AGCO®

Model ST30X / ST32 Hydro Tractor

SERVICE MANUAL
79023898 A Rev.

CONTENTS

Part Number 79023898 (English)

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GENERAL PRECAUTIONS FOR SEPARATION AND RE-INSTALLATION

Before Operation

Always be safety-conscious in selecting clothes to wear and suitable tools to use.

Before disassembly, be sure that you familiarize yourself with the assembled condition for subsequent reference in reassembly.

Keep parts and tools in proper order during operations.

When servicing electrically live parts, be sure to disconnect the negative battery terminal.

To prevent oil or water leaks, use the liquid gasket as required.

When reassembling disassembled parts, discard used gaskets, O-rings, or oil seals and install new ones.

When lifting up only the front or rear part of the tractor, be sure to wedge the grounded wheels.

When the tractor is jacked up, be sure to support the entire tractor with something like a stand. Lifting it up with a jack only is a dangerously unstable procedure.

When replacing parts, use authorized, genuine AGCO parts only. AGCO assumes no responsibility for accidents, operating problems or damage caused by the use of imitation parts. Also, the use of unauthorized parts will result in relatively poor machine performance.

Precautions to be Followed When Installing Common Parts

Roller or Ball Bearings

When a bearing is fitted in by the outer race, use an installer, which is specially designed to push only the outer race and vice versa.

The installer must be designed to install the bearing on the shaft in a parallel position.

When installing a bearing, which appears the same on both sides, install it so that the face, which has the identification number faces in a direction for easy visual identification. All the bearings, which are to be installed in the transmission case should be placed so that their identification number faces outward.

If a shaft or a hole where a bearing is to be installed has a stopper, the bearing should be pushed in completely until it is seated against the stopper.

Installed bearings should turn smoothly.

Oil Seals

Oil seal installer should be designed so as not to deform the oil seals.

During installation, be careful not to damage the lips, and assure that it is pushed in parallel to the shaft or hole.

When oil seals are installed, there should be neither turnover of the lips nor dislocation of the springs.

When a multi-lip seal is installed, the grooves between lips should be filled with grease, not adhesive.

Use a lithium-based grease.

There should be no oil or water leaks through the installed oil seals.

O-Rings

O-rings should be coated with grease before installing.

Installed O-rings should have no slack or twist.

Installed O-rings should maintain proper air tightness.

FIG. 20: Disconnect power steering hoses at the cylinder side (1 & 2). Release hoses from clamps.

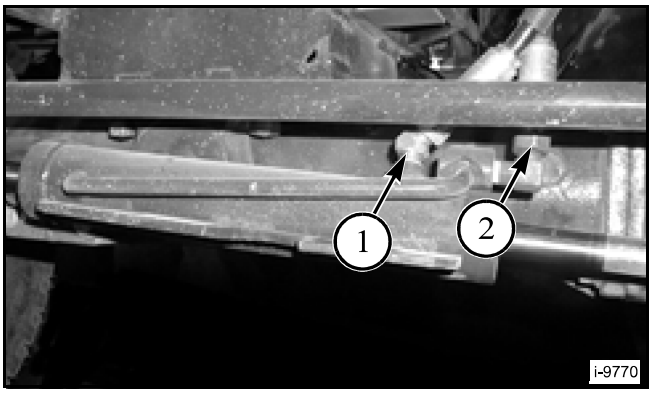

FIG. 20

FIG. 21: Remove fixing bolts and remove the steering post assembly with the fuel tank.

Remove a seat belt.

Remove the rear panel.

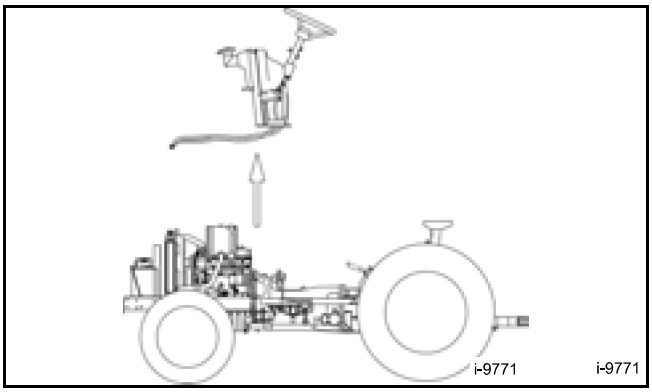

FIG. 21

FIG. 22: Disconnect the hand brake wire.

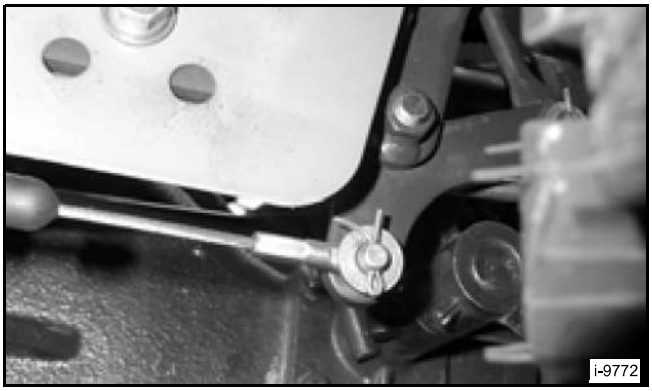

FIG. 22

FIG. 23: Remove the front rubber mounting bolt (1).

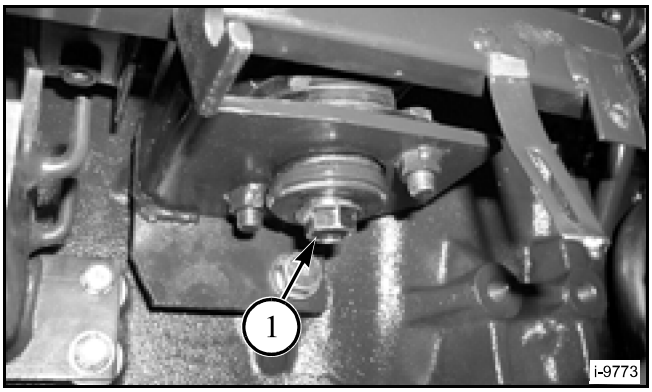

FIG. 23

SEPARATION OF REAR AXLE HOUSING FROM REAR TRANSMISSION CASE

Remove the exterior parts ahead of time referring to "REMOVAL THE EXTERIOR PARTS AS A SET".

Drain transmission oil.

Drive in a wedge between the axle bracket and front axle of both sides for support the engine.

Support the rear transmission case with a jack.

FIG. 53: Remove the plate of the stabilizer (1) (or check chain).

Remove one side of rear tire.

When remove the right hand of rear axle housing:

- Remove the differential lock arm.
- Remove the snap ring and remove the brake arm.

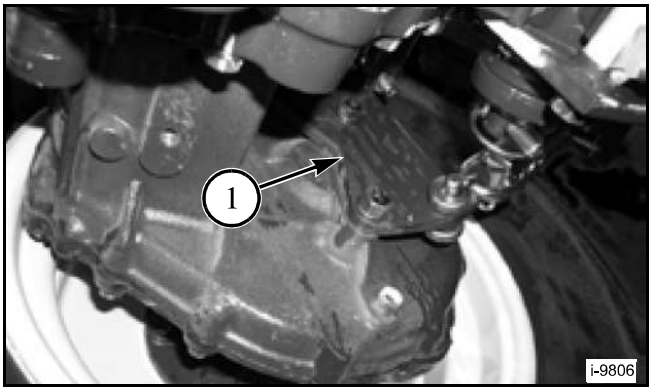

FIG. 53

FIG. 54: When remove the left hand of rear axle housing:

- Disconnect connecting rod of range change (1).
- Remove snap ring (2) and remove range shift arm (3).
- Pulling off the taper pin and remove the PTO change arm (4).

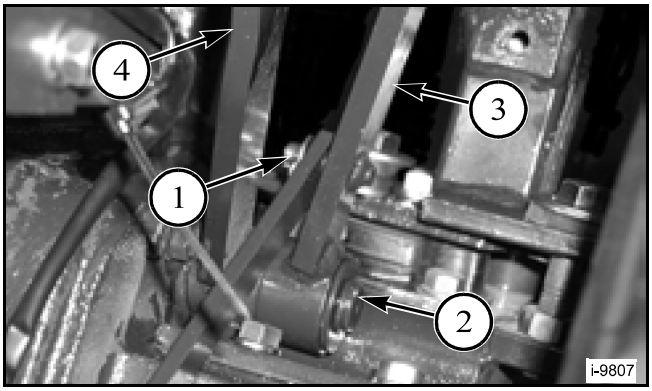

FIG. 54

REMOVAL OF CYLINDER CASE

Remove the exterior parts ahead of time referring to “REMOVAL THE EXTERIOR PARTS AS A SET".

Disconnect the both side of lift rods from rift arms.

FIG. 55: Disconnect the delivery pipe.

Remove bolts and remove cylinder case.

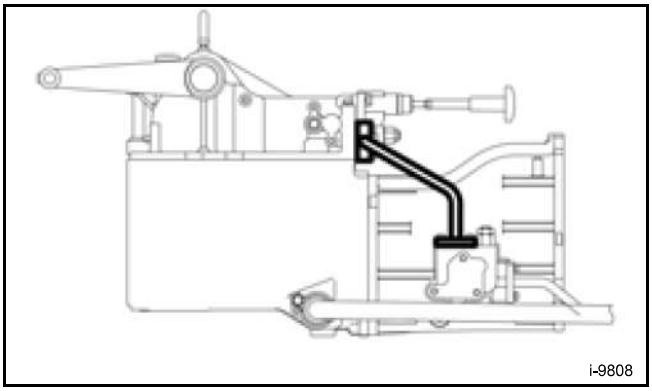

FIG. 55

FUEL SYSTEM

FIG. 8: Fuel system diagram.

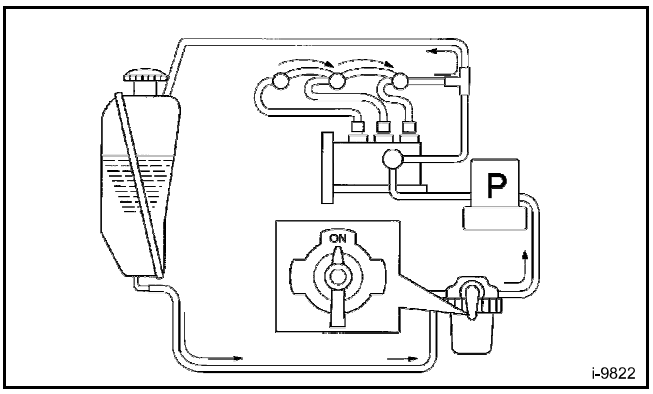

FIG. 8

Inspection

Use only clean diesel fuel of correct grade. Introduction of water or dirt into the fuel tank or other part of the fuel system can cause repeated plugging of the fuel filter and possible injection pump and injector damage.

Fuel Filter

FIG. 9: To replace the fuel filter element or clean sediment, turn the fuel valve to the OFF position (top).

- Inspect the filter element sediment bowl and O-ring (1).
- Examine the small O-ring in the filter head and replace as necessary.

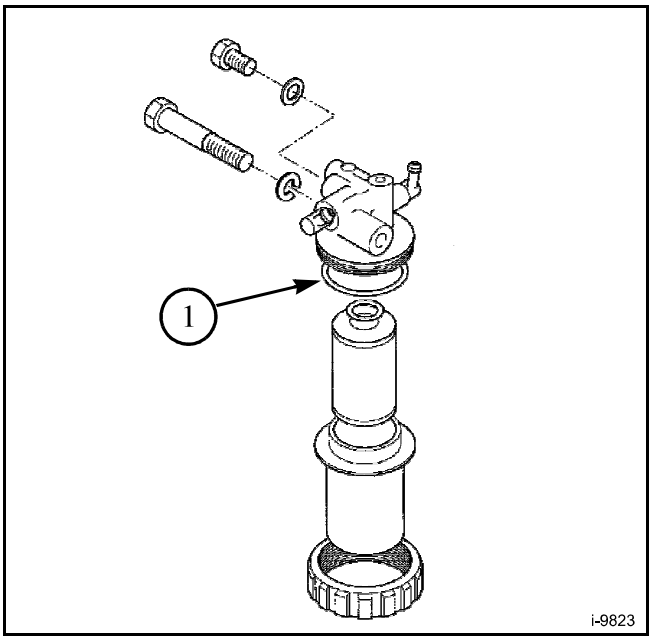

FIG. 9

LOCATION OF REDUCING VALVE AND PIPING

FIGS. 6–7: The reducing valve (1) is installed on the center of the transmission housing. It is located under the steering orbitrol unit.

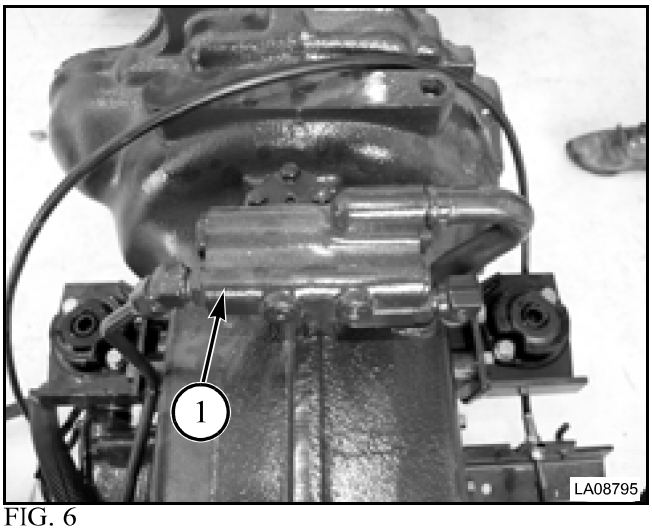

FIG. 6

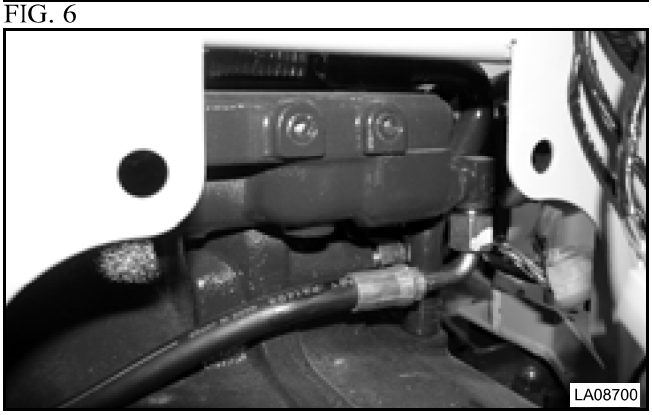

FIG. 7

Overhaul

FIG. 18: Remove PTO clutch.

Disassembly of the PTO clutch assembly should be done in a clean, dust-free place. Exercise special attention to avoid damage of the seal rings, etc.

Pull out PTO drive shaft (3) to the rear.

Pull out PTO helical drive gear (2) to the front.

Remove snap ring (7) and take out back-up plate friction plate and seperator plates.

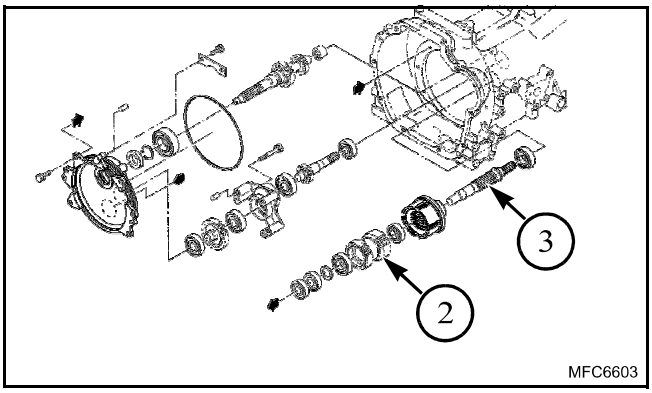

FIG. 18

FIGS. 19–20: While holding return spring (6) compressed with a special tool, remove snap ring (4).

Disassemble into separate parts: piston, return spring, brake disc, and cover assembly.

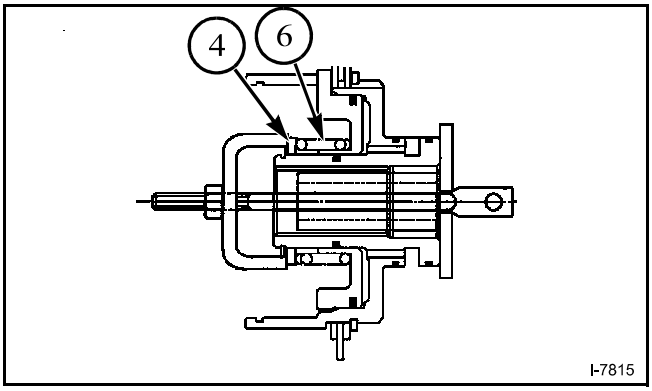

FIG. 19

INSPECTION

Cover Assmebly

Replace a cover assembly which has a damaged or worn sliding surface.

If there is any damage to the cover assembly and the piston seal ring, these parts should also be replaced.

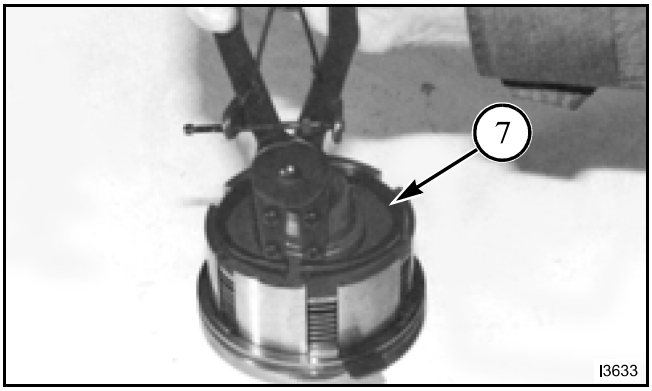

FIG. 20

Disc Assembly (Friction Plate)

FIG. 21: If the thickness of a disc assembly exceeds the usable limit mentioned below or combined width of the disc assembly and driven plate is less than 23.8 mm (0.937"), replace both the disc assembly and driven plate.

Inspection for disc thickness and serration wear.

Inspection Items	Specified Values	Usable Limit
Disc thickness	1.94mm (.075 in.)	1.64 (.065 in.)
Sufrace flatness	0.2 mm (0.008 in.)	

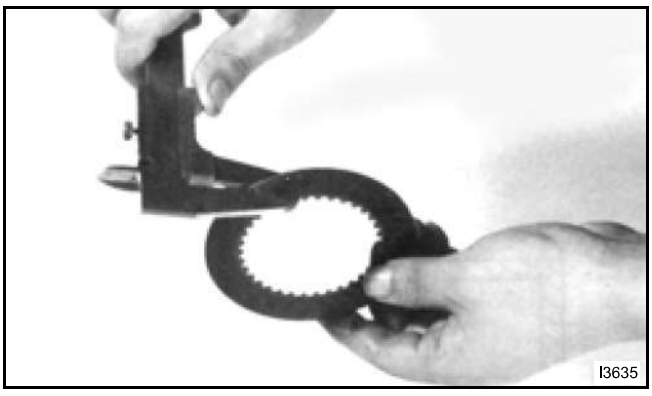

FIG. 21

REMOVAL AND INSTALLATION OF PTO CHANGE SECTION

Removal

Remove the cylinder case with reference to "REMOVAL OF CYLINDER CASE".

Remove the oil seal and snap ring of the PTO shaft.

FIG. 49: Remove the seal cap and snap ring of PTO counter shaft.

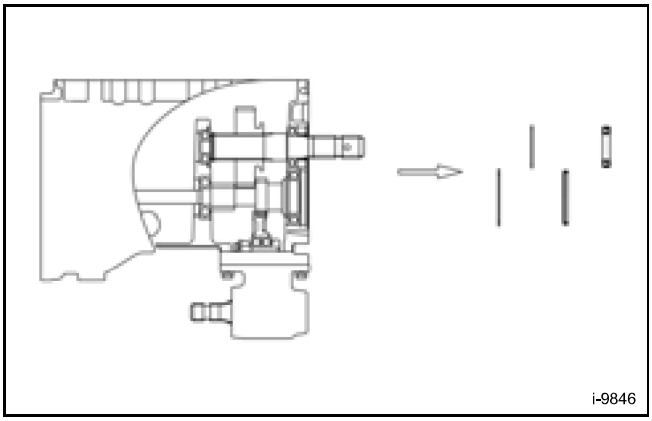

FIG. 49

FIG. 50: Remove bolts and shifter stay locking plate (1).

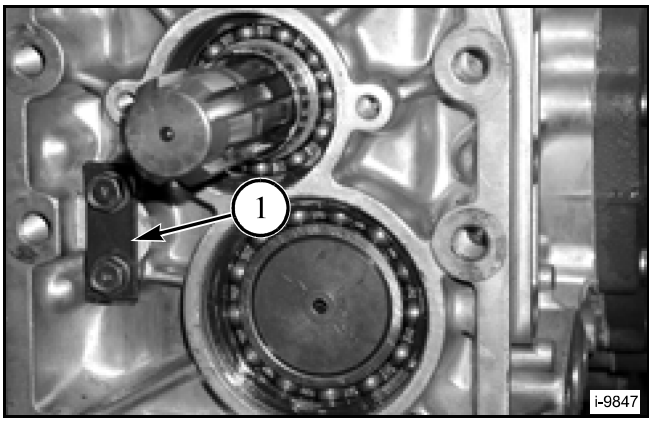

FIG. 50

Pull the PTO shaft out rearward.

Pull the PTO counter shaft out rearward.

Pull the shifter stay out and take the shift fork off.

NOTE: Pay attention not falling parts into MID PTO case.

Installation

Installation is reverse order of removal.

When the oil seal is installed, apply grease between rips of the oil seal and spline part of the PTO shaft.

Put the shift arm into groove of the shift fork certainly.

FIG. 9: Remove cylinder block assembly from motor shaft (8).

NOTE: When removing cylinder bock assembly, be careful not to lose six pins (22) of pump and motor.

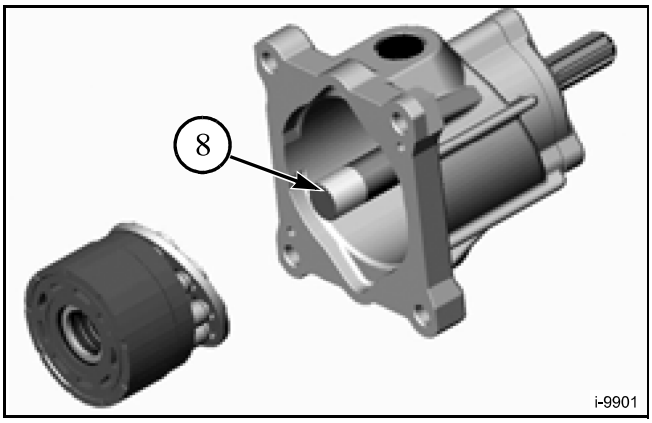

FIG. 9

FIG. 10: Remove thrust plate (12) from case (2).

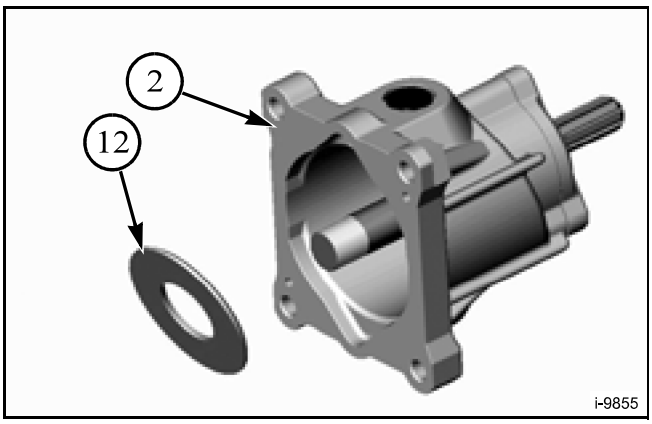

FIG. 10

Removal of the Shaft

Removal of the Pump Shaft

FIG. 11: Remove snap ring (55) from case (1).

Tap the end of shaft (7) with a plastic hammer and remove pump shaft assembly.

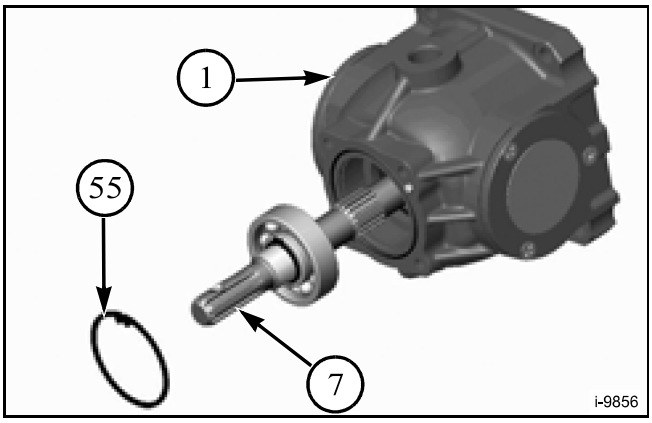

FIG. 11

Confirmation of the operation

FIG. 35: After assembly, make sure that the input shaft and trunnion lever turn smoothly by manipulating them with a wrench.

FIG. 35

FIG. 36: Rotating group breakdown.

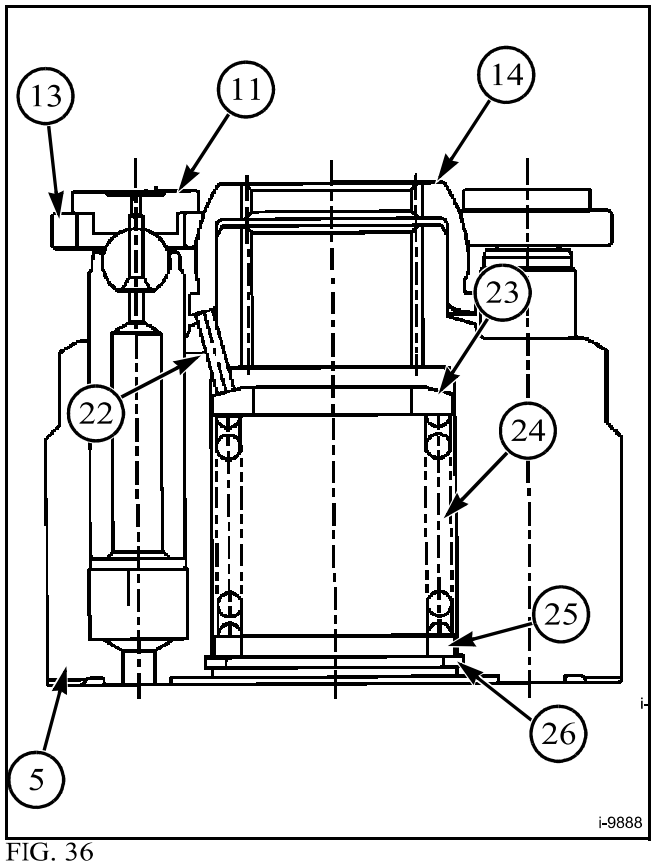

FIG. 36

FRONT AXLE

Contents

STEERING

Contents

INSPECTION

Check the contact surfaces of all components. Replace defective ones. Wash all metal parts in clean solvent and dry them with pressurized air. Refrain from drying them with cloth or paper, as lint and paper waste can contaminate the hydraulic system, which will lead to system trouble. Never file parts or polish them with coarse sandpaper.

NOTE: Apply fresh grease to O-rings ahead of time.

We recommend used O-rings and seals be replaced with new ones whenever possible.

RE-ASSEMBLY

Re-assembly Of Control Side

FIG. 17: Insert the spool (15) into sleeve (14) while turning the spool slowly.

NOTE: Make sure that the spool turns smoothly by holding the spool 's splined part.

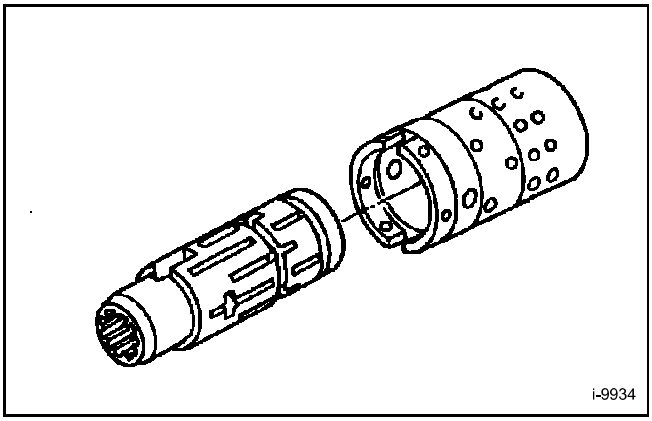

FIG. 17

FIG. 18: Align the spring grooves of the spool and sleeve and insert centring springs (17) and flat springs (18) using a jig. Set the spring ends flush with the sleeve circumference.

NOTE: Set the four centring springs (17) and the two flat springs (18) together with the cut-away parts turned downward.

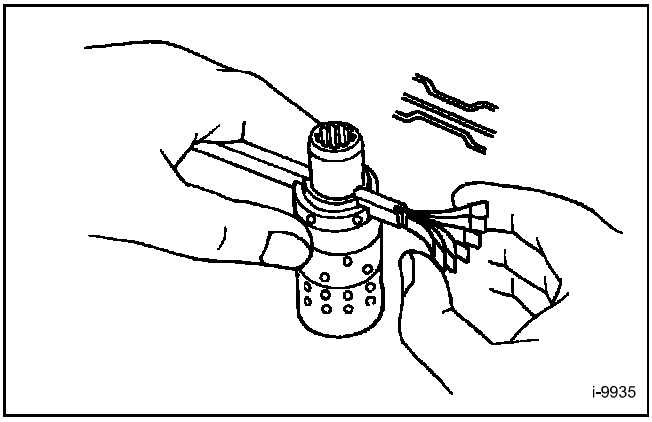

FIG. 18

HYDRAULIC SYSTEM

Contents

FIG. 18: Adjust the clearance between the flow control valve and shaft as specified.

Clearance	16 mm (0.63 in.)

Adjust the operating load of the position control lever as specified with the lock nut.

Lever operating load	3 - 4 kgf (6.6 - 8.8 lb)

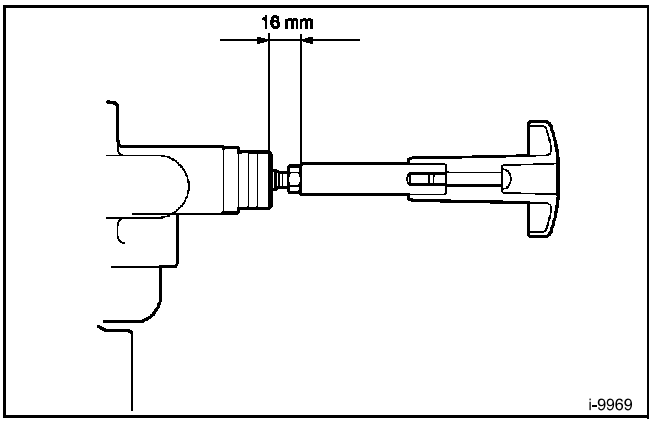

FIG. 18

Operations

Down Position

FIG. 28: The fluid from port C pushes up stop ring C (3) of poppet (5) until the ring comes into contact with adjusting screw (12), as it reaches chamber (R). Consequently, the extent choke (O) is opened is determined by the positioning of adjusting screw (6): that is, when adjusting screw (12) is screwed in clockwise, the opening of choke (O) decreases and the lowering speed of the lift arm slows down; whereas the opening of choke (O) increases and the lowering speed of the lift is accelerated when the adjusting screw is unscrewed counter clockwise. When the adjusting screw is screwed in completely, the poppet comes into contact with body seat (S) and the choke is closed completely, so the lift arm stops.

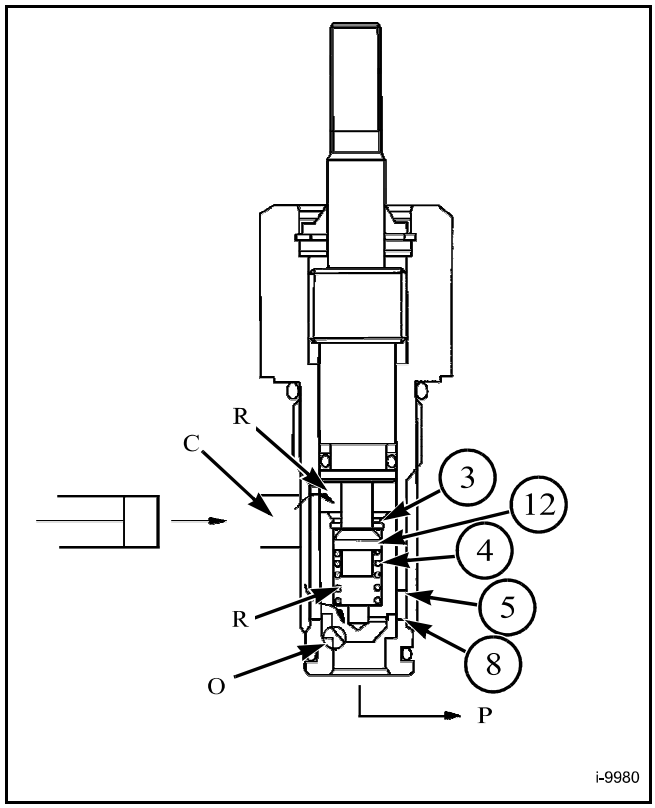

FIG. 28

Up Position

FIG. 29: The flow from port A, overcoming the force of spring (4), pushes up poppet (5) and choke (O) is fully opened regardless of the position of adjusting screw (12). Thus the fluid flows to port B and the cylinder, which results in raising the lift arm.

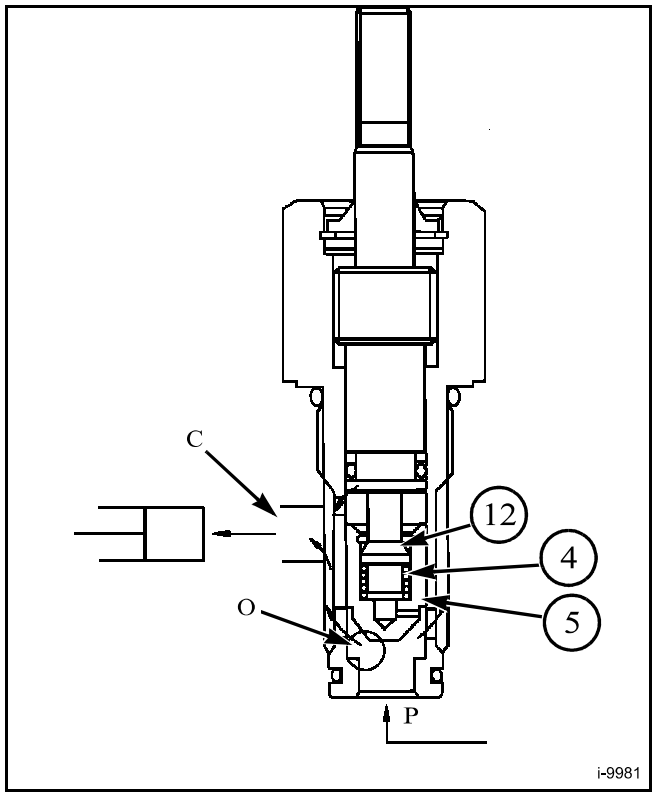

FIG. 29

TABLE 1

Problems	Causes	Countermeasures
Fluid overheating (continued)	Too high or low viscosity of working fluid.	Replace with fluid of adequate viscosity.
	Insufficient fluid.	Maintain specified level by replenishing.
	Too high internal friction of pump.	Replace.
Pump noise	Partially clogged suction-filter or suction piping.	Clean.
	Air inhaled through suction piping connections.	Inspect and re-tighten.
	Air inhaled through intake pipe connection for pump.	Inspect and re-tighten.
	Loosened pump cover tightening bolts.	Inspect and re-tighten.
	Too rich oil viscosity.	Replace with oil of specified viscosity.
	Trapped foreign matter.	Disassemble and clean.
	Broken or worn pump parts.	Inspect and replace defective parts.
Excessive wear, deflection or damage of pump	Dirty fluid.	Eliminate foreign matter and inspect filters.
	Circuit pressure exceeds pump capacity.	Adjust relief valve or replace If necessary.
	Oil less operation due to insufficient oil quantity.	Inspect transmission oil level and maintain specified oil level by replenishing.
	In either case, clean, and repair pump parts and replace damaged ones if necessary.	
Oil leaks outside pump.	Broken or fatigues oil seal or O-ring.	Replace.

ENGINE GLOW PLUGS

Replace

FIG. 16: Engine glow plugs (1) are threaded into engine head. To remove proceed as follows.

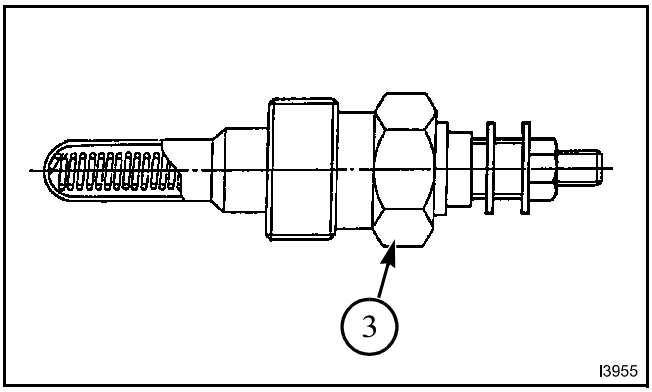

FIG. 16

Remove engine side panel.

Remove electrical connection across glow plugs.

Remove glow plugs.

Reverse procedures to install.

Torque, glow plugs to 17 +/- 2 Nm (12.6 +/- 2 ft. lbs).

Torque electrical connections on glow plug to .97 - 2.4 Nm (.72 - 1.8 ft.-lbs.).

Circuit - Testing

If glow plug system is not operating correctly, it can be checked as follows:

Quick Check

Attach voltmeter positive (red wire) to connector bar across glow plugs, and attach black wire to ground.

Turn main switch key to glow position.

Voltage should read approximately nine volts with a fully charged battery indicating glow plugs are performing satisfactorily. A higher voltage would indicate one or more of the glow plugs are inoperative.

INSTRUMENT LIGHT BULBS

Removal and Installation

Indicator Light Strip

FIG. 17: Indicator light strip (1) contains several warning lights to monitor certain functions. Currently use positions (from left to right) are:

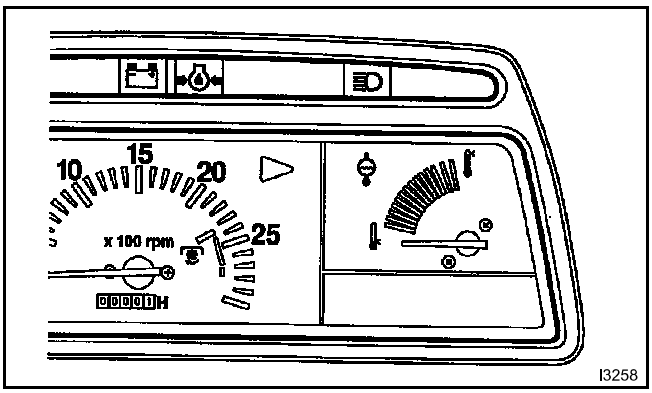

FIG. 17

- Main (high) beam - illuminates when headlamps in front grill are selected to high beam position by light switch.
- Engine oil pressure - Will light up if engine oil pressure is low. If light illuminates while engine is running, shut off engine immediately and investigate cause.
- Battery charge - illuminates when main switch is turned "ON" and will go out after engine starts, in indicate battery is being charged.

To replace light bulbs, remove instrument panel.

Change light bulb.

Replace panel.