# 2250, 2450, 2650, 2650N and 2850 Tractors

## TECHNICAL MANUAL

## 2250, 2450, 2650, 2650N and 2850 Tractors (Repair)

TM4440 (JAN-91)

John Deere Werke Mannheim
European Edition
Printed in Germany

# SUMMARY OF MOST IMPORTANT SPECIFICATIONS FOR 2250, 2450, 2650, 2650N and 2850 TRACTORS

*NOTE: For further specifications, see relevant Technical Manual.*

## ENGINE

Valve clearance (engine hot or cold):
- Intake valves ..... 0.35 mm (0.014 in.)
- Exhaust valves ..... 0.45 mm (0.018 in.)

Minimum engine oil pressure at 800 rpm and normal operating temperature ..... 100 kPa (1 bar; 14 psi)

Compression ..... 2100 kPa (21 bar; 300 psi)

Maximum difference in pressure between cylinders ..... 350 kPa (3.5 bar; 50 psi)

Maximum blow-by at crankcase vent tube ..... 80 liter/kWh (2.8 cu.ft./kWh)

Minimum pressure of turbocharger in intake manifold at rated engine speed ..... 60 kPa (0.6 bar; 9 psi)

Rocker arm shaft to cylinder head ..... 50 Nm (35 ft-lb)

Cylinder head to cylinder block (cap screws dipped in oil)
- 1st step ..... 85 Nm (65 ft-lb)
- 2nd step ..... 135 Nm (100 ft-lb)
- 3rd step ..... +60°

Rocker cover to cylinder head ..... 10 Nm (7 ft-lb)

Connecting rod cap screws (dipped in oil) ..... 65 to 75 Nm (50 to 55 ft-lb)

Main bearing caps to cylinder block ..... 120 Nm (85 ft-lb)

Flywheel to crankshaft ..... 160 Nm (120 ft-lb)

Front axle carrier to engine
- *without increased lifting capacity* .... 230 Nm (170 ft-lb)
- *with increased lifting capacity*
  - Cap screws ..... 230 Nm (170 ft-lb)
  - TORX screws ..... 250 Nm (185 ft-lb)

Oil pan to front axle carrier ..... 400 Nm (300 ft-lb)

Oil pan to clutch housing ..... 230 Nm (170 ft-lb)

Clutch housing to engine ..... 230 Nm (170 ft-lb)

Side frames to front axle carrier ..... 230 Nm (170 ft-lb)

Side frames to flywheel housing ..... 230 Nm (170 ft-lb)

## FUEL INJECTION NOZZLES

Opening pressure of a new or re-conditioned nozzle with new spring
- *– Engine without turbocharger* ..... 21700 to 22400 kPa (217 to 224 bar; 3150 to 3250 psi)
- *– Engine with turbocharger* ..... 25100 to 25800 kPa (251 to 258 bar; 3650 to 3750 psi)

Minimum opening pressure with used nozzle
- *– Engine without turbocharger* ..... 20700 kPa (207 bar; 3000 psi)
- *– Engine with turbocharger* ..... 24100 kPa (241 bar; 3500 psi)

Maximum difference in opening pressure ..... 700 kPa (7 bar; 100 psi)

Fuel injection nozzle to cylinder head ..... 30 Nm (23 ft-lb)

## BATTERIES

Cold state testing current
- – 55 Ah battery ..... 255 amps.
- – 66 Ah battery ..... 300 amps.

## ENGINE SINGLE–STAGE CLUTCH

Thickness of a new disk ..... 10 mm (0.39 in.)

Wear limit ..... 7 mm (0.26 in.)

Maximum permissible warpage of clutch disk ..... 0.5 mm (0.02 in.)

Flywheel to crankshaft ..... 160 Nm (120 ft-lb)

Clutch to flywheel ..... 50 Nm (35 ft-lb)

Clutch pedal free play (mechanical clutch) ..... 25 mm (approx. 1 in.)

## ENGINE DUAL–STAGE CLUTCH

Thickness of a new disk
- *– Engine clutch* ..... 9.0 to 9.6 mm (0.35 to 0.38 in.)
- *– PTO clutch* ..... 7.7 to 8.3 mm (0.30 to 0.33 in.)

Wear limit of a clutch disk
- *– Engine clutch* ..... 6 mm (0.24 in.)
- *– PTO clutch* ..... 4.7 mm (0.18 in.)

Maximum permissible warpage of clutch disk ..... 0.5 mm (0.02 in.)

Flywheel to crankshaft ..... 160 Nm (120 ft-lb)

Clutch to flywheel ..... 50 Nm (35 ft-lb)

Clutch pedal free play ..... 25 mm (approx. 1 in.)

## HI-LO SHIFT UNIT

Operating pressure at 1500 rpm ..... 1050 kPa (10.5 bar; 150 psi)

Operating pressure of automatic shift valve ..... 500 to 700 kPa (5 to 7 bar; 75 to 100 psi)

Hi-Lo shift unit to clutch housing ..... 50 Nm (35 ft-lb)

# SUMMARY OF MOST IMPORTANT SPECIFICATIONS FOR 2250, 2450, 2650, 2650N and 2850 TRACTORS

## SYNCHRONIZED TRANSMISSION

**Differential Drive Shaft**

Rolling drag torque with
- New bearings ..... 0.75 to 1.5 Nm (6.5 to 13 in-lb)
- Used bearings ..... 0.4 to 0.75 Nm (3.5 to 6.5 in-lb)

Special hex. nut or special nut of differential drive shaft ..... 140 Nm (100 ft-lb)

**Range Shaft**

Preload of taper roller bearings ..... 0.05 to 0.10 mm (0.002 to 0.004 in.)

**Countershaft**

Preload of transmission hollow drive shaft ..... 0.05 to 0.10 mm (0.002 to 0.004 in.)

Rolling drag torque ..... 1 to 2 Nm (9 to 18 in-lb)

End play of differential drive shaft ..... 0.03 to 0.13 mm (0.001 to 0.005 in.)

Hex. nut of transmission hollow drive shaft ..... 140 Nm (100 ft-lb)

Countershaft bearing quill ..... 120 Nm (85 ft-lb)

**Intermediate Shaft**

Preload of bearings ..... 0.05 to 0.10 mm (0.002 to 0.004 in.)

Grooved nut ..... 140 Nm (100 ft-lb)

Clutch housing to transmission case ..... 160 Nm (120 ft-lb)

## COLLAR SHIFT TRANSMISSION

**Differential Drive Shaft**

Total thickness of shim pack to adjust cone point ..... 0.5 mm (0.02 in.)

Maximum permissible end play before adjusting preload ..... 0.05 mm (0.002 in.)

Dimension to be added to measured end play ..... 0.15 mm (0.006 in.)

Preload of taper roller bearings ..... 0.15 mm (0.006 in.)

Rolling drag torque with specified preload ..... 0.6 to 1.7 Nm (5 to 15 in-lb)

Hex. nut of differential drive shaft ..... 220 Nm (160 ft-lb)

**Transmission Drive Shaft**

End play ..... 0.10 to 0.15 mm (0.004 to 0.006 in.)

Transmission drive shaft bearing quill ..... 50 Nm (35 ft-lb)

## TRANSMISSION OIL PUMP

Minimum delivery of transmission oil pump at 2000 rpm:

Oil temperature 40°C (100°F)
- *– 2250 and 2450 without Hi-Lo* ..... 34 liters/min. (9 gpm)
- *– 2250 to 2850 with Hi-Lo and 2650 to 2850 without Hi-Lo* ..... 42 liters/min. (11 gpm)

Oil temperature 65°C (150°F)
- *– 2250 and 2450 without Hi-Lo* ..... 30 liters/min. (8 gpm)
- *– 2250 to 2850 with Hi-Lo and 2650 to 2850 without Hi-Lo* ..... 38 liters/min. (10 gpm)

Minimum flow to hydraulic pump at 2000 rpm with:

Oil temperature 40°C (100°F)
- *– 2250 to 2850 without Hi-Lo* ..... 30 liters/min. (8 gpm)
- *– 2250 to 2850 with Hi-Lo and 2650 to 2850 without Hi-Lo* ..... 36 liters/min. (9.5 gpm)

Oil temperature 65°C (150°F)
- *– 2250 and 2450 without Hi-Lo* ..... 26 liters/min. (7 gpm)
- *– 2250 to 2850 with Hi-Lo and 2650 to 2850 without Hi-Lo* ..... 32 liters/min. (8.5 gpm)

Transmission oil pump cap screws ..... 55 Nm (40 ft-lb)

Transmission oil pump to clutch housing ..... 55 Nm (40 ft-lb)

## DIFFERENTIAL

Preload of taper roller bearings ..... 0.05 to 0.13 mm (0.002 to 0.005 in.)

Backlash between ring gear and differential drive shaft pinion ..... 0.30 mm (0.012 in.)

## FINAL DRIVES

To measured rolling drag torque of final drive housing (before tightening 12-point screw) add:
- *Standard final drives* ..... 8 to 12.5 Nm (6 to 9 ft-lb)
- *Heavy-duty final drives* ..... 10 to 13.5 Nm (7.5 to 10 ft-lb)

Final drives to transmission case ..... 120 Nm (85 ft-lb)

# SUMMARY OF MOST IMPORTANT SPECIFICATIONS FOR 2250, 2450, 2650, 2650N 2850 TRACTORS

### INDEPENDENT PTO

Operating pressure at 1500 rpm ..... 1050 kPa (10.5 bar; 150 psi)
Preload of taper roller bearings in bearing quill (at 540 rpm, heavy-duty type) ..... 0.05 mm (0.002 in.)
*Drive gear to clutch drum* ..... 75 Nm (55 ft-lb)
Bearing quill to transmission case ..... 120 Nm (85 ft-lb)

### CONTINUOUS RUNNING PTO

Preload of taper roller bearings in bearing quill (heavy-duty version) ..... 0 to 0.05 mm (0 to 0.002 in.)
Bearing quill to transmission case ..... 120 Nm (85 ft-lb)

### FRONT PTO

Operating pressure at 1500 rpm ..... 1050 kPa (10.5 bar; 150 psi)
Preload of taper roller bearings ..... 0 to 0.05 mm (0 to 0.002 in.)
Front PTO to front axle carrier ..... 400 Nm (300 ft-lb)

### FRONT WHEEL DRIVE

Operating pressure at 1500 rpm ..... 1050 kPa (10.5 bar; 150 psi)
Disk clutch slips at a torque of:
*2250, 2450, 2650 and 2650N* ..... 880 Nm (650 ft-lb)
*2850* ..... 1000 Nm (740 ft-lb)
Front axle to front axle carrier ..... 300 Nm (220 ft-lb)
Front axle axial play ..... 0 to 0.5 mm (0 to 0.02 in.)
Universal-jointed drive shaft to drive hub ..... 75 Nm (55 ft-lb)

### HYDROSTATIC STEERING

Adjustment pressure of double-acting safety valves ..... 21000 kPa (210 bar; 3050 psi)
Steering valve to steering column ..... 50 Nm (35 ft-lb)

### BRAKES

Return travel of pressure ring (within 15 seconds) ..... 0.28 to 0.35 mm (0.011 to 0.014 in.)
Test pressure for leakage test of pressure ring ..... 300 kPa (3 bar; 44 psi)
Maximum pressure drop within 10 seconds ..... 10 kPa (0.1 bar; 1.5 psi)
Retraction pin assembly to pressure ring ..... 15 Nm (11 ft-lb)

### HYDRAULIC PUMPS

Pump stand-by pressure ..... 19000 kPa (190 bar; 2760 psi)
Minimum delivery at 2000 rpm and 17000 kPa (170 bar; 2450 psi) operating pressure:
*12 cm³ (0.7 cu.in.) pump* ..... 19 liters/min. (5 gpm)
*23 cm³ (1.4 cu.in.) pump* ..... 34 liters/min. (9 gpm)
*40 cm³ (2.4 cu.in.) pump* ..... 68 liters/min. (18 gpm)
Hydraulic pump to front axle carrier ..... 120 Nm (85 ft-lb)

### ROCKSHAFT

Opening pressure of pressure relief valve (with 100 mm; 3.94 in. diameter piston) ..... 21000 to 23000 kPa (210 to 230 bar; 3050 to 3340 psi)
Opening pressure of thermal relief valve (with 92 mm; 3.67 in. diameter piston) ..... 24200 to 31000 kPa (242 to 310 bar; 3500 to 4500 psi)
Rockshaft to transmission case ..... 120 Nm (85 ft-lb)

**Adjusting Load Control Arm**
Turn in control arm adjusting screw until it contacts arm and then back off ..... 1/3 to 1/2 a turn

**Adjusting Valve Clearance**

At commencement of lift, turn adjusting screw clockwise ..... 1/4 turn

Control lever play between raising and lowering:

*With SG2 cab* ..... 12 to15 mm (0.5 to 0.6 in.)

*With MC1 cab*

*– Up to Tractor Serial No. 637 600L** ..... 4 to 10 mm (0.16 to 0.4 in.)

*– From Tractor Serial No. 637 601L** ..... 12 to 15 mm (0.5 to 0.6 in.)

*Without cab** ..... 2 to 4 mm (0.08 to 0.16 in.)

*On narrow tread tractors* ..... 3 to 6 mm (0.12 to 0.24 in.)

**Adjusting Rockshaft Control Lever**

*With SG2 cab*

Front edge of rockshaft control lever in position ..... 7 to 7.5

*With MC1 cab (up to Tractor Serial No. 637 600L)*

Clearance from front end position to front edge of rockshaft control lever* ..... 10+6 mm (0.4+0.24 in.)

*With MC1 cab (from Tractor Serial No. 637 601L)*

Front edge of control lever in position ..... 7 to 7.5

*Without cab*

Front edge of rockshaft control lever to front end of quadrant* ..... 12+1/-2 mm (0.47+0.04/-0.08 in.)

*On narrow tread tractors*

Front edge of rockshaft control lever to front edge of quadrant* ..... 15+10/-5 mm (0.6+0.4/-0.2 in.)

Adjusting commencement of lift with load control

*With SG2 cab*

Front edge of control lever in position ..... 2 to 2.5

*With MC1 cab (up to Tractor Serial No. 637 600L)*

Clearance from rear end position to rear edge of rockshaft control lever* ..... 45+6 mm (1.8+0.24 in.)

*With MC1 cab (from Tractor Serial No. 637 601L)*

Front edge of control lever in position ..... 2 to 2.5

*Without cab*

Rear edge of control lever to rear end of quadrant* ..... 50 ± 3 mm (2 ± 0.12 in.)

*On narrow tread tractors*

Clearance from rear end position to rear edge of rockshaft control lever* .... 90+10/-5 mm (3.54+0.4/-0.2 in.)

* Measured at upper edge of quadrant

**FRONT AXLE**

Maximum permissible axial play of knuckle and spindle assy. in axle knee ..... 0.76 mm (0.03 in.)

Front axle axial play ..... 0 to 0.4 mm (0 to 0.015 in.)

Bearing pin to front axle carrier ..... 100 Nm (75 ft-lb)

Axle knees to axle center ..... 400 Nm (300 ft-lb)

Steering arm to knuckle and spindle assy.

– Clamping screw ..... 120 Nm (85 ft-lb)

– Cap screw ..... 230 Nm (170 ft-lb)

**FRONT WHEELS**

Wheel hub to axle spindle ..... 50 Nm (35 ft-lb)

Steel disk to rim

– M16x120 attaching screws ..... 250 Nm (180 ft-lb)

– M16x74 attaching screws ..... 280 Nm (210 ft-lb)

Wheel rim to hub

*Without front wheel drive* ..... 150 Nm (110 ft-lb)

*With front wheel drive* ..... 300 Nm (220 ft-lb)

Front wheel toe-in

*Without front wheel drive* ..... 3 to 6 mm (1/8 to 1/4 in.)

*With front wheel drive* ..... 0 to 3 mm (0 to 1/8 in.)

**REAR WHEELS**

**Flanged Rear Axle**

Steel disk to rim

– M16x120 attaching screws ..... 250 Nm (185 ft-lb)

– M16x74 attaching screws ..... 280 Nm (210 ft-lb)

– 9/16 in. attaching screws ..... 200 Nm (145 ft-lb)

Cast disk to rim ..... 230 Nm (170 ft-lb)

Rear wheels to rear axle ..... 400 Nm (300 ft-lb)

**Rack-and-Pinion Axle**

Wheel hub to rim ..... 230 Nm (170 ft-lb)

Pinion sleeve halves to wheel hub ..... 215 Nm (160 ft-lb)

Sleeve attaching screws to wheel hub ..... 400 Nm (300 ft-lb)

**SG2 CAB**

SG2 cab to mounting brackets or final drives ..... 200 Nm (145 ft-lb)

Studs in final drive housings ..... 35 Nm (25 ft-lb)

**MC1 CAB**

MC1 cab to mountings ..... 245 Nm (180 ft-lb)

**2-POST ROLL-GUARD**

Supports to final drives ..... 230 Nm (170 ft-lb)

Supports to crossmember ..... 230 Nm (170 ft-lb)

**4-POST ROLL-GUARD**

Roll-guard to fender ..... 120 Nm (85 ft-lb)

Fender to final drive ..... 230 Nm (170 ft-lb)

# 2250, 2450, 2650, 2650N AND 2850 TRACTORS TECHNICAL MANUAL TM-4440 (Jan-91)

## SECTION CONTENTS IN GROUPS – REPAIR





INHALT-LB301AE-010490

## SECTION CONTENTS IN GROUPS – REPAIR



INHALT-LB302AE-010888

## SAFETY AND YOU

This is the safety-alert symbol. When you see this symbol on the machine or in this manual, be alert to the potential for personal injury.

T 81389

T81389;053;TMSAFE 19 07OCT85

## IMPORTANT

The IMPORTANT message identifies potential problems which may cause consequential damage to machine. Following recommended procedure will instruct technician how to avoid problem.

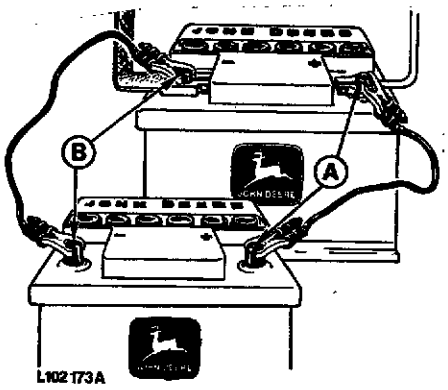
A68;N01;0000 19 U 05NOV82

## NOTES

The word NOTE is followed by a statement that identifies a qualification or exception to a previous statement. A "NOTE" may also identify nice-to-know information pertinent to, but not directly related to previous statement.

A68; N01;0000 19 V 05NOV82

## IMPORTANT NOTES




If the engine is to be run for a short time without battery (using a slave battery for starting), do not, under any circumstances, interrupt this circuit by switching off the main switch before stopping the engine by means of the fuel pump shut-off cable. An additional load (lights) must also be switched on. Do not run engine above 1000 rpm. Insulate battery end of disconnected starter cable properly to avoid damage to alternator and regulator.

On tractors equipped with an operator's cab, do NOT connect ground strap of slave battery to cab frame.

Observe proper polarity when connecting batteries and chargers. Improperly connected batteries ("+" and "–") result in immediate destruction of rectifier diodes.

**A–Positive terminals**
**B–Negative terminals**

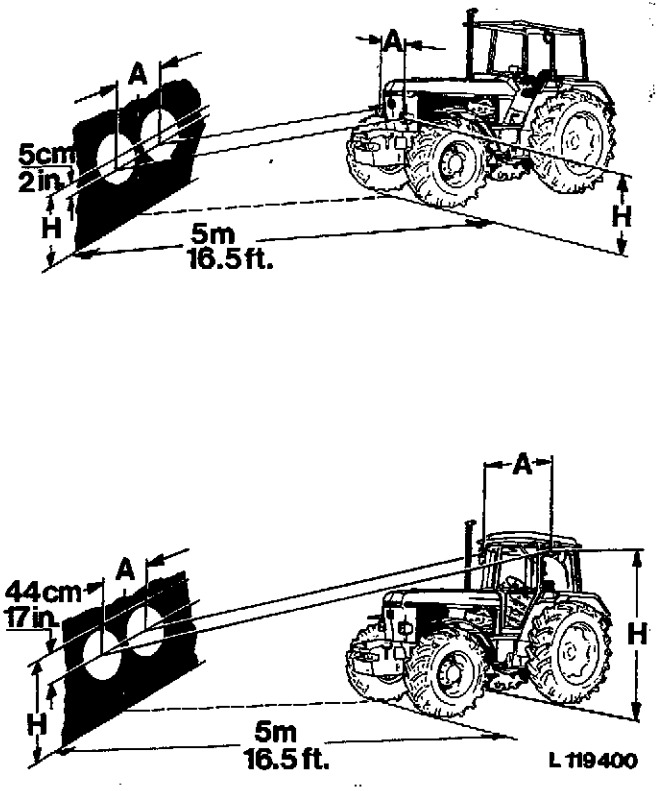
L102173A-LB31010AE-010287

## CHECKING LIGHTING SYSTEM

See Operator's Manual.

Check adjustment of headlights and adjust, when necessary.

When equipped, check adjustment of roof headlights and adjust, when necessary.




L119400-LB21010AE-010488

## CHECKING START SAFETY SWITCH

Operate starter switch (B).

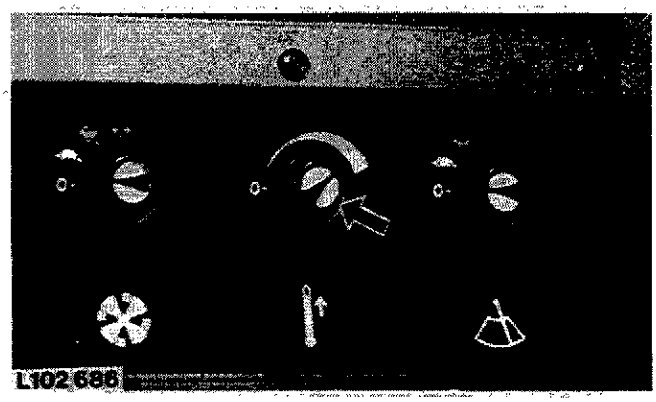
*NOTE: Starting motor should turn only with the range shift lever (A) in neutral position.*


L108567-LB21010AE-010488

## CHECKING HEATER CONTROL SWITCH

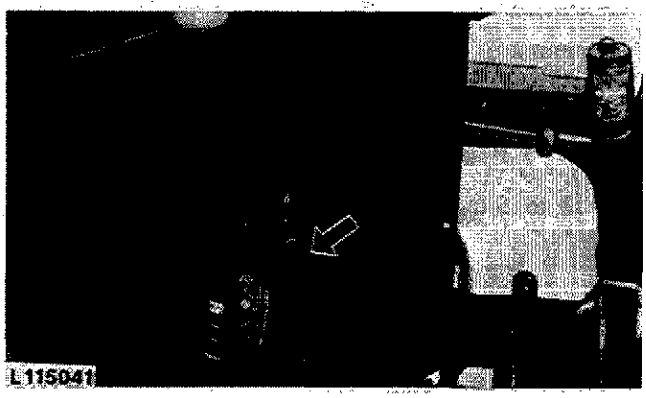
**Tractors With SG2 Cab**

With engine running at operating temperature, turn control switch to the right and wait until warm air enters cab through the air louvers.




**Tractors With MC1 Cab**

With engine running at operating temperature, turn control switch to the right and wait until warm air enters cab through the air louvers.



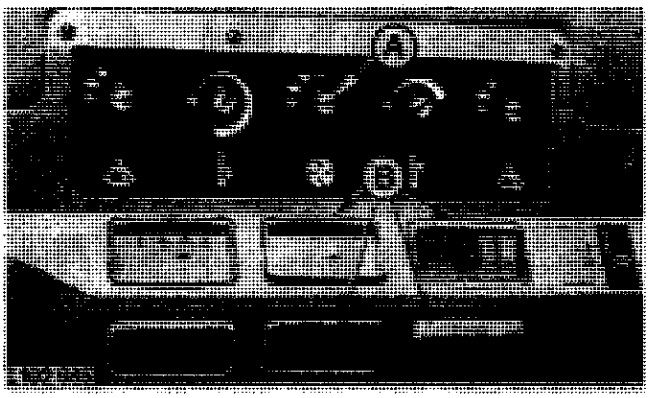

L102686,L115041-LB31010AE-010888

## CHECKING FAN SWITCH

**Tractors With SG2 Cab**

Open air louvers (B).

Check function of three-stage cab ventilation and heater fan switch (A).



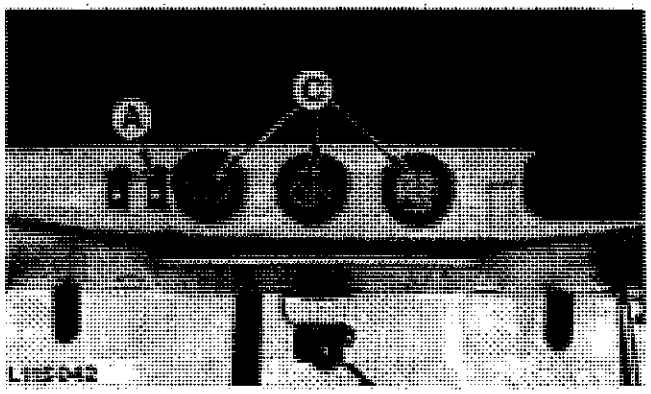

L102685-LB31010AE-010287

**Tractors with MC1 Cab**

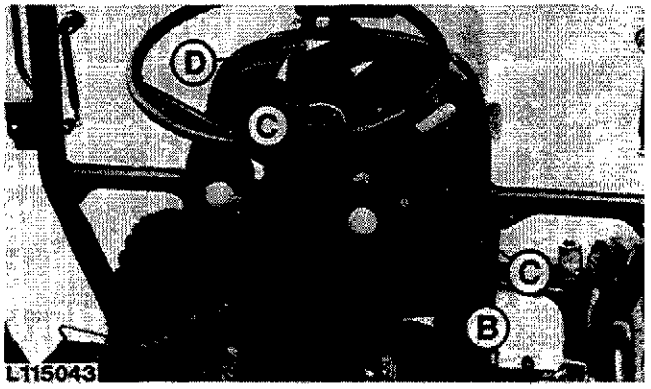
Open air louvers (C).

Check function of switch (A) for fan in roof and switch (B) for fan in dash.

**A–Switch (roof fan)**
**B–Switch (dash fan)**
**C–Air louvers**
**D–Air flow selector switch**



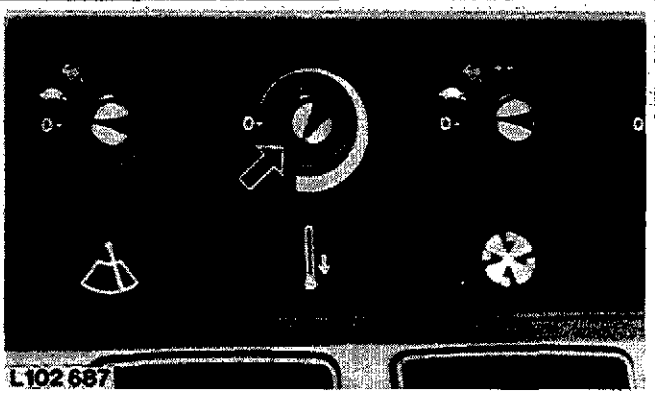

Also check function of air flow selector switch (D). This switch allows to change from fresh air intake to recirculating cab air.




L115042,L115043-LB31010AE-010287

## CHECKING THERMOSTAT SWITCH (Tractors with Air Conditioning System)

With fan switched on, turn infinitely adjustable switch to the right and wait until cool air enters cab through the air louvers.



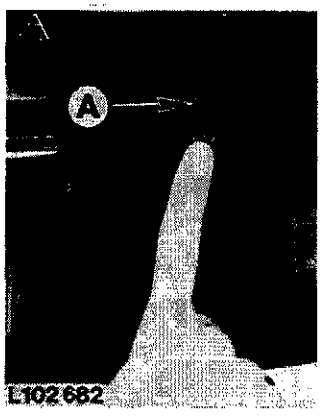

L102687-LB21010AE-010886

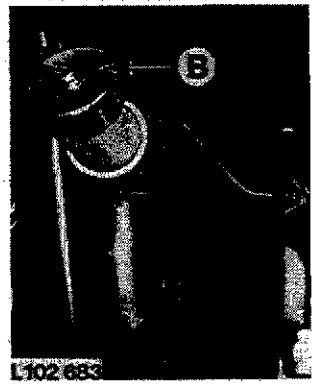
## CHECKING WINDSHIELD WASHER SYSTEM

**Tractors With SG2 Cab**

Operate tumbler switch (A) of washer system.

Add a suitable commercially available anti-freeze solution to reservoir (B) if temperature is liable to drop below freezing point.



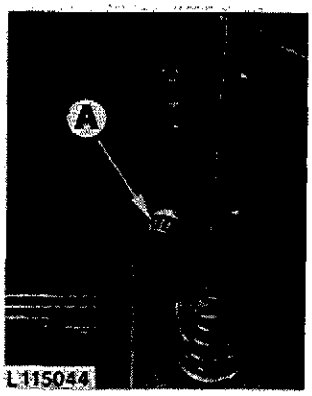



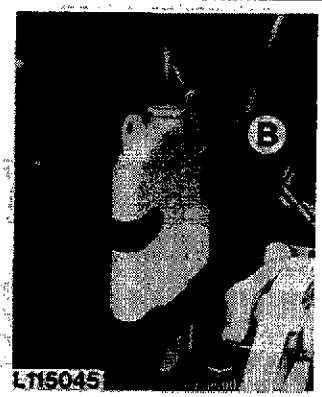

L102682,L102683-LB31010AE-010287

**Tractors with MC1 Cab**

Operate hand pump (A) of washer system.

Add a suitable commercially available anti-freeze solution to reservoir (B) if temperature is liable to drop below freezing point.



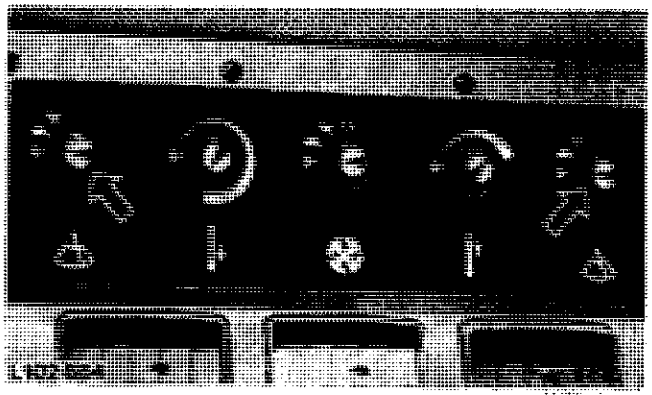




L115044,L115045-LB31010AE-010287

## CHECKING FUNCTION OF WINDSHIELD WIPERS

**Tractors With SG2 Cab**

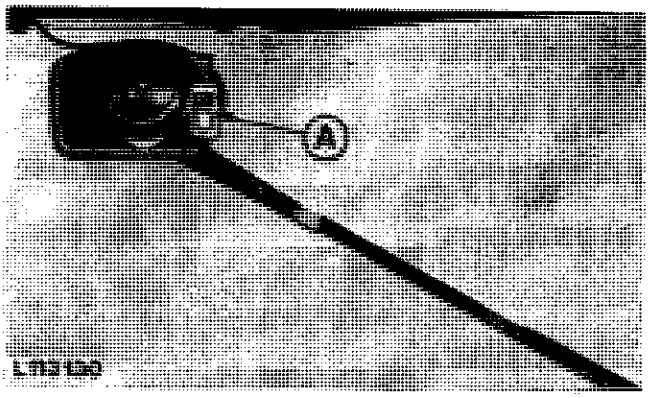
Check both windshield wiper speeds by turning both two-speed switches.



L102684-LB31010AE-010287

**Tractors with MC1 Cab**

Check windshield wiper operation by means of tumbler switch (A).



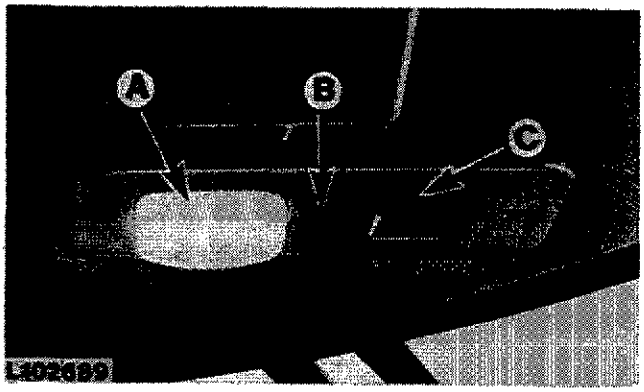

L113130-LB31010AE-010287

## CHECKING CAB INTERIOR LIGHTS

**Tractors With SG2 Cab**

Turn switch (B) to position 1, lamp (A) glows continuously and, in position 2, it glows as long as cab door is open.

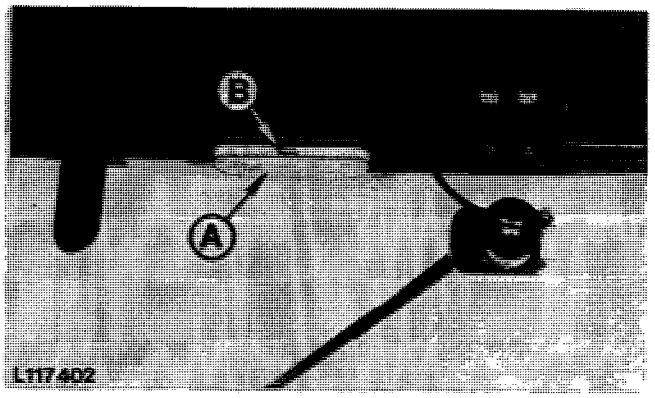
Lamp (C) illuminates transmission shift levers as soon as headlights are switched on.




L102689-LB31010AE-010287

**Tractors with MC1 Cab**

With switch (B) in right-hand position, lamp (A) should glow continuously.




L117402-LB31010AE-010888

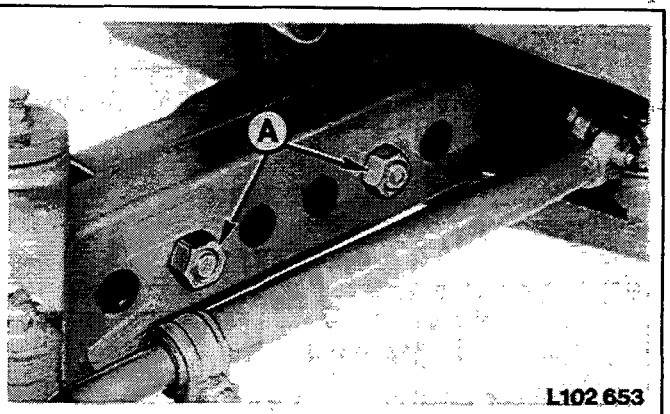
## CHECKING INSTRUMENTS AND INDICATOR LIGHTS

See Operator's Manual.

INSPEK-LB21010FE-010886

## CHECKING TORQUE OF ADJUSTABLE FRONT AXLE BOLTS (When Equipped)

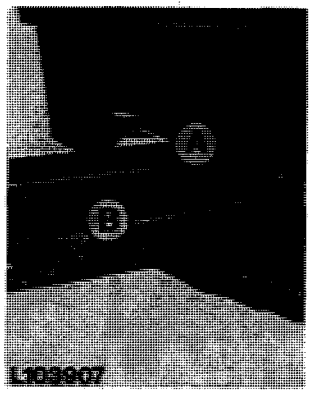
Tighten axle bolts (A) to 400 Nm (300 ft-lb).

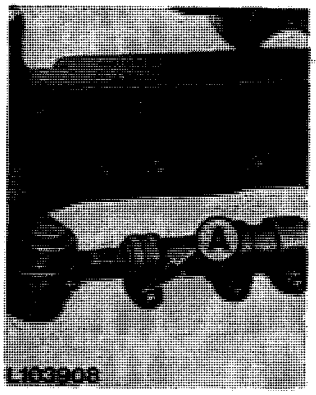



L102653-LB31010AE-010287

## CHECKING TIE ROD BOLTS (Tractors Without Front Wheel Drive)

Tighten clamping screws (A) to 55 Nm (40 ft-lb) and clamping screw (B) to 90 Nm (65 ft-lb).



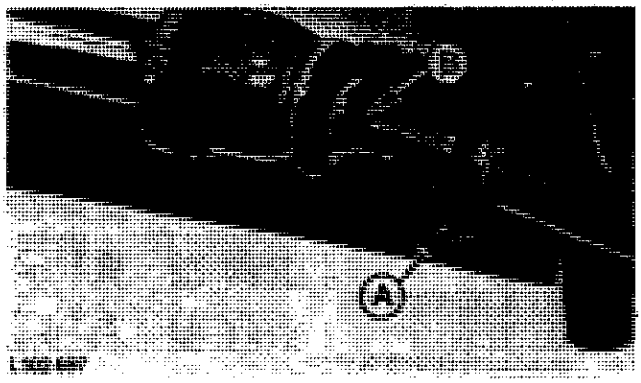




L103907,L103908-LB31010AE-010888

## CHECKING TIE ROD BOLTS (Tractors With Front Wheel Drive)

Tighten clamping screw (A) to 55 Nm (40 ft-lb).

**A–Clamping screw**
**B–Threaded rod**




L102697-LB21010AE-010488

## CHECKING TRANSMISSION/HYDRAULIC SYSTEM OIL LEVEL

**IMPORTANT: Check oil level when oil is cold.**

Park tractor on level ground. Completely lower rockshaft. When equipped, fully lower front hitch. Pull out dipstick (A) and wipe clean. Reinsert dipstick, again pull out and check oil level.

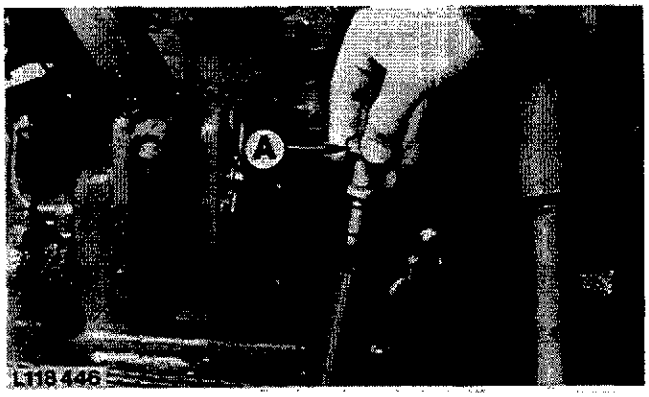
*NOTE: If oil level is below top mark, top up with oil through filler neck (B) to bring level up to top mark on dipstick.*

**IMPORTANT: After having topped up transmission with oil, wait for a period of five minutes before rechecking oil level with dipstick.**

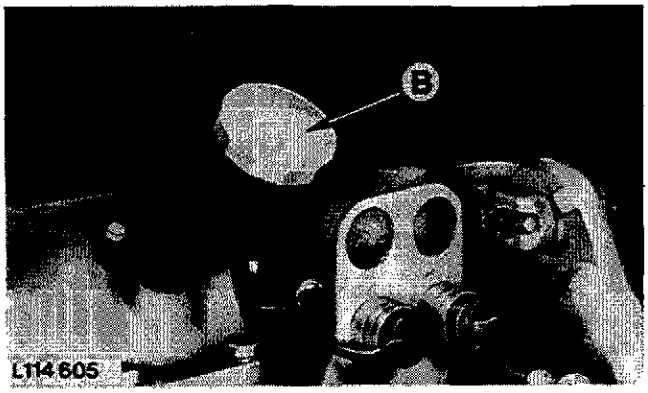
If necessary, add JOHN DEERE Hy-Gard transmission and hydraulic oil or equivalent (see Group 15) to bring oil level to top mark on dipstick.

*NOTE: Types of oil not meeting JOHN DEERE specifications will not give satisfactory service and may result in damage.*

**IMPORTANT: Make sure that transmission oil filter element and oil return flow filter were changed after first 50 hours of operation.**





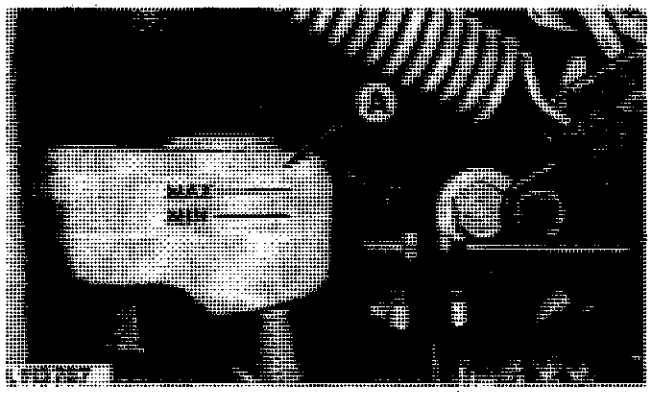



L118446,L113094,L114605-LB31010AE-010888

## CHECKING BRAKE FLUID LEVEL (With Hydraulically Operated Clutch)

Level of fluid should be between the marks "MIN" and "MAX". Add brake fluid type FMVSS 116 DOT 4, when necessary.

**A–Reservoir**



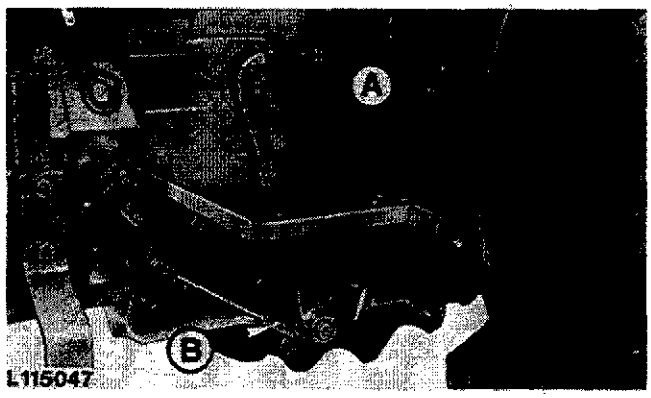
L113787-LB31010AE-010888

## CHECKING CLUTCH PEDAL FREE TRAVEL (With Mechanically Operated Clutch)

Clutch pedal free travel (A) should be 25 mm (1 in.).

When necessary, adjust clutch pedal free travel by turning yoke (B).

**IMPORTANT: Clutch pedal free travel should never be less than 13 mm (approx. 1/2 in.). Should clutch pedal free travel be less than specified minimum, do not operate tractor until clutch pedal free travel has been adjusted to specifications.**

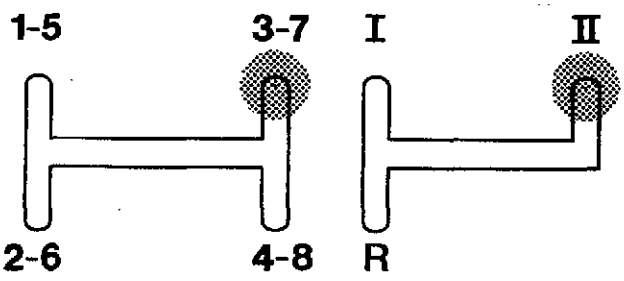



L115047

L115047-LB31010AE-000287

## CHECKING TRANSMISSION

Drive tractor on trial run, shifting transmission through all gears. Remedy any defects.



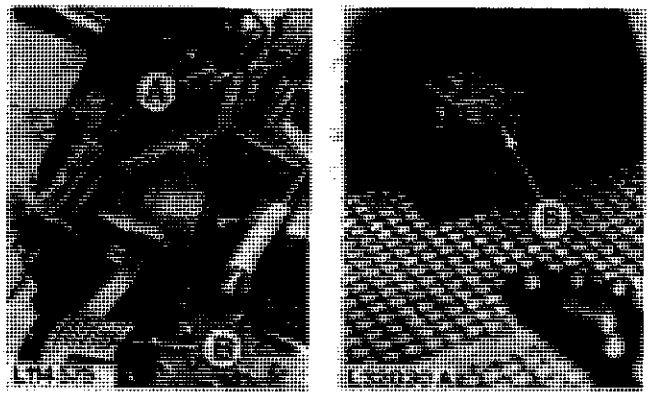

L106 549

L106549-LB31010AE-010287

## CHECKING DIFFERENTIAL LOCK

Drive tractor, checking functions of differential lock by operating hand lever (A) or pedal (B).

**IMPORTANT: Never turn the tractor with differential lock engaged.**



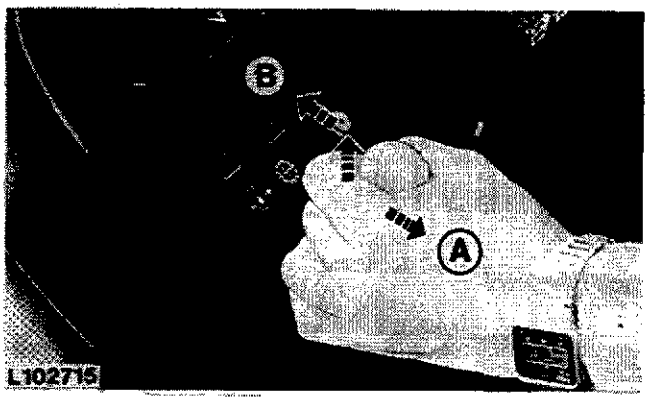
L114575,L32030A-LB31010AE-010287

## CHECKING REAR PTO

Run engine.

**Tractors With Cab**

Raise shift lever and push forward.

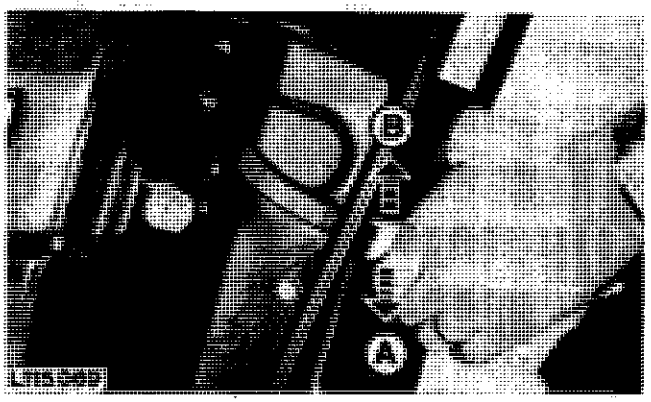



**Tractors Without Cab**

Up to tractor Serial No. 618 706L: Raise shift lever and push forward.

From tractor Serial No. 618 707L: Raise shift lever.

**A–PTO disengaged**
**B–PTO engaged**

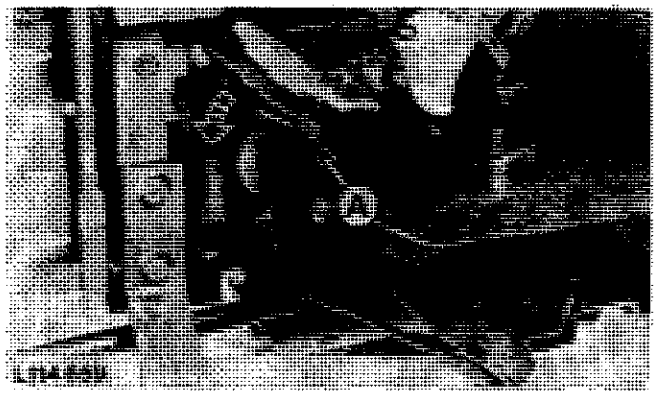



L102715,L115069-LB31010AE-010888

## CHECKING CONTINUOUS-RUNNING PTO (Tractors With Collar Shift Transmission)

Engage PTO by means of lever (B) only when clutch pedal (A) is fully depressed.

**CAUTION: Never engage PTO with tractor in motion.**



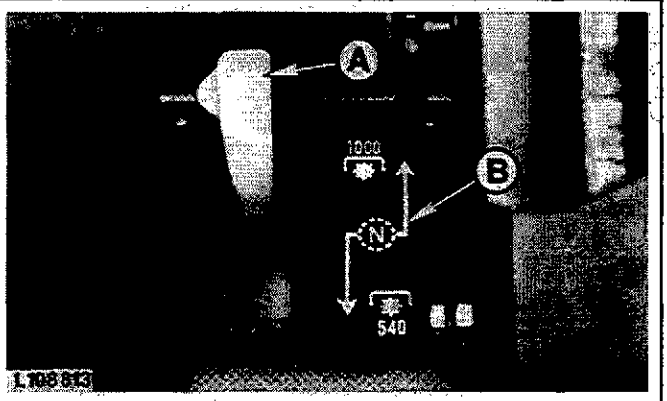


L114659,L115159-LB31010AE-000287

## CHECKING PTO SPEED SHIFT LEVER (When Equipped)

With PTO disengaged, check that shift positions of lever (A) correspond to the positions on decal (B).

*NOTE: Center position is neutral position.*




L108813-LB31010AE-000287

## CHECKING FRONT PTO (When Equipped)

With engine shut-off, engage front PTO transmission by means of lever (A).

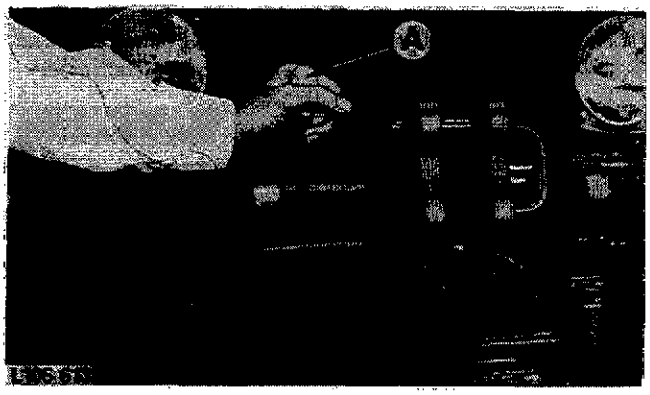
**CAUTION: Engage PTO transmission with engine shut-off only.**

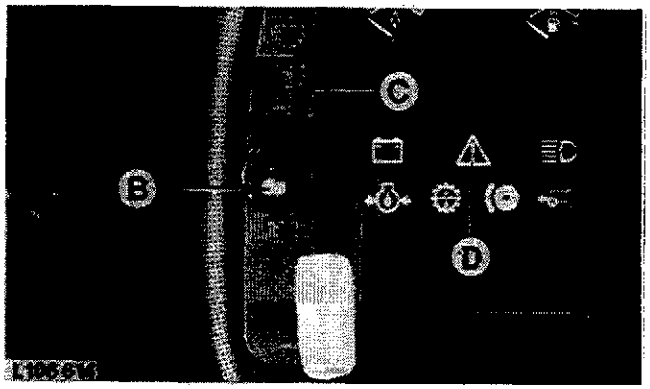
Engage and disengage front PTO clutch with tumbler switch (B) with engine running.

Control light (C) glows when front PTO is engaged.

*NOTE: Control light (D) flashes when front PTO has been engaged with tumbler switch (B) before engine has been started.*

**A–Lever**
**B–Tumbler switch**
**C–Control light**
**D–Control light**




L106613,L106614-LB31010AE-010287

## CHECKING HI-LO SHIFT UNIT (When Equipped)

Drive tractor and operate Hi-Lo shift unit, i.e. move Hi-Lo shift unit lever to both reduced and normal speed position several times, precisely observing Hi-Lo shift unit operation each time.

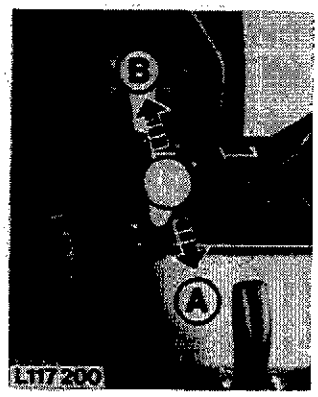
Simulate tractor working under load by applying brakes.

Low oil pressure will be indicated by disk pack slippage, causing the clutch pack to become noisy.

Mechanical failure in the Hi-Lo shift unit will also be indicated by unusual noise.

**A–Reduced speed**
**B–Normal speed**

**IMPORTANT: On tractors equipped with an SG2 cab, Hi-Lo shift unit cannot be shifted with clutch pedal depressed.**

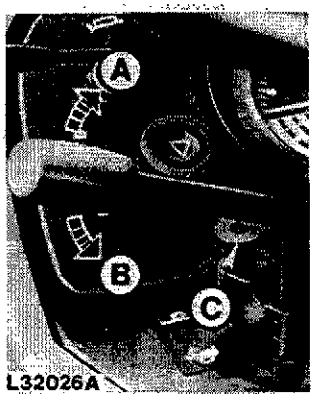




L102667,L117200-LB31010AE-010868

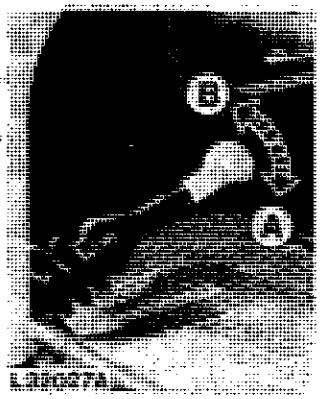
## CHECKING CREEPER TRANSMISSION (When Equipped)

**IMPORTANT: Engage creeper transmission only in I (Low) or reverse range and with clutch pedal depressed.**

**A–Reduced speed**
**B–Normal speed**
**C–Control lever lock**



L32026A



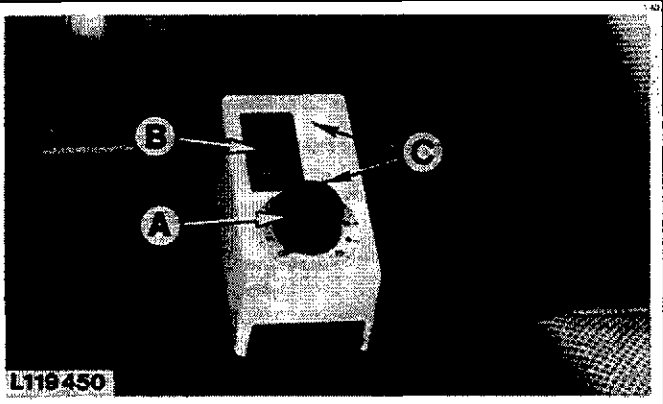

L 14797A

L32026A,L32027A,L14797A-LB31010AE-000287

## CHECKING HYDROSTATIC CREEPER TRANSMISSION (When Equipped)

**IMPORTANT: Engage creeper transmission only with range shift lever in neutral and front-wheel drive engaged.**

**A–Rotary switch for engaged, disengaged and ground travel speed**
**B–Switch for travel direction**
**C–Indicator lights for travel direction**



L119450

L119450-LB31010AE-010888

## CHANGING FRONT WHEEL DRIVE AXLE OIL (When Equipped)

*NOTE: Only change oil directly after having operated tractor for some time.*

Fill with an EP transmission oil as specified in Group 15 of this section.

**Front Axle Housing**

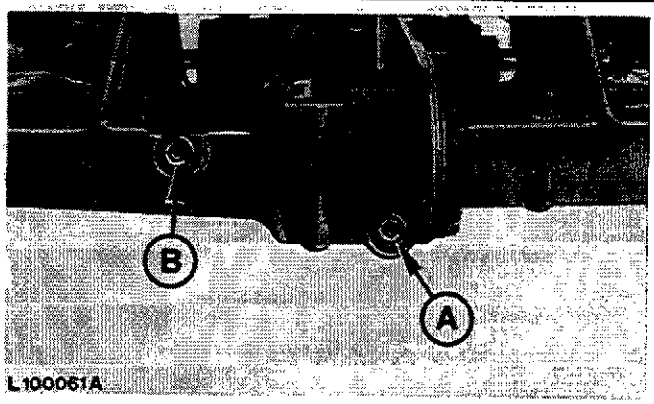
Capacity:
– 5.3 liters (1.4 U.S. gal.)

**Wheel Hub Housing**

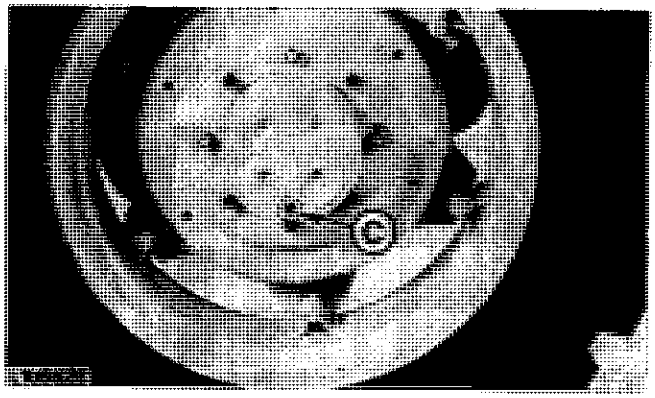
After draining oil, turn wheel until oil level mark is horizontal.

Capacity (Each):
– 0.75 liters (0.2 U.S. gal.)

**A–Drain plug**
**B–Level plug**
**C–Drain and level plug**



L100061A

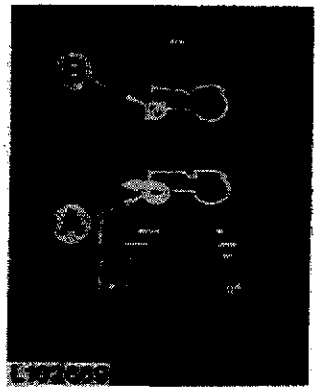


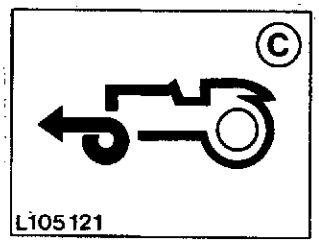

L100061A,L106626-LB31010AE-010287

## CHECKING FUNCTION OF FRONT WHEEL DRIVE (Tractors With Front Wheel Drive)

Drive tractor, engaging and disengaging front wheel drive by operating tumbler switch.

**A–Front wheel drive engaged**
**B–Front wheel drive disengaged**
**C–Control light glows when front wheel drive is engaged**





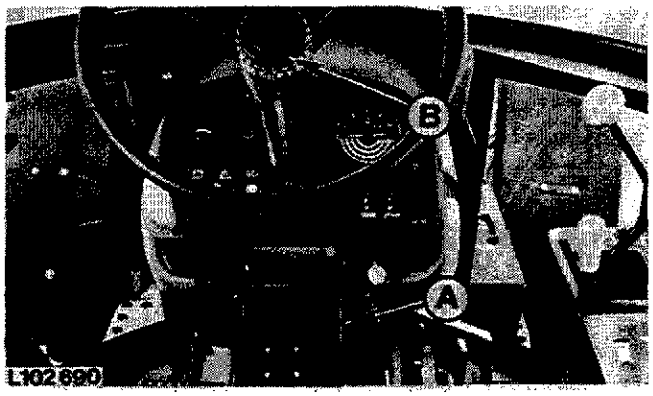
L105121

L102689,L105121-LB21010AE-010886

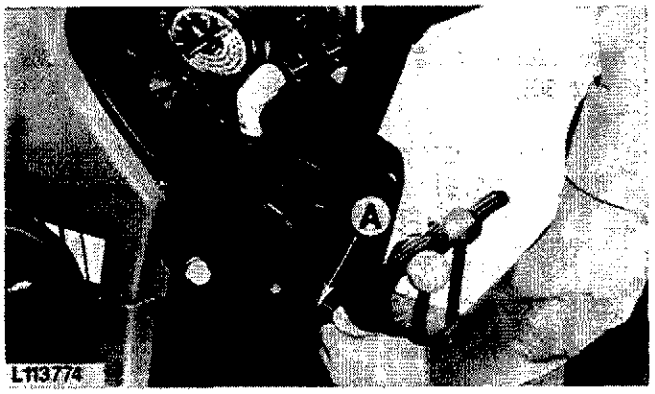
## CHECKING HYDROSTATIC STEERING SYSTEM

Start engine and turn steering wheel to left and right.

**A–Steering wheel tilt adjustment**
**B–Steering wheel height adjustment**




**A–Steering wheel tilt adjustment**



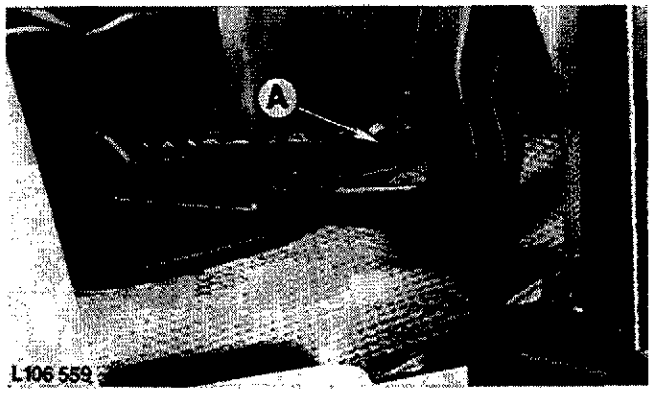

L102690,L113774-LB21010AE-010886

## CHECKING FUNCTION OF FOOT BRAKES

Load each brake pedal with 270 N (60 lb) for one minute. Loaded pedal should drop approx. 25 mm (1 in.) only during this time.

*NOTE: Do not check both brake pedals simultaneously, but each pedal individually.*

**A–Pedal coupler**





L106559,L114574-LB31010AE-010287