

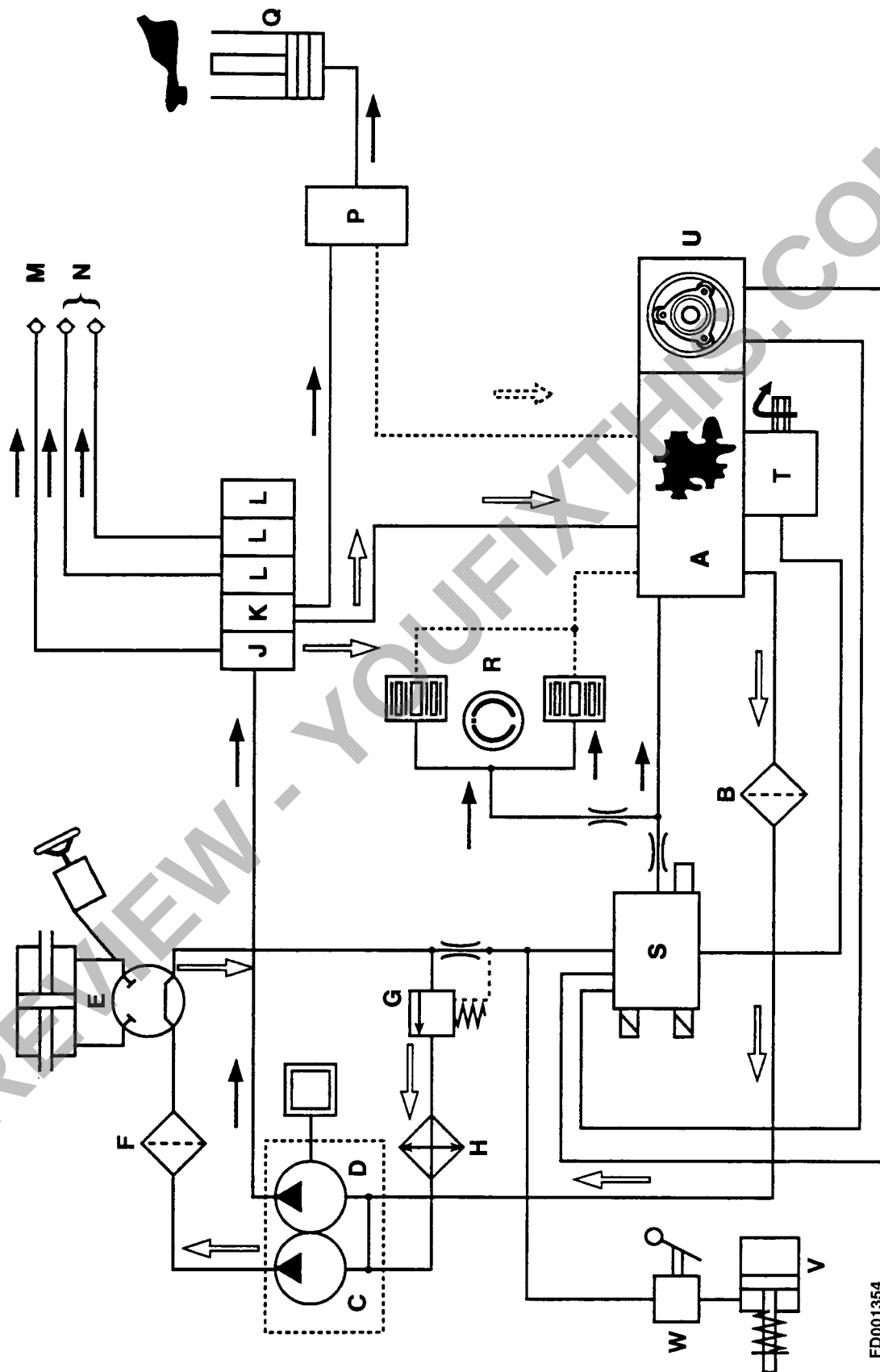
PARTS DESIGNATION IN ELECTRICAL WIRING DIAGRAMS

1 — Beacon light	110 — Load center ^{ce}
2 — R.h. headlight	111 — Load center ²
3 — L.h. headlight	113 — Diode
4 — Front right turn signal light	114 — Diode
5 — Front left turn signal light	173 — Horn
6 — Front work light, right	200 — Engine oil pressure switch
7 — Front work light, left	201 — Coolant temperature sensor
8 — Rear right work light	202 — Fuel gauge
9 — Rear left work light	203 — Stop light switch
10 — R.h. tail and stop light	204 — Handbrake switch
11 — L.h. tail and stop light	205 — Neutral start switch
12 — Licence plate light	206 — Air cleaner restriction switch
13 — Cab interior light	214 — Brake fluid switch
25 — Engine shut-off	221 — Flasher
30 — Battery	222 — Front work light relay
31 — Alternator	223 — Rear work light relay
32 — Starting motor	227 — Starting motor relay
34 — Thermostat	230 — Electric starting aid relay
40 — Front PTO switch	231 — Rear PTO indicator light relay
43 — Windshield wiper switch	234 — FWD switch
45 — Front work light switch	240 — Mode selector switch
46 — Rear work light switch	241 — Calibration switch
47 — Windshield washer switch	250 — Speed sending unit
49 — Switch for hazard warning lights	HP1 — L.h. speaker
52 — Switch for beacon light	HP2 — R.h. speaker
58 — Neutral start switch for rear PTO	
59 — Rear PTO switch	CONNECTORS
60 — Main key switch	P/J01 — Engine/superstructure connector
64 — Blower switch	P/J02 — Engine/superstructure connector
65 — Lights/horn switch	P/J03 — Superstructure connector (under cab)
67 — Handbrake relay	P/J04 — Under-cab/transmission connector
68 — Stop light relay	P/J05 — Superstructure/splitter connector
81 — Trailer socket	P/J06 — Light switch connector
82 — Power outlet socket for electrical equipment	P/J16 — Electric starting aid connector
86 — Cigarette lighter	J20 — Theor. speed sending unit connector
89 — Diagnostic socket	P/J21 — Under-cab/rear wiring harness connector
90 — Blower	P/J22 — Windshield washer connector
92 — Windshield wiper motor	P/J23 — Under-cab/top of cab connector
94 — Front PTO clutch	P/J25 — Beacon light connector
96 — Windshield washer pump	P/J26 — Radio socket connector
99 — 7-terminal splitter relay	P/J27 — Loudspeaker socket connector
100 — 5-terminal splitter relay	P/J28 — Windshield wiper connector
101 — FWD solenoid	P/J30 — Twinshift splitter connector
102 — Oil pressure switch, Twinshift splitter	P/J38 — Front PTO connector
103 — Twinshift splitter solenoid	J40 — 13-way shunt base
104 — Twinshift splitter switch	J41 — 13-way shunt base
105 — Twinshift splitter indicator light	JX1 — Instrument unit connector
109 — Load center	JX2 — Instrument unit connector

¹ With "high roof"

² With normal roof

GENERAL LAYOUT

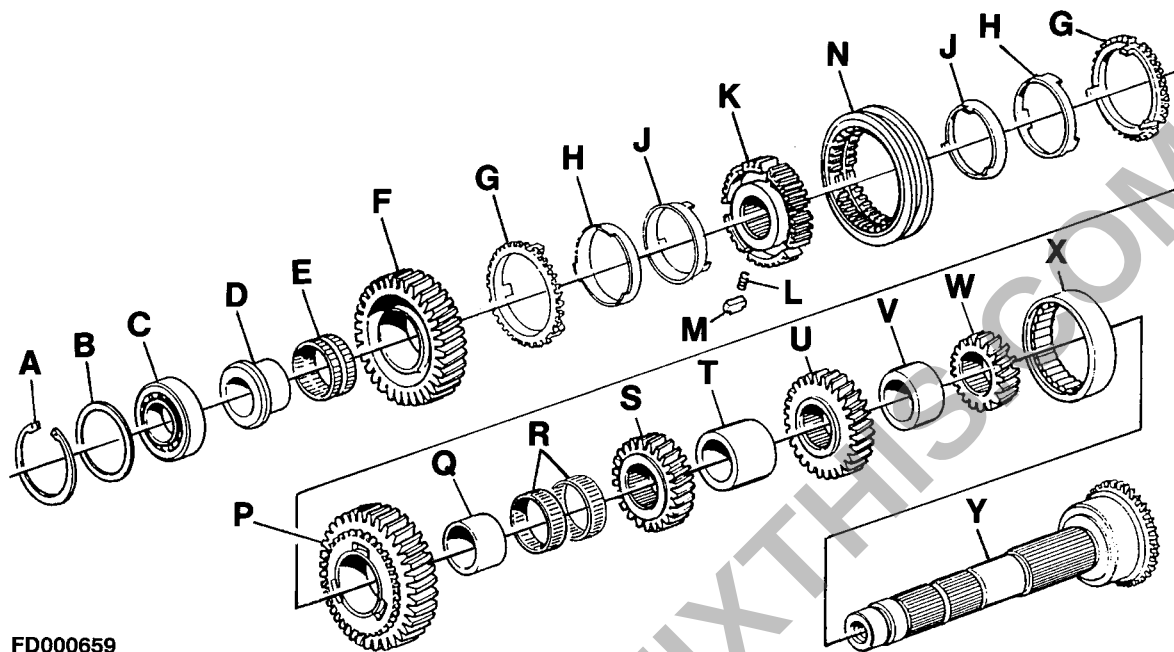


FD001354

FD001354 -JUN-18JAN96

FD, 000940-19-10NOV95

Front Drive Shaft — Exploded View



FD000659

FD000659 -UN-15SEP95

A—Snap ring
B—Shim (use as many as required)
C—Taper roller bearing
D—Bushing
E—Needle bearing
F—Gear, 2nd gear

G—Synchronizer double cone locking ring
H—Double cone friction ring
J—Intermediate ring of synchronizer double cone
K—Synchronizer hub
L—Spring

M—Woodruff key
N—Shift collar
P—Gear, 1st gear
Q—Bushing
R—Needle bearing (2 used)
S—Gear, 4th gear

T—Spacer
U—Gear, 3rd gear
V—Spacer
W—Gear, 5th gear
X—Cylindrical roller bearing
Y—Front drive shaft

FD, 000484-19-01SEP95

UNIFIED INCH BOLT AND CAP SCREW TORQUE VALUES

SAE Grade and Head Markings	NO MARK	1 or 2 ^b	5	5.1	5.2	8	8.2
SAE Grade and Nut Markings	NO MARK	2	5			8	

Size	Grade 1				Grade 2 ^b				Grade 5, 5.1, or 5.2				Grade 8 or 8.2			
	Lubricated ^a		Dry ^a		Lubricated ^a		Dry ^a		Lubricated ^a		Dry ^a		Lubricated ^a		Dry ^a	
	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft
1/4	3.7	2.8	4.7	3.5	6	4.5	7.5	5.5	9.5	7	12	9	13.5	10	17	12.5
5/16	7.7	5.5	10	7	12	9	15	11	20	15	25	18	28	21	35	26
3/8	14	10	17	13	22	16	27	20	35	26	44	33	50	36	63	46
7/16	22	16	28	20	35	26	44	32	55	41	70	52	80	58	100	75
1/2	33	25	42	31	53	39	67	50	85	63	110	80	120	90	150	115
9/16	48	36	60	45	75	56	95	70	125	90	155	115	175	130	225	160
5/8	67	50	85	62	105	78	135	100	170	125	215	160	240	175	300	225
3/4	120	87	150	110	190	140	240	175	300	225	375	280	425	310	550	400
7/8	190	140	240	175	190	140	240	175	490	360	625	450	700	500	875	650
1	290	210	360	270	290	210	360	270	725	540	925	675	1050	750	1300	975
1-1/8	400	300	510	375	400	300	510	375	900	675	1150	850	1450	1075	1850	1350
1-1/4	570	425	725	530	570	425	725	530	1300	950	1650	1200	2050	1500	2600	1950
1-3/8	750	550	950	700	750	550	950	700	1700	1250	2150	1550	2700	2000	3400	2550
1-1/2	1000	725	1250	925	990	725	1250	930	2250	1650	2850	2100	3600	2650	4550	3350

DO NOT use these values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

^a "Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated without any lubrication.

^b Grade 2 applies for hex cap screws (not hex bolts) up to 152 mm (6-in.) long. Grade 1 applies for hex cap screws over 152 mm (6-in.) long, and for all other types of bolts and screws of any length.

Fasteners should be replaced with the same or higher grade. If higher grade fasteners are used, these should only be tightened to the strength of the original.

Make sure fasteners threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of the dry torque shown in the chart, applied to the nut, not to the bolt head. Tighten toothed or serrated-type lock nuts to the full torque value.

; ENGINE TEMPERATURE
INCORRECT ENGINE TEMPERATURE

FD, 001010-19-20NOV95

1a Test the temperature probe.	See Group 25.	OK: Go to 1b. NOT OK: Replace the temperature probe. FD, 001011-19-20NOV95
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1b Check the electrical wiring harness.		OK: Replace the instrument unit. NOT OK: Repair or replace the harness and repeat the test. FD, 001012-19-20NOV95
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‘ TRAVEL SPEED
INCORRECT SPEED DISPLAYED

FD, 001013-19-20NOV95

2a Repeat calibration.	See Operator's Manual.	OK: The tractor is fully operational. NOT OK: Go to 2b. FD, 001014-19-20NOV95
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2b Check the speed sending unit.	See Group 25.	OK: Go to 2c. NOT OK: Replace the speed sending unit. FD, 001016-19-20NOV95
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Capacities**Fuel tank**

- Standard tractors 115 l (30.4 US gal)
- Version "X" 145 l (38.3 US gal)

Cooling circuit

- 3100 tractor 11 l (2.9 US gal)
- 3200, 3200 X, 3300, 3300 X, 3400 and 3400 X tractors . 13.5 l (3.6 US gal)

Engine crankcase

- 3100 tractor 7 l (1.8 US gal)
- 3200, 3200 X, 3300 and 3300 X tractors 9 l (2.4 US gal)
- 3400 and 3400 X tractors 11 l (2.9 US gal)

Transmission/hydraulic circuit

- 3100, 3200 and 3200 X tractors
 - without front-wheel drive 53 l (14.0 US gal)
 - with front-wheel drive 56 l (14.8 US gal)
- 3300, 3300 X, 3400 and 3400 X tractors
 - without front-wheel drive 57 l (15.1 US gal)
 - with front-wheel drive 60 l (15.9 US gal)

Front-wheel drive axle*

- Axle housing 5.5 l (1.45 US gal)
- Final drives (each) 0.6 l (20.3 US fl oz)

Front PTO** 0.5 l (16.9 US fl oz)

* FWD axle oil (see Group 10, this Section)

** Transmission/hydraulic oil (see Group 10, this Section)

FD, 000812-19-07OCT95

SPECIFICATIONS

Engine

Type

- 3100, 3200, 3200 X, 3300 and 3300 X tractors naturally aspirated diesel engine
- 3400 and 3400 X tractors turbocharged diesel engine

Number of cylinders

- 3100 tractor 3
- 3200 to 3400 X tractors 4

Bore 106.5 mm (4.19 in)

Stroke

- 3100, 3200, 3200 X, 3400 and 3400 X tractors 110.0 mm (4.33 in)
- 3300 and 3300 X tractors 127.0 mm (5.00 in)

Displacement

- 3100 tractor 2940 cm³ (179 cu in)
- 3200, 3200 X, 3400 and 3400 X tractors 3920 cm³ (239 cu in)
- 3300 and 3300 X tractors 4530 cm³ (276 cu in)

Firing order

- 3100 tractor 1-2-3
- 3200, 3200 X, 3300, 3300 X, 3400 and 3400 X tractors 1-3-4-2

Valve clearance (engine hot or cold)

- Intake valve 0.35 mm (0.014 in)
- Exhaust valve 0.45 mm (0.018 in)

Slow idle 850 rpm

Fast idle 2550 rpm

Rated engine speed 2350 rpm

Working speed range 1500 - 2350 rpm

Power, ECE-R24 at rated speed

- 3100 tractor 40 kW (55 hp)
- 3200 and 3200 X tractors 48 kW (65 hp)
- 3300 and 3300 X tractors 55 kW (75 hp)
- 3400 and 3400 X tractors 63 kW (85 hp)

FD, 000803-19-05OCT95

SEPARATING THE ENGINE BLOCK FROM THE CLUTCH HOUSING

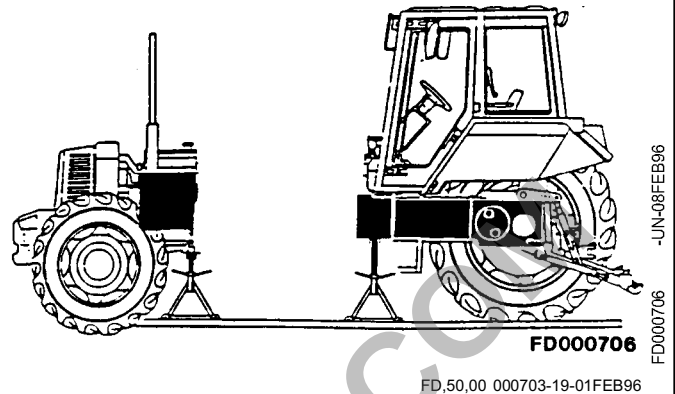
Remove the FWD u.j. shaft*.



CAUTION: Block up the front axle/FWD axle to prevent any pendulum movement.

Remove hood and side panels.

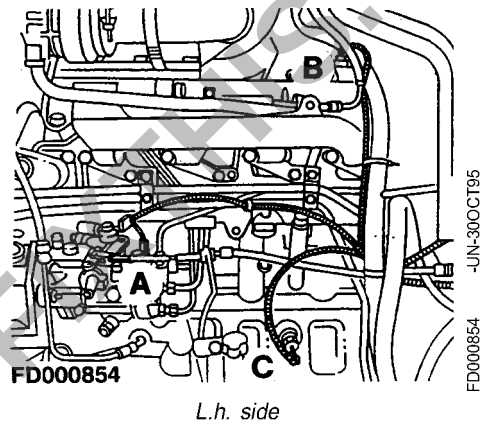
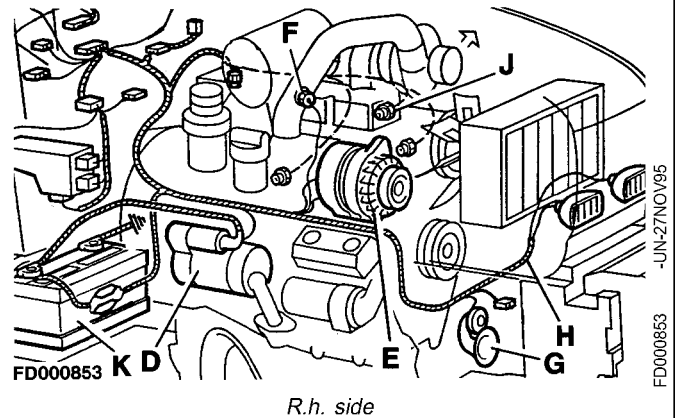
* If equipped



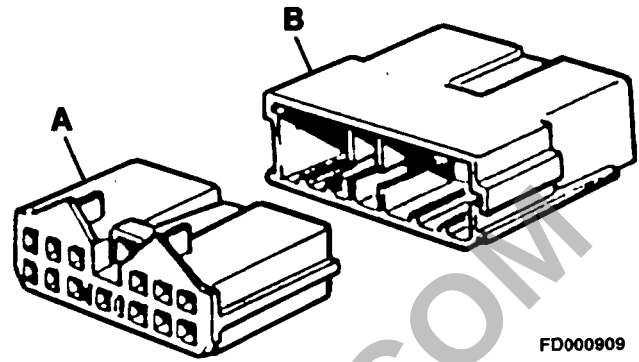
Disconnect the following electrical cables:

- Engine shut-off valve (A)
- Coolant temperature sensor (B)
- Pressure switch, engine oil (C)
- Starting motor (D)
- Alternator (E)
- Electrical cold-weather starting aid (F)
- Horn (G)
- Full beam/low beam headlights (H)
- Air cleaner restriction warning light (J)
- Battery (K)

NOTE: Refer also to Section 40.



FD,50,00 000704-19-06SEP95

CONNECTOR 137

FD000909

-UN-02FEB96
FD000909

Housing A		Housing B					
Colour	Sect.	Colour	Sect.	No.	Function	from	to
Rs	3	Rs	2	A1	Low beam headlights	65	3/2
Ve	3	Ve	3	A2	Full beam headlights	65	3/2
B	2	B	2	A3	Battery charge warning light	31	174/171
R	2	R	2	A5	Oil pressure warning light	174	200
NM	2	MN	2	A6	Engine temperature	174	201
G	3	G	3	A7	Starting motor	227	32
BcV	2	VBc	2	B1	Horn	111	173
NR	2	RN	2	B2	Air cleaner restriction warning light	174	206
BcB	2	BBc	2	B3	Tachometer (rev counter)/hour meter	31	171
BcJ	4	JBc	4	B4	Thermostat	60	34
JR	1	JR	1	B5	Stop solenoid	60	25
				B6	Not used		
Or	1	Or	1	B7	Front PTO clutch	80	94

FD, 000768-19-05OCT95

PREVIEW - YOUFIXTHIS.COM

CHECKING THE TENSION OF THE ALTERNATOR/COOLANT PUMP BELT AND COMPRESSOR BELT*

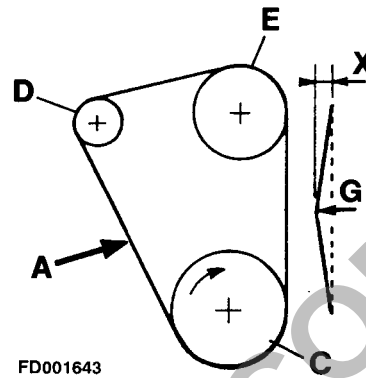
IMPORTANT: Excessive tension on the belts causes premature wear at the bearings of the coolant pump and alternator, while insufficient tension causes the belt to wear out prematurely, the hour meter to malfunction and the engine to overheat.

Check belt tension with the aid of a tension tester half-way between the pulleys. The following values must be obtained:

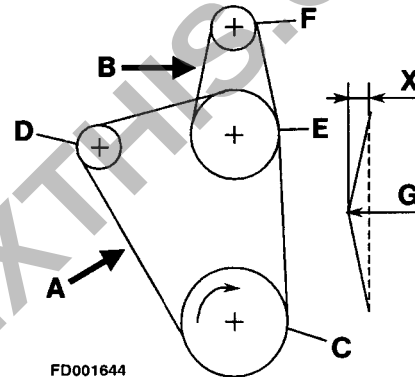
	Force (G)	Deflexion (X)
Alternator/coolant pump belt (A)	90 N (20 lb)	19 mm (0.75 in.)
Compressor belt* (B)	60 N (13.5 lb)	19 mm (0.75 in.)

NOTE: It is possible to check belt tension manually by pressing down on the belt with the thumb half-way between the pulleys. Belt deflexion must not exceed 1 cm (0.4 in.). Moreover, tension is incorrect if, on turning the alternator pulley by hand, the alternator pulley slips against the belt.

- A—Alternator/coolant pump belt
- B—Compressor belt*
- C—Crankshaft pulley
- D—Alternator pulley
- E—Coolant pump pulley
- F—Compressor pulley*
- G—Force
- X—Deflexion



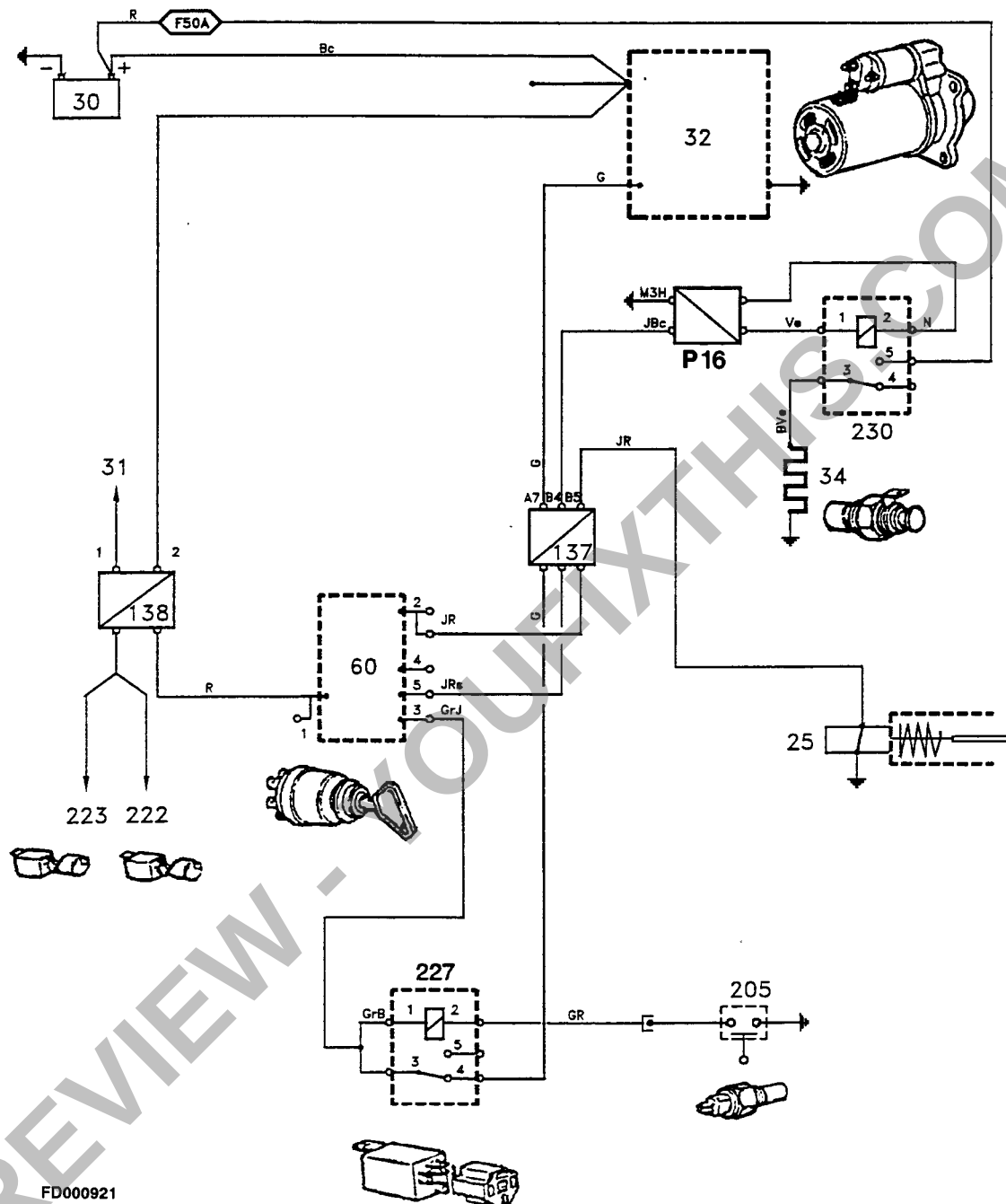
Without air conditioning



With air conditioning

* Tractors with air conditioning

SE1A — STARTING MOTOR AND FUEL PREHEATER CIRCUIT



FD000921

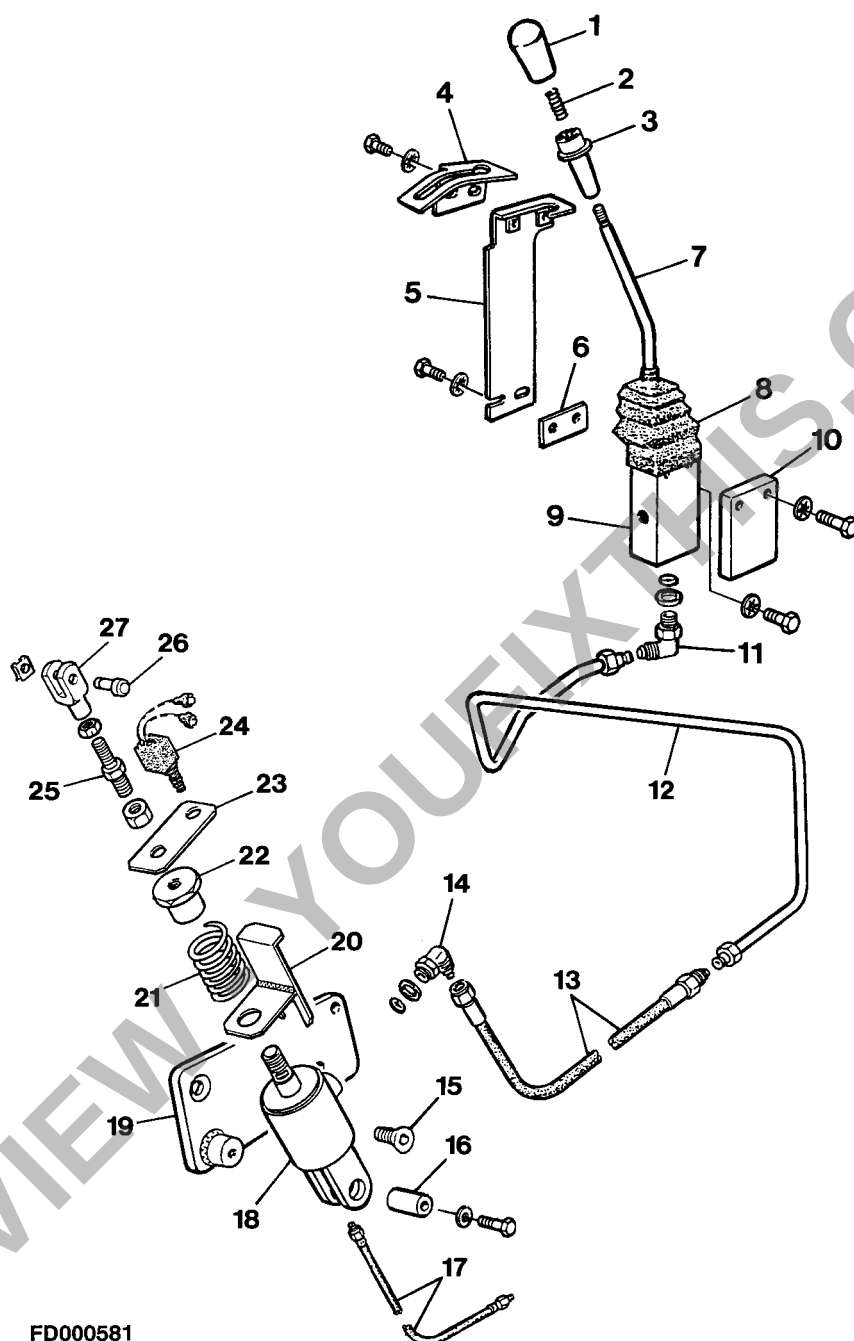
FD000921 -UN-02FEB96

- 25 — Engine shut-off
- 30 — Battery
- 31 — Alternator
- 32 — Starting motor
- 34 — Thermostat
- 60 — Main (key) switch
- 205 — Neutral start switch

- 222 — Front work light relay
- 223 — Rear work light relay
- 227 — Starting motor relay
- 230 — Relay for cold-weather starting aid
- 137 — Engine/superstructure connector
- 138 — Engine/superstructure connector
- P16 — Electric starting aid connector

FD, 000780-19-06OCT95

Exploded View



FD000581

FD000581 JUN-09 OCT95

- 1—Knob
- 2—Spring
- 3—Locking mechanism
- 4—Slide channel
- 5—Support
- 6—Plate
- 7—Rod

- 8—Boot
- 9—Distributor
- 10—Plate
- 11—Elbow fitting
- 12—Hydraulic line
- 13—Hose
- 14—Elbow fitting

- 15—Allen screw
- 16—Spacer
- 17—Hose
- 18—Hydraulic cylinder
- 19—Support
- 20—Switch stop
- 21—Spring

- 22—Spring seat
- 23—Plate
- 24—Switch
- 25—Threaded pin
- 26—Pin
- 27—Yoke

Installing the Shift Forks

The shift forks for the medium/high ranges (H) and 1st/2nd gears (E) have already been installed at an earlier stage.

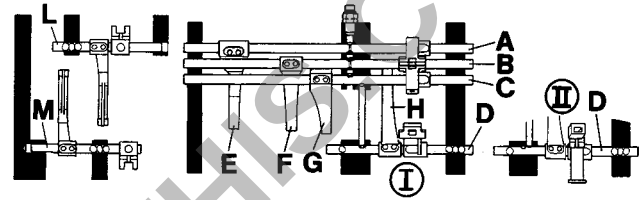
Place the two transmission housing attaching screws (arrows) in the holes in the differential housing (at the top and on the inside of the transmission housing).

One after the other, install the following:

- the shift forks for 3rd/4th (F) and 5th (G) gears
- the springs and balls
- the gear shifter shafts (A), (B) and (C) with their actuating elements and the shafts that operate the neutral start switch (J), in the following order: 5th, 3rd/4th, 1st/2nd
- the finger* (K) for locking out 5th gear in the high range (the range synchronizer must be in the position for medium range).
- the shifter shaft for medium/high range (D) and its actuating element.

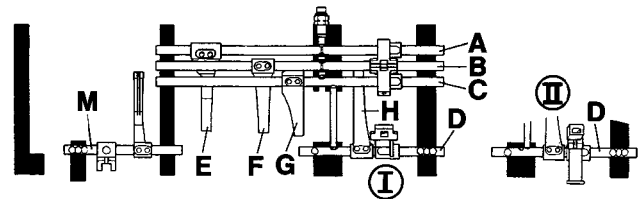
- I—Standard tractors
II—Version "X"
- A—Shifter shaft, 1st/2nd gears
B—Shifter shaft, 3rd/4th gears
C—Shifter shaft, 5th gear
D—Shifter shaft, medium/high ranges
E—Shift fork, 1st/2nd gears
F—Shift fork, 3rd/4th gears
G—Shift fork, 5th gear
H—Range shift fork
J—Neutral start switch
K—Locking finger*
L—Shifter shaft, splitter
M—Shifter shaft, reverse drive

FD000663



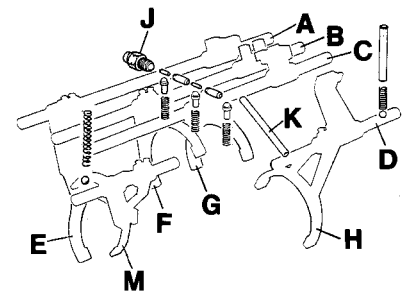
FD000664

With splitter, without low range



FD000665

With Twinshift



* 30 km/h (18.5 mph) transmissions

FD, 000471-19-01SEP95

-UN-05JAN96

FD000663

-UN-05JAN96

FD000664

-UN-05JAN96

FD000665

PRELOADING THE DIFFERENTIAL BEARINGS

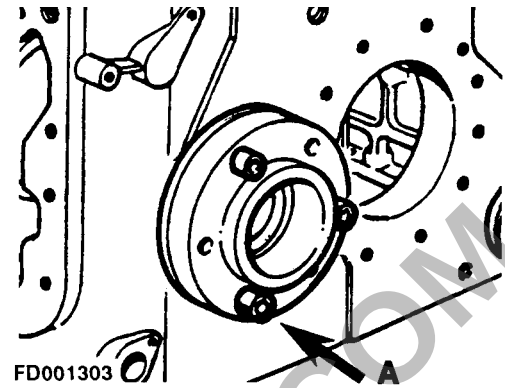
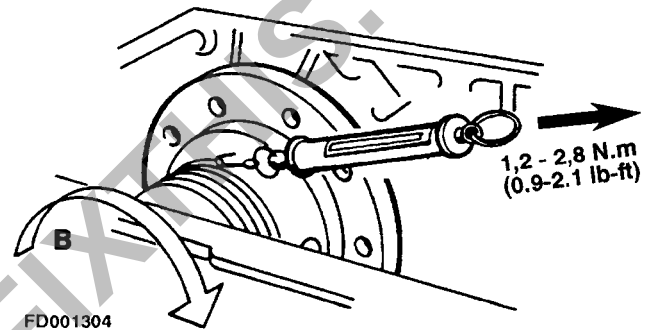
If the bearings have been replaced, the preload must be adjusted.

Carry out assembly without the ring gear. Use the same shims that were used before.

Tighten the screws on the r.h. bearing.
Progressively tighten the screws on l.h. bearing (A) while at the same time turning the differential.
If the bearings seize, add more shims. Take shims off if there is freeplay.

Check the preload with a spring scale.

A—L.h. bearing
B—10 turns

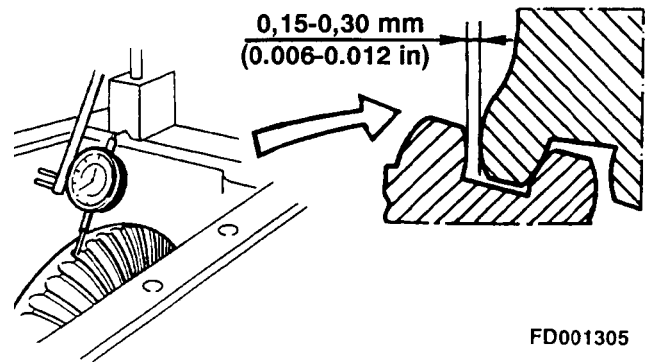


FD, 000621-19-09NOV95

CHECKING FOR BACKLASH

Check backlash using a dial gauge. Backlash must be between 0.15 and 0.30 mm (0.006 and 0.012 in.).

If backlash is out of tolerance, transfer the shims from one bearing to the other.



FD, 000622-19-09NOV95

ADJUSTING A SEPARATE PRESSURE-LIMITING VALVE USING A COMPLETE TRACTOR

To perform this adjustment, use the oil flow from a separate (complete) tractor. Proceed as follows:

Remove the steering unit to be adjusted (see Group 00).

Connect tester (F) as follows:

1. Connect one selective control valve (A) on the complete tractor using a hose that matches the tester inlet (B).
2. Seal L and R connections of the steering unit with plugs.
3. Connect tester outlet (C) to inlet P of the steering unit (D).
4. Connect outlet T of the steering unit to the return connection (E).

Make sure that all the connections are tight.

Open the constriction valve on tester (F).

Start the complete tractor's engine and run it at slow idle. Actuate the lever for the SCV connected to the steering unit.

NOTE: The oil flows through the tester and the steering unit that is being tested and returns to the housing on the complete tractor.

Set the engine speed until the flow rate recorded on the tester is approximately 30 to 35 l/min (7.9 to 9.2 gpm).

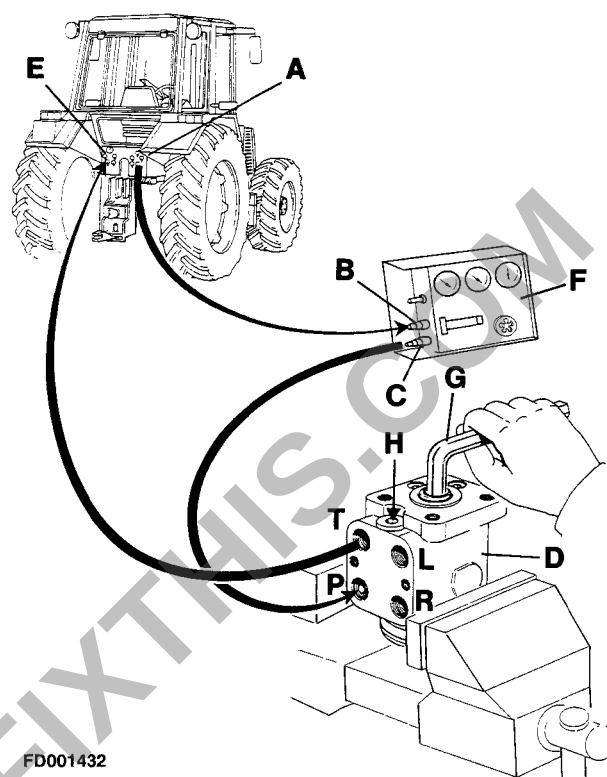
Oil temperature must be approximately 40°C (104°F).

Using a 16 mm Allen key (G), operate the steering unit in one direction. Record the pressure on the tester. Operate the steering unit in the other direction and record the pressure on the tester.

Steering pressure is the pressure difference between the two recorded pressures. Pressure should be 14000 kPa (140 bar; 2030 psi).

If the pressure difference is not equal to specification, maintain the torque and turn the adjusting screw (H) on the pressure-limiting valve. Observe the pressure on the tester's high-pressure gauge.

Under the same conditions, make sure that there is no leak at the seal and that maintaining the torque does not cause the spool to rotate too much, as this would indicate significant internal leakage.



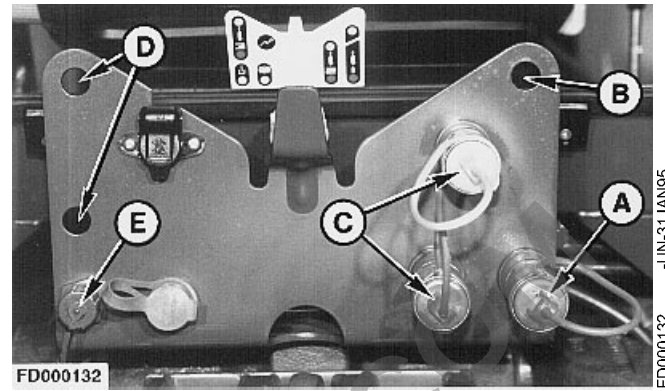
FD001432

- A—Selective control valve on complete tractor
- B—Tester inlet
- C—Tester outlet
- D—Steering unit
- E—Return connection
- F—Tester
- G—Allen key
- H—Adjusting screw
- L,R—Ports to steering cylinder
- P—Steering unit inlet
- T—Steering unit outlet

FD001432 -UN-15JAN96

PRESSURE OUTLETS

- A — Pressure outlet for single-acting SCV No. 1, or 1st pressure outlet for double-acting SCV No. 1 (if equipped)
- B — Location for 2nd pressure outlet for double-acting SCV No. 1 (if equipped)
- C — Pressure outlets for double-acting SCV No. 2 (if equipped)
- D — Locations for optional installation of pressure outlets for double-acting SCV No. 3
- E — Oil return



FD,EQUIP 000229-19-01JUN94

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