TD75D, TD95D, TD95D HIGH CLEARANCE REPAIR MANUAL COMPLETE CONTENTS

The following pages are the collation of the contents pages from each section and chapter of the TD75D, TD95D, and TD95D High Clearance Repair manual. Complete Repair part # 87572972.

The sections used through out all New Holland product Repair manuals may not be used for each product. Each Repair manual will be made up of one or several books. Each book will be labeled as to which sections are in the overall Repair manual and which sections are in each book.

The sections listed above are the sections utilized for the TD75D, TD95D, and TD95D High Clearance Tractors.

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1st Printing

SECTION 31 – POWER TAKE-OFF

BOOK 3 - 87572975

Chapter 1 – Power Take-Off

CONTENTS

SECTION 55 - ELECTRICAL SYSTEM

BOOK 4 - 87572976

Chapter 5 - Battery

CONTENTS

HEALTH AND SAFETY

CONTENTS

HEALTH AND SAFETY PRECAUTIONS

Many of the procedures associated with vehicle maintenance and repair involve physical hazards or other risks to health. This section lists, alphabetically, some of these hazardous operations and the materials and equipment associated with them. The precautions necessary to avoid these hazards are identified.

The list is not exhaustive and all operations and procedures and the handling of materials, should be carried out with health and safety in mind.

PRECAUTIONARY STATEMENTS

PERSONAL SAFETY

Throughout this manual and on machine decals, you will find precautionary statements ("**DANGER**", "**WARNING**", and "**CAUTION**") followed by specific instructions. These precautions are intended for the personal safety of you and those working with you. Please take the time to read them.

⚠ DANGER ⚠

This word "DANGER" indicates an immediate hazardous situation that, if not avoided, will result in death or serious injury. The color associated with Danger is RED.

⚠ WARNING ⚠

This word "WARNING" indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury. The color associated with Warning is ORANGE.

⚠ CAUTION ⚠

This word "CAUTION" indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices. The color associated with Caution is YELLOW.

FAILURE TO FOLLOW THE "DANGER", "WARNING", AND "CAUTION" INSTRUCTIONS MAY RESULT IN SERIOUS BODILY INJURY OR DEATH.

MACHINE SAFETY

The precautionary statement ("**IMPORTANT**") is followed by specific instructions. This statement is intended for machine safety.

IMPORTANT: *The word "IMPORTANT" is used to inform the reader of something he needs to know to prevent minor machine damage if a certain procedure is not followed.*

INFORMATION

NOTE: *Instructions used to identify and present supplementary information.*

CONSUMABLES

COMPONENT TO BE FILLED OR TOPPED UP	QTY Liters (US gal)	NEW HOLLAND RECOMMENDED PRODUCTS	INTERNATIONAL SPECIFICATION
Cooling system: - without cab: TD75D, TD95D, TD95D (HC) .... - with cab: TD75D, TD95D, TD95D (HC)	 14.0 (3.7) 16.0 (4.2)	Fleetguard Compleat concentrate and water 50% and 50%	Ethylene Glycol concentrate and water 50% and 50%
Windscreen washer bottle	2.0 (0.5)	Water and cleaning fluid	
Fuel tank TD75D, TD95D ..... TD95 (high clearance)	92.0 (24.3) 74.0 (19.15) 26.9 (7.1) (Auxiliary tank)	Decanted and filtered diesel fuel	-
Engine sump: without filter : TD75D, TD95D, TD95D (HC) .... with filter : TD75D, TD95D, TD95D (HC)	 10.5 (2.8) 11.2 (3.0)	AMBRA Supergold SAE 15W-40 (NH330G) AMBRA Supergold SAE 10W-30 (NH324G)	API CF-4/SG CCMC D4 MIL-L-2104E
Brake control circuit	0.4 (0.1)	AMBRA Brake LHM oil (NH610A)	ISO 7308
Hydrostatic steering circuit	2.0 (0.5)	Oil AKCELA MULTI G (NH410B)	API GL4 ISO 32/46 SAE 10W-30
Front axle: - axle housing: TD75D, TD95D, TD95D (HC) .... - final drives (each): TD75D, TD95D, TD95D (HC)	 7.0 (1.8) 1.25 (0.3)		
Rear transmission (bevel drive, final drives and brakes), transmission, hydraulic lift, PTO and hydrostatic steering: TD75D, TD95D, TD95D (HC) .... - with synchro-reverser: All Models	 55.0 (13.1) 55.0 (13.1)		
Front wheel hubs	-	Grease AMBRA GR8 (NH710A)	NLGI 2
Grease fittings	-		

*See page 26 for information about using biodegradable oil in the transmission, axles, hubs and hydraulic system.

***IMPORTANT**: Use only heavy-duty, low silicate coolant such as NH Fleetguard Compleat. Automotive antifreeze purchased at local supply store outlets most likely is not low silicate and must not be used in heavy-duty diesel engines. Always have a minimum of 50% ethylene glycol coolant in the cooling system, adjusting the concentration based on ambient temperature, according to coolant label instructions. Use good quality water. Deionized water is ideal for cooling systems and is contained in some prepackaged coolants labeled as pre-mixed with water. If the low silicate ethylene glycol coolant is not pre-charged with supplemental diesel coolant additive/inhibitor, this must be added to the solution to provide protection against corrosion and pitting.*

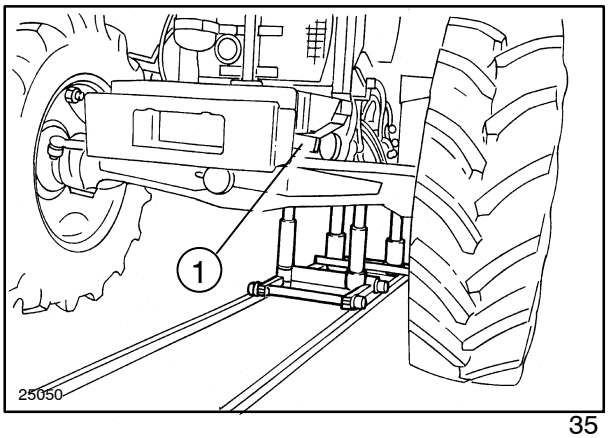
CYLINDER HEAD DATA	mm (in)
Cylinder head	with valve seats cut directly in the casting and press-fitted steel valve guides.
Original height of cylinder head	92 (3.622)
Maximum face regrinding depth	0.5 (.019)
Diameter of standard valve guide bores in head	13.950 to 13.983 (.549 - .550)
Outside diameter of standard valve guides	13.993 to 14.016 (.550 - .551)
Guide interference fit in bores	0.010 to 0.066 (.0004 - .002)
Inside diameter of valve guide (installed in head)	8.023 to 8.043 (.315 - .316)
Valve stem diameter	7. 985 to 8.000 (.314 - .315)
Assembly clearance between valve stem and guide	0.023 to 0.058 (.001 - .002)
Wear limit endfloat	0.13 (.005)
Maximum runout of valve guided on its stem measured through 360° with dial gauge contact point resting on valve head contact band	0.03 (.001)
Valve guide oversizes	0.2 (.007)
Valve seat angle in head:	
- intake valve	$60^{o} \pm 5'$
- exhaust valve	$45^{o} \pm 5'$
Valve face angle:	
- intake valve	$60^{o}\ 30' \pm 7'$
- exhaust valve	$45^{o}\ 30' \pm 7'$
Valve head diameter:	
- intake valve	45.300 to 45.500 (1.783 - 1.791)
- exhaust valve	37.500 to 37.750 (1.476 - 1.486)
Valve stand-in relative to cylinder head face	0.7 to 1.0 (.027 - .039)
Maximum permissible valve stand-in	1.3 (.051)
Intake and exhaust valve springs:	
- free length	44.6 (1.755)
- length with valve closed, under load of 256 to 284 N (57.55 to 63.71 lbs.)	34 (1.338)
- length with valve open, under load of 502 to 554 N (112.8 to 124.78 lbs.)	23.8 (.937)
Injector protrusion relative to head face:	
• BOSCH injector	0.3 to 1.1 (.011 - .043)

TROUBLESHOOTING

Problem	Possible Cause	Remedy
Engine lacks power and runs unevenly. (continued)	Fuel supply pump damaged.	Replace fuel supply pump.
	Incorrect valve clearances.	Adjust valve clearances.
	Cylinder compression low.	Test compression and overhaul engine if necessary.
	Air filter clogged.	Clean air filter unit and replace element if necessary.
	Tierod in linkage between accelerator and injection pump incorrectly adjusted.	Adjust to correct length.
	Maximum speed screw on injection pump incorrectly adjusted.	Adjust max. speed screw.
Engine produces abnormal knocking noises.	Injectors partially obstructed or damaged.	Clean, overhaul and calibrate injectors.
	Impurities accumulating in fuel lines.	Clean fuel lines and replace severely dented pipes. Clean injection pump if necessary.
	Incorrect injection pump timing.	Adjust injection pump timing.
	Crankshaft knocking due to excessive play in one or more main or big-end bearings or excessive endfloat.	Regrind crankshaft journals and crankpins. Install oversize shell bearings and thrust washers.
	Crankshaft unbalanced.	Check crankshaft alignment and balance; replace if necessary.
	Flywheel bolts loose.	Replace any bolts that have worked loose and tighten all bolts to the specified preliminary and angular torque values.
	Connecting rod axes not parallel.	Straighten connecting rods, check axes parallelism; replace connecting rods if necessary.
	Piston knock due to excessive wear.	Rebore cylinders and install oversize pistons.
	Noise caused by excessive play of gudgeon pins in small-end and piston bushings, or loose fit of small-end bushing.	Install oversize gudgeon pin, rebore piston seats and small-end bushings. Replace bushings.
	Excessive tappet / valve noise.	Check for broken springs or excessive play between valve stems and guides, cam followers and bores. Adjust valve clearances.

(continued)

28. Position stand **380000236** underneath the tractor and insert a wedge (1), either side of the axle, to prevent the axle from pivoting.



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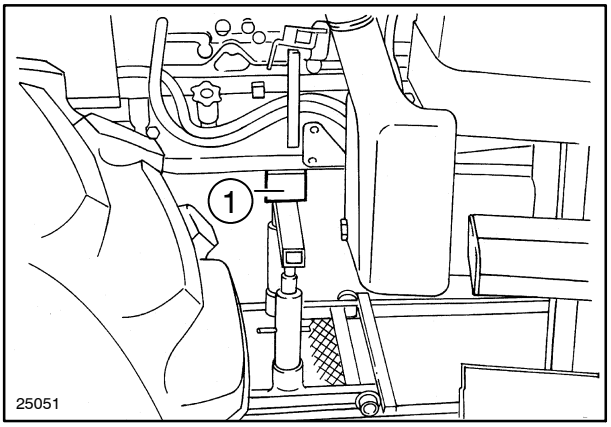
29. Insert a wooden block between the stands and the tractor.



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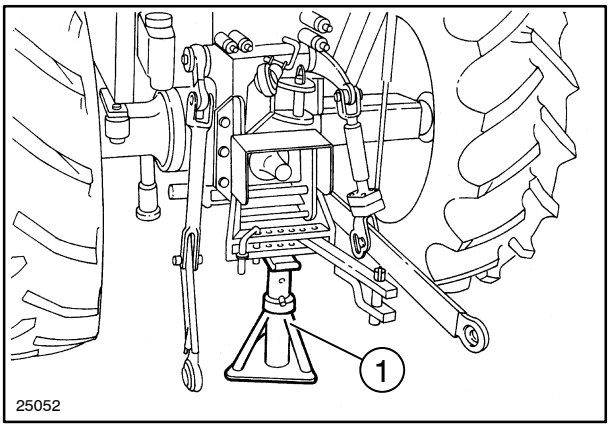
30. Place a fixed stand (1) underneath the drawbar support and apply the handbrake.



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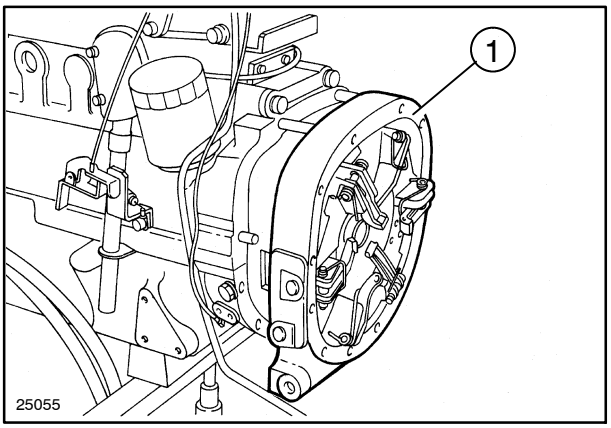
32. Unscrew the four remaining bolts securing the engine to the transmission.

33. Separate the engine from the transmission.

31. Remove the distance collar (1) between the engine and transmission.



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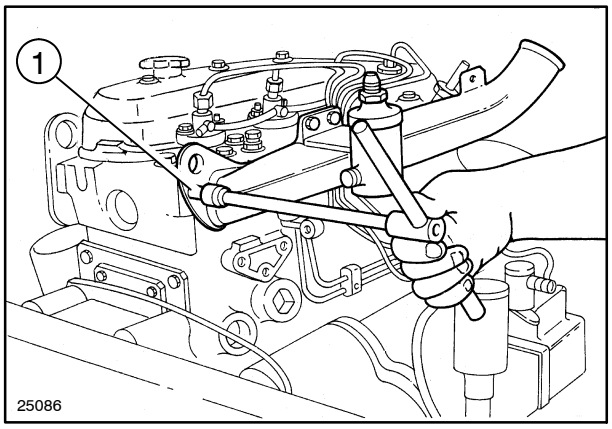
21. Unscrew the bolts (1) securing the inlet manifold to the cylinder head and remove the manifold.



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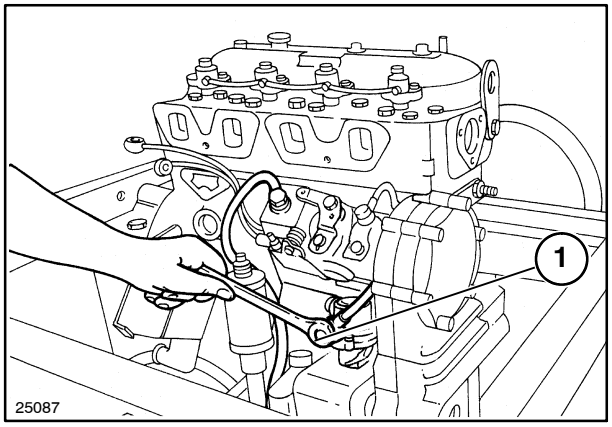
22. Remove the pipes and unions (1) to the fuel supply pump.



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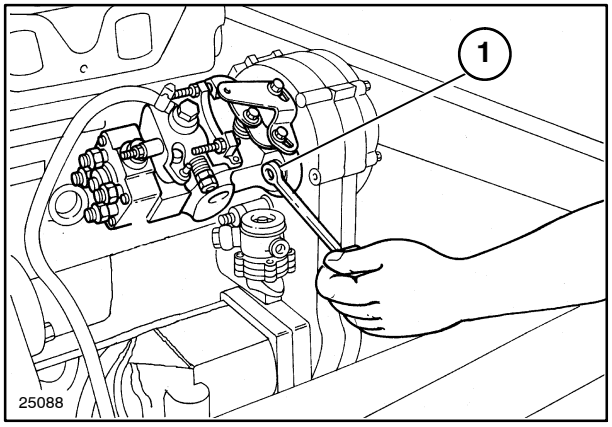
23. Unscrew the nuts (1) securing the injection pump to the timing gear case.



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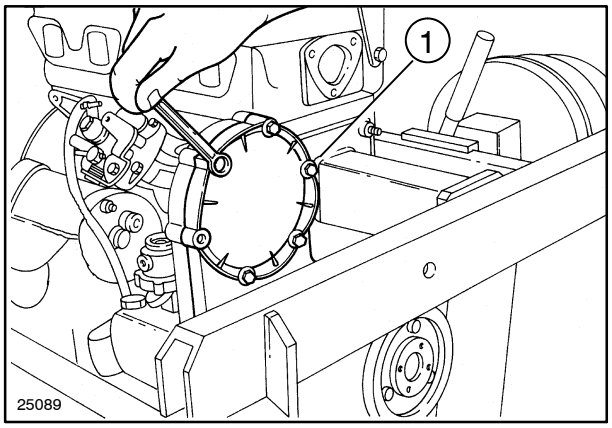
24. Remove bolts (1) and the injection pump drive gear cover.



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68. Remove the lubricating oil pipe (3) fig. 107.

69. Remove the circlip (18).

70. Remove the circlip (25) and cover (23) with relative O-ring seal (24).

71. Remove gear (22) from sump.

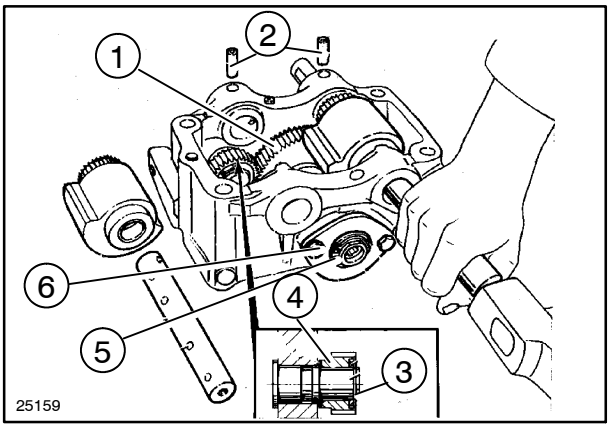
72. Remove the circlip (2), gear (26) and the two thrust washers (1).

73. Inspect shaft (27). If it shows signs of scoring or wear it must be replaced.

74. Extract the roll pins and remove the counterweight shafts (8) using a suitable drift.

75. Remove the counterweight drive gear (1) fig. 106 by removing the circlip (5) and the carrier retaining bolts (6).

76. Remove circlip (3) and intermediate gear (4) fig. 106.



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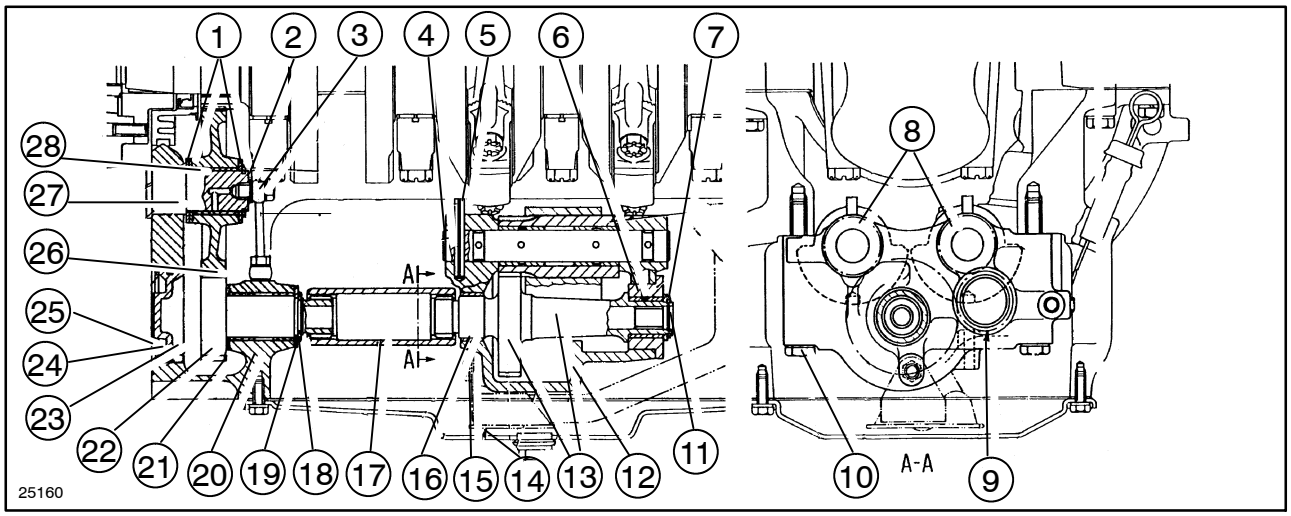

Counter-Rotating Dynamic Balancer
(TD75D and TD95D models)

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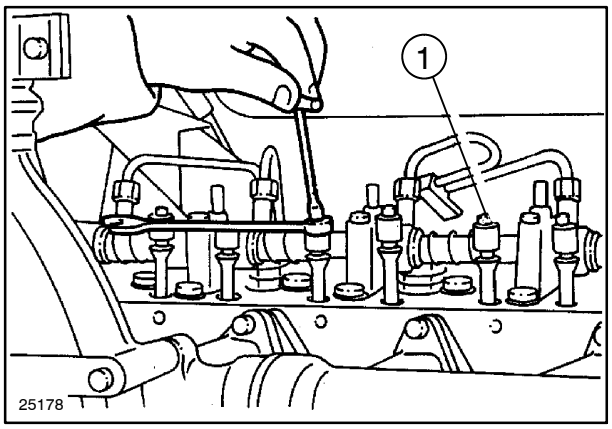
1. Thrust washers
2. Circlip
3. Lubricating oil pipe for bushing
4. Counterweight rotation shaft
5. Shaft retaining spring pin
6. Carrier for counterweight drive gear
7. Thrust washer
8. Counterweight
9. Counterweight intermediate gear
10. Bolts securing counterweight housing to sump
11. Circlip
12. Counterweight housing
13. Counterweight drive gear
14. Screen filter
15. Screen filter retaining bolt
16. Bushing
17. Rigid coupling sleeve
18. Circlip
19. Thrust washer
20. Carrier for gear
21. Thrust washer
22. Counterweight drive gear
23. Cover
24. O-ring seal
25. Circlip
26. Intermediate gear
27. Shaft for gear
28. Bushing

Valve/Rocker Arm Clearance

1. Before installing the rocker cover, adjust the valve clearances as described under Valve Clearance-Adjustment at the end of this Chapter.
2. Tighten the rocker arm adjuster screw locknuts (1) to a torque of 22 N·m (16 ft.-lb.).



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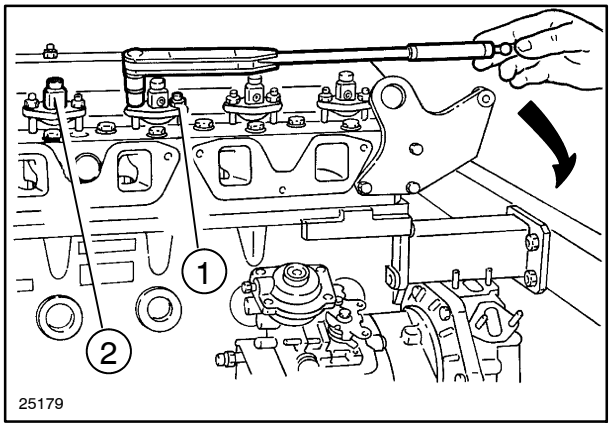
Injectors

Proceed as follows:

1. Insert the injectors (2) in the respective bores.
2. Position the injector support brackets and install the spherical washers.
3. Screw the bracket retaining nuts (1) to the spherical washers. Tighten the nuts in two stages as follows:
   1st stage – tighten nuts to 10 N·m (73 ft-lbs);
   2nd stage – tighten nuts to 25 N·m (18 ft-lbs).
4. Tighten the leak-off pipe unions.
5. Tighten the high-pressure fuel line unions.



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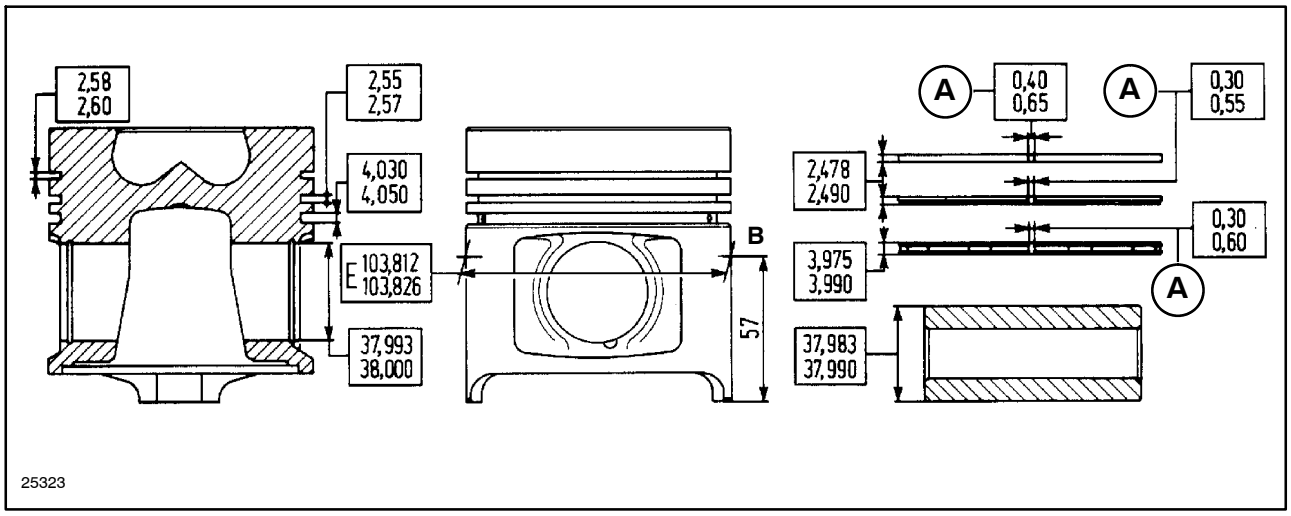

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Dimensions (mm) of Standard Pistons, Gudgeon Pins and Rings.

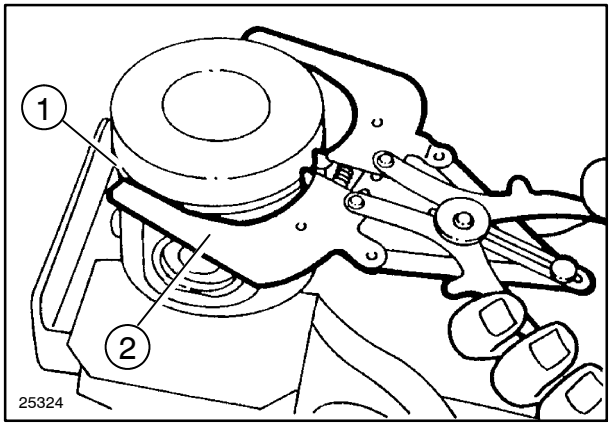
A Measurement to be obtained with ring inserted in cylinder bore.

B Piston diameter measured at 57 mm (2.24 in.) from the base of the skirt.

When removing or installing piston rings (1), use pliers **380000221** (2).

Install rings in grooves in the order indicated in fig.151.

When installing pistons on connecting rods, check that the clearance between the gudgeon pin and bore in the piston is within the tolerance listed in the SPECIFICATIONS table in the beginning of this chapter.



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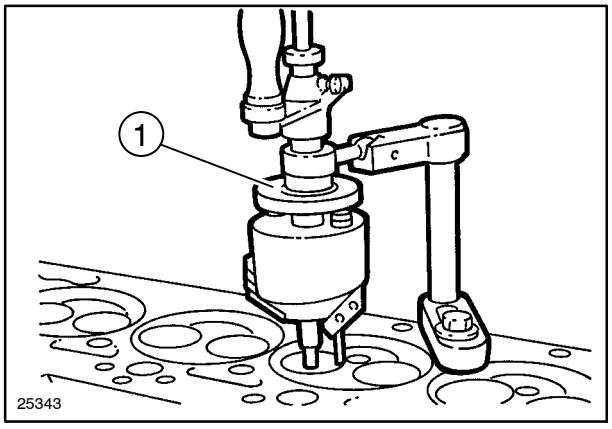
Valve Seats in Cylinder Head

CAUTION

Handle all parts carefully. Do not put your hands or fingers between parts. Wear suitable safety clothing - safety goggles, gloves and shoes.

When refacing the valve seats is required, grind as little material as possible. Use a universal valve grinder (1) if available.



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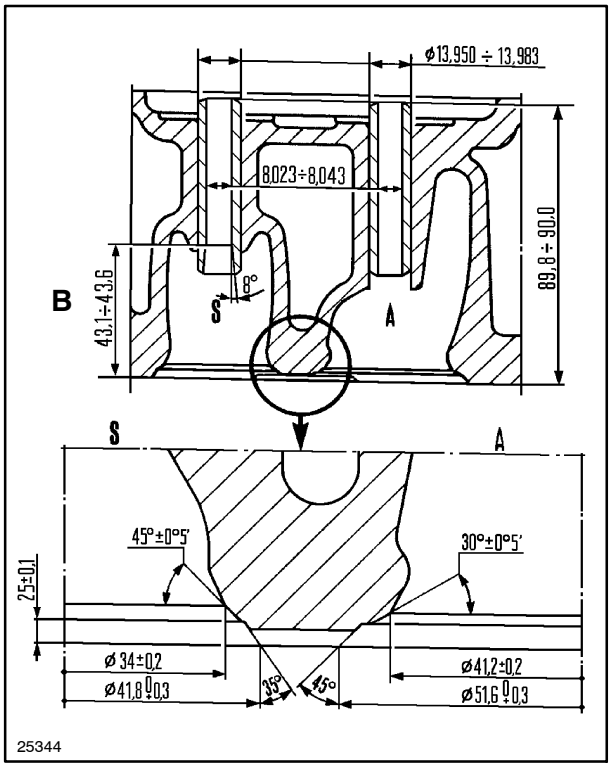
Dimensions (mm) of valve seats and guide valves.

A. Inlet.
B. Depth of taper.
(relative to cylinder head face)
S. Exhaust.



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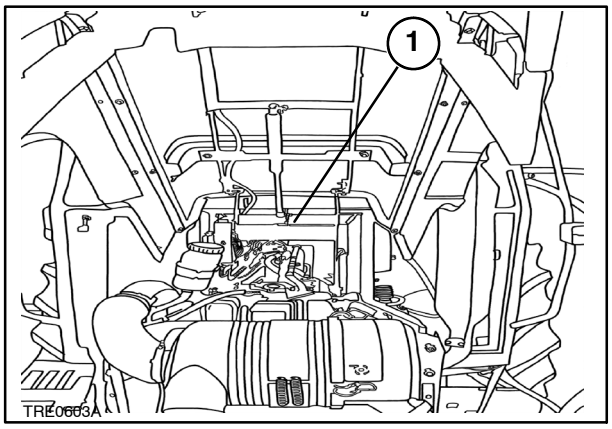
SECTION 10 - ENGINE

Chapter 2 - Cooling System

CONTENTS

6. Detach the strut (1) from hood.



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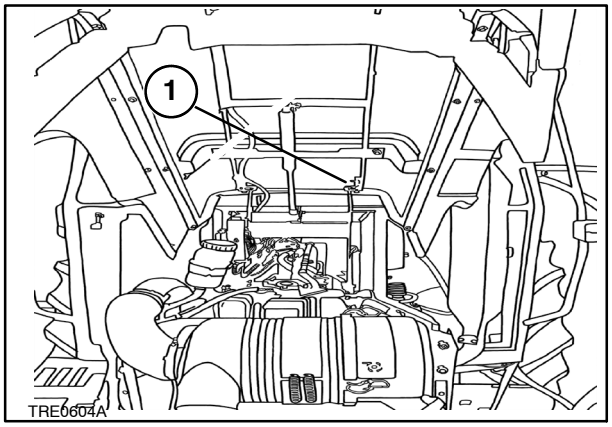
7. Remove the four hood hinge bolts (1) and lift the hood clear.



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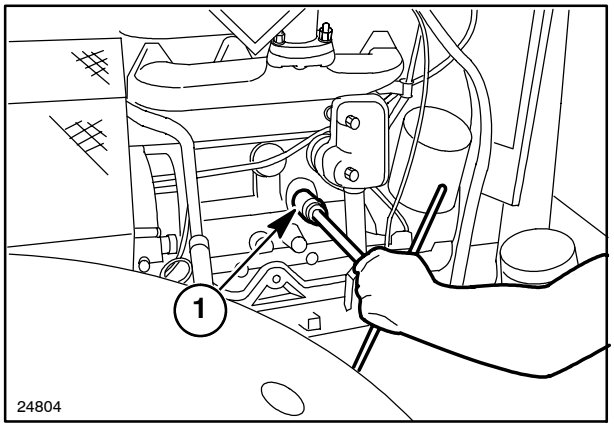
8. Drain the cooling system from the drain plug (1) on the engine block.



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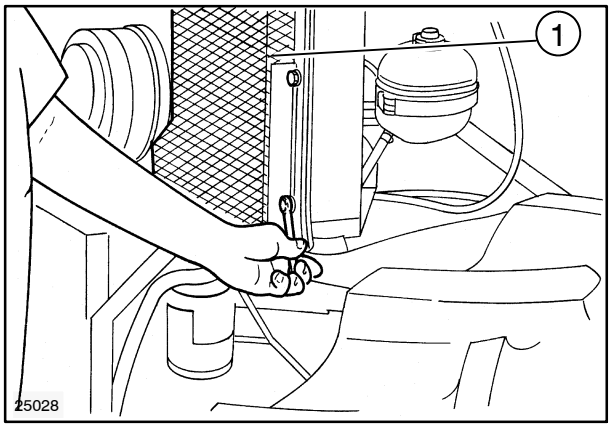
9. Remove the fan guard (1) from the right-hand side of the radiator.



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SPECIAL TOOLS

⚠ WARNING ⚠

The operations described in this Section must only be performed with the ESSENTIAL tools marked with an X.
To work safely and efficiently and obtain the best results, it is also necessary to use the recommended specific tools listed below and certain other tools, which are to be made according to the drawings included in this manual.

List of specific tools required for the various operations described in this Section.

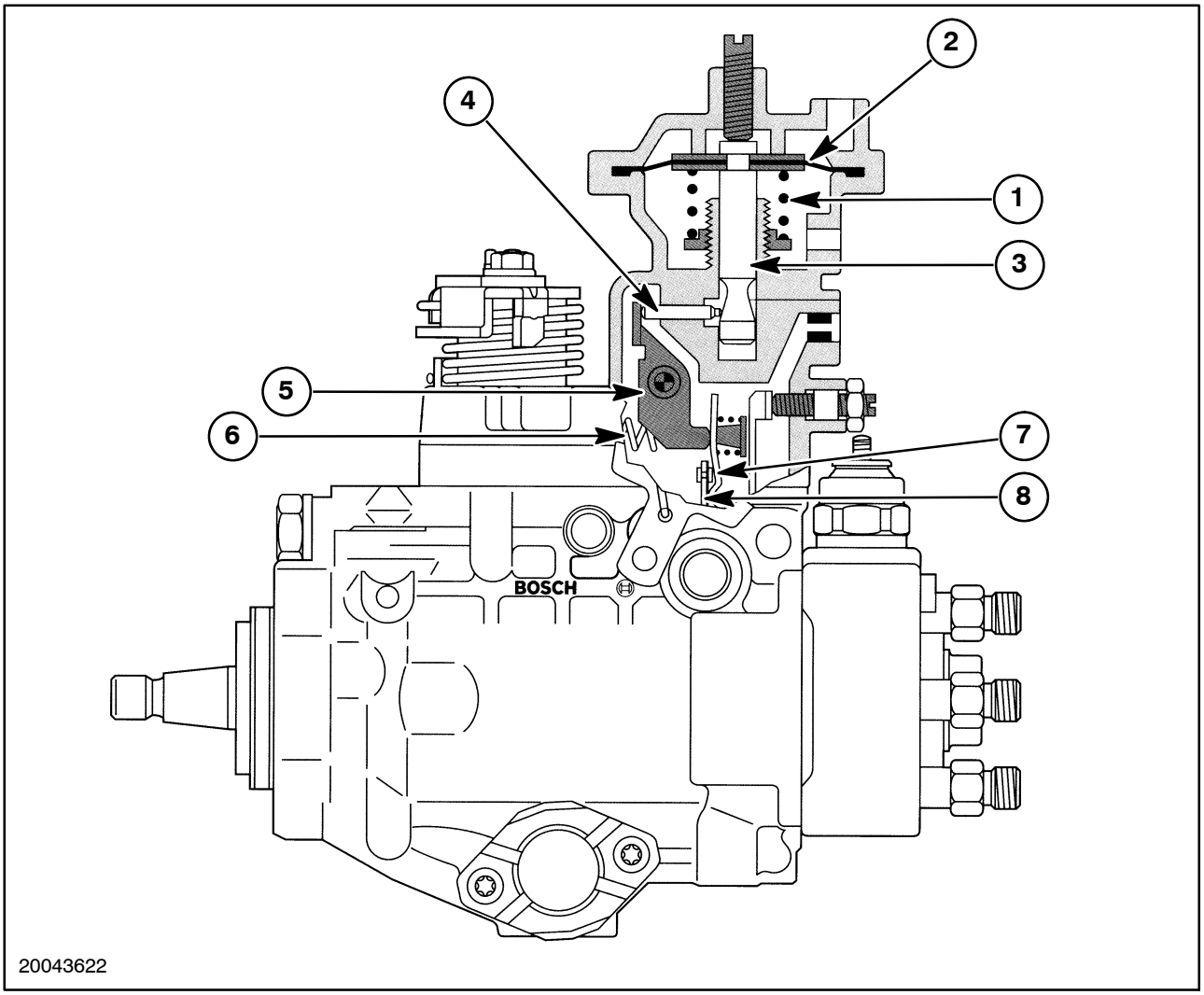
380000240	Engine oil lubrication pressure test kit.

Operation

In the lower speed range of the engine, the air pressure generated by the turbocharger is insufficient to overcome the pressure of the compression spring (1) under the diaphragm (2). Therefore, the diaphragm remains in the initial position. When the air pressure becomes sufficient to overcome spring force, the diaphragm and sliding pin (3) shift against the force of the compression spring. The guide pin (4) changes position and causes the reverse lever (5) to swivel around a pivot. Due to the force exerted by the governor spring (6), a nonpositive connection between the tensioning lever (7), reverse lever (5), guide pin (4) and sliding pin (3) exists. This action results in the tensioning lever following the swivel movement of the reverse lever, causing the starting lever (8) and tensioning lever to swivel around pivots to shift the control collar in the direction of increased fuel delivery. Fuel delivery adapts in response to increased air mass in the combustion chamber.

When air mass decreases, the compression spring pushes the diaphragm upward with the sliding pin. The compensation of the governor lever mechanism reverses direction, which adapts the fuel quantity to the change in air pressure.

In case of turbocharger failure, the LDA reverts to the initial position, and the engine operates normally without developing smoke.



5

Manifold Pressure Compensator (LDA)

1. Compression Spring
2. Diaphram
3. Sliding Pin
4. Guide Pin
5. Reverse Lever
6. Governor Spring
7. Tensioning Lever
8. Starting Lever

11. Unscrew the locknut that holds the injection pump to the gears (1).

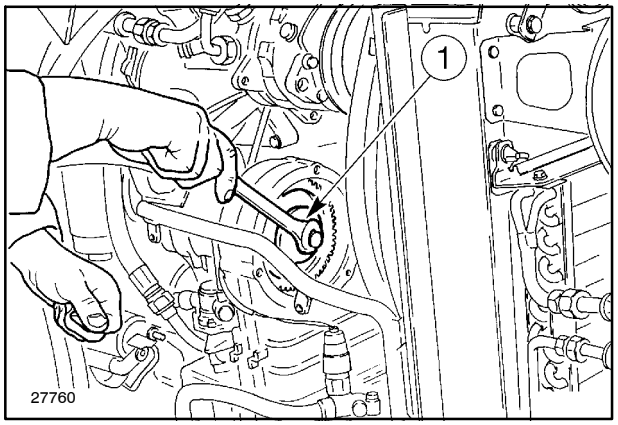
***IMPORTANT**: If the fuel injection pump was not secured (locked) with the locking bolt before removal, the pump must be properly lock-timed (refer to "Lock-Time the Fuel Injection Pump with Pump Removed from the Tractor").*

12. Extract the injection pump drive gears using tool **380000322** (2) and recover the injection pump with the woodruff key.

***NOTE**: Some Tier 2 engines produced before serial 988328 may or may not have the woodruff key installed. Because of the confusion the removed key has caused for technicians, the key has been installed again at engine serial number 25910 (engine production date July 29, 2004).*

***IMPORTANT:** The woodruffkey is not required as long as the nut securing the injection pump drive gear to the tapered pump shaft is tightened to the proper torque of 105 N·m (75 ft.-lb.). The gear and pump shaft have an interference taper fit so when the nut is tightened properly, the gear will not move on the shaft without the key installed.*

The Tier 2 Bosch VE injection pump consists of a pump drive shaft-locking bolt and shim. When the locking bolt is loosened, the shim removed, and the bolt retightened, the drive shaft is unable to turn. This allows the pump to be lock-timed with the number one piston at top dead center before removal.



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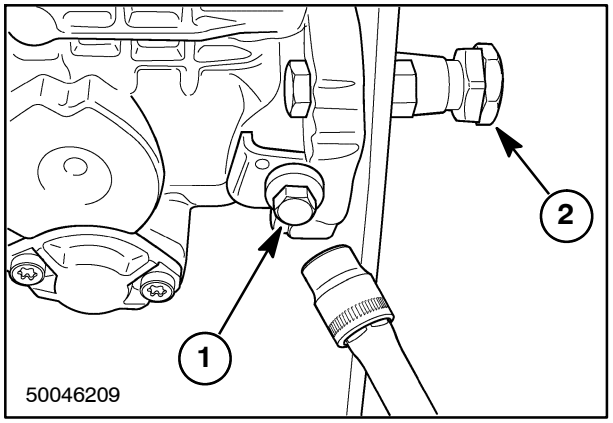
Model	Timing at Top Dead Center (PMS)
TD75D	1.47 mm at PMS ± 0.03 mm
TD95D	1.00 mm at PMS ± 0.03 mm

18. Remove the jamnuts (2) from the end of the pump shaft while watching the dial indicator needle to be sure the needle does not move. If the dial indicator needle moves this indicates the shaft turned and you will need to reset it. The lock-timing screw (1) will hold the pump driveshaft at this setting as long as you use caution when installing the pump onto the engine.
19. Disconnect the 12-volt battery jumper wires.
20. Remove the dial indicator and timing tool adapter. Loosely install the plunger access plug at this time because the pump to engine timing will need to be verified after the pump is mounted to the engine.
21. Remove the injection pump from the mounting plate. Pump is ready to be installed on the engine.



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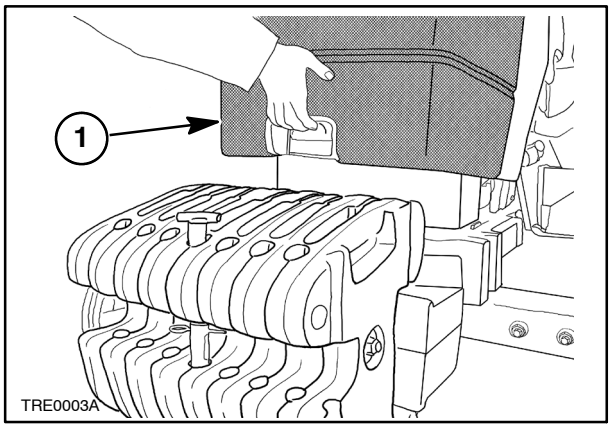
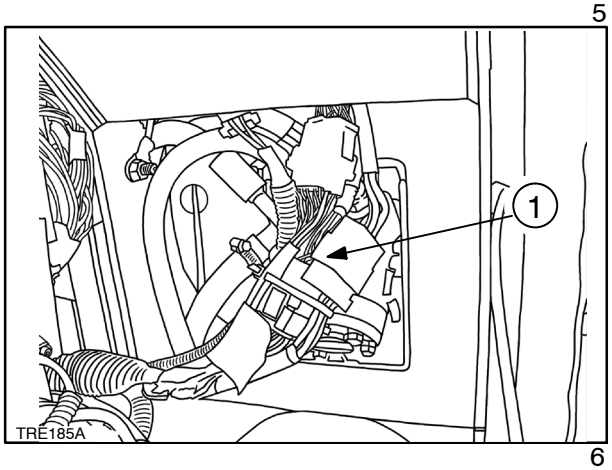
6. Raise the hood (1).



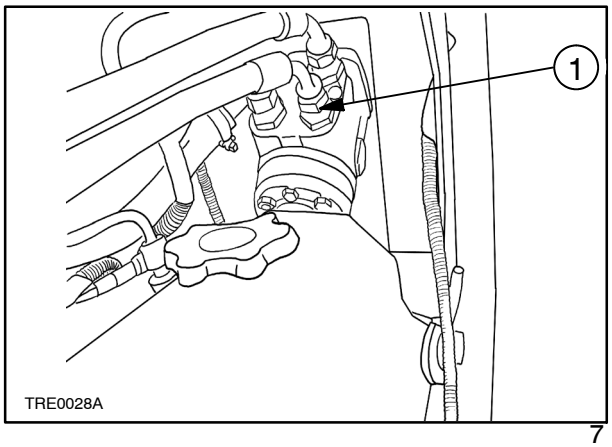
5

7. Remove the electrical connections (1)



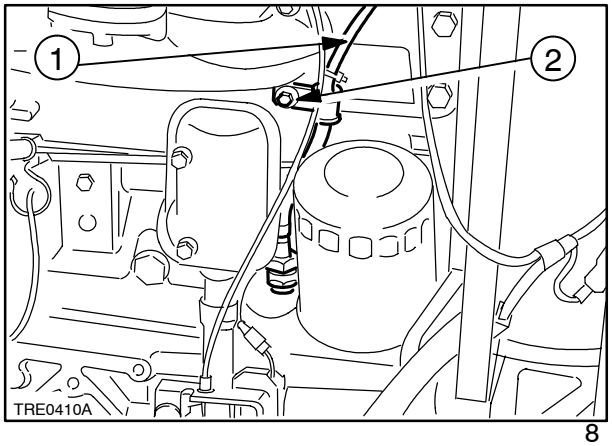
6

8. Disconnect the oil pipes (1) to the hydrostatic steering control valve.



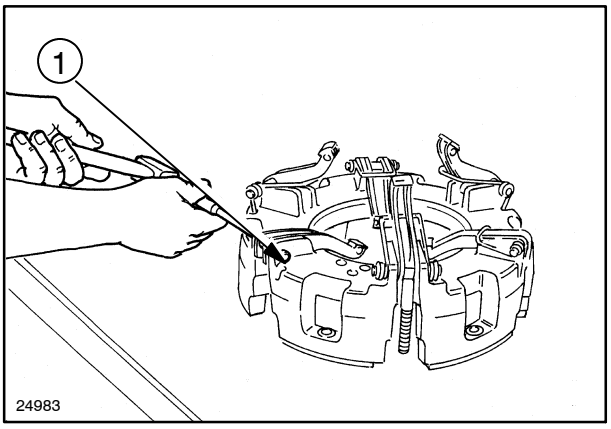
7

9. Disconnect the multimeter cable (1) from the engine and remove the clamp (2).



8

13. Remove the main clutch control lever pivot pins (1).



40

Assembly

To assemble, proceed as follows:

1. Install the lever pivot pins and the relative springs.

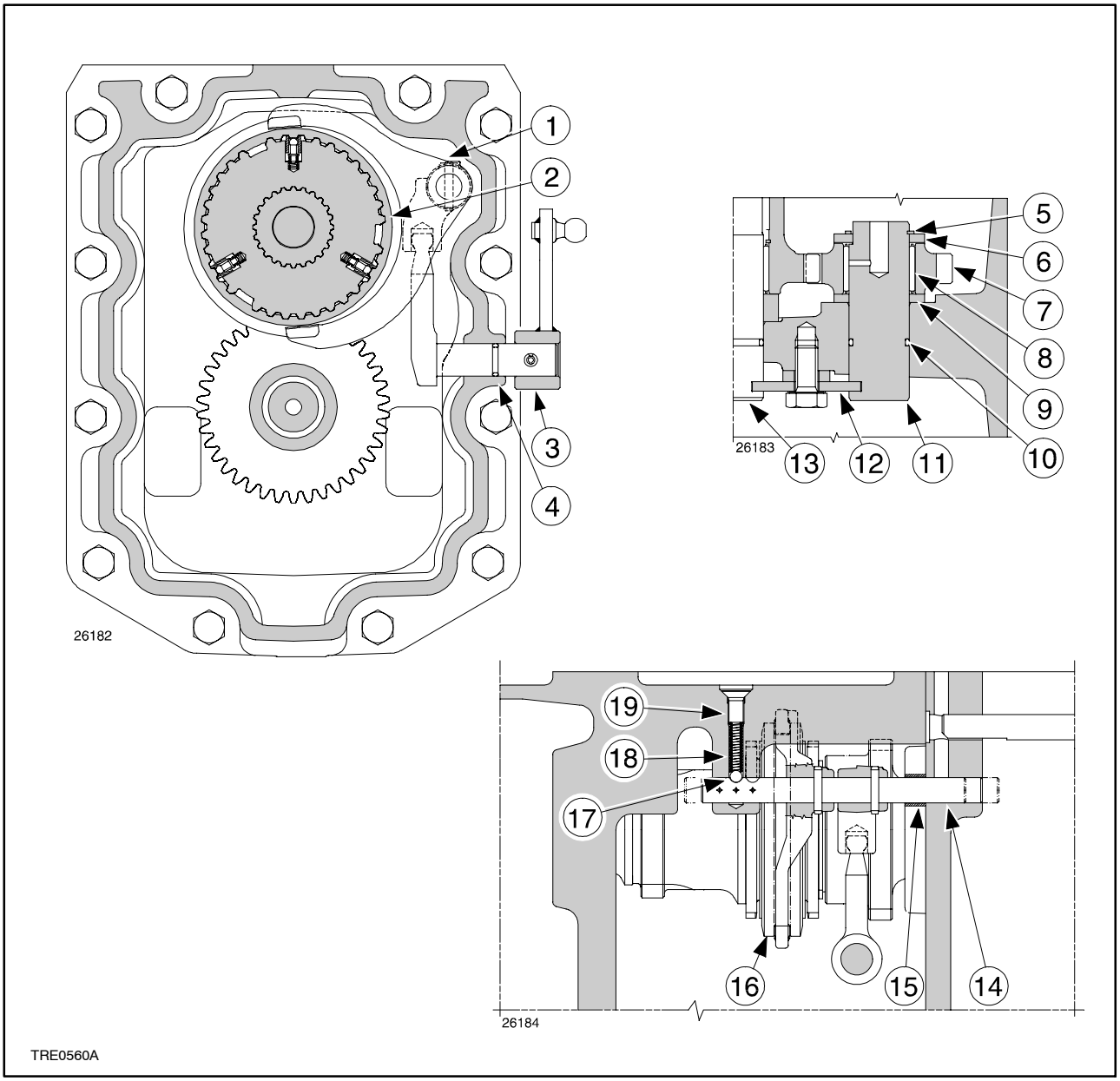
2. Install the main clutch disc in the clutch housing.

3. Install the main clutch pressure plate and secure to the pins with the bolts.

4. Insert the Belleville spring disc into the housing. Position three clamps at intervals of 120° on the clutch body and evenly and progressively compress the spring. Insert the six spring retaining clips.

NOTE: *Ensure to firmly insert the six spring retaining clips in each respective seat.*

5. Install the PTO clutch friction disc, three washers, and the coil springs on the pins and secure with the three PTO clutch lever adjustment nuts (1).



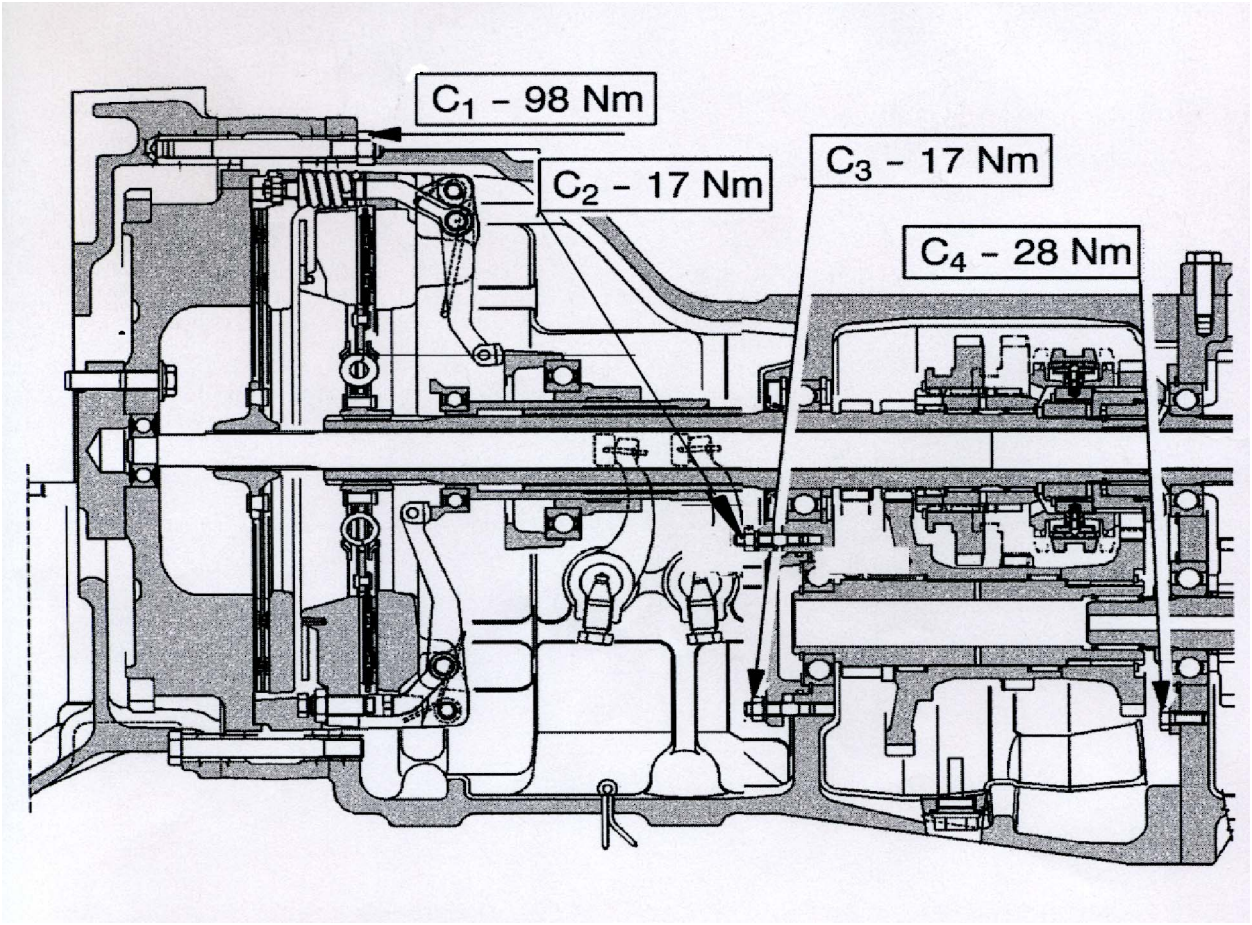
3

Cross-Sectional View of Synchronizer Reverser

1. Synchronizer reverser selector fork.
2. Reverser synchronizer.
3. External reverser control lever.
4. Seal.
5. Circlip.
6. Thrust washer.
7. Synchronizer reverser idle gear.
8. Roller bearing.
9. Thrust washer.
10. Seal.
11. Journal of idle gear (7).
12. Stop plate for journals (11 and 13).
13. Synchronizer reverser driven gear.
14. Synchronizer reverser control rod.
15. Spacer.
16. Reverser synchronizer.
17. Detent ball.
18. Spring for detent ball (17).
19. Detent ball retaining bolt.

TORQUE VALUES

PARTS	Thread	Torque Settings	
		Nm	ft-lbs
Bolt or nut securing clutch casing - reverser and creeper unit to the engine (C_1)	M 12 x 1.25	98	72
Sleeve cover nuts (C_2)	M 8 x 1.25	17	13
Synchronizer reverser - creeper unit driven shaft cover nuts (C_3)	M 8 x 1.25	17	13
Gearbox driving and driven shaft bearings cover screws (C_4)	M 8 x 1.25	28	20
Bolt securing clutch casing - reverse and creeper unit to the rear transmission-gearbox	M 12 x 1.25	98	72



TRE0561A

Assembly

To assemble all the reverser and creeper components in the casing follow the instructions below :

Refer to the illustrations on pages 6 and 7 for the orientation of the various components.

Adhere to the torque setting values prescribed on page 3.

To install the seal (1, Figure 19), proceed as follows:

⚠ WARNING ⚠

Always use suitable tools to align holes. NEVER USE YOUR FINGERS OR HANDS.

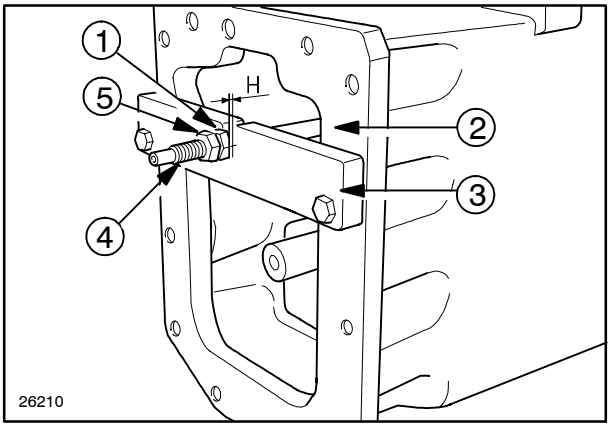
1. Install the circlip (1, fig. 18) in the seat.

2. Make the bracket **50043** (4) and tool **50137** (5) (see page 4), if not already done.

3. Install the bracket (3) on the clutch casing, insert the installation drift (4) in the seal seat in contact with the circlip (1, fig. 18).

4. Screw in nut (1) to obtain a distance (H) between the bracket and nut of 3.3 - 3.6 mm (0.1299 - 0.1417 in.) and secure with the locknut (5).

Note - Leave the drift (1) with the nut in the position reached on completion of the installation operation, and on future seal installation operations simply check that the distance (H, fig. 20) is as prescribed.



20

5. Remove the drift (1), the bracket (2) and the circlip (1, fig. 18).

6. Locate the new seal in the seat (see page 6 for correct orientation of seal). Install the bracket (2) on the clutch casing and insert the drift in the bracket.

7. Force the seal in until the nut (1, fig. 20) contacts the bracket (2).

8. Dismantle the bracket (2) and remove the drift (1).

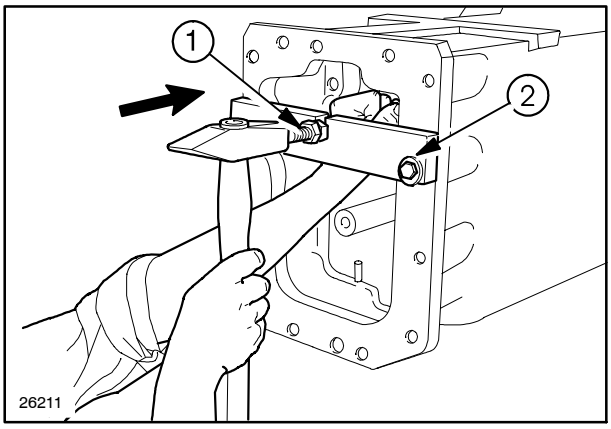
9. Install the driveshaft complete with bearing and circlips.

10. Install the cover-support.

11. Install the reverser and creeper driven gear shaft.

12. Install the cover for the driven gear shaft and secure with the relative screws.

13. Install the reverser intermediate gear assembly and secure with the relative screw.

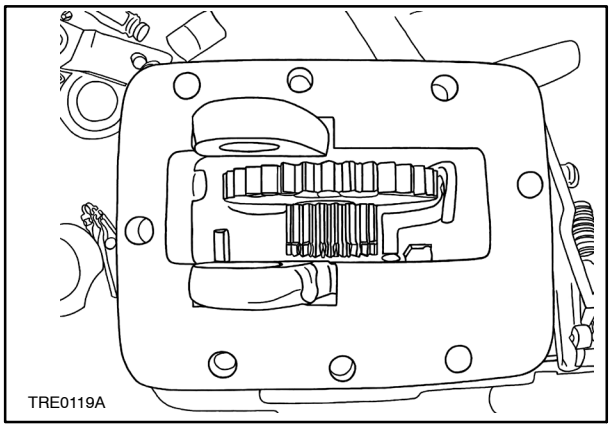


21

Assembly

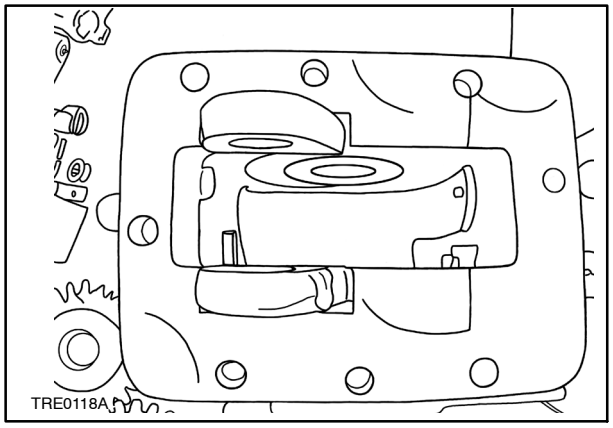
WARNING

Use suitable tools to align holes. NEVER USE FINGERS OR HANDS.



13

1. Insert the shaft in the housing, then assemble the gear unit, washer and circlip.
2. Install the internal lever ,the external lever, the coupling pad and secure in position by means of the washer and relative circlip.
3. Install the bearing and relative circlips
4. Using tool **380000821**, fit the seal and dust ring (use the spacer to fit the dust ring)
5. Drive gear housing installation.
6. Transmission shafts and guard installation.



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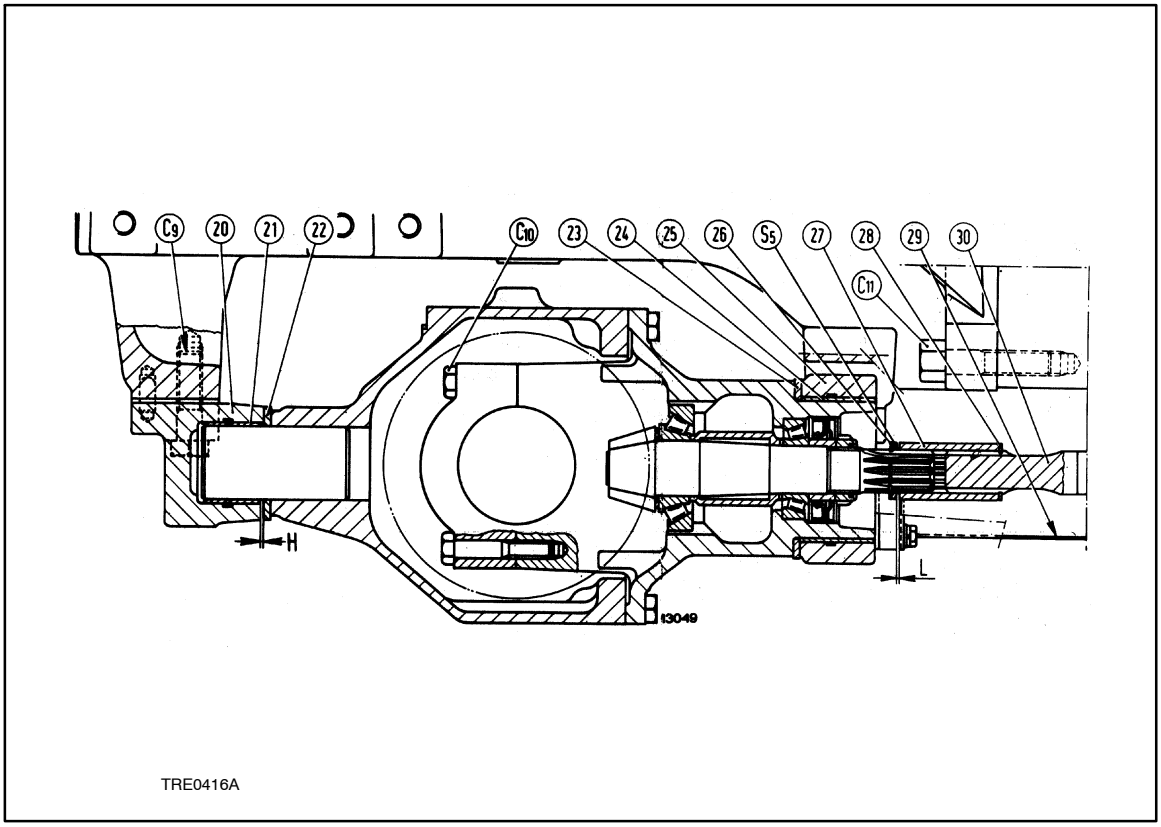


4

Cross-sectional view of front axle pivot

H = 1 mm (0.039 ins)
L = 1 to 1.5 mm (0.039 - 0.059 ins)
S_5 = Sleeve position shim

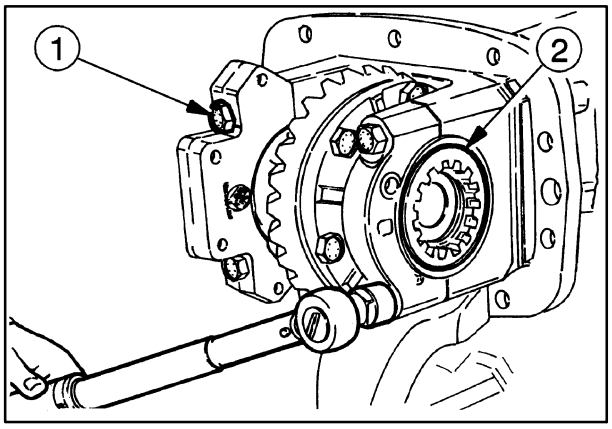
C_9 = Axle pivot support capscrew
C_{10} = Differential bearing cap capscrew
C_{11} = Capscrews securing front axle support to engine
20. Front axle pivot support
21. Front bushing
22. Front thrust washer
23. Rear thrust washer
24. Rear bushing
25. Rear axle pivot support
26. Retaining rings
27. Front splined sleeve
28. Retaining rings
29. Drive shaft guard
30. Drive shaft

TD75D and TD95D models have a centrally pivoting front axle with the pivot and the drive shaft coaxial with the longitudinal axis of the tractor. The drive shaft has no universal joints.

The differential has two planetary pinions; drive is transmitted to lateral epicyclic final drive units (installed on the wheel hubs) through universal joints which require no maintenance.

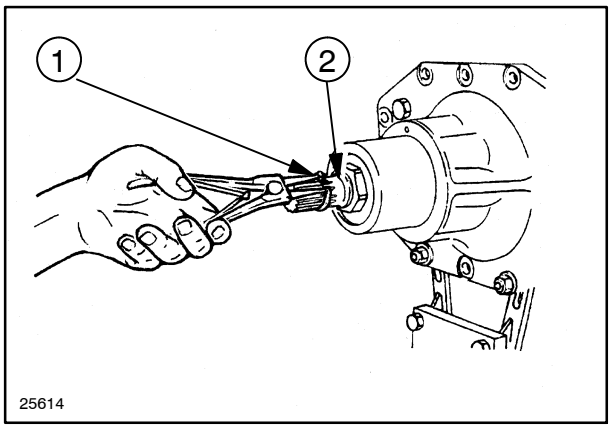
21. Remove bolts (1) and the left-hand ring nut lock plates (2) and remove the differential.

NOTE: *Check that the right and left-hand caps are clearly marked as to re-install in the same position before removal.*



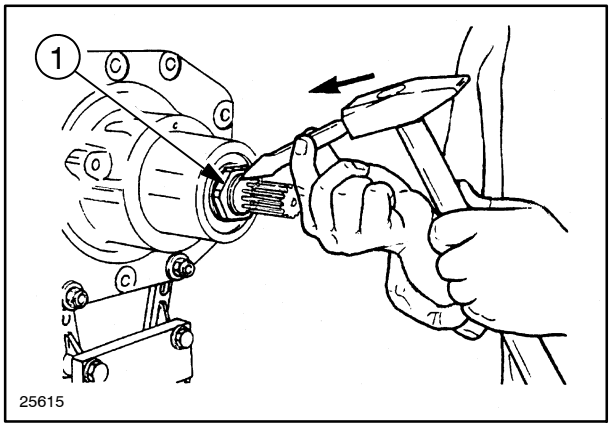
37

22. Remove the circlip (1) from the splined shaft (2).



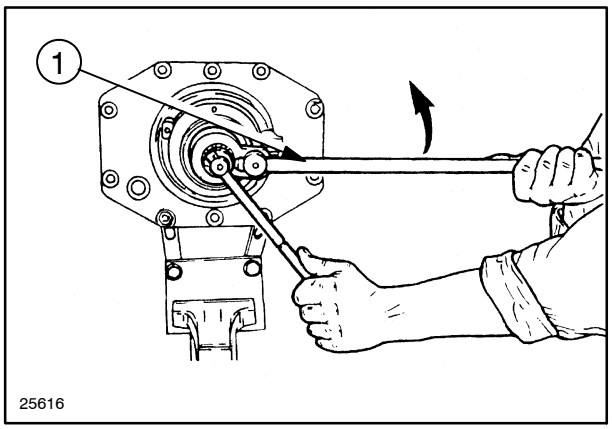
38

23. Straighten the locking tab on the splined shaft-lock nut (1).



39

24. Unscrew the nut using wrench **380000268** (1) while preventing rotation of the pinion shaft using wrench **380000257**.



40

BEVEL DRIVE ADJUSTMENTS

Front Axle Differential

Backlash Between Side and Planetary Pinion Teeth

When overhauling the differential assembly it is necessary to adjust the backlash between the teeth of the planetary pinions and the side gears.

Proceed as follows:

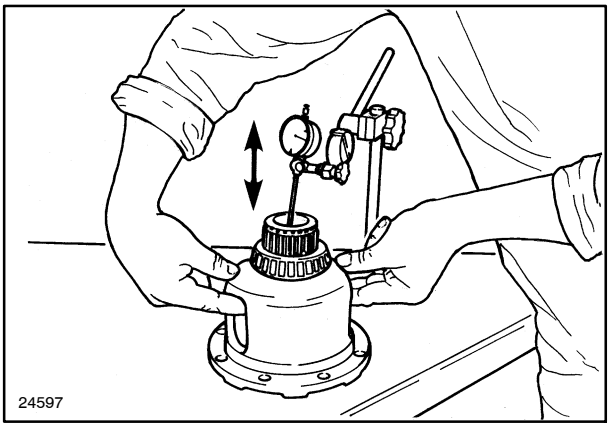
1. Thoroughly clean the components of the differential to remove any traces of oil which would otherwise prevent accurate backlash measurement.

2. Install the two side gears without thrust washers.

3. Install the planetary pinions complete with thrust washers and pins and screw the pin retaining bolts in by a few turns sufficient to hold the pins in place.

4. Position a dial gauge on the differential housing, as shown.

5. Move the left-hand side gear, to bring it into full contact with the planetary pinion and then push it up against the differential housing, reading the backlash (G_L) on the dial gauge.



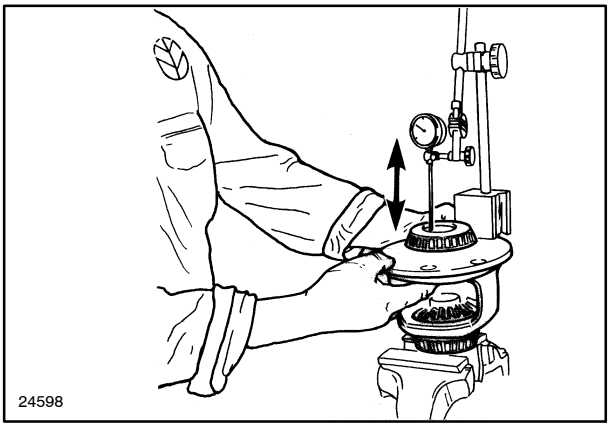
58

6. Repeat the above operations to measure the backlash on the right-hand side gear (G_R).

   The endfloat should be **0.25 mm (0.010 ins)**. Therefore the shims to be inserted in the differential housing are given by:

   $S_L = G_L$ - 0.25 mm (0.010 ins) for the left-hand side gear;

   $S_R = G_R$ - 0.25 mm (0.010 ins) for the right-hand side gear.



59

7. Install shims as near as possible to the calculated value and, using a dial gauge and following the procedure described above, check that the backlash of the left and right-hand side gears is approximately 0.25 mm (0.010 ins).

SECTION 27 - REAR TRANSMISSION

Chapter 1 - Rear Axle and Transmission

CONTENT

OVERHAUL

REAR AXLE TRANSMISSION - GEARBOX CASE

Removal

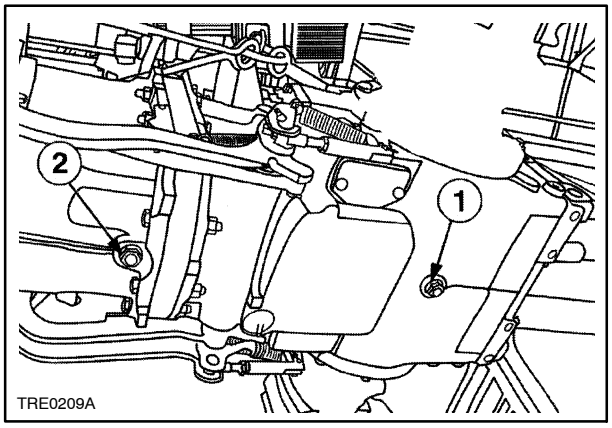
Related service instructions up to item 44, guides also removal operations of suspended platform with the exception of heating pipes and air condition components removal.

WARNING

Lift and handle all heavy parts using proper equipment of adequate lifting capacity.
Make sure that the assemblies and parts are supported by appropriate tools and hooks. Make sure that no person is standing in the vicinity of the load to be lifted.

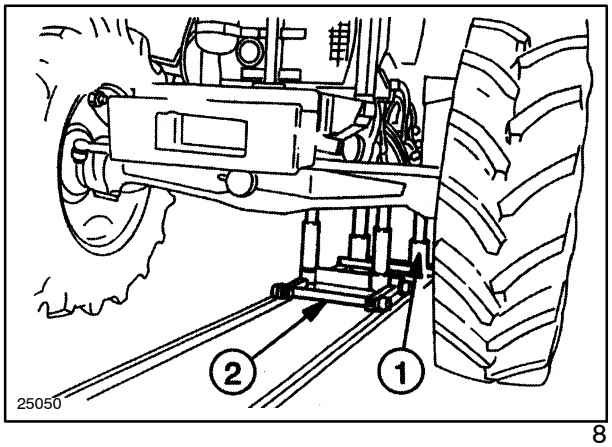
To remove the body, proceed as follows :

1. Disconnect the negative terminal of the battery. Remove the plug of rear transmission (1) and gearbox (2) and drain the oil into suitable containers.



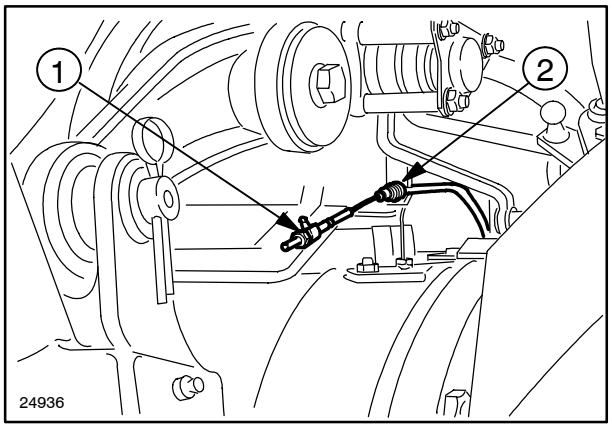
7

2. Place the tractor dismantling stand **380000236**, so that the fixed support (1) is under the rear transmission case in the area of the engine coupling flange and the mobile support (2) under the engine in the area of the flange attached to the gearbox case.



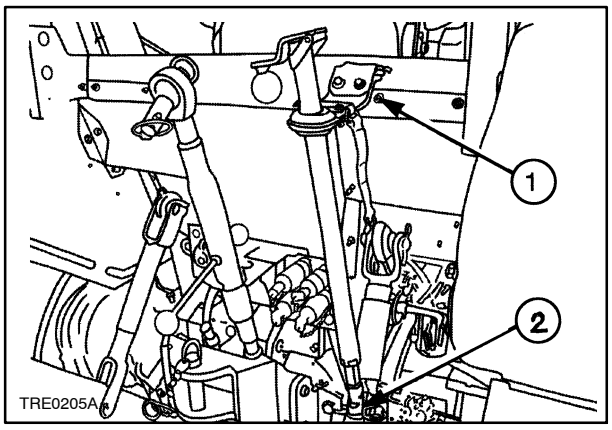
8

37. Remove the fast raise/lower control cable (1) from the lever and from its mounting (2).



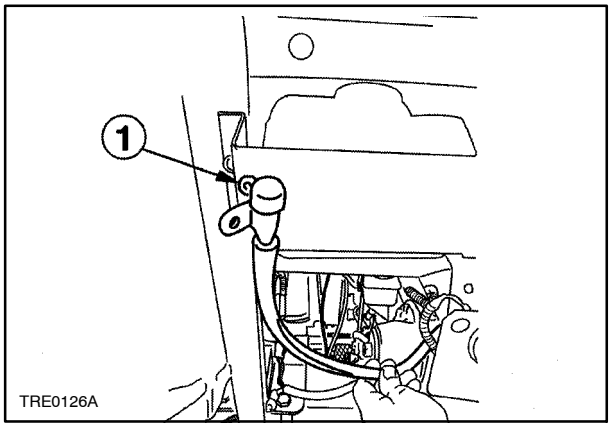
43

38. Remove retaining pin (2) from the bottom, and support bracket bolts (1) from the top of the hydraulic lift control rod. Remove the left and right lift rods.



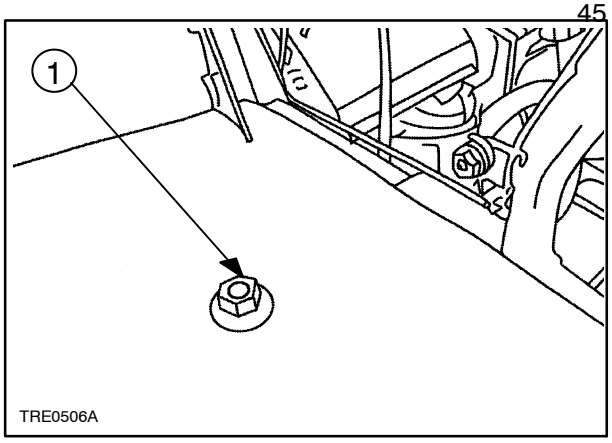
44

39. Remove the bolt (1) that secures the gearbox breather pipe clamp.



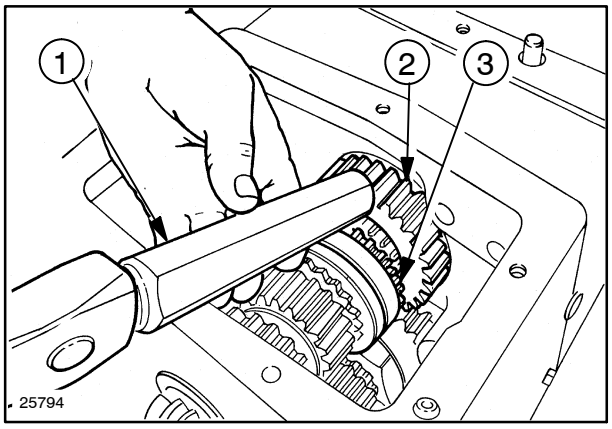
45

40. Remove the bolt (1) that secures each side of the front supports to the platform.



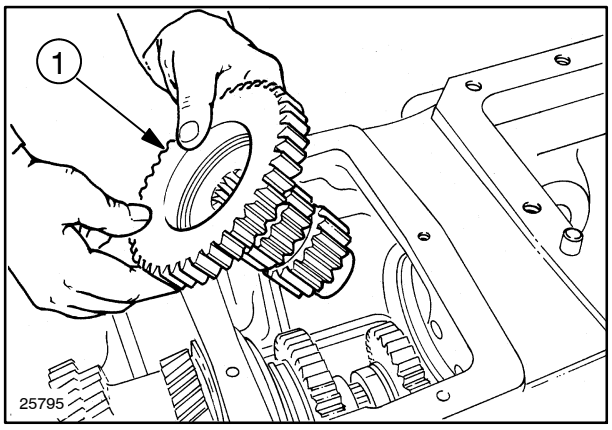
46

9. Using a hammer and a brass punch (1) remove the gear (2) for the mid-range speeds together with the respective bearings and engagement sleeve (3).



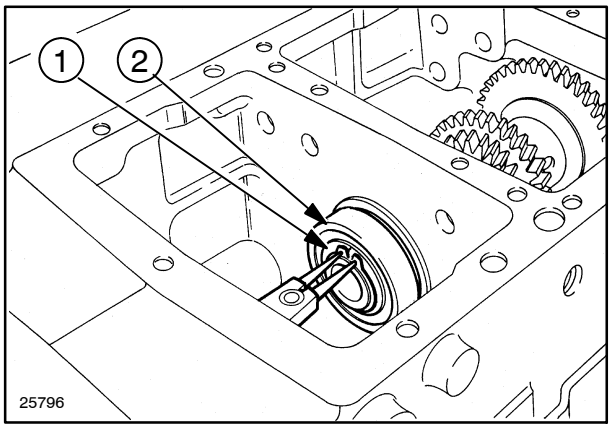
76

10. Remove the final drive driving shaft (1).



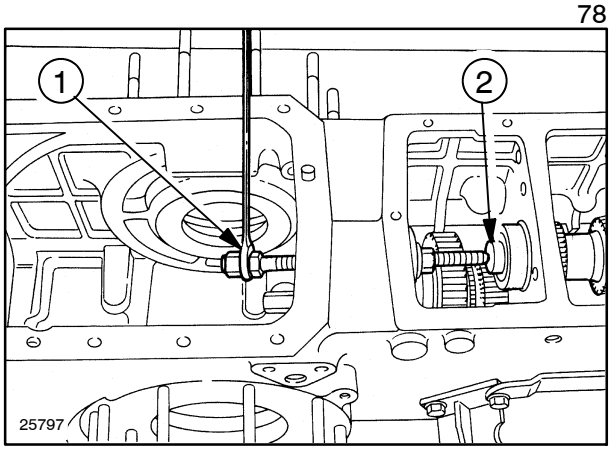
77

11. Remove the snap ring (1) that holds the bearing (2) onto the gearbox drive shaft.



78

12. Install the tool **50006** (2) (see Sect. 21) onto the driving shaft and use the extractor (1) to remove the driving shaft. Remove the bearings, gears and respective bushings.



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DIFFERENTIAL BEARINGS AND BACK-LASH OF RING AND PINION TEETH

WARNING

Handle all parts with great care.
Never place your hands or fingers between one part and another. Wear the prescribed safety clothing, including glasses, gloves and protective footwear.

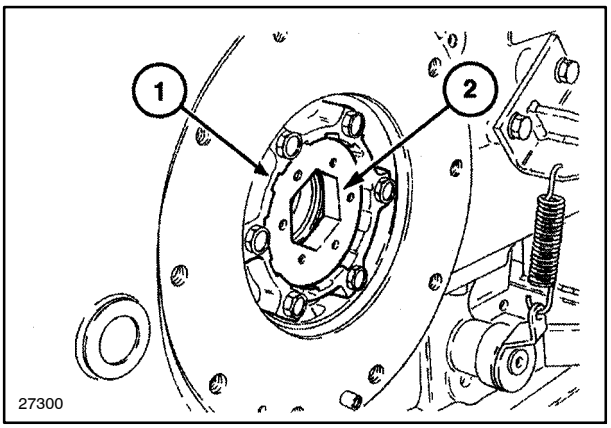
WARNING

Always use appropriate tools to align the holes. NEVER USE YOUR FINGERS OR HANDS.

Proceed as follows :

1. With pinion installed, install differential with ring gear.

Install LH support (1) and tighten ring nut (2) to ensure minimum ring gear to pinion backlash of 1 mm (0.04 ins) approximately.



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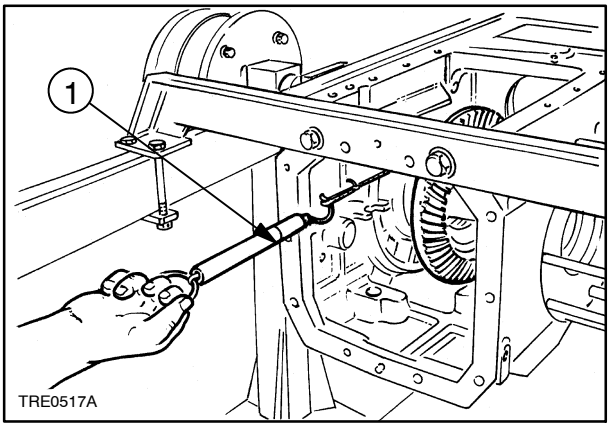
2. Install RH support and tighten to 49 Nm (36 ft-lbs).

Install and tighten RH ring nut while turning the ring gear to seat the bearings. Tighten ring nut until pinion ring gear assembly rolling torque is 9.8 - 14.7 Nm (7.23 - 10.85 ft-lbs). Torque can be measured using spring scale and a cord wrapped around differential carrier flange. Specified rolling torque is equivalent to a spring scale force of 95 - 147 N (22 - 33 lbs).



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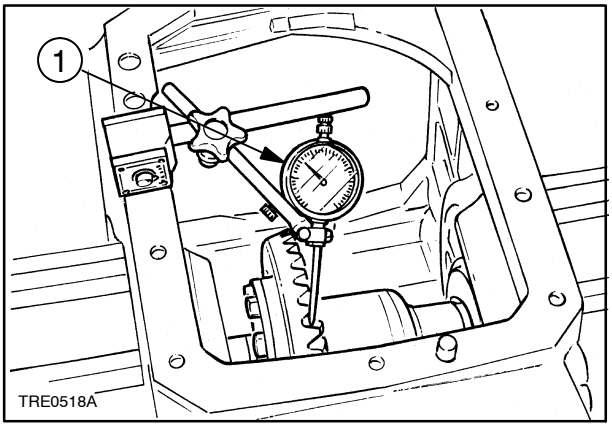
3. Use a dial gauge (1) to check the backlash (G) of the ring and pinion (three measurements at 120° and average of the readings). Compare the average of the three values with the normal prescribed clearance: 0.18-0.23 mm, mean 0.21 mm (0.007 - 0.009, average 0.008 ins).

Note - Differences among the three readings should not exceed 0.05 mm (0.002 ins).



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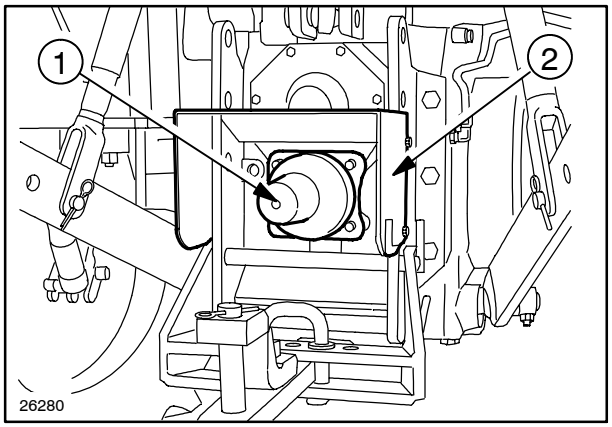
The PTO, located at the rear of the tractor, transfers power to the implement being transported or towed. It can be controlled either directly from the engine clutch or from the gearbox clutch. The PTO is shown with the safety cap (1) and the guard (2) in position. The safety cap must be removed to couple up an implement to the PTO shaft.



4

The PTO with mechanical engagement/disengagement is available in two versions:

— single-speed PTO, 540 rev/min (standard)

— two-speed PTO, 540/1000 rev/min (option).

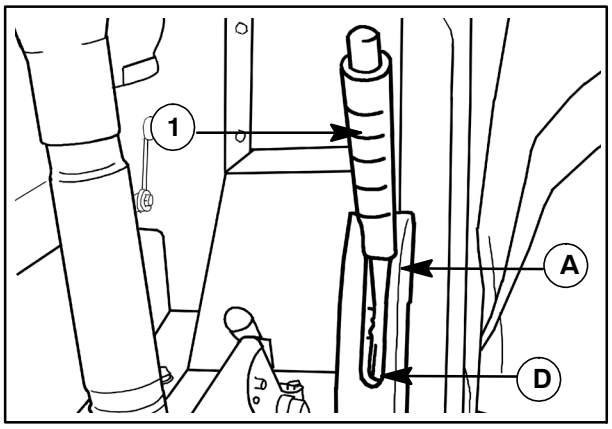
Independent PTO

Proceed as follows:

— disengage the PTO clutch by moving the control lever (1) fig. 5, rearward to position A;

— move the PTO selector lever (1) fig. 6, to position B so as to engage the PTO sleeve (3), with the toothed coupling of the shaft (2) which is driven by the engine;

— engage the PTO by slowly moving the lever (1) fig. 5, forward to position D.



5

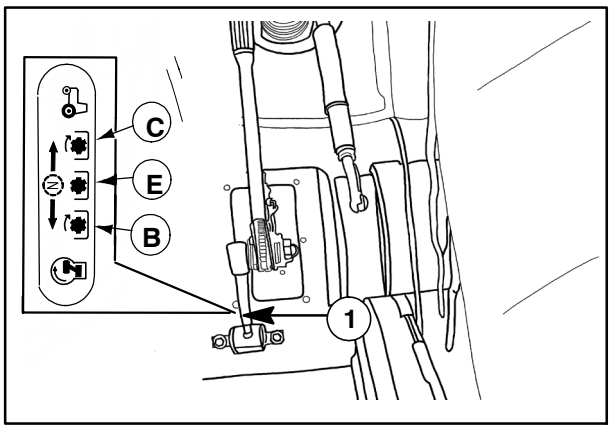
When engaged, the PTO shaft rotates and the PTO warning lamp on the instrument panel lights up.

In these conditions the operation of the PTO is completely independent of the travel of the tractor, so:

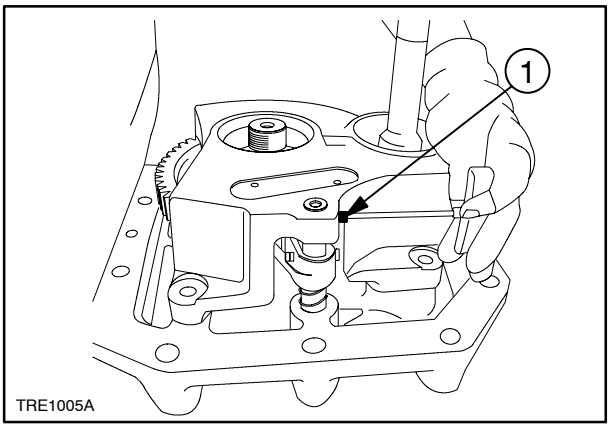
— the tractor can be stopped without stopping the PTO;

— the PTO can be stopped without stopping the tractor (by disengaging the PTO clutch).

To disengage the PTO move the PTO speed selector (1) fig. 6, to the central position E.



7. Remove the socket head screw bolt (1) on the side of the cover.



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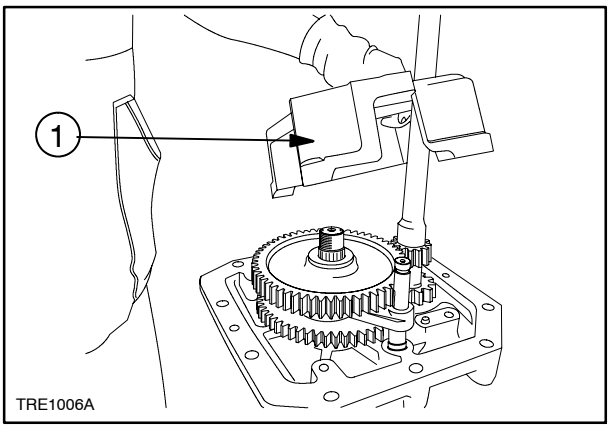
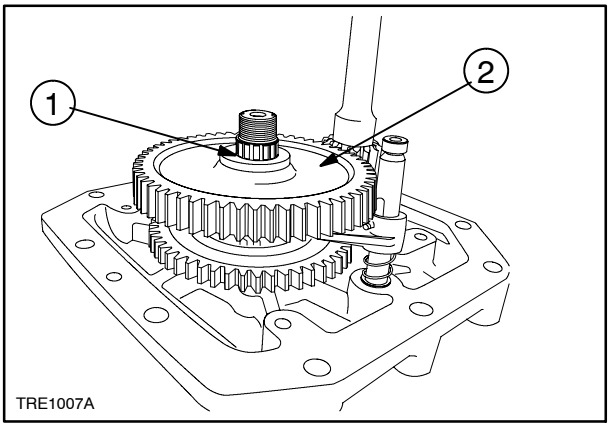
8. Remove the cover (1).



32

9. Remove the washer (1) and take off the gear (2).



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TROUBLESHOOTING

Problems	Possible causes	Solutions
Braking ineffectual.	Friction material on brake discs worn.	Replace the brake discs.
Unbalanced braking.	Incorrect tire pressure.	Inflate the tires to the correct pressure.
	Friction material on one of the brake discs worn.	Replace the discs.
Braking noisy.	Friction material on brake discs worn.	Replace the discs.
Parking brake does not lock.	Braking sectors worn.	Replace the braking sectors.
The tractor continues to be braked when the parking brake is disengaged.	Braking sectors seized on brake discs.	Release and replace damaged parts.

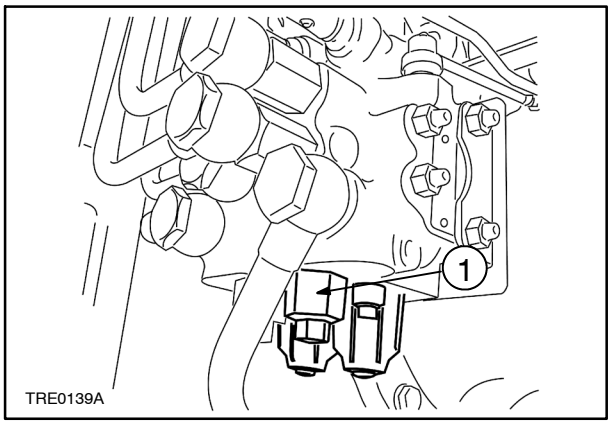
DESCRIPTION AND OPERATION

The TD series tractor is equipped with a dual pump, low-pressure and high-pressure, open-center hydraulic system. Both systems share a main hydraulic filter, and the rear axle housing as a reservoir. For information on the Steering System, refer to Section 41.

The high-pressure system supplies oil for the operation of the hydraulic lift, remote control valves, and external equipment. In addition, the high-pressure system in combination with the 3-point hitch provides accurate and sensitive control of implements over a wide range of operating conditions.

The high-pressure system is an open-center type, which allows for the continuous flow of oil through the system and back to return. This type of system reduces wear on the control valve seals, and prevents damage to components caused by prolonged static pressure.

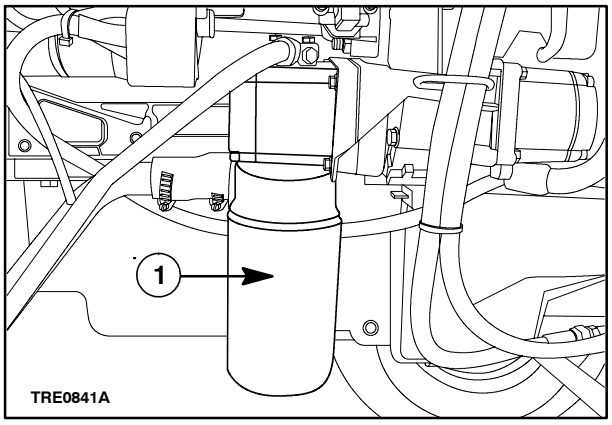
A relief valve (1) installed in the auxiliary control valve block, protects the high-pressure (lift) system from excessive pressure.



1

A filter assembly (1), located on the right-hand side of the engine, cleans the oil before it enters the high-pressure system.

In the high-pressure system, the rear remote valves have oil priority over the hydraulic power lift (HPL). When operating a remote valve(s), oil flows from the remote valve to the actuated cylinder. Return oil from the cylinder flows back through the remote valve assembly to sump. The hydraulic lift is not operable during operation of a remote control valve.



2

Principles of Draft Control

The Draft Control system manages the working depth of soil engaging implements to maintain an even pull on the tractor, and to reduce wheel slippage.

When lowering a soil-engaging implement, e.g. a plow, into the ground, the draft forces applied to the implement tend to make the plow pivot at the point where it attaches to the lower links. The HPL senses the force on the lower link arms via a torsion bar. Without the top link, the plow would tip up. Due to the top link resistance, the plow stays level in the ground. This demonstrates compressive force acting on the top link against the tractor. The draft force will alter according to the depth of work and soil type.

Move the position control lever full forward and set the implement depth in the ground by gradually shifting the draft control lever. Forward movement of the draft control lever increases implement depth and rearward movement of the lever reduces the depth. The depth reached by the implement is proportional to the traction power determined by the soil consistency. The lift automatically maintains drive power required of the tractor at a constant level.

Principles of Position Control

Position control allows for pre-setting and maintaining the working depth or height of an implement, relative to the tractor.

Move the draft control lever full forward and set the position of the implement by shifting the position control lever forward to lower the implement, and rearwards to raise the implement. Movement of the implement is proportional to movement of the lever.

In addition to the position control lever, movement of the implement is possible by using the Fast Raise/ Lower control buttons to raise and lower the implement.

SPECIFICATIONS

MECHANICALLY CONTROLLED HYDRAULIC HITCH		
Type		position or draft control with a combination of the two
Operating system		two independent levers
Fast Raise/Lower Control Device		provides fast lifting/lowering operations using pushbuttons, without using the position or draft control levers
Single-acting cylinder:		
- rated diameter and stroke:	mm (in.)	100x128 (3.936 x 5.039)
- capacity:	cm^3 (oz)	1005 (33)
Pressure relief valve setting	bar (psi)	186 - 191 (2645 - 2716)
Cylinder safety valve setting	bar (psi)	210 - 215 (2986 - 3058)
Lift piston diameter:	mm (in.)	99.980 - 100.000 (3.936 - 3.937)
Internal diameter of cylinder liner:	mm (in.)	100.036 - 100.071 (3.938 - 3.939)
Clearance between piston and liner	mm (in.)	0.036 - 0.091 (0.001 - 0.003)

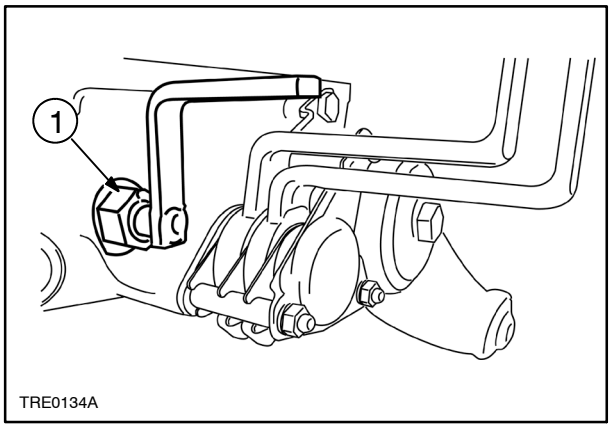
(continued)

TROUBLESHOOTING

Problem	Possible Cause	Remedy
The lift does not raise.	**1.** Oil filter clogged.	Replace filter.
	2. Control valve jammed in discharge position.	Release control valve.
	3. Hydraulic pump defective.	Overhaul or replace pump.
The lift operates jerkily.	**1.** Oil filter clogged.	Replace filter.
	2. Air has got into the pump suction line.	Check that the couplings are airtight and the seals are effective.
The lift raises too slowly.	**1.** Oil filter clogged.	Replace filter.
	2. Oil leaking past piston seals or seals on discharge fitting to cylinder, with consequent loss of pressure.	Replace all defective seals.
	3. Hydraulic pump defective.	Overhaul or replace pump.
The lift operates too quickly.	**1.** Foreign matter between the ball and its seat on the discharge control valve.	Take off the valve, remove the foreign matter and inspect the oil filter.
	2. Discharge control valve ball seal defective.	Replace discharge control valve.
	3. Discharge control valve piston jammed.	Take off the valve and free the piston.
The lift operates too slowly.	**1.** Discharge ports on the discharge control valve blocked.	Take off the valve, unblock the holes and inspect the oil filter.
	2. Discharge control valve piston jammed.	Take off the valve and free the piston.

(continued)

6. Remove the retaining pin from the internal draft lever. Remove the nut (1), then remove the unit complete with internal linkages and the FAST RAISE LOWER device control lever.



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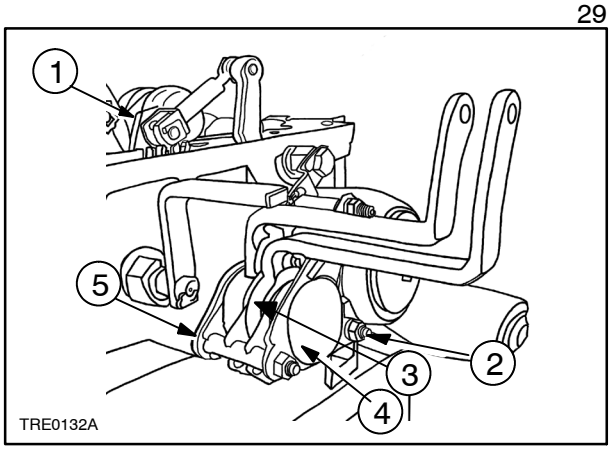
7. Remove the circlip and the internal position control lever (1).
Remove the nuts (2) and remove the spring and fixing bracket (4).

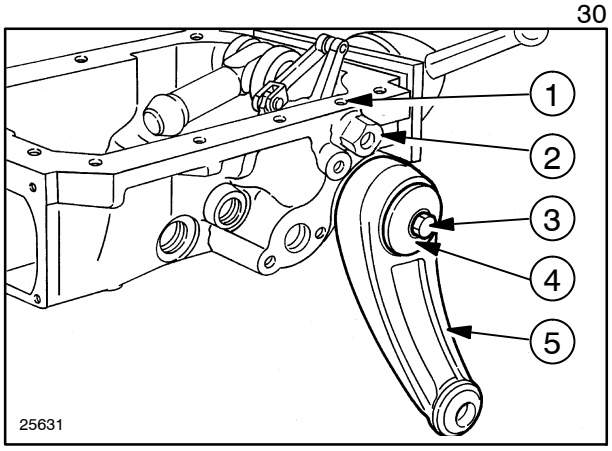
8. Remove the circlip, then remove lever (3), friction discs, lever (5) and stud bolts.



30

9. Loosen the eccentric pin (2) retaining bolt (1). Remove the eccentric pin and internal linkage.

10. Remove the bolt (3), washer (4), lift arm (5) and the thrust washer. Repeat on the other lift arm.



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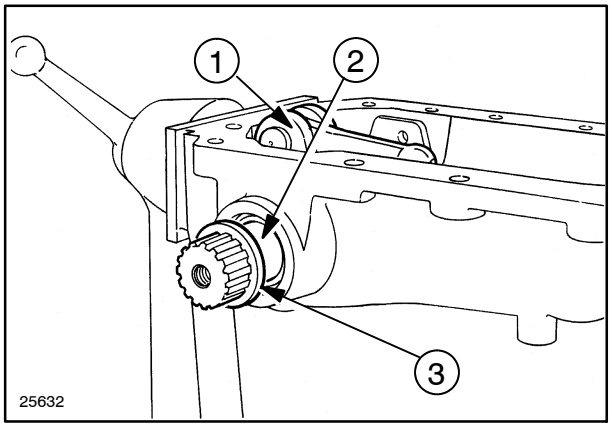
11. Undo the crimping on the internal arm locking bolt (1) and remove the bolt, shaft (2) and the seals (3).



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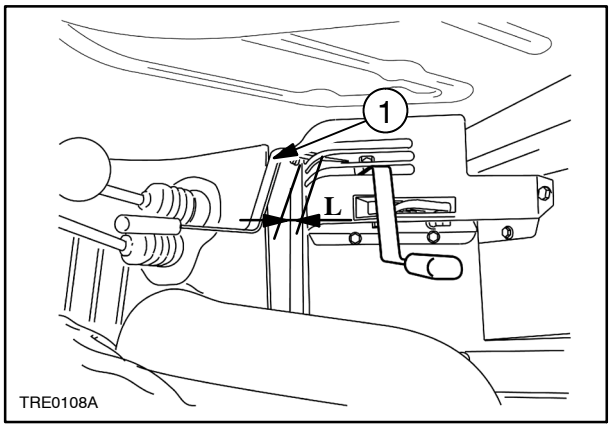
Position Control Linkage

1. Move the position control lever (1) fully forward on the quadrant and check that the distance (L) is between 15 and 20 mm (0.59 - 0.78 in.).



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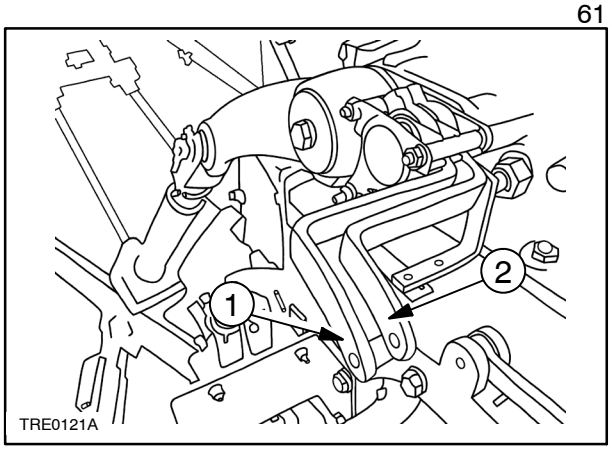
2. Move the external position control lever (1) fully rearward, against the spacer.

3. Connect the control linkage and adjust the length, if necessary.

4. Fasten the linkage using the lock nuts.



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Draft Control Linkage

Test Conditions:

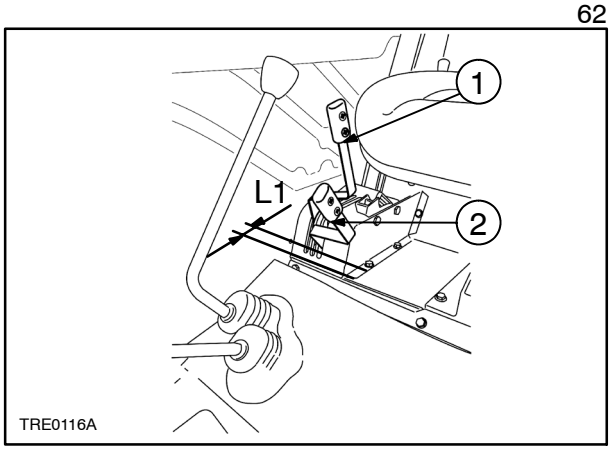
- Engine running at medium speed
- Allow the hydraulic oil to warm to 50°C (122°F).

Then proceed as follows:

1. Move the position control lever (1) fully forward on the quadrant and the draft control lever (2) to a distance (L_1) of 15 - 20 mm (0.59 - 0.78 in.) from the beginning of the slot.

2. Move the draft control lever (2) fully back against the spacer.

3. Connect the control linkage and adjust the length if necessary.



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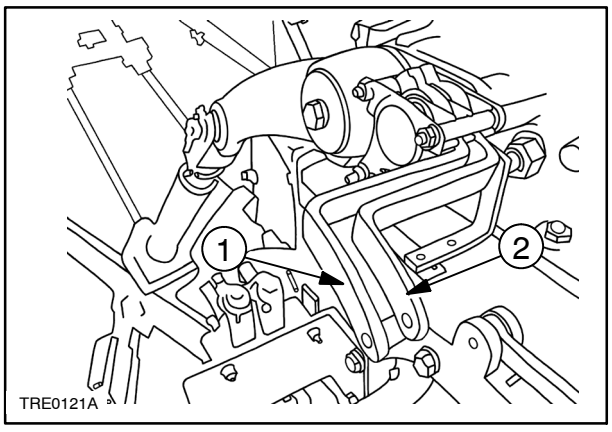

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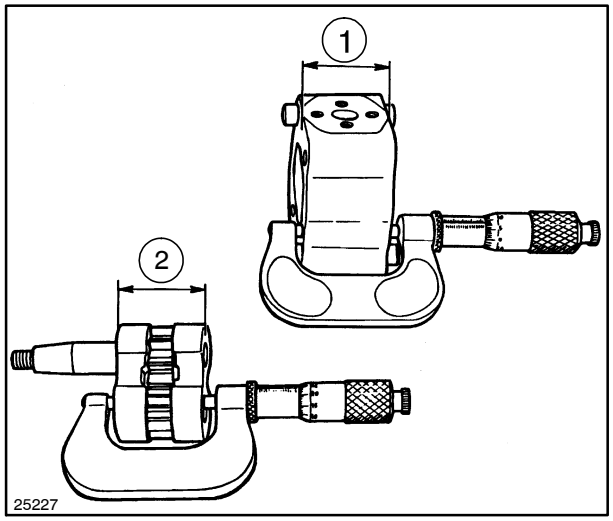
2. Check that the axial play of the gear-support unit in the pump body is 0.090 - 0.160 mm (0.003 - 0.006 in.). The distance (2) must be 0.090 - 0.160 mm smaller than the distance (1).
3. If necessary, true the flat surfaces involved using lubricated abrasive paper to remove extremely small quantities of material. Ensure that axial play is still within the limits of 0.090 - 0.160 mm (0.003 - 0.006 in.).
4. Clean all constituent parts thoroughly.
5. Replace the seals (2, 9 and 11).
6. Lubricate the parts with the same oil as the system. Install the pump, referring to fig. 84 and proceed as follows:



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Assembly

1. Perform operations 6 to 1 in reverse order;
2. Install previously marked parts (3), (4), (5) and (6) fig.84; see Disassembly procedures.
3. Mount the gear supports (4) and (6) fig. 84, in the pump body. Mount them with the fittings on the external circumference matched up with the discharge pipes and the front faces with lubrication millings in contact with the gears;
4. Install the plastic anti-extrusion rings on the seals (2) fig. 84:
5. Mount the seals (9) and (11) fig. 84, on the control side cover (8), complete with spacer (10). Mount them so that the cavity is between the seal lips on the opposite side from this spacer. Finally fill the cavity with **AMBRA GR9**.

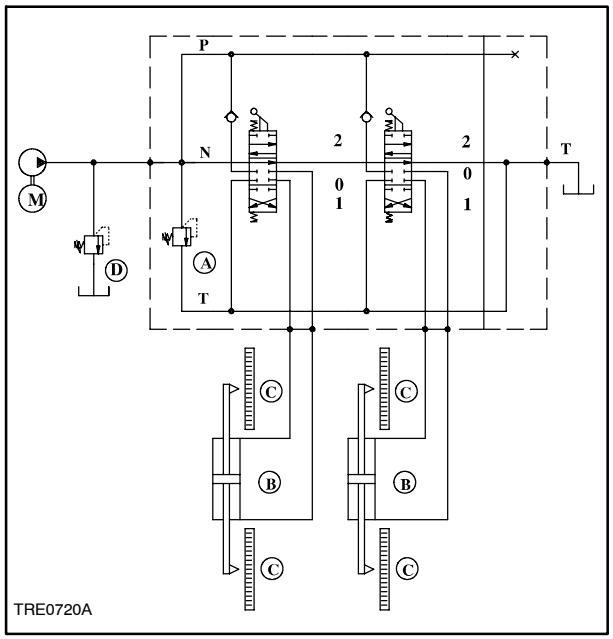
SPOOL LEAKAGE TEST

Auxiliary Control Valve Leakage Test

After the binding test (with hot oil and valve), measure the leakage rate for each section. It is important to do this with the system hot. Connect working ports A and B of each section to the cylinders (one for each section). Alongside each cylinder lay a ruler to measure the stroke.

Supply oil to the cylinder, moving the spool to the working position (oil flowing from A or B) until it reaches the end of its stroke and the main relief valve opens. Now that the oil column is pressurised from the working section to the cylinder allow the lever to return to the neutral position (called 0). The spool closes A and B ports. Now check the position of the cylinder observing the ruler beside it. As the cylinder moves, check the stroke in a fixed time (say 60 seconds). From this stroke, calculate the volume of oil per minute through that section of the cylinder. This check has to be carried out for each section (each spool).

After this check, with the pump disconnected, move the spool to its working position: now test the check valve (VU:Check Valve) of the distributor. This valve closes the connection from P to T (N), also the connection P with A or P when B is open (spool in working position). If the check valve is working correctly, the normal flow rate will be seen (the same value observed with spool in the neutral position). If it is see that one or more sections operates more than in a previous check, it means that check valve is not working properly (does not close completely).



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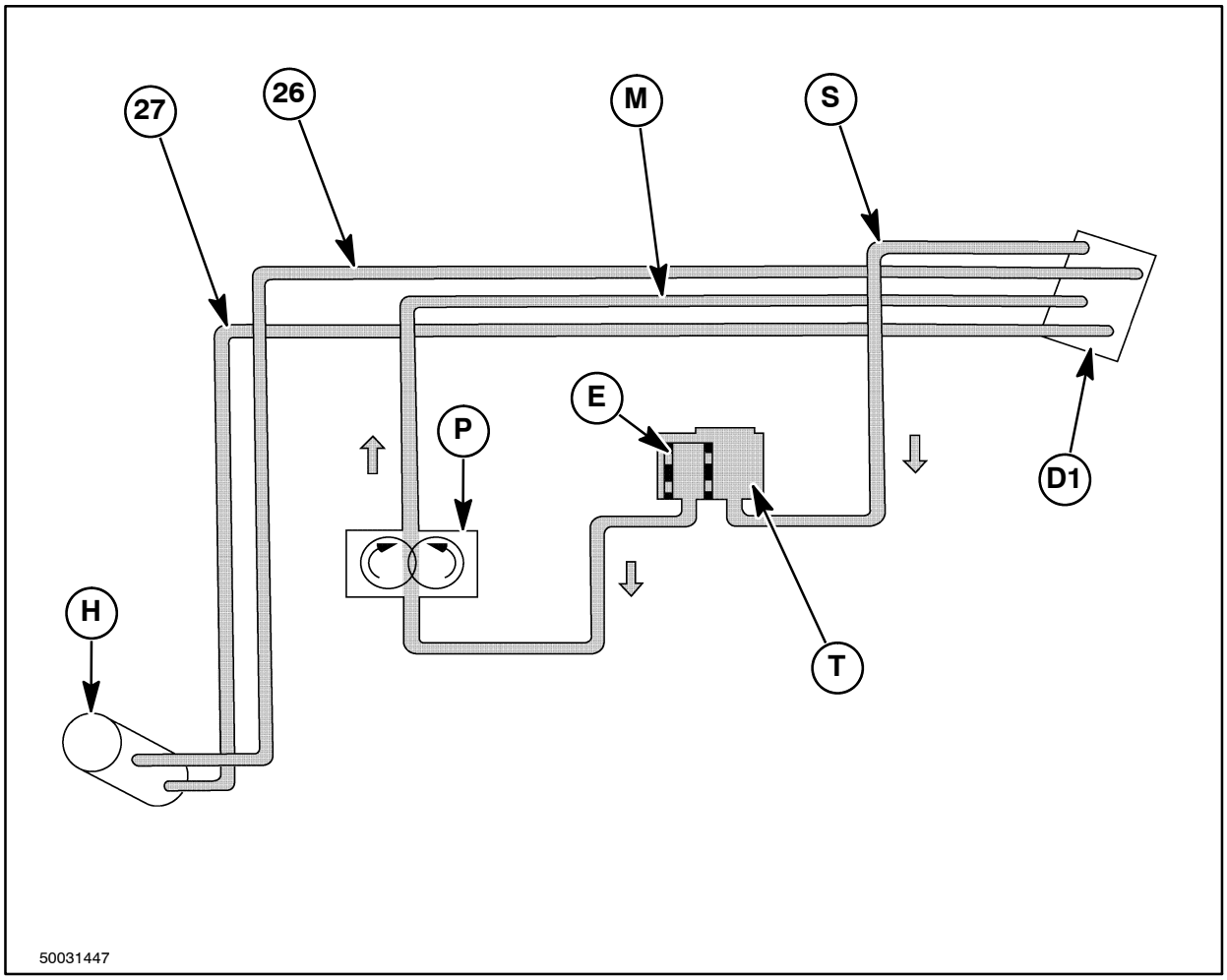


General Hydraulic Diagram 3

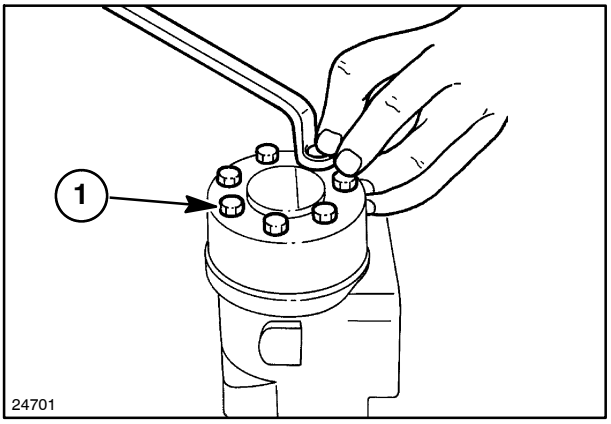
H - - - - Control cylinders
D1 - - - Hydrostatic steering control valve
E - - - - Filter
T - - - - Oil tank
P - - - - Pump

26 Oil in intake line
27 Oil in delivery line from pump
M - Oil
S - Oil at lubrication pressure

Op. 41 204 34
Disassembly

To disassemble the hydrostatic steering control valve, proceed as follows:

1. Remove the cover retaining bolts (1).



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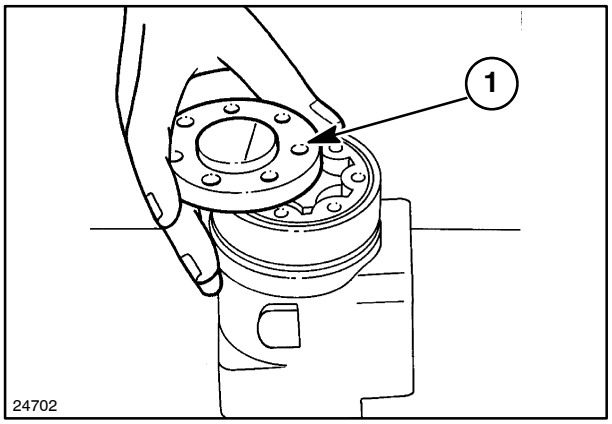
2. Remove the cover (1) by sliding to the side.



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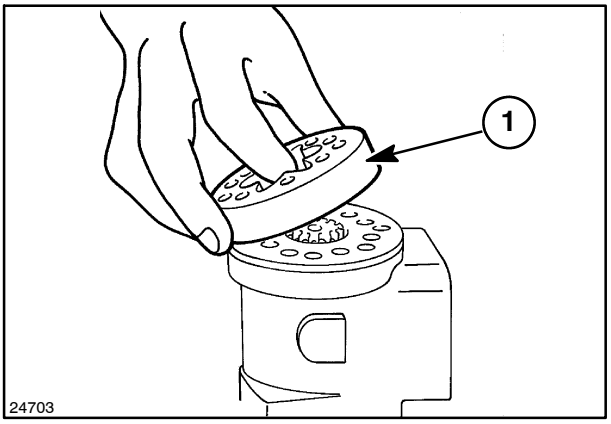
3. Remove the rotor fixed ring (1), the rotor and the inner spacer.

4. Remove the two O-rings on the rotor fixed ring.



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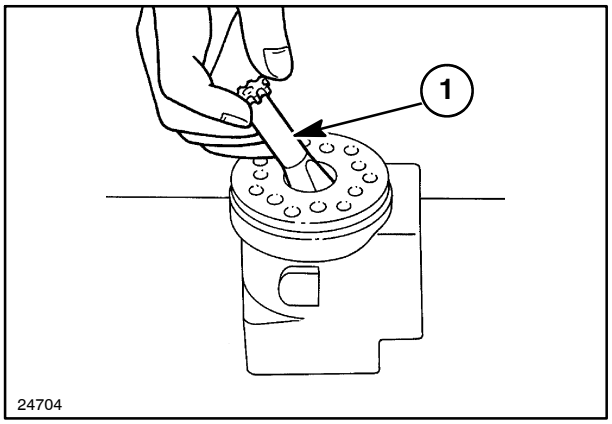
5. Extract the rotor drive shaft (1).



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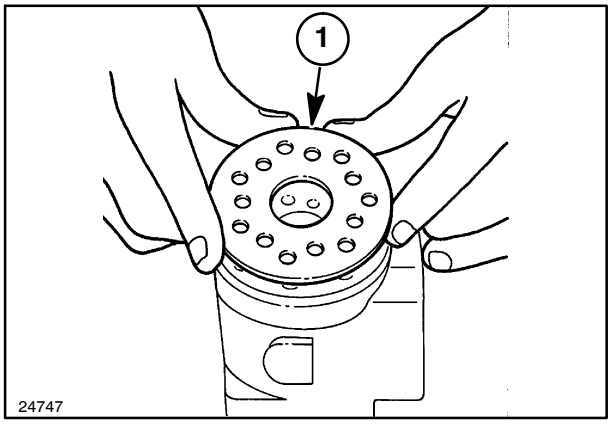
19. Install the shim ring (1), so that the holes coincide with the holes on the control valve body.



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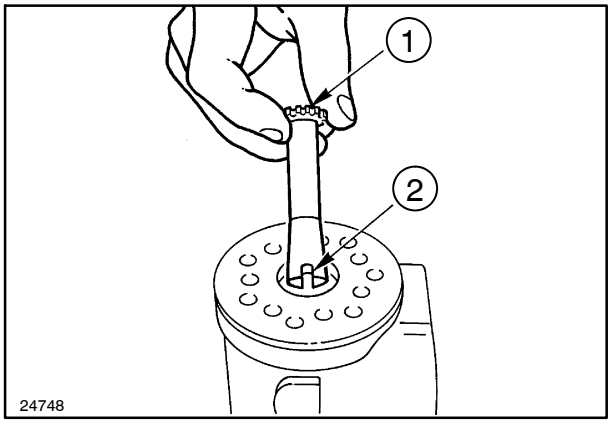
20. Make a reference mark on the upper part of the drive shaft teeth (1), in line with the seat (2), to indicate the exact position of the valve-to-sleeve trim pin.



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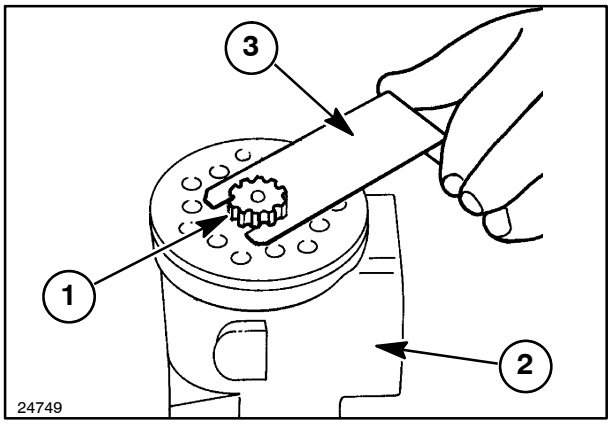
21. Install the rotor drive shaft (1) into the control valve body (2), insert tool **380000307** (3) between the rotor drive shaft and the thrust washer. Rotate the shaft to facilitate coupling between the seat and trim pin installed on the sleeve.



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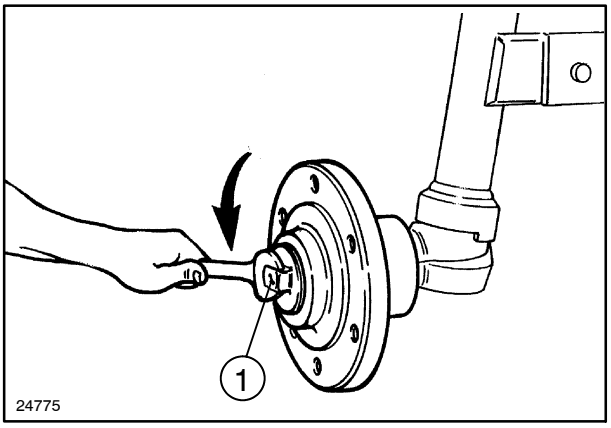
SECTION 44 - FRONT AXLE AND WHEELS (2WD)

Chapter 1 - Axle and Wheels

CONTENTS

5. Remove the wheel hub bearing cover (1).



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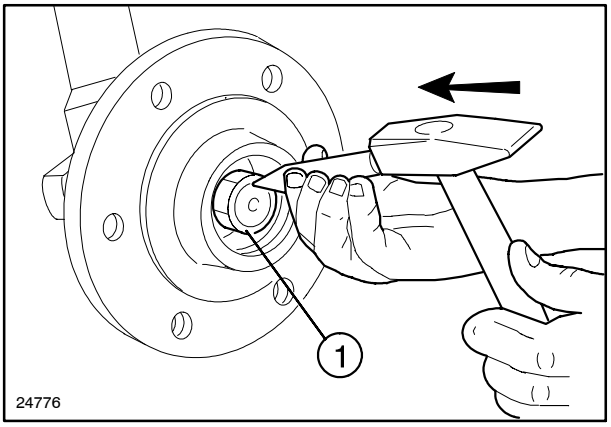
6. Remove the staking securing the wheel hub bearing adjuster nut (1).



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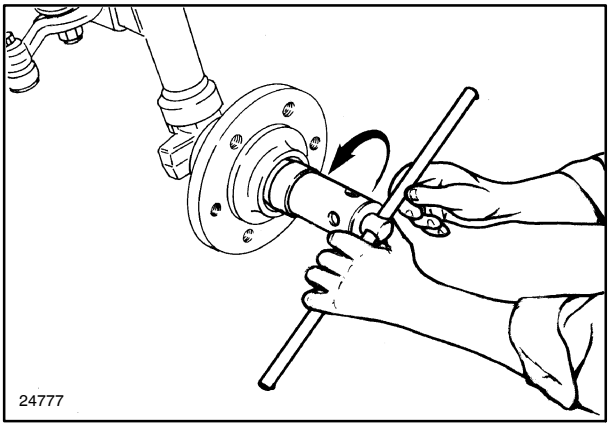
7. Using a socket wrench, unscrew the wheel hub bearing adjuster nut.



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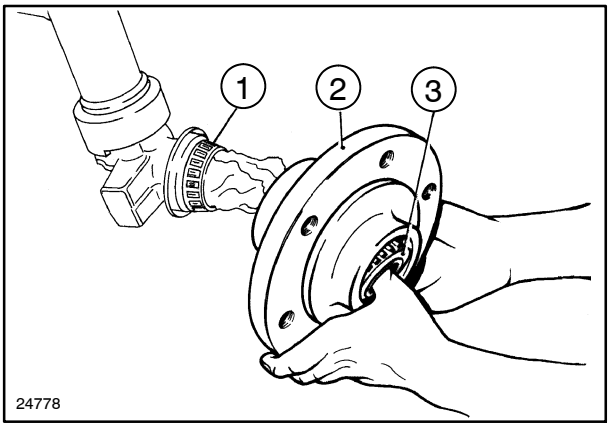
8. Remove the wheel hub (2) and take out the bearings (1 and 3).



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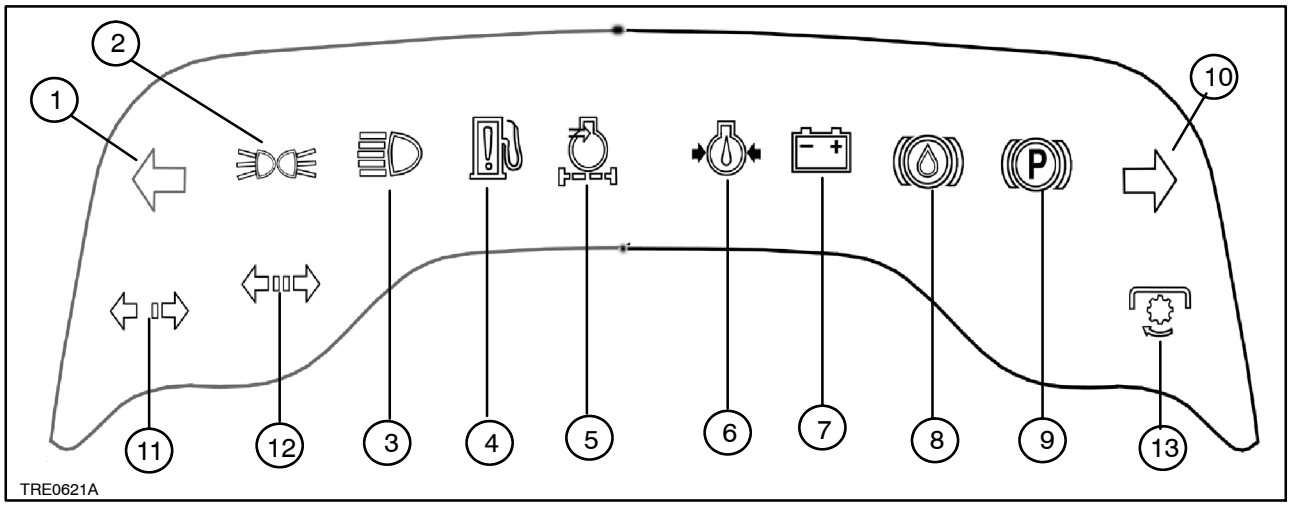
Warning and Indicator Lights



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	Condition	Indicator
1.	Left direction indicator ON	Flashing (green)
2.	Side lights ON	Fixed (green)
3.	Main beam headlights ON	Fixed (blue)
4.	Water in fuel warning	Fixed (red)
5.	Air filter blocked warning	Fixed (amber)
6.	Engine oil pressure low warning	Fixed (amber)
7.	Battery charge low warning	Fixed (red)
8.	Brake fluid level low warning	Fixed (red
9.	Hand brake ON	Fixed (red)
10.	Right direction indicator ON	Flashing (green)
11.	First trailer direction indicator*	Flashing (green)
12.	Second trailer direction indicator*	Flashing (green)
13.	Power take-off ON	Fixed (amber)

* Not available on North America models.

SECTION 55 - ELECTRICAL SYSTEM

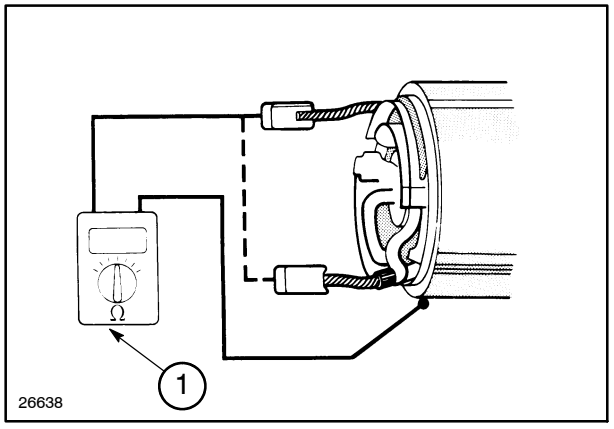
Chapter 3 - Starting System

CONTENTS

3. Armature insulation can be checked by connecting an ohmmeter (1, fig. 12) between commutator segments and armature shaft. This reading should show infinity, in other words there should be no continuity.
4. To test there are no short circuits, use an appropriate testing device. The only alternative is to try changing the armature.
5. If the armature circumference has obviously been in contact with pole pieces, the pole bearings are probably worn. First check to insure that the pole pieces are fixed and that the armature spins well in a lathe. If necessary, change the armature bearing.

Field Windings

1. To test field winding insulation, connect an ohmmeter to each of the coil brushes in turn and to a clean and unpainted area of the casing. There should be no readings, that is, there should be no continuity.
2. To test coil continuity, connect an ohmmeter to each of the coil brushes in turn and to the main power clamp (biggest braided wire). The reading should be 1 Ω.
3. If there is a failure in the field windings, then it will be necessary to change the whole box and field winding system.



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Bearing Bushings

1. Check if the bushing on the brush plate and in the box on the pinion side are worn. Assemble the armature shaft and note play. Change the bushing if there is too much play. Check the field poles to see if there are any signs of scraping against the casing. This can also be caused by a worn bushing.

Driving Pinion

1. Check the roller clutch operation. The pinion must spin clockwise only. If the pinion is either seized or spins in both directions, or if the pinion teeth are damaged, assemble a new control group.
2. If there is clear evidence of damage to the pinion teeth, check the flywheel ring gear, as described in section 10, Engines.

Charging Circuit Voltage Drop

Insulated side voltage drop

See figure 7.

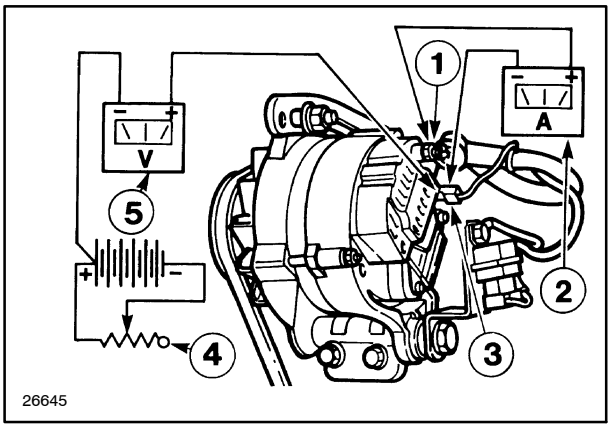
Check that the ignition key is in OFF position.

1. Disconnect the negative battery cable and the B+ alternator wire (1).
2. Connect a millivoltmeter (5) between the positive battery terminal clamp and D+ wire (3) (positive side of the wire).
3. Connect an ammeter (2) between the B+ alternator terminal and the D+ wire (negative side of the wire).
4. Reconnect the negative battery cable and connect a varying load resistance (4) with cursor in minimum current absorption position (maximum resistance) through the battery terminal clamps.
5. Start the engine and increase speed to 2000 rev/min.
6. Decrease resistance charging load (decreasing resistance) slowly until the ammeter reads 45 or 65 A according to the type of alternator.
7. Note the reading on the millivoltmeter. This must not be higher than 400 millivolts.

A reading higher than 400 millivolts indicates a malfunction due to excessive resistance in the external circuits.

If the alternator does not output required power and the millivoltmeter reading is less than 400 millivolts, there is a malfunctioning component in the alternator. Carry out the alternator component tests, as described in this section.

8. Stop the engine.

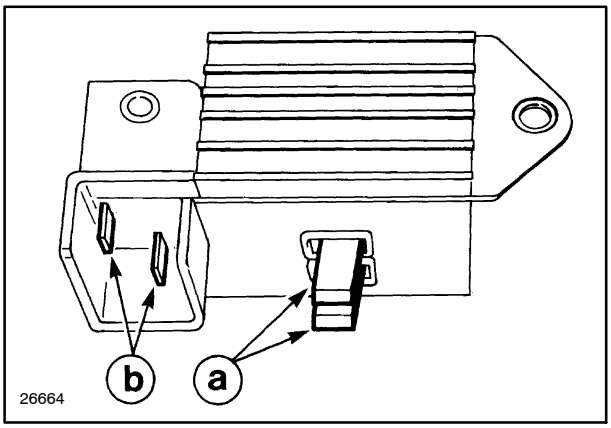


7

Electronic voltage regulator

a. Brushes

b. Pins



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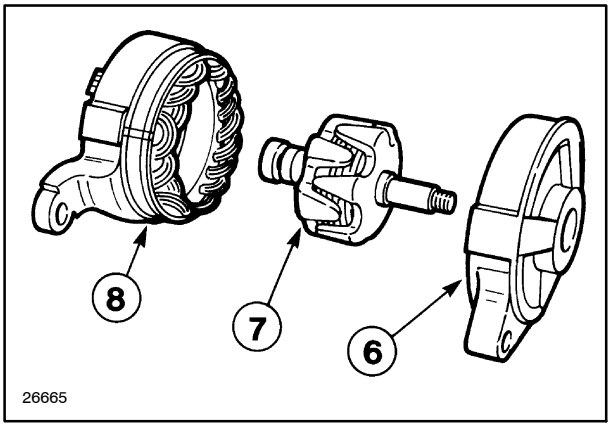
Separate the parts (as illustrated) bearing in mind that it is necessary to apply a considerable degree of pressure on the rotor shaft to free the front support plate (6) and the rotor (7) (Fig. 27).

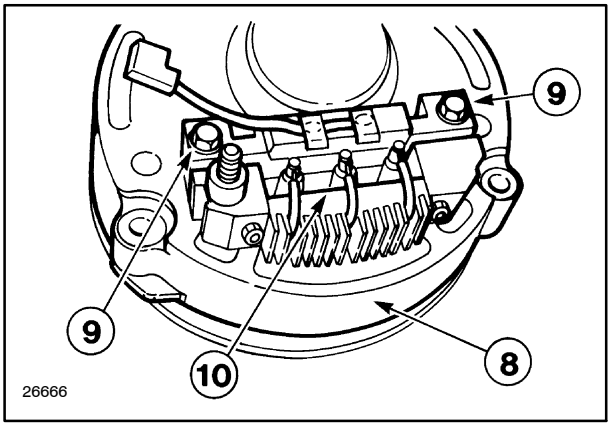
If you do not have a press, use a brass drift, to avoid damaging the thread.



27

Unscrew the screws (9) which fasten the rectifier bridge (10) to the rear support plate (8) (Fig. 28).

The rectifier bridge must not be dismantled: the spare part is supplied as a complete unit.



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If violent boiling occurs during charging, due to gas formation or electrolyte leakage, or if the battery box is hot (50°C (122°F) or higher), temporarily reduce or stop battery charging to avoid damaging the battery.

Table 2

Charging Program	120Ah (800 cca)
Slow charging programs	30 hrs at 5A 15 hrs at 10A
Fast charging programs (emergency use only)	10 hrs at 18A

Testing

Before carrying out battery tests, check the breathers are not blocked, there is no rust, the breather caps are not open and the casing is not cracked.

Required testing equipment:

- Densimeter
- Battery starter tester (high amperage tester)
- Thermometer
- Battery charger

Relative density: This test shows the charge level of a battery.

1. With the float in a vertical position, note the reading.
2. Regulate the densimeter reading for battery electrolyte temperature variations subtracting 4 points (relative density 0.004) for every 5.5°C (42°F) below the temperature the densimeter is calibrated at and adding 4 points (relative density 0.004) for every 5.5°C (42°F) above this temperature.

The following examples have been calculated with a densimeter calibrated at 30°C (86°F).

Example 1:

Temperature below	30°C (86°F)
Battery electrolyte temperature	19°C (66°F)
Densimeter reading	1.270
Subtract $\frac{11.0 \times 0.004}{5.5}$	
Correct relative density =	1.262

Example 2:

Temperature above	30°C (86°F)
Battery electrolyte temperature	40°C (104°F)
Densimeter reading	1.220
Add $\frac{10.0 \times 0.004}{5.5}$	0.007
Correct relative density =	1.227

3. Use Table 3 to determine the charge level.

Table 3

Charge condition	Correct relative density at 15°C (59°F)	Correct relative density at 25°C (77°F)	Average battery voltage (dc)
100%	1.295	1.287	12.66
75%	1.253	1.246	12.45
50%	1.217	1.210	12.30
25%	1.177	1.170	12.00
Flat	1.137	1.130	11.84

***NOTE**: Relative density should not vary more than 0.025 points between cells.*

4. If relative density is 1.280 or higher, the battery is fully charged and in good working condition.
5. If the correct relative density is less than 1.280, charge the battery and check the charging system, to find the cause of low battery load.

***NOTE:** If distilled water has recently been added, the battery must be charged for a short period of time to obtain precise densimeter readings.*

If the battery has been loaded and kept still, the battery electrolyte will be thicker at the base of the elements. The battery must be shaken periodically to mix the electrolyte. This will improve charging amperage and allow more precise densimeter readings during tests.

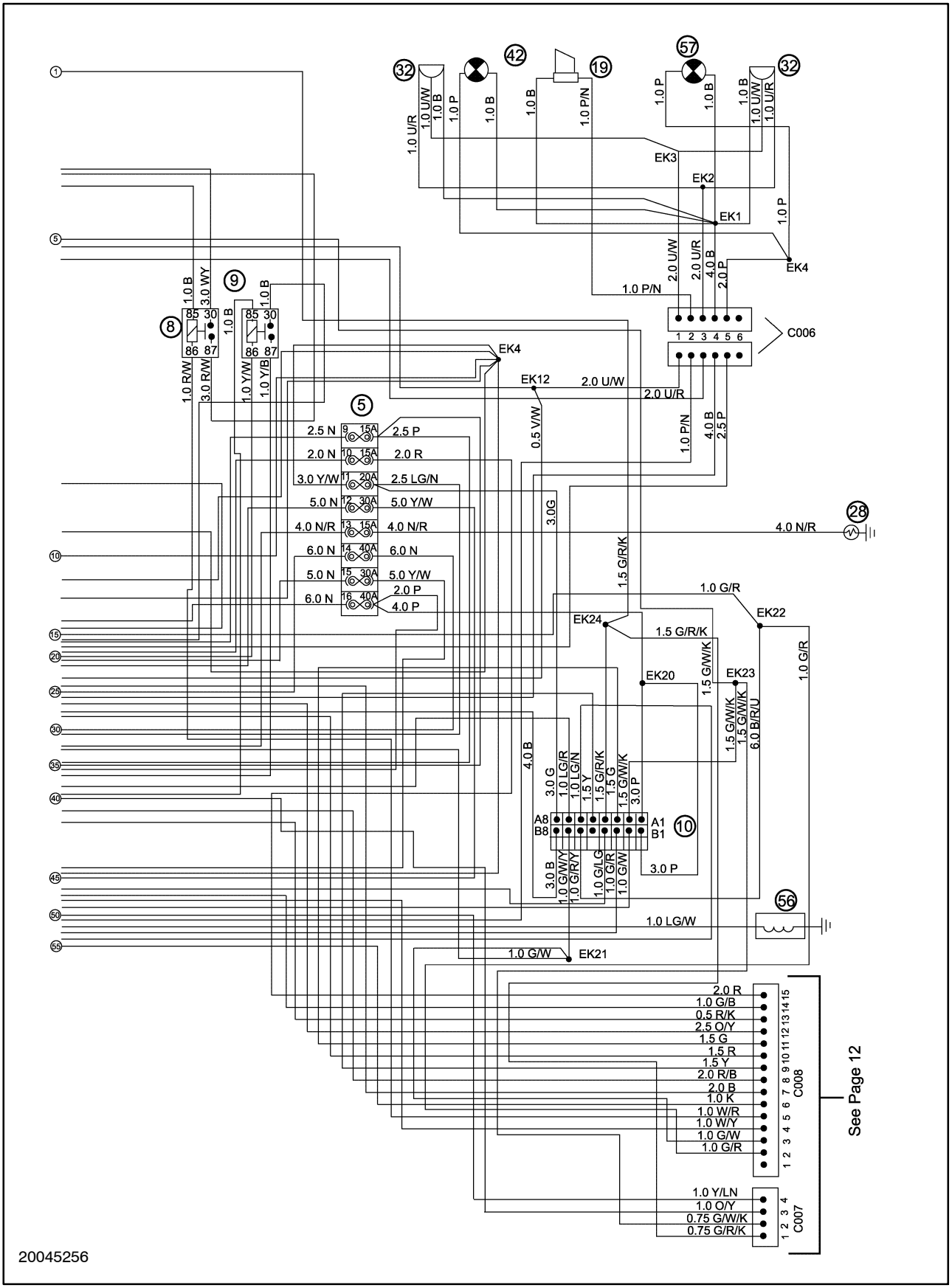
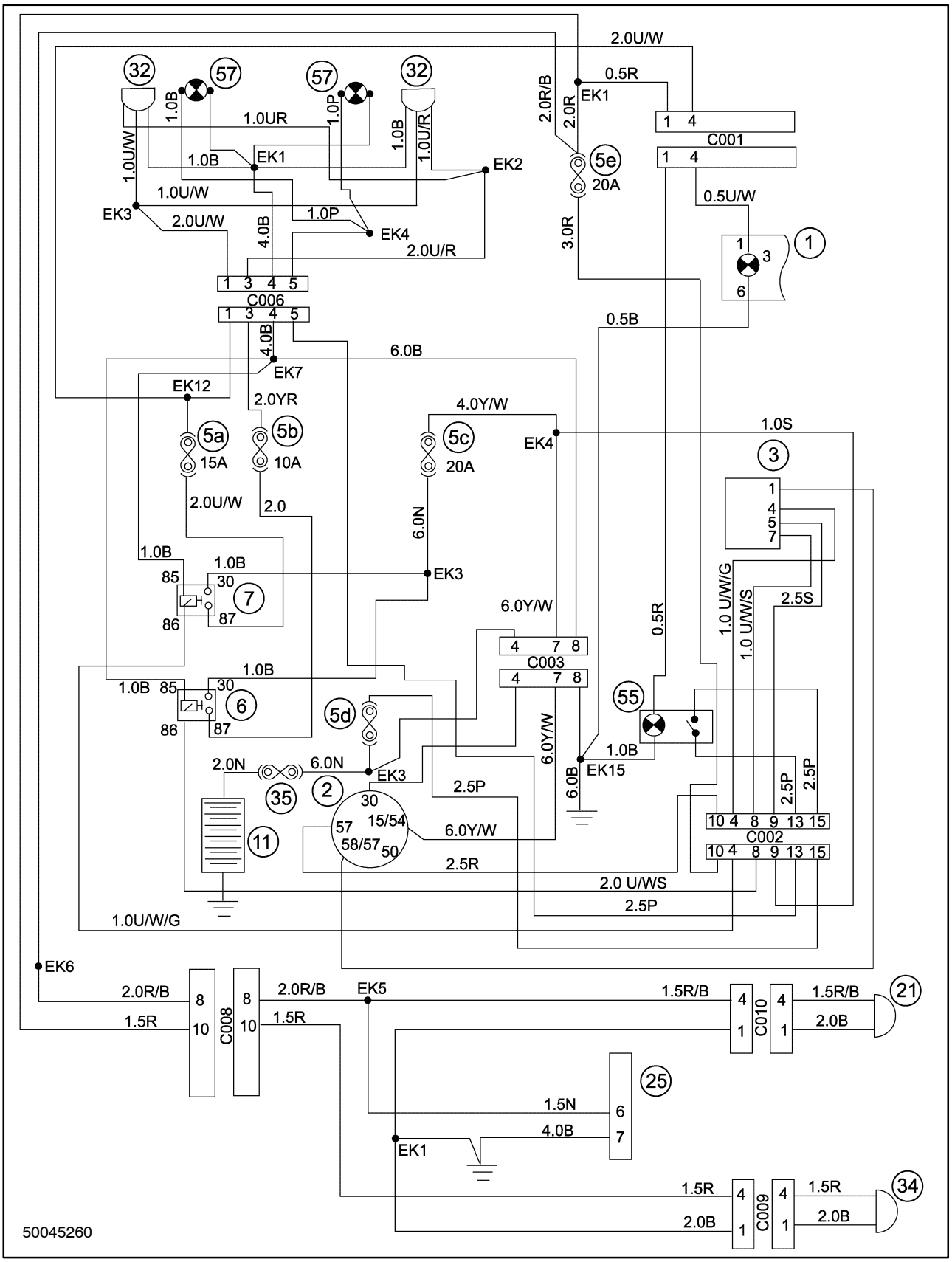


Diagram “A” (Main Harness) (continued)



High and Low Beam Headlights, Cornering and Parking Lights

SECTION 90 - PLATFORM, CAB, BODYWORK AND DECALS

Chapter 1 - Cab

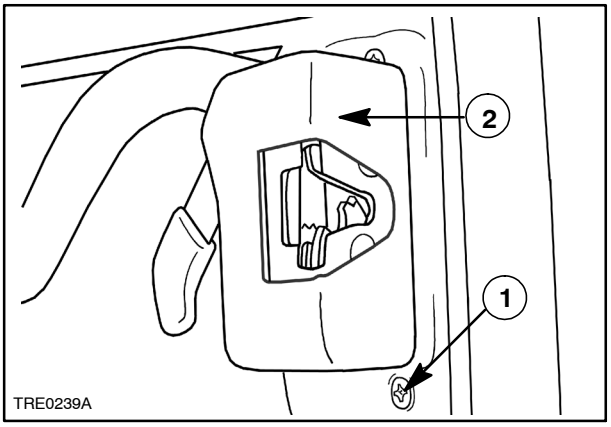
CONTENTS

LOCK AND EXTERIOR HANDLE

Disassembly

1. Disconnect the negative cable from the battery.

2. Unscrew the three screws (1) securing the interior lock cover (2).



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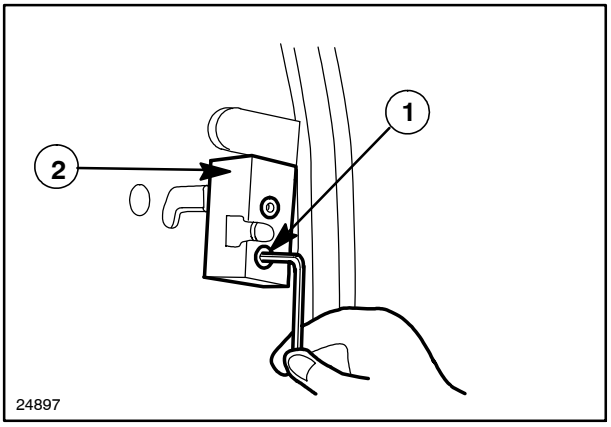
3. Remove two screws (1) securing the interior lock (2).



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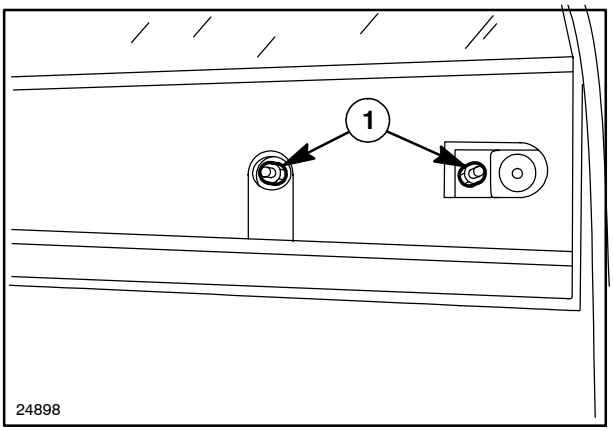
4. Remove the exterior handle by unscrewing the two retaining screws (1) from the inside.



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Assembly

1. Install the exterior handle.
2. Install the lock.
3. Connect the negative cable to the battery.

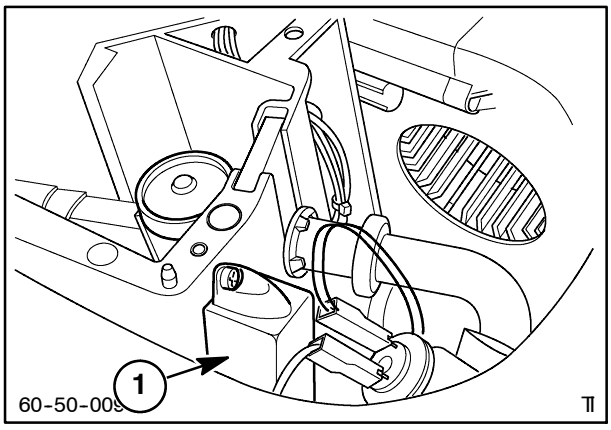
SPECIAL TOOLS

Warning - The operations described in this section cannot be carried out without the ESSENTIAL tools marked (**X**) in the following list.
To work in safety and to obtain the best possible results while saving both time and energy, we recommend that the other specific tools in the list are also used.

List of specific tools for the various operations in this section	
380000558	Evacuation and charging station
380000559	Recovery and recycling station
294044	Set of flexible hoses for 380000558 and 380000559
294043	Tool kit for 380000558
294042	Receiver-dryer for 380000559
380000314	Gas leak detector with audible leak indication
380000556	Athermal tape for expansion valve
380000312	Combs for cleaning and straightening the fins on the condenser and evaporator
293825	Oil for pumps of stations 380000558 and 380000559

Air Conditioner Temperature Cycling Control Switch

The air conditioner temperature cycling control switch is mounted on the left hand side of the evaporator housing and close to the expansion valve, figure 12.



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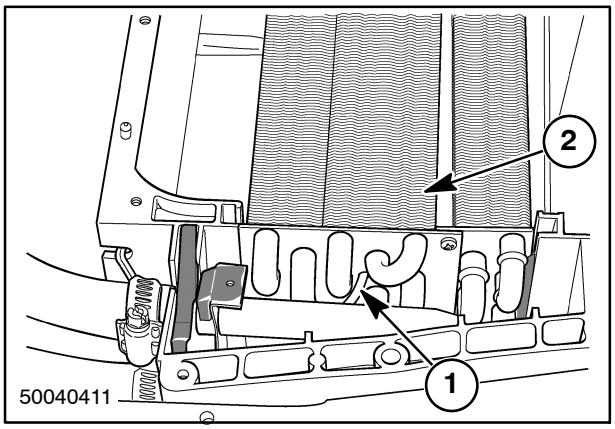
Thermostatic Switch (ANTIFROST)

The thermostatic switch is a safety device equipped with a sensor (1) which is inserted between the fins of the evaporator (2) where it constantly monitors the temperature.

The switch is a device which turns the compressor clutch on and off to maintain a variable average evaporator temperature and senses the evaporator temperature using a thermistor positioned within the evaporator fins, figure 13.



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The temperature cycling control switch compares the voltage of the thermistor, which is dependent on the temperature of the evaporator, with the voltage across the potentiometer of the 'in cab' temperature control switch.

The switch upon comparing the two voltages determines whether the compressor clutch should be switched 'on' or 'off' in order to maintain the desired in cab temperature control.

The thermostatic sensor (1) thus prevents ice from forming on the evaporator and obstructing the flow of air into the cab.

Note - In case of malfunction, replace the entire thermostatic switch.

Refer to figure 21 and proceed as follows:

47. Rotate the outer casing (30) so that pressure value indicated on the graduated scale corresponds with the value shown on pressure gauge (2).

48. When the refrigerant in the cylinder has reached the required level, as indicated on the glass rod (29), close the cock of the external cylinder, the cock on the charging pipe (24) and cock (27).

Note - If excessive time is required to transfer refrigerant from the external cylinder to cylinder (31), slightly open valve (1) and discharge air from the cylinder (31); the pressure reading on gauge (2) should not exceed 5 bar (72.5 psi).

Evacuation of the cab air conditioning system (previously discharged using the recovery/recycling station)

49. Remove the caps from the service valves on the suction and discharge lines of the compressor.

50. Connect the blue service pipe (17) to the valve on the low pressure side of the compressor marked "S".

51. Connect the red service pipe (15) to the valve on the high pressure side of the compressor marked "D".

52. Open the quick-fit cocks (16).

53. Open cocks (4 - 9 - 10 - 22).

54. Start the pump by turning switch (19) to position "I" and evacuate the system for at least thirty minutes; pressure gauges (5 - 6 - 8) should show a negative reading. If the evacuation procedure dose not function correctly, check all connections.

55. Close cock (9), switch off the pump by turning switch (19) to position "0" and check the vacuum seal for at least five minutes using vacuum meter (8). When this is accomplished, close all cocks.

Charging the cab air conditioning system (after evacuation) with new oil

If no significant refrigerant leaks have been detected, on recharging, replace the contaminated oil previously recovered in operations (25 and 26) with the same quantity of new oil. If, on the contrary, significant leaks have occurred in the past, proceed with the compressor oil level check procedure described on page 44.

Refer to figure 21 and proceed as follows:

56. Pour the oil into the graduated oil meter of kit **294043**.

57. Connect the oil meter to the oil meter (20).

58. Close cocks (4 and 10).

59. Set switch (19) to position "2" to switch on the refrigerant heater on cylinder (31).

60. Open cock (12) and the cock on the graduated oil meter.

61. Check the quantity of oil flowing from the oil meter, and once the required quantity has been reached, close cocks (12) and the cock on the oil meter, then remove the graduated meter.

Charging the cab air conditioning system with refrigerant (after evacuation)

Note - The quantity of refrigerant to be put into the system is 1400 grams (3.08 lbs) (refrigerant R134a).

Refer to figure 21 and proceed as follows:

62. Keep switch (19) in position 2, with the refrigerant heater in cylinder (31) on, and heat the refrigerant for approximately 10 to 15 minutes to facilitate transfer from the cylinder to the air conditioning system on the tractor.

63. According to the refrigerant type, rotate the outer casing (30) so that the graduated scale and the pressure values correspond with the pressure reading on gauge (2).

64. Move the external ring (26) along the cylinder glass to mark the quantity of refrigerant to be charged.

65. Open cock (22) and charge from the high pressure side.

66. Open cock (3), charge approximately 300 grams (10.5 oz) of refrigerant, close cock (3) and check for leaks.

67. If there are no leaks, continue charging up to the prescribed quantity.

68. On completion of charging, turn switch (19) back to position "0", close cocks (3 and 22), disconnect pipes (17 and 15), and replace the caps on the service valves.

Carry out functional tests with the system set to maximum performance levels, as described below.

TROUBLESHOOTING *(cont.)*