Service Manual

JCB 354/360 TRACTOR

Section 1 - General Information

Section 2 - Care and Safety

Section 3 - Routine Maintenance

Section A - Attachments

Section B - Body and Framework

Section C - Electrics

Section E - Hydraulics

Section F - Transmission

Section G - Brakes

Section H - Hydraulic Steering

Section K - Engine



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Contents **Page No.**

Introduction
About This Publication ..... 1 - 1
Identifying Your Machine ..... 1 - 3

Standard Torque Settings
Front Axle Housing and Transmission ..... 1 - 5

Service Consumables
Sealing and Retaining Compounds ..... 1 - 7

Service Tools
Numerical List Section H - Steering ..... 1 - 9
Tool Detail Reference Section H - Steering ..... 1 - 10

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Safety Notices

Important Information

T1-015

The Operator Manual

⚠ WARNING

Study the Operator Manual before starting the machine. You must understand and follow the instructions in the Operator Manual. You must observe all relevant laws and regulations. If you are unsure about anything, ask your JCB dealer or employer. Do not guess, you or others could be killed or seriously injured.

INT-1-1-1_2

Do not operate the machine without an Operator Manual.

Treat the Operator Manual as part of the machine. Keep it clean and in good condition. Replace the Operator Manual immediately if it is lost, damaged or becomes unreadable.

Safety Warnings



This safety alert system identifies important safety messages in this manual. When you see this symbol, be alert, your safety is involved, carefuly read the message that follows, and inform other operators.

In this publication and on the machine, there are safety notices. Each notice starts with a signal word. The signal word meanings are given below.

⚠ DANGER

Denotes an extreme hazard exists. If proper precautions are not taken, it is highly probable that the operator (or others) could be killed or seriously injured.

INT-1-2-1

⚠ WARNING

Denotes a hazard exists. If proper precautions are not taken, the operator (or others) could be killed or seriously injured.

INT-1-2-2

⚠ CAUTION

Denotes a reminder of safety practices. Failure to follow these safety practices could result in injury to the operator (or others) and possible damage to the machine.

INT-1-2-3

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Standard Torque Settings

Front Axle Housing and Transmission

Introduction

The following table gives the torque tightening values for the major parts of the Front Axle Housing (4WD Type) and the Transmission.

Table 1. Standard Torque Settings

Major Part	Bolt and Nut Size (Hardness)	Torque Value		
		Nm	kgf/m	lbf/ft
Front Axle Housing				
Axle bracket to engine	5/8-11UNC (9T)	156.9 - 176.5	16.0 - 18.0	115.7 - 130.2
Front pivot metal	M14 (9T)	156.9 - 176.5	16.0 - 18.0	115.7 - 130.2
Rear pivot metal	M18 (7T)	196.0 - 235.2	20.0 - 24.0	144.6 - 173.5
Front axle final case	M12 (7T)	88.2 - 107.9	9.0 - 11.0	65.1 - 79.6
Bearing cover	M14 (7T)	132.3 - 137.2	13.5 - 14.0	97.6 - 101.2
Wheel shaft cover	M8 (7T)	53.9 - 68.6	5.5 - 7.0	39.8 - 50.6
Front wheel	M18 (7T)	225.4 - 235.2	23.0 - 24.0	166.3 - 173.5
Bevel gear case	M12 (7T)	88.2 - 107.9	9.0 - 11.0	65.1 - 79.6
Diff-metal (support)	M10 (7T)	73.5 - 87.2	7.5 - 8.9	9.4 - 13.1
Transmission				
Front transmission - engine	M12 (7T)	88.2 - 107.9	9.0 - 11.0	65.1 - 79.6
Front transmission - spacer	M12 (7T)	88.2 - 107.9	9.0 - 11.0	65.1 - 79.6
Space transmission - rear transmission	M12 (7T)	88.2 - 107.9	9.0 - 11.0	65.1 - 79.6
Input metal (support)	M12 (7T)	88.2 - 107.9	9.0 - 11.0	65.1 - 79.6
Drive pinion metal (support)	M10 (7T)	53.9 - 68.6	5.5 - 7.0	39.8 - 50.6
Drive pinion				
Diff-case metal (support)	M12	53.9 - 68.6	5.5 - 7.0	39.8 - 50.6
Diff-case ring gear	M12 (7T)	88.2 - 107.9	9.0 - 11.0	65.1 - 79.6

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Pre Start Cold Checks, Service Points and Fluid Levels

	Operation	Daily	50	100	150	200	250	300	350	400	450	500	550	600
ENGINE														
Engine oil level	- Check	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		☐	☐
Engine oil(1)	- Change		☐									☐		
Engine oil filter(1)	- Change		☐									☐		
Engine coolant level	- Check	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Engine coolant (2)	- Change					☐				☐				☐
Radiator	- Check	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Radiator, fins and screen	- Clean					☐				☐				☐
Radiator hose clamp	- Check	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Fuel tank level	- Check	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Fuel filter	- Check			☐		☐			☐	☐		☐		
Fuel filter	- Clean				☐		☐				☐		☐	
Fuel filter	- Change											☐		
Air cleaner dust ejector	- Clean			☐		☐		☐		☐		☐		☐
Air cleaner elements	- Clean			☐		☐		☐		☐		☐		
Air cleaner elements	- Change													☐
Safety start system	- Check	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Fan belt	- Check and Adjust	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
TRANSMISSION														
Grease fittings/nipples	- Lubricate		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Wheel bolt torque	- Check and Adjust	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Tyre pressure and condition	- Check and Adjust	☐	☐		☐		☐		☐		☐		☐	
Brake adjustment and balance	- Check and Adjust	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Accelerator pedal	- Adjust							☐						☐
Clutch pedal free play	- Check and Adjust	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Steering wheel free play	- Check	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Steering wheel joint	- Check	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Steering wheel joint	- Adjust							☐						☐

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Fluids, Lubricants and Capacities

Table 2.

Item	Capacity Litres	Fluid / Lubricant	International Specification
Fuel Tanks	72 litre	Diesel Oil	⇨ *Types of Fuel (3-33)*
Engine (Oil)	7 litre	JCB 10W/30 or SAE 30 above 25°C (above 77°F)	API CD/CE
		10W30 Multigrade SAE 20 0°C to 25°C (32°F to 77°F)	
		10W-30 or SAE 10 below 0°C (32°F)	
Hydraulic (Oil)	43 litre	RPM Tractor Hydraulic Fluid or Textron TDH Premium (Caltex)	
		TDH Oil or TDH Oil Special (Texaco)	
		Chevron 1000 THF	
Engine Coolant	8 litre	JCB Universal Antifreeze/water ⇨ *Coolant Mixtures (3-11)*	ASTM D3306-74
Front Axle and final drive case (B) (Oil)	16.3 litres		
All Other Grease		JCB MPL Grease	Lithium based no 2 consistency

Initial Hydraulic Oil and Filter Change.....50 hours

Hydraulic Oil and Filter Change, Thereafter.....350 hours

Initial Engine Oil and Filter Change.....50 hours

Engine Oil and Filter Change, Thereafter.....100 hours

Note: *Change intervals stated above are for normal usage. Due to adverse operating conditions that may be experienced (extremely dusty or muddy), change intervals may need to be more frequent.*

Coolant Mixtures

T3-009_3

Check the strength of the coolant mixture at least once a year, preferably at the start of the cold period.

Replace the coolant mixture according to the intervals shown in the machine's Service Schedule.

⚠ WARNING

Antifreeze can be harmful. Obey the manufacturer's instructions when handling full strength or diluted antifreeze.

7-3-4-4_1

You must dilute full strength antifreeze with clean water before use. Use clean water of no more than a moderate hardness (pH value 8.5). If this cannot be obtained, use de-ionized water. For further information advice on water hardness, contact your local water authority.

The correct concentration of antifreeze protects the engine against frost damage in winter and provides year round protection against corrosion.

The protection provided by JCB High Performance Antifreeze and Inhibitor is shown below.

50% Concentration (Standard)

Protects against damage down to -40 °C (-39 °F)

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General Fault Indications

There are several indications that may help to determine the fault area on a system not working efficiently:

a)	Poor performance.	Low system pressure -	Evacuate and recharge system.
		Condenser matrix air flow restricted -	Remove debris from around matrix using compressed air or low pressure water.
		Air filter blocked -	Remove and replace.
		Compressor drive belt too slack -	Adjust to correct tension.
b)	Warm or slightly cool air emitted from unit.	Expansion valve stuck open or closed -	Renew expansion valve.
	Blower does not operate.	Fuse blown -	Replace fuse and retest.
c)	Compressor clutch continually cuts out.	Condenser matrix blockage -	Remove debris from around matrix/renew condenser.
		Overcharging of refrigerant system -	Evacuate and recharge system.
		Blocked expansion valve/condenser -	Clear blocked component.

Sight Glass Indications

An approximate indication of the condition of the refrigerant can be seen through the receiver/drier sight glass when the compressor is running. ⇒ ***Table 1. Sight glass indications (B-10)***. Refer also to ⇒ ***Checking Refrigerant Charge Level (B-19)***.

Note: *Sight glass indications cannot always give a positive identification of a problem. Further diagnosis, preferably by a refrigeration engineer using pressure gauges, is advisable before reaching a definite conclusion.*

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Circuit Diagrams

JCB 354 and 360 Hydraulic Circuit

The hydraulic circuit diagram is shown in ⇨ *Fig 33. (E-30)*.

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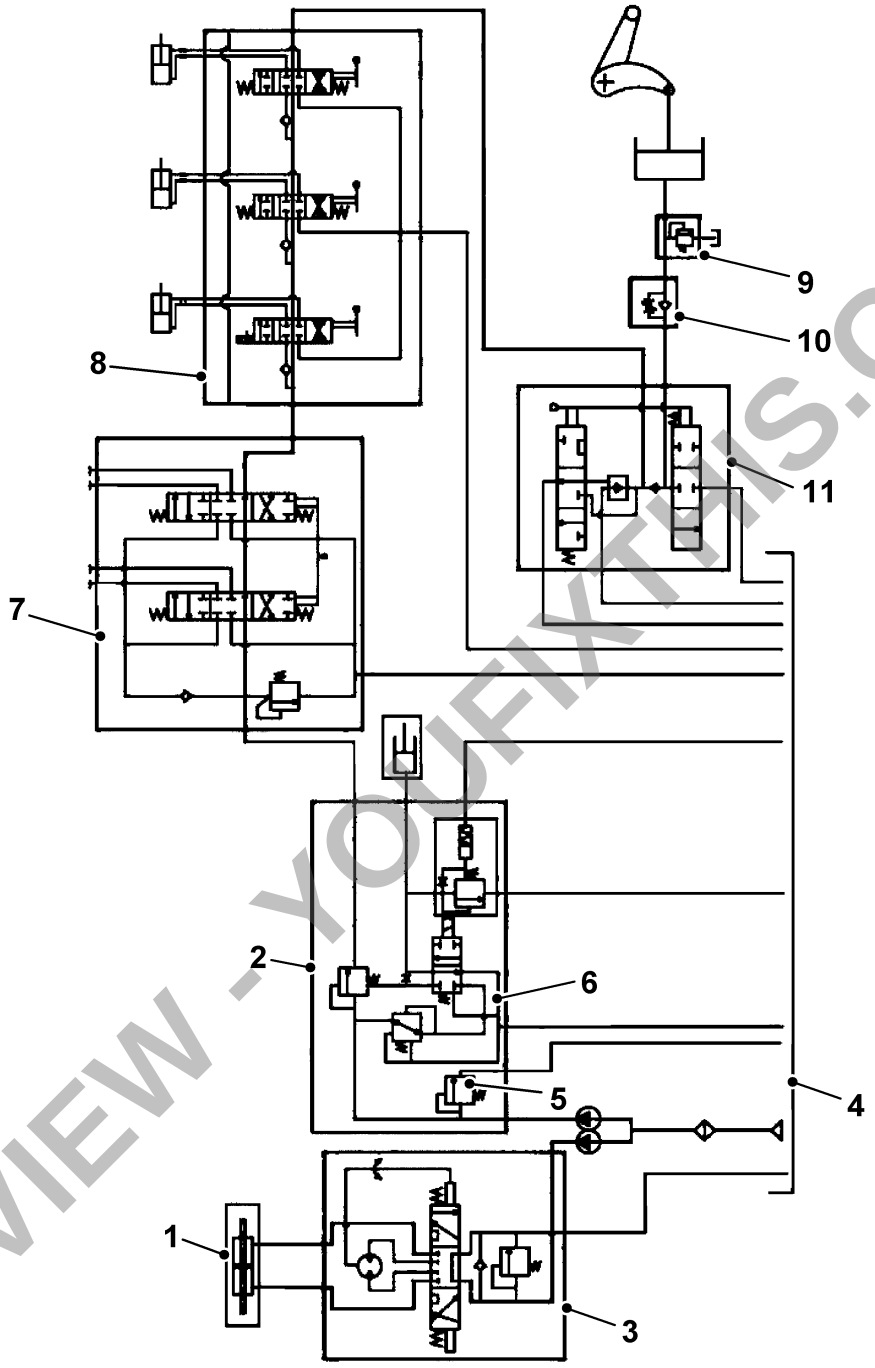


Fig 33. JCB 354 and 360 circuit diagram

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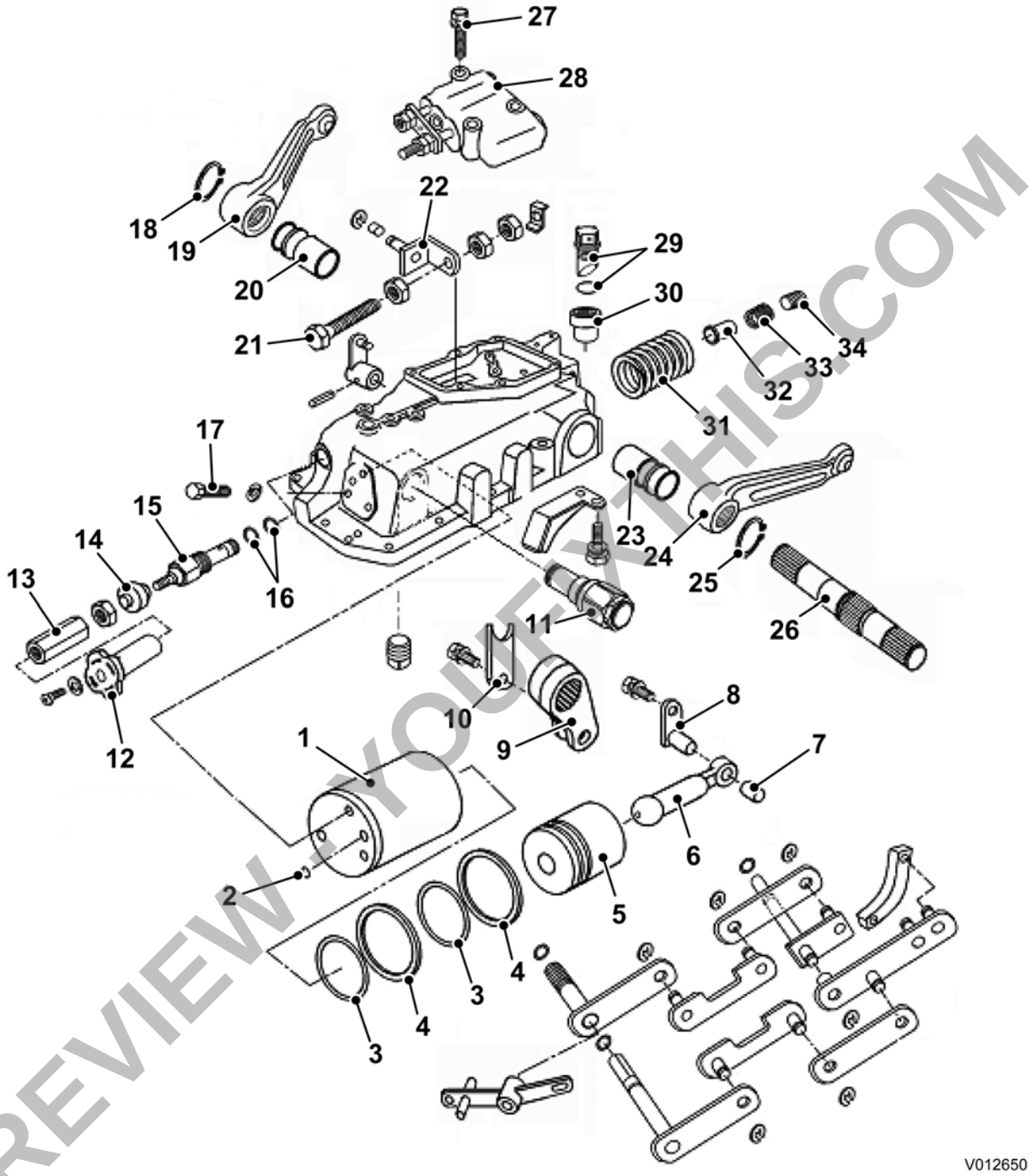


Fig 9.

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Fitting Procedure

1 Drill a hole in the machine body/framework where the rivet nut is to be fitted. De-burr hole edges.

2 Screw the rivet nut onto the mandrel of the installation tool. The bottom of the mandrel should be in line with the bottom of the rivet nut **11-A**.

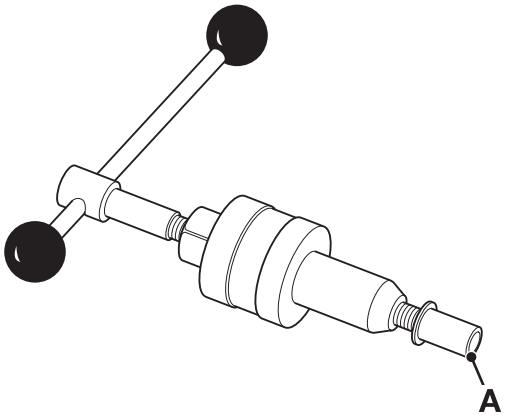


Fig 11.

3 Wind the body of the installation tool down the threaded mandrel until it touches the head of the rivet nut **12-B**.

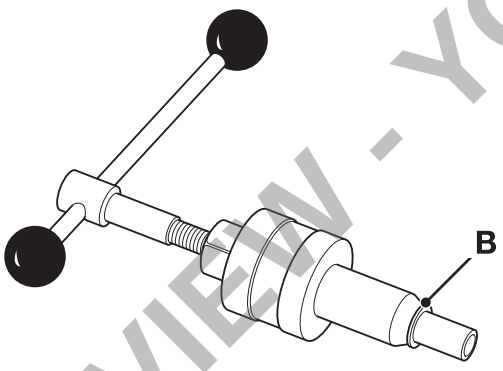


Fig 12.

4 Insert the rivet nut (assembled to the tool) into the hole drilled in step 1.

5 Hold handle **13-C** and at the same time draw the mandrel into the installation tool by turning nut **13-D**. The rivet nut will contract in length and form an 'upset' (smooth bulge) seating itself against the body/framework **13-E**.

Note: *The thread of the rivet nut must not be stripped, take care when 'upsetting' the rivet nut.*

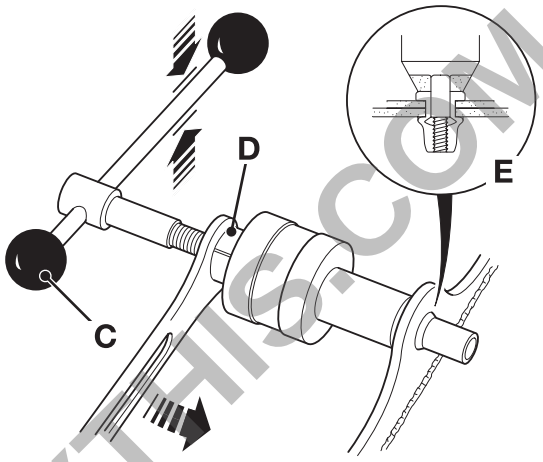


Fig 13.

6 Remove the installation tool.

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Clutch

Adjustment of the clutch involves checking the clutch pedal free movement. The correct pedal free movement should be between 19.81 and 29.98 mm (0.78 and 1.18 in). Adjust the brakes as follows:

1 Loosen the lock nuts **A** on the turn buckle **B**.

2 Turn the turnbuckle in the required direction until the correct pedal free movement id obtained.

3 Tighten the lock nuts and check the pedal free movement is correct.

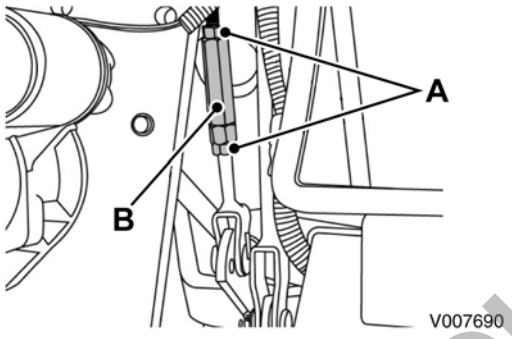


Fig 5.

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Tightening Leaking Hoses

⚠ WARNING

The air conditioning system is a closed loop system and contains pressurised refrigerant. No part of the system should be disconnected until the system has been discharged by a refrigeration engineer or a suitably trained person. You can be severely frostbitten or injured by escaping refrigerant.

4-3-4-1_2

The refrigerant hoses have crimped ferrule end fittings. The hose connectors have an 'O' ring seal which compresses when the connection is tight, creating an air tight seal.

Hoses are used to connect the inlets and outlets of the compressor, condenser, receiver drier and expansion valve (the evaporator coil is connected to the expansion valve within the air conditioning unit using rigid pipes).

If leakage is detected from a hose connector, either by means of an electronic leak detector or soapy water, tighten the connector up and repeat the leakage test. If leakage is still evident, it will be necessary to discharge the system and renew the connector 'O' ring seal.

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Combination Switch

Removal

1 Remove the meter panel **1** ⇒ *Fig 35. (C-40)*.

2 Remove the light switch knob and the turn signal lever **36**.

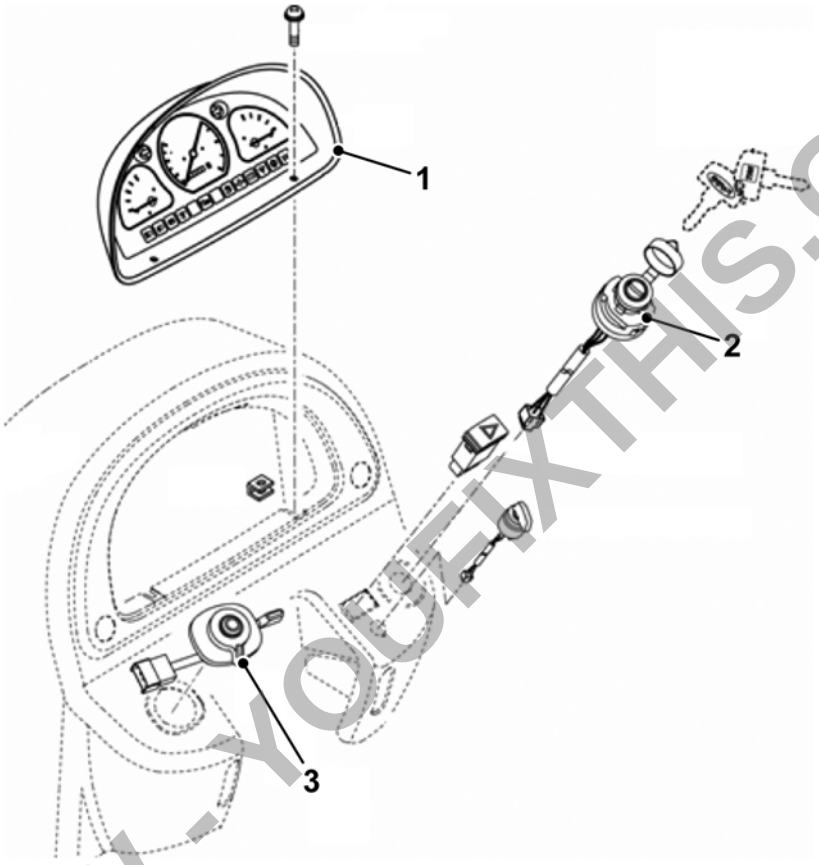


Fig 35.

3 Release the ring nut and remove the combination switch **2**.

Inspection

Each switch circuit is as shown in the following tables. Check each switch for continuity across respective terminals with a tester. Replace a defective switch as an assembly.

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1 Remove the cylinder case assembly and set it down on a wooden surface to prevent damage to the cylinder case surface.

2 Remove the link pin **A** and remove the lift link **B**. ⇨ *Fig 36. (E-45)*.

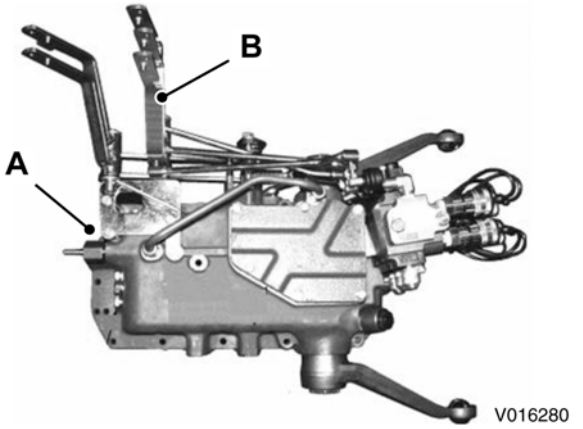


Fig 36.

3 Remove the cylinder head and extract the cylinder. ⇨ *Fig 37. (E-45)*.

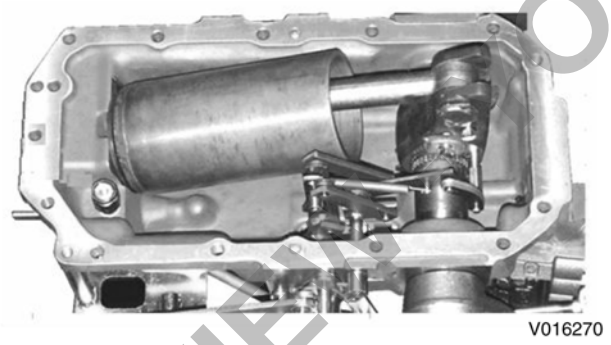


Fig 37.

4 Remove the piston from the cylinder. ⇨ *Fig 38. (E-45)*.



Fig 38.

5 Make alignment marks **A** on the lift shaft and the right hand lift arm. ⇨ *Fig 39. (E-45)*.

6 Remove the right hand lift arm.

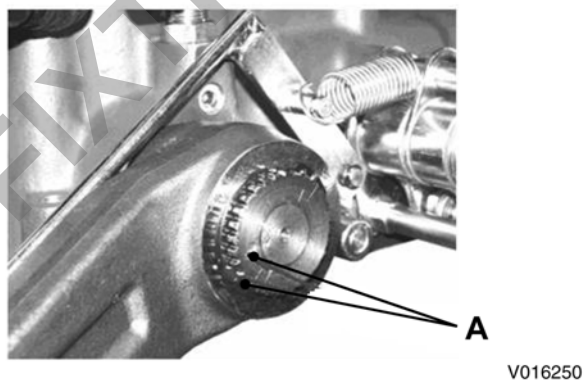


Fig 39.

7 Make alignment marks **A** on the draft shaft and the draft arm. ⇨ *Fig 40. (E-46)*.

8 Remove the draft shaft.

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Reassemble

Reassemble the parts in reverse order of disassembly taking note of the following:

1 Wash each part before assembly.

2 Apply multi-purpose grease to needle bearings before assembly.

3 Check for smooth rotation of gears after installation.

4 Make sure all snap rings are seated correctly in their grooves.

5 When installing sealing rings, apply fresh oil before assembly and install them carefully to avoid damage.

6 Install the return plate **1** with the press-processed side **3** facing towards the brake disc **2**. ⇨ *Fig 37. (F-37)*.

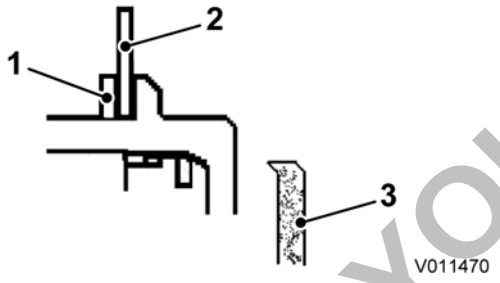


Fig 37.

7 When installing the return spring, use a special tool; the snap ring should be securely seated in the groove.

8 When pushing the roller ball bearings into the gear, only push on their outer races.

9 Install the snap ring in correct direction.

10 After reassembly, lock the PTO clutch and check that the gear turns smoothly. ⇨ *Fig 38. (F-37)*.

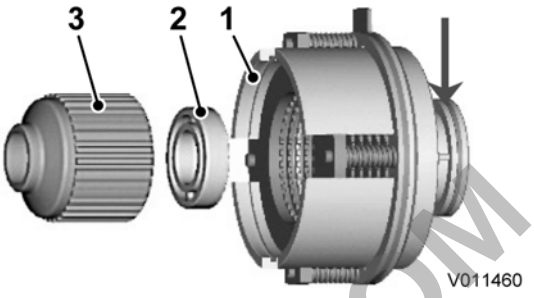


Fig 38.

1 PTO clutch assembly
2 Ball bearing
3 PTO hub

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Key to ⇒ Fig 108. (F-91)							
1	Bevel gear (9-24) set	2	Diff case	3	Diff side gear	4	Thrust washer (40x58x1)
5	Diff pinion	6	Diff pinion washer	7	Diff pinion shaft	8	Spring pin
9	Spring pin	10	Ball bearing	11	Snap ring	12	Shim (67x72x0.1)
13	T.R.B.	14	Collar, spacer	15	Sleeve	16	Spacer collar
17	Snap ring	18	Nut (M30)	19	Oil seal	20	Shim
21	Shim	22	Snap ring (hole)				

Disassembly

1 Remove the front axle .⇒ *Centre Pivot (F-88)*.

2 Remove both road wheels.

3 Remove the drain plug from the final case and drain the oil.

4 Remove both final case assemblies **A** and **B** from the front axle. ⇒ *Fig 109. (F-92)*.

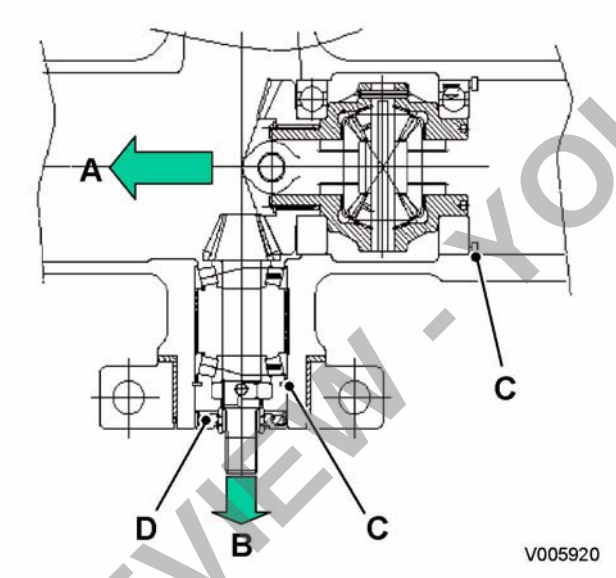


Fig 109.

A Diff Case
B Bevel Pinion
C Snap-Ring
D Oil Seal

5 Remove the oil seal making sure the ring gear and bearing are parallel. Discard the oil seal

Note: *Make a note of the number of shims* ***1*** ⇒ *Fig 110. (F-93) installed and the shimming thickness.*

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