



2120 Tractor



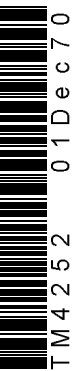
JOHN DEERE

TECHNICAL MANUAL 2120 Tractor

TM4252 (01Dec70) English

John Deere Werke Mannheim
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CONTENTS

SECTION 10 — GENERAL INFORMATION

- Group 5 - Specifications
- Group 10 - Pre-delivery, delivery and after-sales inspections
- Group 15 - Lubrication and service
- Group 20 - Engine and tractor tune-up and adjustment
- Group 25 - Removal and installation of assemblies

SECTION 20 — ENGINE

- Group 5 - General information, diagnosing malfunctions
- Group 10 - Cylinder head, camshaft and balancer shafts
- Group 15 - Cylinder block, liners, pistons and connecting rods
- Group 20 - Crankshaft, crankshaft bearings and flywheel
- Group 25 - Timing gear train
- Group 30 - Oil pump, oil pressure regulating valve and oil filter
- Group 35 - Engine cooling system
- Group 40 - Speed control

SECTION 30 — FUEL SYSTEM

- Group 5 - Diagnosing malfunctions
- Group 10 - Fuel tank, transfer pump, fuel filters
- Group 15 - ROTO-DIESEL injection pump
- Group 20 - ROOSA-MASTER injection nozzles
- Group 25 - Cold weather starting aids

SECTION 40 — ELECTRICAL SYSTEM

- Group 5 - Diagnosing malfunctions
- Group 10 - Components and wiring diagrams

SECTION 50 — POWER TRAIN

- Group 5 - Engine clutch and clutch linkage
- Group 10 - HIGH-LOW shift unit
- Group 15 - Transmission
- Group 20 - Differential assembly
- Group 25 - Final drives
- Group 30 - Continuous-running power shaft
- Group 35 - Independent power shaft

SECTION 60 — FRONT AXLE, STEERING AND BRAKES

- Group 5 - Front axle
- Group 10 - Steering
- Group 15 - Brakes

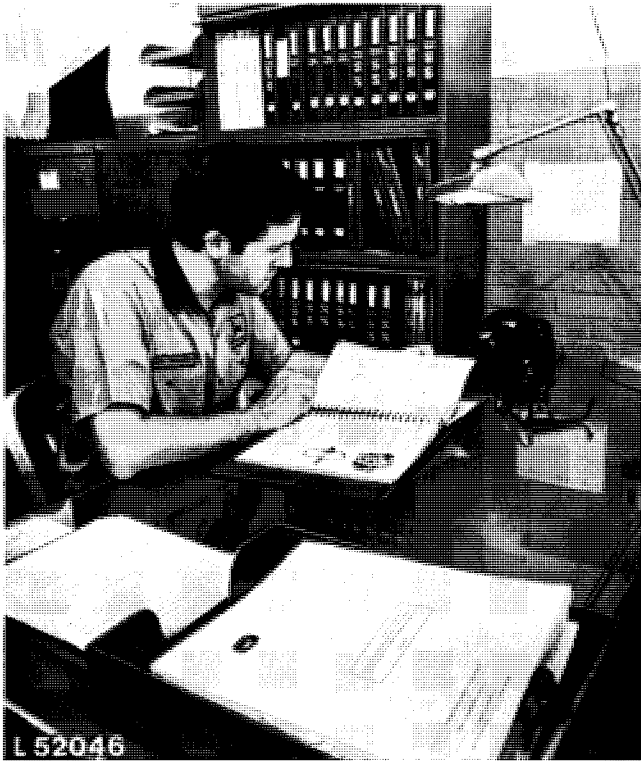
SECTION 70 — HYDRAULIC SYSTEM

- Group 5 - General information, diagnosing malfunctions, pressure tests
- Group 10 - Oil reservoir, filter, valves and oil cooler
- Group 15 - Hydraulic pump and transmission oil pump
- Group 20 - Rockshaft
- Group 25 - Selective control valves (spool type)
- Group 30 - Selective control valve (poppet valve type)
- Group 35 - Remote hydraulic cylinder

SECTION 80 — MISCELLANEOUS

- Group 5 - Belt pulley
- Group 10 - DE LUXE seat
- Group 15 - Front and rear wheels
- Group 20 - Hydraulic hitch
- Group 25 - Roll guard

INTRODUCTION



L 52046

Use FOS Manuals for Reference

This technical manual is part of a twin concept of service:

- FOS Manuals – for reference
- Technical Manuals – for actual service

The two kinds of manuals work as a team to give you both the general background and technical details of shop service.

Fundamentals of Service (FOS) Manuals cover basic theory of operation, fundamentals of trouble shooting, general maintenance, and basic types of failures and their causes. FOS Manuals are for training new men and for reference by experienced men.

Technical Manuals are concise service guides for a specific machine. Technical Manuals are on-the-job guides containing only the vital information needed by a journeyman mechanic.



When a serviceman should refer to a FOS Manual for more information, a FOS symbol like the one at the left is used in the TM to identify the reference.



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Use Technical Manuals for Actual Service

Some features of this technical manual:

- *Table of contents at front of whole Manual.*
- *Contents at front of each Section*
- *Specifications at end of each Group*
- *Special tools at end of each Group*

This technical manual was planned and written for you – a journeyman mechanic. Keep it in a permanent binder in the shop where it is handy. Refer to it whenever in doubt about correct service procedures or specifications.

Using the technical manual as a guide will reduce error and costly delay. It will also assure you the best in finished service work.

Section 10

GENERAL INFORMATION

CONTENTS OF THIS SECTION

GROUP 5 — SPECIFICATIONS

| | Page |
|---|------|
| Serial numbers | 5-2 |
| Model numbers | 5-2 |
| Engine | 5-2 |
| Engine clutch | 5-2 |
| Electrical system | 5-2 |
| Transmission | 5-3 |
| HIGH-LOW shift unit | 5-3 |
| Differential and final drives | 5-3 |
| Differential lock | 5-3 |
| Powershafts | 5-3 |
| Hydraulic system | 5-3 |
| Hydraulic steering | 5-3 |
| Manual steering | 5-3 |
| Hydraulic brakes | 5-3 |
| Handbrake | 5-3 |
| Capacities | 5-3 |
| Travel speeds | 5-3 |
| Front and rear wheels | 5-3 |
| Dimensions and weights | 5-3 |

GROUP 10 — PREDELIVERY, DELIVERY AND AFTER-SALES INSPEC- TIONS

| | |
|----------------------------------|------|
| Predelivery inspection | 10-1 |
| Delivery inspection | 10-4 |
| After-sales inspection | 10-4 |

GROUP 15 — LUBRICATION AND PERIODIC SERVICE

| | Page |
|--|------|
| Lubrication and periodic service | 15-1 |

GROUP 20 — ENGINE AND TRACTOR TUNE-UP AND ADJUSTMENT

| | |
|--|------|
| General information | 20-1 |
| Preliminary engine testing | 20-1 |
| Engine checks and adjustment | 20-2 |
| Performance test | 20-3 |
| Tractor adjustment | 20-3 |
| Standard torques | 20-5 |
| Special tools | 20-5 |

GROUP 25 — REMOVAL AND INSTALLATION OF ASSEMBLIES

| | |
|---|-------|
| Separating between engine and tractor front end | 25-1 |
| Removal and installation of engine | 25-3 |
| Removal and installation of clutch housing | 25-5 |
| Removal and installation of final drives | 25-7 |
| Removal and installation of rockshaft | 25-8 |
| Torques for hardware | 25-9 |
| Special tools | 25-10 |

Group 5

SPECIFICATIONS

SERIAL NUMBERS

The engine serial number is stamped into the name plate at the lower right of the front cylinder block.

NOTE: If ordering engine parts, indicate all digits of the serial number on the name plate.

The name plate showing the tractor serial number is located on the right-hand side of the front support.

NOTE: If ordering tractor parts, (excluding engine parts), indicate all digits of the serial number on the name plate.

MODEL NUMBERS

The injection pump, injection nozzles, the generator (alternator), starter and the main hydraulic pump have model numbers to facilitate identification of different makes of a given unit.

SPECIFICATIONS

ENGINE

| | |
|--|------------------------------------|
| Number of cylinder | 4 |
| Cylinder liner bore | 4.02 in. (102 mm) |
| Stroke | 4.33 in. (110 mm) |
| Displacement | 219 cu.in. (3590 cm ²) |
| Compression ratio | 16.7 : 1 |
| Maximum torque at 1500 rpm | 170 ft.lbs. (23.5 mkg) |
| Firing order | 1 - 3 - 4 - 2 |
| Valve clearance (engine hot or cold) Intake valve 0.014 in. (0.35 mm) Outlet valve 0.018 in. (0.45 mm) | |

| | |
|--|---|
| Fast idle | 2650 rpm |
| Slow idle | 650 rpm |
| Working speed range | 1500 to 2500 rpm |
| Flywheel horsepower ¹ at 2500 rpm | |
| Net | 67 HP (68 PS) |
| Gross ² | 71 HP (72 PS) |
| PTO horsepower ³ | 60 HP (61 PS) (at 2500 rpm engine speed and 650 or 1210 rpm powershaft speed) |

ENGINE CLUTCH

Dual dry disk clutch, foot operated.

Single dry disk clutch with torsion damper (isolator), foot-operated (on tractors with independent PTO)

ELECTRICAL SYSTEM

| | |
|-------------------------------------|-----------------------|
| Batteries | 2 x 12 Volts, 55 Ah |
| Starter | 12 Volts, 4 HP (4 PS) |
| Alternator | 12 Volts, 28 A |
| Generator | 12 Volts, 11 A |
| Battery terminal grounded | negative |

1) 1 PS = 1 ch = 0.736 KW; 1 KW = 1.36 PS = 1.36 ch; 1 PS = 0.986 HP; 1 HP = 1.01 PS

2) Less water pump, fan, generator (alternator), air cleaner and muffler.

3) With the engine run in (above 100 hours of operation) and having reached operating temperature (engine and transmission); measured by means of a dynamometer. Permissible variation \pm 5%.

TRANSMISSION

Collar shift transmission with helical cut gears.

This transmission is available in three variations:

- 8 speed transmission with parking lock, without independent hand brake;
- 8 speed transmission without parking lock and with independent hand brake;
- 8 speed transmission without parking lock, with blocked 8th gear and independent hand brake.

With this transmission 8 or 7 forward and 4 reverse speeds are available.

HIGH-LOW SHIFT UNIT

Hydraulically controlled reduction gear which can be shifted under load, with "wet" multiple disk clutch and "wet" multiple disk brake. Allows reduction of the individual gear speeds by 26%.

DIFFERENTIAL AND FINAL DRIVES

Planetary reduction gear and differential with spiral bevel gears.

DIFFERENTIAL LOCK

Hand or foot operated; spring-loaded out of engagement.

POWER SHAFTS

Continuous Running Power Shafts

The power shafts are independent of the transmission if the tractor is equipped with a dual stage engine clutch.

Independent Power Shafts

Independent of transmission, can be engaged and disengaged under load.

The independent power shaft is engaged by a hydraulically operated disc clutch. Disengaging the clutch is achieved by operating the hydraulically actuated band type brake.

Power Shaft Speeds (in rpm)

| Engine Speed in rpm | 540 rpm shaft | 1000 rpm shaft |
|---------------------|---------------|----------------|
| 650 | 169 | 315 |
| 2067 | 538 | 1000 |
| 2075 | 540 | 1004 |
| 2500 | 650 | 1210 |
| 2650 | 689 | 1283 |

HYDRAULIC SYSTEM

Closed center, constant pressure system; also includes rockshaft, power steering and selective control valves.

System pressure 2220 to 2280 psi
 (156 to 160 kg/cm²)

Pump 4 or 8-piston pump driven by the engine

POWER STEERING

The steering system is a "closed center" type incorporated by the hydraulic system and supplied with oil by the main hydraulic pump. It is connected to the front wheels by means of a steering linkage.

MANUAL STEERING

The manual steering is a recirculating ball bearing, worm and nut type. A number of steel balls between ball nut and steering wheel shaft provide for positive engagement of steering wheel and steering linkage.

HYDRAULIC BRAKES

The disk brakes run in an oil bath and are hydraulically controlled.

HANDBRAKE

Band-type locking brake acting on differential.

CAPACITIES

| | Imp. Gals. | US Gals. | Liters |
|--|------------|----------|--------|
| Fuel tank | 16.25 | 19.5 | 73.8 |
| Cooling system | 2.5 | 3.0 | 11.4 |
| Engine crankcase incl. filter | 1.25 | 1.5 | 5.7 |
| Transmission-hydraulic system | | | |
| Dry system | 7.9 | 9.5 | 36.0 |
| At service intervals . . . | 6.5 | 7.4 | 28.0 |
| Oil-bath air cleaner | 0.22 | 0.26 | 1.0 |
| Belt pulley | 0.25 | 0.30 | 1.1 |

TRAVEL SPEEDS

See Operator's Manual

FRONT AND REAR WHEELS

For tire sizes, treads, inflation pressure and weights see Operator's Manual.

DIMENSIONS AND WEIGHTS

See Operator's Manual.

Group 25

SEPARATING ASSEMBLIES

SEPARATING BETWEEN ENGINE AND TRACTOR FRONT END

REMOVAL

For safety disconnect ground strap (cable) from battery.

Remove front end weights (if equipped).

Remove radiator and fuel tank caps. Remove radiator side grilles and hood. Install radiator and fuel tank caps.

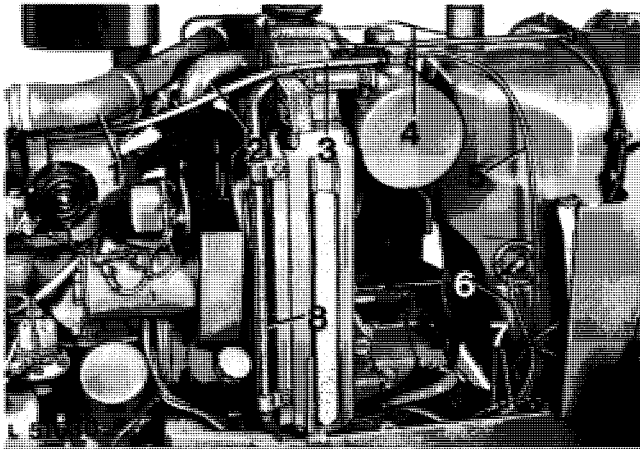


Fig. 1 — Separating between Tractor Front End and Engine

- 1 Air intake hose
- 2 Upper water hose
- 3 Leak-off and vent line
- 4 Fuel return line
- 5 Leak-off and vent line
- 6 Cable of fuel gauge sending unit
- 7 Distributor
- 8 Hydraulic line (on tractors without oil cooler)

Disconnect air intake hose (see 1, fig. 1) at engine intake manifold and air cleaner.

Disconnect leak-off and vent lines 3 and 5 at hydraulic oil reservoir.

Remove support rod at top of radiator. Disconnect fuel return line 4 at fuel tank.

Disconnect headlight wires at distributors 7.

Drain coolant and disconnect upper and lower water hoses at radiator.

Only on tractors without oil cooler: Disconnect hydraulic oil line (see 8, fig. 1) at top and bottom hose and remove.

Only on tractors equipped with oil cooler: Remove hose elbow between hydraulic oil reservoir and oil cooler at oil cooler end. Disconnect return oil line at bottom of oil cooler.

NOTE: Plug lines and openings immediately with plugs or caps to prevent loss of oil and entering of dirt into the system.

Remove screws securing fan shroud to radiator and slide over fan to the rear.

Remove screws securing radiator to front axle support and lift out radiator to the left of tractor.

Close fuel shut-off valve at bottom of fuel tank.

Disconnect fuel inlet line at fuel tank and fuel transfer pump. Remove transfer pump and fuel inlet line.

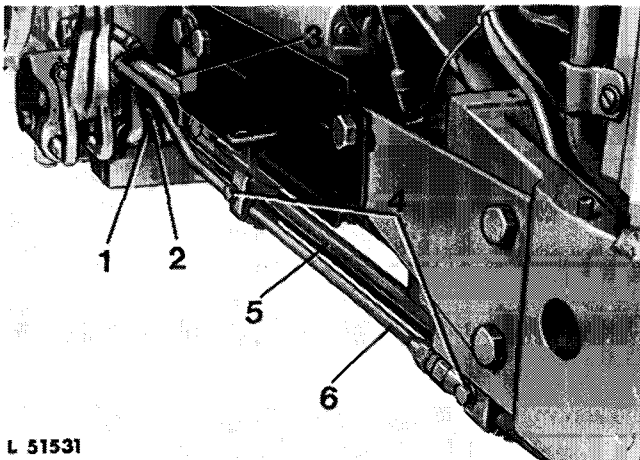


Fig. 2 — Disconnecting Hydraulic Lines

- 1 Retainer
- 2 Cap screw
- 3 Return line to transmission case
- 4 Pipe clamps
- 5 Hydraulic pump inlet line
- 6 Hydraulic pump pressure line

Remove side frames.

Remove pipe clamps (see 4, fig. 2).

Unscrew cap screw 2 and remove retainer 1 which supports the hydraulic pump inlet line 5 and return line 3 of oil cooler (oil reservoir if not equipped with oil cooler).

On tractors not equipped with HIGH-LOW transmission: Take care that the check valve installed in hydraulic pump inlet line 5 is not lost when the inlet line is removed.

Disconnect pressure line 6 at connector situated at front of engine.

Disconnect drag link at bell crank.

Remove securing screw of hydraulic pump drive shaft.

Securely support rear of tractor under clutch housing by placing assembly stand 19.58-90.619 under transmission case.

Insert wooden blocks between front axle and front support to prevent the latter from slipping sideways.

Suspend front of tractor to a suitable hoist or support with assembly stand 19.58-90.618.

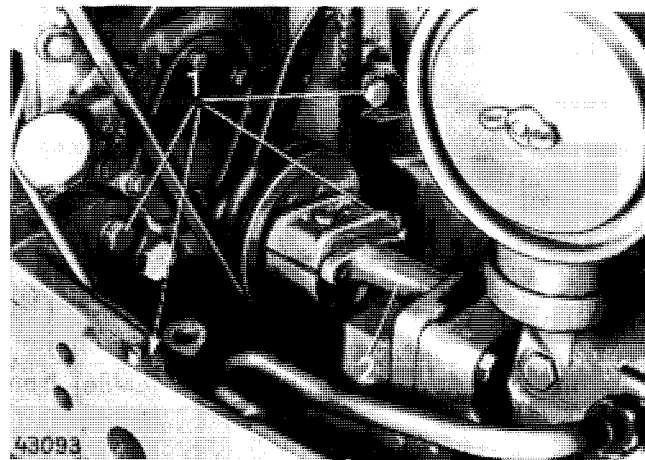


Fig. 3 — Attaching Points of Tractor Front End

- 1 Attaching screws of front axle support
- 2 Hydraulic pump drive shaft

Remove cap screws (see 1, fig. 3) of front support and separate front end from engine. Take measures to prevent front of tractor from tipping forwards. (Drain fuel tank if it contains too much fuel or support front end of tractor).

INSTALLATION

Make sure woodruff key is installed in shaft of hydraulic pump.

Move front of tractor towards engine.

Engage pump shaft in hydraulic pump drive shaft and at the same time connect return line of oil cooler (reservoir if not equipped with oil cooler). Slide hydraulic pump inlet line into clutch housing and tighten both lines (see fig. 2). Tighten cap screw (see 2, fig. 2) securing retainer 1 to the specified torque.

CAUTION: On tractors not equipped with HIGH-LOW transmission: Ensure check valve is inserted in hydraulic pump inlet line before it is installed.

Attach front end of tractor to engine, using cap screws (see 1, fig. 3). Tighten cap screws to specified torque. Tighten hydraulic pump drive shaft cap screw to specified torque.

NOTE: Do not tighten securing screw of hydraulic pump drive shaft until tractor front end is secured to engine.

Install fuel transfer pump and connect fuel lines.

Make sure transfer pump inlet line is behind and below fuel pressure line.

Open fuel shut-off valve.

Connect cable to fuel gauge sending unit.

Connect headlight cables to junctions.

Lift and slide radiator into location from the left side of tractor. Slide fan shroud forward over radiator, insert and tighten set screws. Secure radiator to front axle support. Install upper and lower water hoses.

Only on tractors not equipped with oil cooler: Connect oil line to oil reservoir and tighten both hose clamps (see fig. 1).

Only on tractors equipped with oil cooler: Connect hose elbow between hydraulic oil reservoir and oil cooler at top of oil cooler and return line at bottom of oil cooler.

Connect air vent lines to hydraulic reservoir.

Connect hydraulic pump pressure line and install line clamps (see fig. 1).

Connect air intake pipe at manifold and air filter.

Attach drag link to bell crank and tighten castellated nut to specified torque.

Install hood and radiator side grilles.

Fill radiator with clear, soft water, adding an anti-freeze-rust inhibitor mixture (see operators manual).

Connect ground strap to battery.

CAUTION: Always connect ground strap to negative(-) pole of battery.

Start engine and check fuel lines, hydraulic lines and water hoses for leaks.

REMOVING AND INSTALLING ENGINE

NOTE: For most engine service operations the engine need not be removed. However, if the crankshaft has to be removed or in case of major overhaul, remove engine.

REMOVAL

For safety disconnect ground strap (cable) from battery.

Separate front of tractor from engine, as explained previously.

On tractors equipped with power steering: Disconnect power steering pressure line at steering housing and hydraulic pump pressure line.

On tractors equipped with an alternator: Disconnect cable between alternator and regulator by removing plug at alternator. Immediately connect terminals D+, D and DF with bridge piece supplied with the tractor. Disconnect terminal B+ at alternator.

On tractors equipped with a generator: Disconnect cable to starter and generator indicator lamp at regulator.

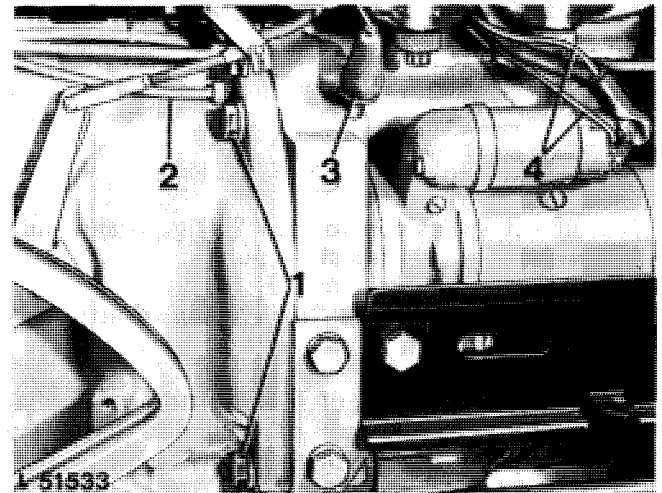


Fig. 4 — Separating between Engine and Clutch Housing, R.H. Side

- 1 Engine attaching screws
- 2 Flexible shaft of tractorometer
- 3 Oil pressure switch
- 4 Starter cable

Disconnect all cables at starter (see fig. 4). Disconnect oil pressure switch cable 3 and cable at signal horn.

Disconnect flexible shaft of tractorometer 2 at clutch housing and camshaft. If necessary, renew gasket.

On tractors equipped with starting fluid adapter: Disconnect starting fluid line at intake manifold.

On tractors equipped with Thermostart aid: Disconnect cable at heater of intake manifold.

Disconnect air vent line of hydraulic oil reservoir at cylinder head cover.

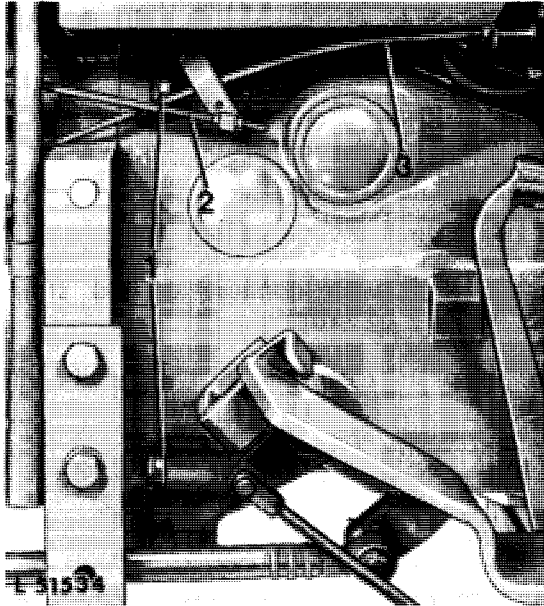


Fig. 5 — Separating between Engine and Clutch Housing, L.H. Side

- 1 Engine attaching screws
- 2 Speed control rod
- 3 Shut-off cable

Disconnect speed control rod 2 (fig. 5) and shut-off cables 3 at fuel injection pump.

On tractors with muffler facing downwards: Remove muffler.

Screw retaining screw of flexible tube of coolant temperature gauge out of cylinder head and withdraw from cylinder head.

Remove left dash panel as well as both batteries.

Remove cap screws attaching dashboard to flywheel housing.

Attach JD 244-1 and 244-2 engine lifting eyes to cylinder head and attach engine to a suitable hoist.

Remove cap screws 1 (figs. 4 and 5) attaching flywheel housing to clutch housing and both cap screws securing oil pan to clutch housing.

Lift engine out to the front by means of the hoist.

CAUTION: Move engine properly in line with drive shaft and hollow drive shaft until these shafts come loose of the driven disks of the engine dual-stage clutch, or free of driven disk and torsion damper if tractor is equipped with a single-stage clutch.

INSTALLATION

Align engine properly with drive shaft and hollow drive shaft. Move engine towards rear of tractor. Align splines of both shafts with internal splines of driven disks (tractor with dual-stage clutch), or (if equipped with a single-stage clutch) with splines of driven disk and torsion damper. Align screw holes of flywheel housing with holes in clutch housing. Slide engine evenly towards clutch housing. Engage two dowels of flywheel housing in bores of clutch housing until engine is in full contact with clutch housing.

CAUTION: Make sure flywheel housing is flush against clutch housing before tightening cap screws to specified torque.

Secure oil pan to clutch housing, tightening both cap screws to the specified torque.

Attach dashboard to flywheel housing.

Connect speed control rod and shut-off cable to fuel injection pump.

Insert flexible tube of coolant temperature gauge in cylinder head and tighten retaining screw.

On tractors equipped with an alternator: Disconnect bridge piece from terminals D+, D- and DF and connect harness plug to terminals. Connect cable from starter to terminal B+ on alternator.

On tractors equipped with a generator: Connect cables from starter and generator indicator lamp to regulator.

Connect cables to starter.

Connect cables to signal horn and oil pressure warning switch.

Install both batteries.

CAUTION: Connect battery cable to positive poles of batteries.

Lubricate rubber seal of tractorometer flexible shaft and attach shaft to clutch housing (see 2, fig. 4). Make sure driving tab of flexible shaft engages in slot of camshaft. Do not tighten excessively to avoid damage to the seal resulting in leakage.

On tractors equipped with starting fluid adapter: Connect starting fluid line to intake manifold.

On tractors equipped with Thermostart aid: Connect Thermostart aid wire to heater in intake manifold.

On tractors equipped with muffler facing downward: Install muffler.

Secure oil reservoir bleed line to cylinder head cover.

Attach front of tractor to engine.

CAUTION: Connect ground strap of batteries to negative (-) poles.

NOTE: If engine has been overhauled, tune up engines as explained in group 20.

REMOVAL AND INSTALLATION OF CLUTCH HOUSING

NOTE: Separating and attaching of engine and clutch housing as well as of clutch housing and transmission case is explained below. Where the tractor is to be separated depends on the individual repair operation. If, e.g., repair work has to be carried out on the transmission, separation between the clutch housing and the transmission case will be sufficient.

REMOVAL

Disconnect battery ground strap.

Drain transmission oil.

Separate engine from clutch housing as explained under "REMOVING ENGINE", the tractor front end may remain attached to the engine.

Disconnect drag link at steering arm.

Disconnect hydraulic oil reservoir vent line (see 5, fig. 6) at connector on gear shift cover.

Remove pipe clamps (see 4, fig. 2), screws 2 and retainer 1 which secure suction line 5 of hydraulic pump and return line 3 of oil cooler (oil reservoir if not equipped with oil cooler) to front side of clutch housing.

On tractors not equipped with HIGH-LOW transmission and independent PTO: Take care not to lose check valve installed in hydraulic pump pressure line when latter is removed.

On tractors equipped with power steering: Disconnect power steering pressure line at connectors.

Remove clamp (see 6, fig. 6) and hydraulic pump pressure line 3.

Insert wooden blocks between front axle and front support to prevent front support from tipping sideways.

Suspend tractor front end and engine to a suitable hoist or support under the engine by means of assembly stand 19.58-90.618. Similarly the rear of tractor should be suspended to a suitable hoist or be supported under the transmission case by means of assembly stand 19.58-90.619.

Roll engine and tractor front end away from clutch housing.

CAUTION: Move engine properly in line with drive shaft until these shafts come loose of the driven disks of the engine dual-stage clutch, or on tractors with single-stage clutch, free of driven disk and torsion damper.

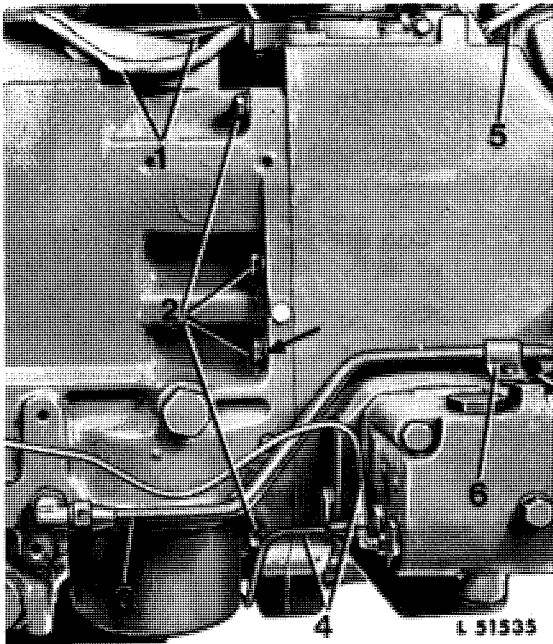


Fig. 6 — Separating between Clutch Housing and Transmission Case, R.H. Side

- | | |
|--------------------------------|-------------------------------------|
| 1 Wiring harness | 4 Brake lines |
| 2 Attaching screws | 5 Hydraulic oil reservoir vent line |
| 3 Hydraulic pump pressure line | 6 Line clamp |

Disconnect brake line (see 4, fig. 6) at master cylinder.

Remove transmission cover.

Disconnect both harnesses to rear fenders at connectors. Disconnect cable at starter safety switch and cables at stop light switch.

On tractors equipped with HIGH-LOW transmission: Remove screws (see 3, fig. 7). Disconnect connecting rod from lever shaft and remove cover 4 complete with lever shaft and control arm.

On tractors equipped with independent PTO: Before removing cover (see 4, fig. 7), move PTO shift lever in engaged position. After cover 4 has been removed, do not move PTO shift lever otherwise lock balls and springs will drop out of cover.

Remove screws attaching transmission shift cover to clutch housing. Remove gear shift cover complete with shift levers.

Remove transmission oil filter.

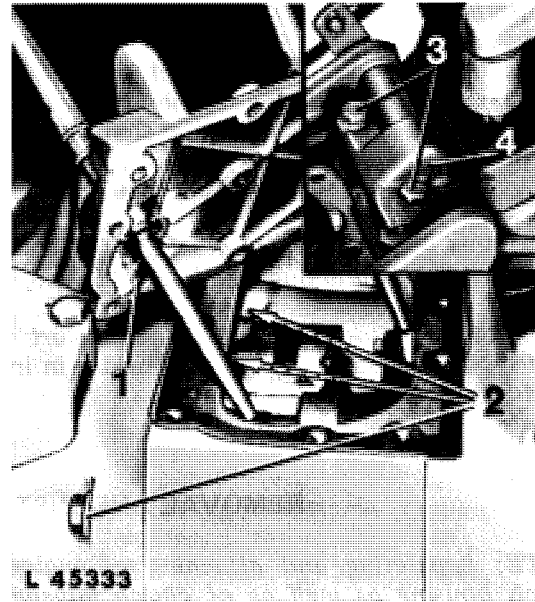


Fig. 7 — Removing Gear Shift Cover

- | | |
|-----------------------------------|--------------------|
| 1 Shift cover | 3 Attaching screws |
| 2 Clutch housing attaching points | 4 Cover |

Remove cap screws 2 (figs. 6 and 7) securing clutch housing to transmission case, and separate clutch housing from transmission case.

Discard seal rings provided between the two housings.

On tractors with continuous-running PTO: Be sure ball and spring provided on some PTO shaft types do not get lost (see section 50, group 30).

INSTALLATION

Install new seal rings in clutch housing front facing transmission case.

Slide clutch housing against transmission case.

Slide PTO drive shaft into needle bearing sleeve of front PTO shaft or, if front PTO is not provided, into needle bearing sleeve of bearing cover.

On tractors with continuous-running PTO: Make sure, spring and ball provided on some powershaft types are installed in PTO drive shaft, bearing housing or front powershaft. Align clutch housing with centerline of PTO drive shaft and slide against transmission case. Mesh powershaft gears with splines of hollow PTO drive shaft.

Make sure clutch housing is flush against transmission case before tightening cap screws to the specified torque.

NOTE: Before inserting the third retaining screw in clutch housing (see arrow, fig. 6) coat it with a film of oil-resistant sealant.

NOTE: If clutch housing has also been separated from engine, assemble as explained under "Installation of Engine."

Insert hydraulic pump inlet line (see 5, fig. 2) and oil cooler return line 3* in bore of clutch housing and secure by means of screw and retainer. Tighten screw to correct torque.

* Oil reservoir when not equipped with oil cooler.

On tractors not equipped with HIGH-LOW Shift unit: Ensure check valve is installed in feed line to hydraulic pump before connecting.

Connect hydraulic pump pressure line.

On tractors equipped with power steering: Connect power steering pressure line.

As regards further installation operations reverse removal procedure.

CAUTION: Connect ground cable of batteries to negative(-)poles.

REMOVAL AND INSTALLATION OF FINAL DRIVES

REMOVAL

NOTE: The removal of both final drives is explained below. If only one final drive is to be removed, remove only one wheel, wiring harness etc.

For safety disconnect ground strap at batteries.

Lift up rear of tractor by means of a suitable jack or hoist and remove rear wheels.

CAUTION: Support transmission safely to prevent tipping of tractor.

Disconnect both rear wiring harnesses at connectors.

Remove rear fenders and roll-over guard.

Disconnect cables at stop light switch located in left-hand rear axle housing.

Disconnect brake lines on both brake housings.

On tractors equipped with selective control valve(s): Disconnect hydraulic lines and remove two screws securing the bracket* or hydraulic manifold** onto the right-hand final drive assembly.

Cover connections and exposed openings with plastic plugs or caps to prevent particles of dirt from entering the system.

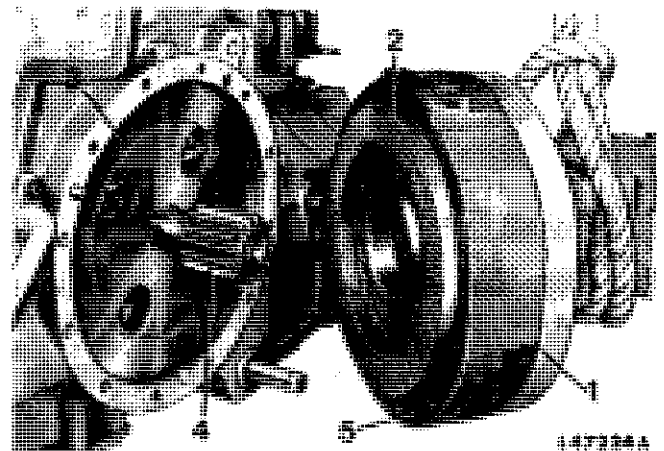


Fig. 8 — Removing Final Drive

- 1 Final drive housing
- 2 Pressure ring
- 3 Brake disk
- 4 Final drive shaft
- 5 Brake housing

Remove selective control valve(s).

* On earlier tractors

** On later tractors



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