wheel, lock to lock 3.3

Turning circle: unassisted without four wheel drive 32.75 ft. (9.98 m)

Turning circle: unassisted with four wheel drive engaged 36.0 ft. (10.97 m)

Turning circle: with steering brakes 25.0 ft. (7.62 m)

HYDRAULIC LIFT LINKAGE

British standard category I or II type implement linkage. Draught and position control hydraulics with flow control. Double acting top link control of implement draught.

HYDRAULIC PUMP

Gear type (with eight speed transmission) situated in rear transmission centre housing. P.T.O. shaft driven.

Power operating pressure 2500 lb./in.² (176 kg/cm²)

Pump output at 2200 engine r.p.m. 4.5 gall/min (20.4 l/min)

Lifting capacity at lower link ends 3200 lb. (1451 kg)

Piston type (with ten speed select-o-speed transmission) engine mounted camshaft driven.

Pump operating pressure 2500 lb./in.² (176 kg/cm²)

Pump output at 2200 engine r.p.m. 4.42 gall/min (20.1 l/min)

Lifting capacity at lower link ends 3200 lb. (1451 kg)

DRAWBAR—standard

Lateral adjustment 9 in. (229 mm)

each side of centre line

Diameter of drawbar pin hole .. 1 in. (25.4 mm)

POWER TAKE OFF

With eight speed transmission

Standard .. Rear mounted independent p.t.o. engaged by independent hand lever.

Speed .. 540 r.p.m. at engine speed 1800 r.p.m.

Optional .. Rear mounted transmission p.t.o. engaged by main transmission clutch foot pedal.

Speed .. 540 r.p.m. at engine speed 1800 r.p.m.

With optional select-o-speed transmission (ten speed)

Standard .. Rear mounted independent p.t.o. engaged by independent hand lever.

Speed .. 540 r.p.m. at engine speed 1800 r.p.m.

Optional .. Rear mounted two speed independent p.t.o. engaged by independent hand lever.

Speed .. 540 r.p.m. at engine speed 1800 r.p.m. and 1000 r.p.m. at engine speed 1950 r.p.m.

Also available ground speed p.t.o.

540 r.p.m. 2.95 m.p.h. (4.7 k.p.h.)

1000 r.p.m. 5.47 m.p.h. (8.72 k.p.h.)

P.T.O. shaft 540 r.p.m. 1 $\frac{3}{8}$ in. (34.9 mm) diameter, 6 spline

P.T.O. shaft 1000 r.p.m. 1 $\frac{3}{8}$ in. (34.9 mm) diameter, 21 spline

P.T.O. shafts readily interchangeable.

ELECTRICAL

Battery	12 volt, 128 amp hour capacity
Safety start key switch.	
Head, side and rear lights.	
Horn.	

CAPACITIES

Water	23 pints (13.1 litres)
Engine oil	13.5 pints (7.7 litres)
Transmission:	
eight speed	22 pints (12.5 litres)
select-o-speed	21 pints (11.9 litres)
Rear axle and hydraulics	56 pints (31.8 litres)
Steering p.a.s. reservoir	3 pints (1.7 litres)
Front axle	18 pints (10.23 litres)
Transfer gearbox	10 pints (5.68 litres)
Fuel tank	13.3 gallons (60.5 litres)

DIMENSIONS

Wheelbase	83.0 in. (2.11 m)
Overall length	140.0 in. (3.56 m)
Height:	
to top of exhaust	85.0 in. (2.16 m)
to hood line	58.0 in. (1.47 m)
to steering wheel	63.0 in. (1.60 m)
Track width, rear track:	
minimum	56.0 in. (1.42 m), to
maximum	68.0 in. (1.73 m)
in increments of	4.0 in. (101.6 mm)
Track width, front axle:	
minimum	58.0 in. (1.47 m)
maximum	66.0 in. (1.67 m)

WEIGHTS WITHOUT BALLAST

	LESS CAB	WITH DUNCAN SAFETY CAB
Total weight ..	5572 lb. (2527 kg)	6272 lb. (2845 kg)
Front axle weight ..	2538 lb. (1151 kg)	2716 lb. (1232 kg)
Rear axle weight ..	3034 lb. (1376 kg)	3556 lb. (1613 kg)
On wheels ..	Front 10×24; Rear 12×38	

The County 4000-FOUR tractor is the subject of British and Foreign patents and patents pending.

County Commercial Cars reserve the right to change the specifications at any time without notice.

CONTROLS AND INSTRUMENTS

APART from the dog clutch associated with the front wheel drive mechanism, and a re-positioning of the transmission handbrake, the controls and instruments of the 4000-FOUR are identical to those of the Ford 4000 and are fully described in the Ford Operator's Handbook. The special features are explained in the paragraphs which follow. Before attempting to start, or operate, your 4000-FOUR you should read, and fully understand, the Controls and Instruments sections of both the County and the Ford Manuals.

Front Wheel Drive Dog Clutch

The front-wheel drive dog clutch is located on the transfer gearbox and is used to engage or disengage the drive to the front axle.

Handbrake

A dry type, multi-disc, transmission handbrake is located on the transfer gearbox and is shown in Figure 1. Although its position has been changed it is operated and adjusted in the manner described in the Ford Handbook.

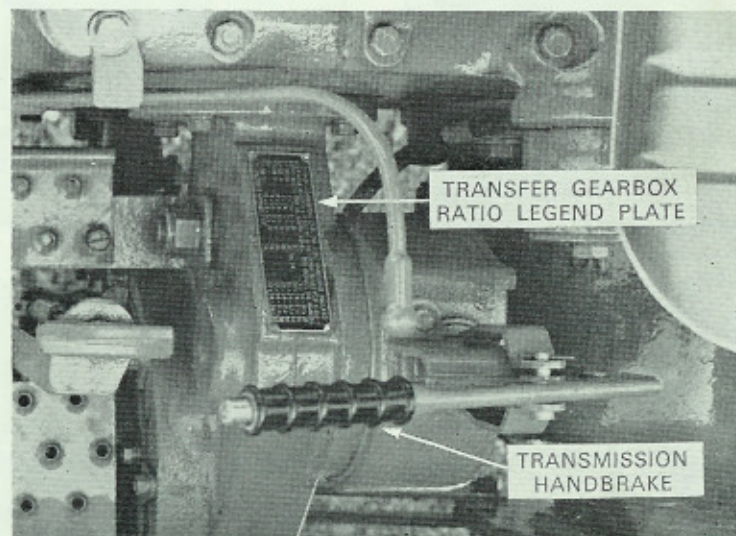


Figure 1

PREPARING FOR USE

EACH day you intend to use the tractor, a few minutes taken to complete several simple checks before starting up may save you time during the day, will prolong the tractor's life, maintain its efficiency and may prevent a costly repair bill. The recommended daily checks are:

- (1) Check the fuel state, refuel if necessary.

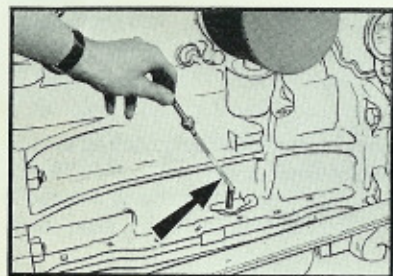


Figure 2a

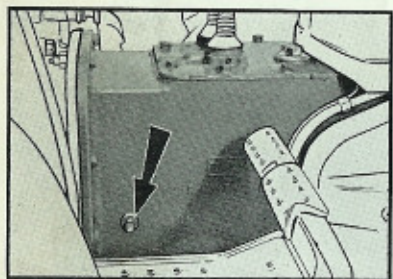


Figure 2b

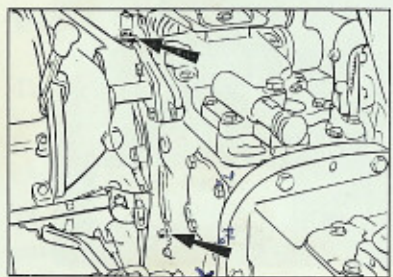


Figure 2c

(2) Oil Levels

(a) Sump

Check for oil leaks and examine the oil level in the sump (ensuring that the tractor is standing on level ground). If necessary add oil of the type specified in the Lubricant Table to bring the level to the FULL mark on the dip-stick. The dip-stick is located on the left-hand side of the engine and is shown in Figure 2a.

(b) Transmission

Check the oil level in the transmission, the level should reach the level plug hole on right-hand side of casing.

(c) Rear Axle

Raise the hydraulic lift arms and extend external equipment ram cylinders and check that the oil level reaches the level plug hole of the back axle.

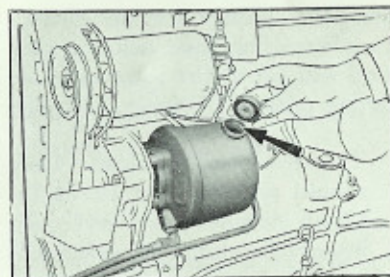


Figure 2d

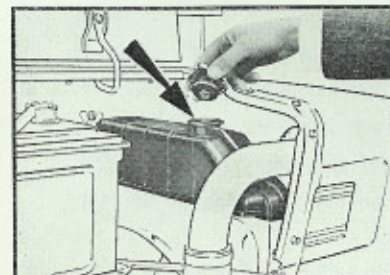


Figure 3

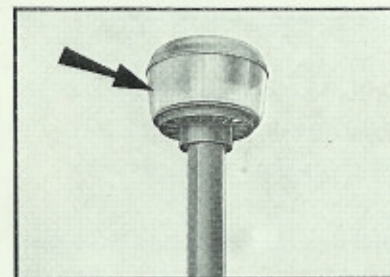


Figure 4



Figure 5

(d) Power Assisted Steering

Stop the engine with the wheels in the straight ahead position. Check that the oil level reaches the bottom of the filler neck.

- (3) Examine the water or coolant level in the radiator. Refill as necessary, with clear, soft water or anti-freeze solution. The location of the radiator cap is shown in Figure 3.
- (4) Remove the dirt from pre-cleaner bowl. Loosen the serrated nut on the top of the pre-cleaner and remove the bowl, Figure 4. Remove the dirt and wipe the bowl clean, dry and re-install. If conditions are dusty, inspect periodically during the day and clean when necessary. The dirt should never be allowed to accumulate above the level mark on the bowl.
- (5) Remove the radiator chaff screen and inspect the air cleaner (oil bath type). Loosen the thumbscrew which secures the air cleaner retaining band, as shown in Figure 5, remove the inner cup from the bowl and examine the oil and dirt level. If the dirt level is more than 0.25 in. (6.35 mm) high, drain the oil and clean the cup. Refill the cup and bowl with clean engine oil to the correct level, taking care not to over-fill. Replace the bowl, locate the retaining band, tighten the thumbscrew and replace the radiator chaff screen.

Caution: In severe dust or chaff conditions, inspect the air cleaner twice daily, servicing as required. During servicing, take extreme care not to spill oil on the radiator fins. The oil will cause dirt to accumulate thus restricting the air passage and reducing cooling efficiency.

- (6) Test the tyre pressures. They should normally be 12-14 lb. When testing the tyres also inspect for damaged side walls and tread cuts.

RUNNING IN

WHEN running in a new tractor it is recommended that the following procedures are adopted:

- (1) During the first 50 hour period keep the tractor on light work but avoid prolonged idling periods and running under no-load conditions.
- (2) After each 10 hours, during the first 50 hours of tractor operating, examine the power steering, transmission, rear and front axle fluid levels. Consistent loss of fluid from any system will indicate a leak and its early detection may prevent a costly repair bill. After the first 50 hours the fluid level inspections should be made at the periodicity recommended in the servicing schedule.
- (3) Change the engine oil after 50 hours running.
- (4) Change the transmission oil after 1,200 hours running.
- (5) Check the tightness of all nuts, bolts and screws frequently during running in, this check should include the tensioning of the fan belt as in the Ford Operator's Handbook F15 section F.

Note: Before topping up any fluid level, refer to the Lubricant Table on page 26 for the correct grade.

OPERATOR'S INSTRUCTIONS

BEFORE reading the Operator's Instructions it is important that the Controls and Instrumentation sections which are contained in this Handbook and the Ford Operator's Handbook are fully understood.

Driving the Tractor

Your four wheel drive County 4000-FOUR is a far more efficient tractor than a rear wheel drive model of the same engine power.

On tractors which are driven solely by the rear wheels, the front wheels provide no assistance in pulling a load, they only provide the steering. The front wheels, in fact, absorb power. With four wheel drive, both the front and back wheels are driven, thus the engine power is applied to all four wheels and the front wheels assist the rear wheels in pulling the load.

To use the tractor to its maximum efficiency, however, it is necessary to adopt the correct style of driving and to ensure that the correct ballasting is used. When driving:

- (1) Use the fastest ground speed consistent with load and minimum wheel spin. This results in an economical fuel consumption. Where possible, pull a lighter load at a higher ground speed.
- (2) In bad conditions, do not operate in too high a gear, this will cause engine 'lugging' (the engine is lugging when it will not respond to a throttle increase). Choose the gear ratio and throttle control carefully.
- (3) Unless driving on a road when a higher drawbar load is not required the four wheel drive should always be engaged. The drive selection must always be operated when the tractor is stationary.



Figure 6

To engage the front wheel drive, push the dog clutch operating handle firmly down as shown in Figure 6.



Figure 7

To disengage the front wheel drive, pull the dog clutch operating handle firmly up as shown in Figure 7.

Caution: As engine braking can apply to all four wheels when four wheel drive is engaged, the front wheel drive should always be engaged when working on a slope.

The 4000-FOUR Tractor leaves the factory in standard trim, that is without any additional ballast. It should be remembered, however, that the driven front axle adds weight to the front of the tractor.

In standard trim the tractor can be used for a variety of applications, depending of course on soil conditions and the type of equipment used. In the interest of fuel economy and to reduce weight as much as possible, to lessen compaction, the tractor should be operated with just enough ballast to undertake the particular operation without excessive wheel spin.

For high drawbar pulls and with heavy mounted equipment, it will be found necessary to add weight to the tractor in the form of front wheel weights and radiator weights. If increased tractor weight is required, this can be added in the form of water ballast to front and rear tyres.

Should excessive wheel spin occur adopt the following procedure until it is eliminated:

- (1) Check tyre pressures (12 to 14 lb p.s.i. is the pressure recommended for normal farm operation). If necessary reduce to a lower level. Ensure that front tyres are inflated equally as on the rear.
- (2) Confirm that the tractor is carrying the right ballast.
- (3) Close the throttle setting until 1400 r.p.m. is indicated.

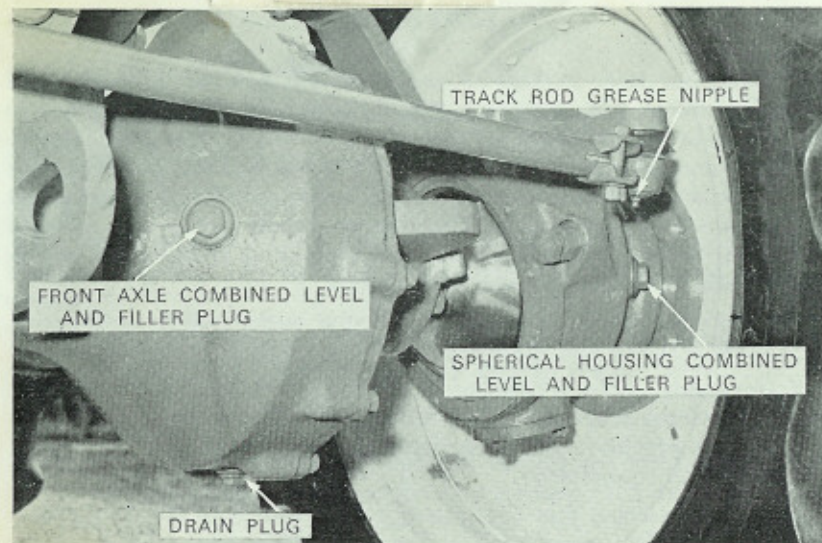


Figure 8

- (5) *Power assisted steering.* With the engine stopped and the wheels straight ahead position, the level should reach the bottom of the filler neck. Figure 2d.
- (6) *Air cleaners (oil bath type).* Remove the air cleaner bowl securing nut and check the oil and dirt level in both cups. Drain the oil and clean the cups if the dirt level is more than 0.25 in. (6 mm) deep. Refill both cups to the proper level. Do not overfill. During extremely dusty conditions check the bowls at least once daily. Figure 4.

To inspect the radiator chaff screen loosen the thumbscrew securing the air cleaner retaining band, and remove the inner cup from the bowl, Figure 5, and examine the oil and dirt level. Refill the cup and bowl with clean engine oil to the correct level having cleaned out dirt and refit.

Caution

In severe dust or chaff condition inspect the air cleaners twice daily, servicing as required. Care should be taken to avoid spilling oil on to radiator fins as this could cause dirt to accumulate restricting the passage of air thus reducing the effective cooling.

Radiator Coolant

Check the coolant level in the radiator and top up if necessary. Caution when the engine is very hot, great care must be exercised in removing the

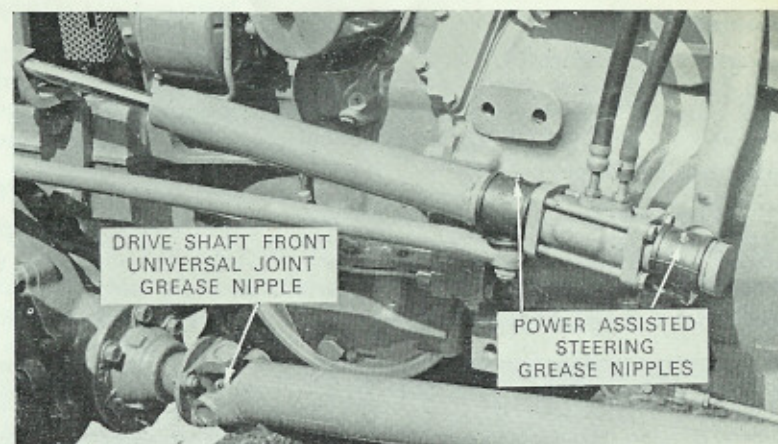


Figure 9

radiator cap. Top up to the correct level, using anti-freeze of the correct strength when necessary.

Wheels Nuts

During the first 50 hours of operation check all wheels nuts for tightness.

Battery Electrolyte

Check level and top up if necessary with distilled water. Figure 7, Ford Manual.

Tyre Pressures

Check tyre pressures which should normally be 12-14 lb. Inspect walls of tyres for damage also for cut treads.

EVERY 50 HOURS

Repeat the 10 hour service.

Change engine oil and replace the filter element.

Check battery electrolyte level and top up if necessary.

Fuel filter, carry out service as Ford Manual, section G3.

Clutch Release Bearing

Screw down cup greaser (Ford Manual, F12) one half turn, using high melting point grease. (See Lubrication Recommendation).

Greasing Points

Universal joints, Figure 10.

Track rod, Figure 8.

Front axle pivots, Figure 9(d), Ford Manual.

Hydraulic lift linkage.

Clutch pedal pivot.

Power steering, Figure 9.

Handbrake cross shaft and lever extension tube.

Differential lock pedal support.

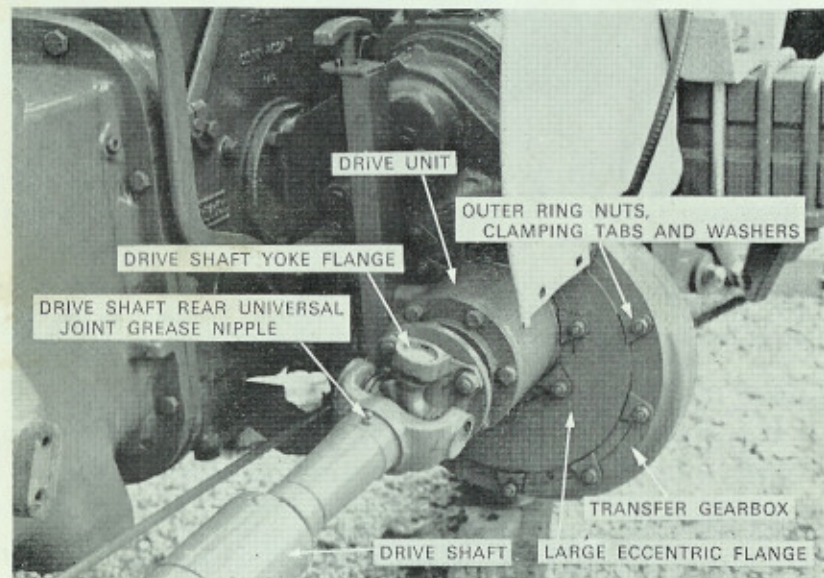
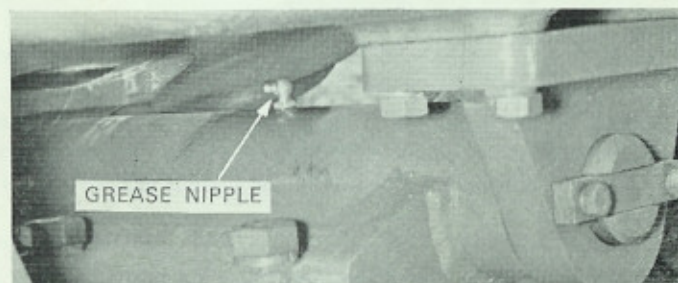


Figure 10



EVERY 150 HOURS

Repeat 50 hour service.

Check and if necessary adjust the fan belt tension as Ford Manual.

Power assisted steering reservoir on pump, check oil level, Figure 16(b), Ford Manual.

EVERY 600 HOURS

Repeat 150 hour service.

Air cleaner (oil bath type), remove assembly clean in suitable solvent and refill with clean oil to the correct level.

Engine tappet clearances, check and adjust if necessary as per Ford Manual, section G.

Fuel injectors, swing out battery tray, remove injectors, these should be checked by an authorised Ford dealer.

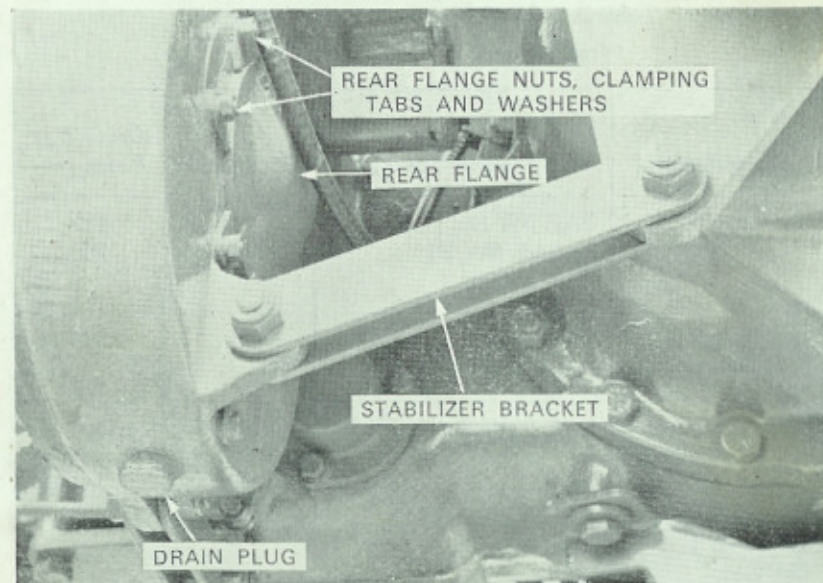
Fuel filter, carry out service as per Ford Manual, section G3.

EVERY 1200 HOURS OR ANNUALLY (whichever occurs first)

Repeat the full service for 600 hours.

Drain oil and replace with oil of correct specification replacing the filter elements where fitted:

Engine, Front Axle Unit, Transmission, Lift Linkage, Power Assisted Steering and Rear Axle Unit.



LUBRICANTS

The recommended lubricants are listed in the following tables:

Table 1. Recommended assembly lubricants

Assembly	Lubricant
Transmission: Eight speed gear box Select-O-Speed gearbox	SAE 20W/30 or SAE 80 EP Ford Oil Specification ESN-M2C41-A
Rear axle	Ford Oil Specification ESN-M2C53A or ESEN-M2C86A
Front axle	SAE 80 EP
Steering box	SAE 80 EP
Power steering reservoir	SAE 10 (antifoam)
Belt pulley	SAE 20W/30 or SAE 80 EP

Table 2. Recommended engine lubricating oils
(sulphur content less than one percent)

Temperature	Oil Viscosity and Type	A.P.I. Classification	Oil Change Period (hr)
Below 10°F (-12°C)	SAE 5W Supplement I or SAE 5W/20 Supplement I	DM DM	150 150
10°F to 40°F (-12°C to 4°C)	SAE 10W Series III	DS	300
32°F to 90°F (0°C to 32°C)	SAE 20W Series III	DS	300
Consistently above 75°F (24°C)	SAE 30 Series III	DS	300

NOTE 1

When using diesel fuel with sulphur content between 1% and 1.3%.

Use oils listed above as appropriate for temperature range applicable but change lubricating oil at the following periods:

All Supplement I DM type oils—change every 100 operating hours.

All Series III DS type oils—change every 150 operating hours.

NOTE 2

When using diesel fuel with sulphur content of more than 1.3%.

This is not recommended but where it is the only fuel available use Series III type oils only. Use same grades of Series III oils as listed above as appropriate for temperature range applicable but change oil every 150 operating hours.

CAUTION

Where operation is at temperatures below 10°F in the winter and above 10°F in the summer and hence it is required to change from a Supplement I oil to a Series III oil or vice versa, the following first oil and oil filter change should be at half the normal specified period. Subsequent changes thereafter should be at the normal specified period.

MECHANICAL MAINTENANCE

THIS section contains only the Mechanical Maintenance information for assemblies and components which have been developed by County for your 4000-FOUR.

For the standard Ford content reference should be made to the Ford 4000 Operator's Handbook.

When it becomes necessary to fit new tyres, the size of the replacements should be identical to those originally fitted. The ratio of the transfer gearbox is determined by the tyre size (see the appropriate section of the Technical Specification). If the tyre sizes are wrong for the ratio, undue tyre wear will occur. If it is required to change the tyre sizes, change the transfer gearbox ratio if it is necessary.

Before fitting tyres or wheels other than those originally fitted on the tractor, consult County Commercial Cars Limited.

Inspect the tyres regularly to ensure that the tyre wear is evenly distributed. Running a tractor with a new set and old set of tyres, front or rear, will cause undue wear to the new set.

Ensure that the tyres are inflated to pressures suitable for the operating conditions.

Front Wheel Steering Stops

Steering stop bolts (Figure 13) are provided on the forward and rear inner faces of both the spherical housings and these act on cast lugs incorporated in the main front axle assembly.

Should adjustment become necessary:

- (1) Position a trolley jack under the centre of the front axle and raise until the wheels are clear of the ground.
- (2) Turn the front wheels on the lefthand lock and adjust the rear lock stop bolt on the lefthand wheel so that the maximum lock is 33° to the centre line of the tractor then adjust the righthand front lock stop bolt so that it contacts the corresponding stop lug. It is important that both these lock stop bolts are in contact with the axle stop lugs when the wheels are on full lock.
- (3) Turn the wheels to the righthand lock and repeat the above procedure, again adjusting the appropriate steering stop bolts to give a maximum steering lock of 33° .

- (4) Check the steering stop bolt lock nuts for tightness.
- (5) Lower the tractor to the ground and remove the jack.

Front Wheel Alignment

The front wheels should always be parallel and this point should be checked regularly. If adjustment is necessary first slacken off the track rod clamp securing bolts at each end of the track rod which has opposed threaded ends and rotate the rod until the correct wheel alignment is achieved.

Before tightening the clamp bolts it is important to ensure that the track rod ends are correctly aligned.

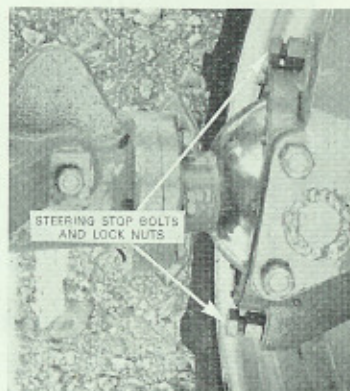


Figure 13.

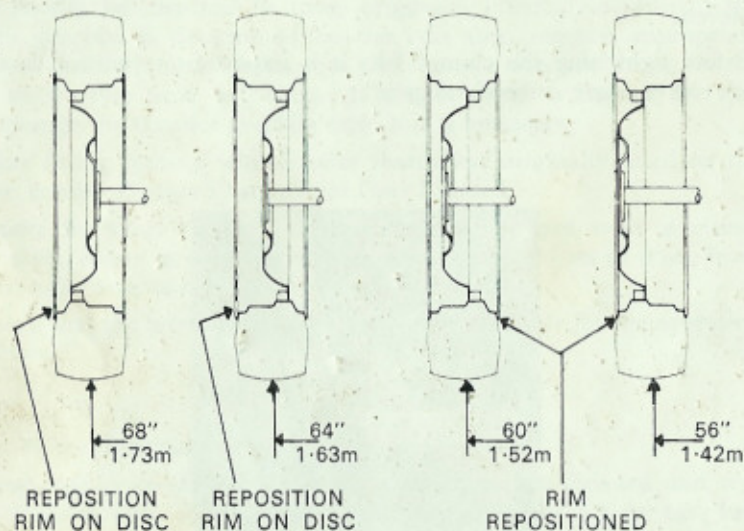
Track Adjustment

Front Wheels. The front wheels may be set to a track of 58 in. (1.47 m) or 66 in. (1.68 m) by changing the position of the wheels as follows: Track 58 in. (1.47 m) with wheel dishing facing inwards (as built).

To increase the track to 66 in. (1.67 m). Fit the nearside wheel on the offside and the offside wheel on the nearside, ensuring that the wheel dishings are now facing outwards, this ensures that the tyre treads remain correct.

Rear Wheels. The rear wheel track settings are adjustable in 4 in. (10.2 cm) increments from 56 in. (1.42 m) to 68 in. (1.73 m) by changing the position of the wheel discs and the rims to any of the positions shown below.

**INTERCHANGING REAR WHEEL ASSEMBLIES
GIVE THESE COMBINATIONS**



CHANGING THE TRANSFER GEARBOX RATIO

If the tractor type sizes are changed, it may be necessary to change the transfer gearbox ratio. The ratio appropriate to the selected tyre sizes is accommodated in the transfer gearbox (Figure 10) by an eccentrically adjustable device that locates and retains the final gear in the correct mesh with the fixed location gears. Details of the front wheel drive final transmission are contained in the specification section of this Manual. Details of the correct driven gears for the ratio required to suit the selected tyre sizes are contained on a legend plate fixed to the top of the transfer gearbox (Figure 1). They are listed in Table 3. For a rear axle ratio of 3.5:1 use 27 and 28 tooth gears; for a rear axle ratio of 6.666:1 use 51 and 54 tooth gears.

Table 3. Driven gears for tyre size combinations

Gears (Teeth)	Tyre Combination		Gears (Teeth)	Tyre Combination	
	Front	Rear		Front	Rear
27	9.5/ 9-24	12.4/11-36	27	9.5/ 9-24	16.9/14-30
27 or 51	9.5/ 9-24	13.6/12-36	28 or 54	11.2/10-24	12.4/11-36
27 or 51	9.5/ 9-24	18.4/15-30	28	11.2/10-24	13.6/12-36
27	9.5/ 9-24	12.4/11-38	28	11.2/10-24	18.4/15-30
27 or 51	11.2/10-24	13.6/12-38	28	11.2/10-24	12.4/11-38
27 or 51	11.2/10-24	16.9/14-34	54	11.2/10-24	16.9/14-30

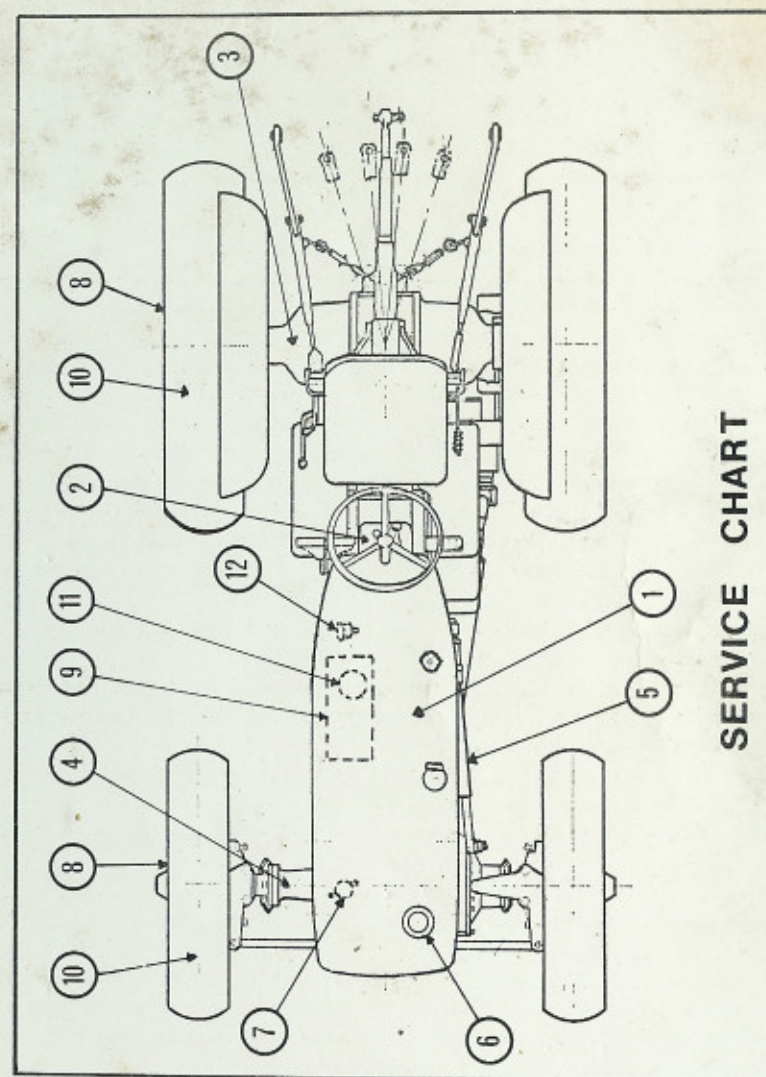
To prepare to change the driven gear ratio to suit the selected tyre sizes, proceed as follows:

- (1) Remove the transfer box drain plug and drain the oil (Figure 12).
- (2) Remove the footplate, from the fender and fixing bracket.
- (3) Loosen the shear pin retaining clip on the companion flange to the rear of the drive shaft. Move the shear pin retaining clip rearwards to permit the fixing bolts to be removed from the drive shaft yoke flange (Figure 10).
- (4) Lower the drive shaft from the transfer gearbox drive unit.
- (5) Remove the ten outer 5/16 in. UNF nuts, clamping tabs and washers from the outer ring of studs of the transfer gearbox (Figure 10). Withdraw the drive unit by using the two, 5/16 in. UNC threaded, withdrawal positions. To withdraw, insert a 5/16 in. bolt in each withdrawal position and tighten. The action of tightening the bolts pulls the assembly out.
- (7) Transfer the drive unit to a bench.

- (8) Remove the driven gear from the drive unit using a suitable withdrawal tool (preferably three leg.)
- (9) Remove eight inner 5/16 in. UNF nuts, clamping tabs and washers connecting the drive unit to the large eccentric flange (Figure 10) and tap the drive unit free from the flange.
- (10) Remove nuts, washers and tabs, then remove rear flange (Figure 12).

To re-assemble, proceed as follows:

- (1) Refer to Table 3 of this Manual or the legend plate on the transfer gearbox and select the correct drive gear for the ratio required.
- (2) Renew the drive unit gasket and apply jointing compound.
- (3) Replace the drive unit onto the large eccentric flange, ensuring that the drive unit is located in the correct dowel locating position appropriate to the selected gear. The positions are marked on the face of the flange adjacent to the dowel holes.
- (4) Replace the eight 5/16 in. nuts, clamping tabs and washers.
- (5) Fit bush and bearing into track (assemble with flange innermost) and ball bearing if appropriate to the selected driven gear.
- (6) Ensure that the front wheel drive dog clutch is in the up (neutral) position (Figure 3).
- (7) Position the selected gear in the drive unit and tap home into the bearing with a soft mallet.
- (8) Renew the large eccentric flange gaskets and apply jointing compound, ensuring that the hole in the gasket coincides with correct dowel hole for the selected gear.
- (9) Locate drive unit ensuring that it is correctly positioned with the dowel in the appropriate hole.
- (10) Replace the ten 5/16 in. UNF nuts, clamping tabs and washers to the outer ring of the transfer gearbox casting (Figure 10).
- (11) Renew the rear flange gasket and apply jointing compound, ensuring that the hole in the gasket coincides with the correct dowel hole for the selected gear.
- (12) Confirm that the dowel is fitted to the transfer gearbox rear face.
- (13) Locate the rear flange (Figure 12) onto the transfer gearbox, confirming that the roller bearing is positioning itself freely onto the inner track mounted on the selected gear.
- (14) Replace the eight 5/16 in. nuts, clamping tabs and washers.
- (15) Locate the drive shaft on the companion flange and replace the four fixing bolts.
- (16) Re-position the shear pin retaining clip and tighten.
- (17) Replace the transfer gearbox drain plug (Figure 10).
- (18) Refill the rear axle with correct oil (refer to the Lubricant Table) to the level plug. Replace the filler and level plugs.
- (19) Replace the footplate to the fixing brackets and fender.



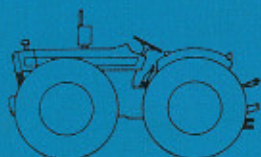
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