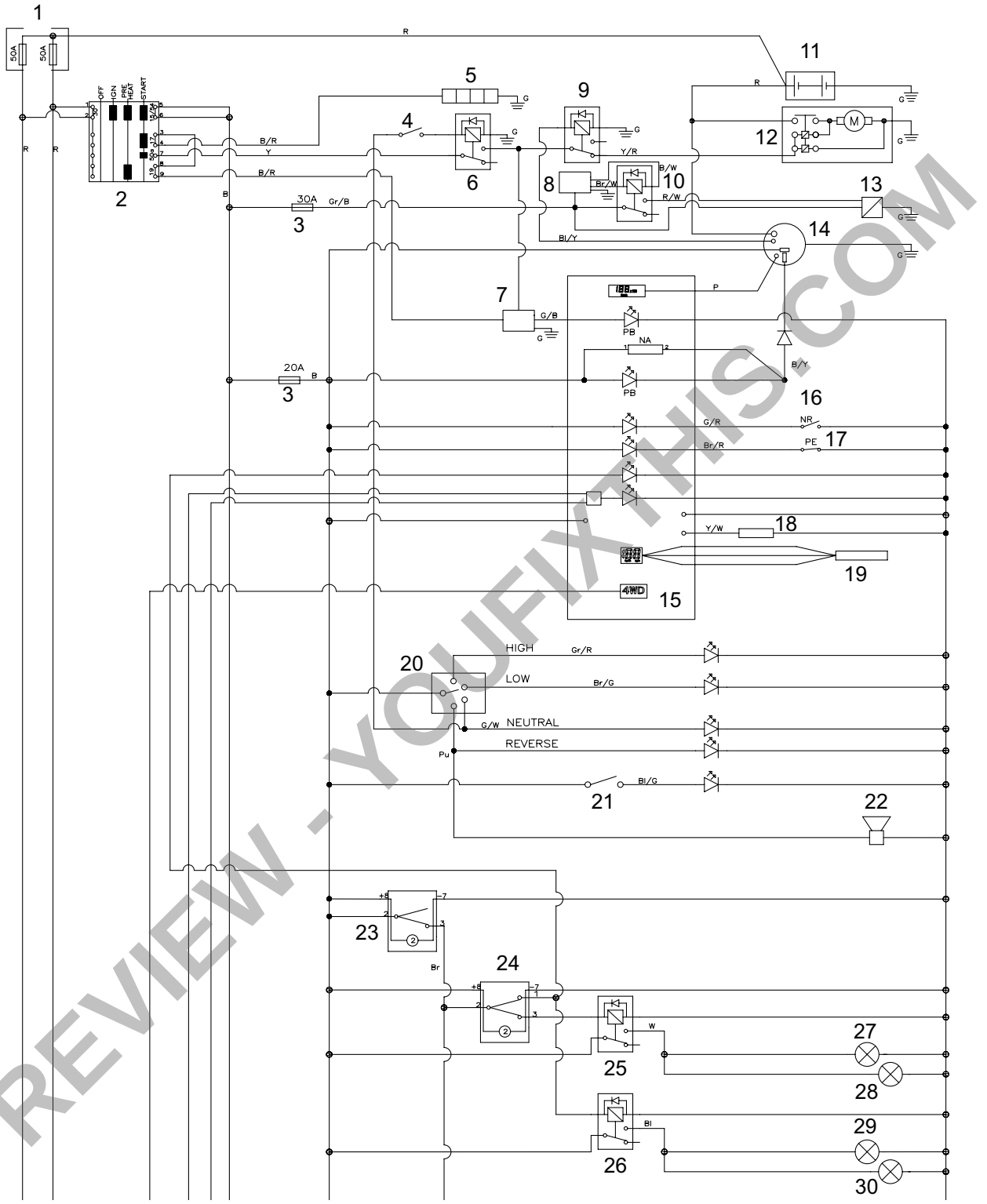
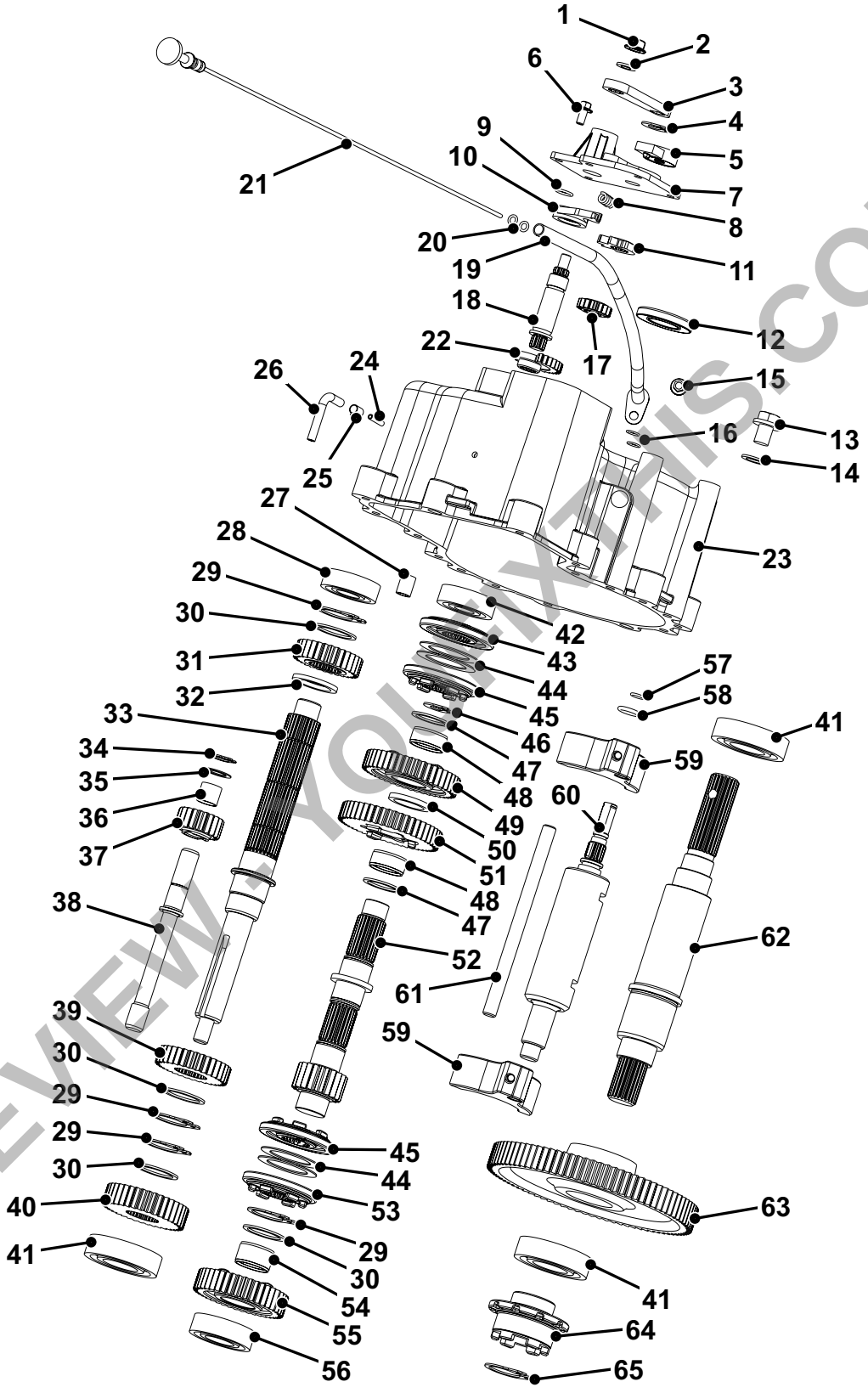


C099620

Fig 16. Page 1 of 2

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C107940-C1

Fig 1.

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Zinc Plated Fasteners and Dacromet Fasteners

Table 2. Torque Settings - UNF Grade 'S' Fasteners

Bolt Size		Hexagon (A/F)	Condition 1			Condition 2		
in.	mm	in.	Nm	kgf m	lbf ft	Nm	kgf m	lbf ft
1/4	6.3	7/16	11.2	1.1	8.3	10.0	1.0	7.4
5/16	7.9	1/2	22.3	2.3	16.4	20.0	2.0	14.7
3/8	9.5	9/16	40.0	4.1	29.5	36.0	3.7	26.5
7/16	11.1	5/8	64.0	6.5	47.2	57.0	5.8	42.0
1/2	12.7	3/4	98.00	10.0	72.3	88.0	9.0	64.9
9/16	14.3	13/16	140.0	14.3	103.2	126.0	12.8	92.9
5/8	15.9	15/16	196.0	20.0	144.6	177.0	18.0	130.5
3/4	19.0	1 1/8	343.0	35.0	253.0	309.0	31.5	227.9
7/8	22.2	1 15/16	547.0	55.8	403.4	492.0	50.2	362.9
1	25.4	1 1/2	814.0	83.0	600.4	732.0	74.6	539.9
1 1/8	31.7	1 7/8	1181.0	120.4	871.1	1063.0	108.4	784.0
1 1/4	38.1	2 1/4	1646.0	167.8	1214.0	1481.0	151.0	1092.3

Table 3. Torque Settings - Metric Grade 8.8 Fasteners

Bolt Size		Hexagon (A/F)	Condition 1			Condition 2		
ISO Metric Thread	mm	mm	Nm	kgf m	lbf ft	Nm	kgf m	lbf ft
M5	5	8	5.8	0.6	4.3	5.2	0.5	3.8
M6	6	10	9.9	1.0	7.3	9.0	0.9	6.6
M8	8	13	24.0	2.4	17.7	22.0	2.2	16.2
M10	10	17	47.0	4.8	34.7	43.0	4.4	31.7
M12	12	19	83.0	8.5	61.2	74.0	7.5	54.6
M16	16	24	205.0	20.9	151.2	184.0	18.8	135.7
M20	20	30	400.0	40.8	295.0	360.0	36.7	265.5
M24	24	36	690.0	70.4	508.9	621.0	63.3	458.0
M30	30	46	1372.0	139.9	1011.9	1235.0	125.9	910.9
M36	36	55	2399.0	244.6	1769.4	2159.0	220.0	1592.4

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Changing the Oil and Filter

Note: *Only drain the oil when the engine is warm, as the contaminants held in suspension are drained with the oil.*

⚠ WARNING

Make the machine safe before getting beneath it. Park the machine on level ground and lower the attachments. Stop the engine and remove the starter key. Make sure the park brake is engaged. Disconnect the battery to prevent the engine being started. Block all four wheels before getting under the machine.

3-3-1-1

⚠ CAUTION

Oil will gush from the hole when the drain plug is removed. Hot oil and engine components can burn you. Keep to one side when you remove the plug.

13-3-1-15

1 Make the machine safe. ⇨ ***Make the Machine Safe (3-17)***

2 Raise the loadbay. ***Refer to Operation, Raising and Lowering the Loadbay***.

3 Drain the oil:

- **a** Put a container that can hold a minimum of five litres (1.09 gal) below the engine to catch the oil.
- **b** Remove the dipstick.
- **c** Remove the drain plug **A** and its sealing washer. Let the oil drain out of the engine. ⇨ ***Fig 16. (3-34)***.
- **d** Make sure the sealing washer and its mating surfaces are not damaged.
- **e** Clean, then install the drain plug and the sealing washer.
- **f** Torque the drain plug to 54- 64 Nm (40 - 47 lbf ft).

4 Change the oil filter:

- **a** Unscrew the filter **B**. (Turn anti-clockwise) ⇨ ***Fig 16. (3-34)***.
- **b** Clean the filter head and its sealing face.

Note: *Make sure the old seal is removed from the filter head.*

- **c** Apply oil to the rubber seal on the new filter.
- **d** Screw in the new filter, hand tight only. Then tighten one additional turn using an oil filter wrench.

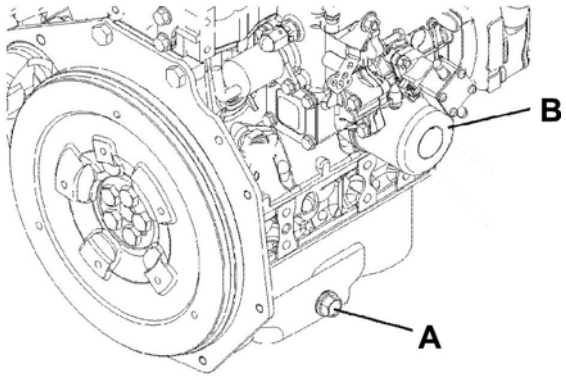
5 Fill the engine with oil:

- **a** Fill the engine to the top mark on the dipstick with new oil. ⇨ ***Checking the Oil Level (3-33)***.
- **b** Clean any spilt oil.
- **c** Replace the dipstick and filler cap.

6 Check for leaks:

- **a** Run the engine for a few minutes to let the oil circulate.
- **b** Stop the engine and check for oil leaks.
- **c** Check the oil level and top-up if necessary.

Note: *Do not overfill with engine oil. Overfilling can result in white smoke, engine overspeed or engine damage.*



C100180

Fig 16.

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Fault Finding

Service Brakes

Note: *The brakes generate a high temperature when operating, this means that the disc will be hot to touch, this condition is normal.*

Fault(s)

⇨ *Table 1. One or more brakes do not apply. (Brake travel not excessive, brakes not pulling to one side) (G-5)*

⇨ *Table 2. Pedal travel excessive (but not touching floor) (G-5)*

⇨ *Table 3. Pedal hard to operate. (G-5)*

⇨ *Table 4. Pedal touches floor under constant pressure - no fluid loss. (G-6)*

⇨ *Table 5. Pedal touches floor under constant pressure and fluid loss. (G-6)*

⇨ *Table 6. Poor braking (not pulling to one side). (G-6)*

⇨ *Table 7. Brakes not releasing (G-6)*

⇨ *Table 8. Poor braking when hot (G-6)*

⇨ *Table 9. Excessive brake noise in operation (G-7)*

⇨ *Table 10. Fluid loss when machine standing for instance - overnight (G-7)*

Table 1. One or more brakes do not apply. (Brake travel not excessive, brakes not pulling to one side)

Possible Cause		Action
1	Master cylinder fault.	Check master cylinder to identify fault area, service as required.
2	Brake disc distortion.	Renew front or rear brake discs in pairs

Table 2. Pedal travel excessive (but not touching floor)

Possible Cause		Action
3	Air in hydraulic system.	Check fluid reservoir level. Check for fluid/air leaks, rectify as required. Bleed the brake system.
4	Leak in hydraulic system.	Check for fluid loss at master cylinder and brake piston, all pipes and fittings for loose connections. Rectify as required. Top up brake reservoir and bleed the brake system.
5	Brake disc distortion.	See Item 2.

Table 3. Pedal hard to operate.

Possible Cause		Action
6	Tightness at pedal pivot.	Inspect pedal pivot. Free-off/lubricate.
7	Fluid contamination/seal damage.	Flush system and renew all hydraulic seals. Bleed the brake system.
8	Misaligned push rod/pedal.	Check and rectify as required.
9	Kinked or crushed brake hoses.	Check/renew brake hoses.

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Technical Data

Specifications

Variable Speed Drive System

System Type	Friction, single V-belt, Continuously-Variable Transmission (CVT).
Driver Clutch (Variator)	Engine crankshaft mounted. Two half pulleys, one fixed, the other moveable via centrifugal rollers.
Driven Clutch	Gearbox input shaft mounted.

Gearbox

Type	Fixed ratio gearbox.
	Two Forward-Neutral-Reverse (Full constant mesh)
Maximum Travel Speed (dependent on size of tyre)	40 kph (25 mph)

Differential

Lock	Rear Hand Selectable	
Reduction Ratios		
	Front	3.1:1
	Rear	3.1:1
Weight		
	Front	10 kg
	Rear	10 kg

Wheels and Tyres

Refer to **Section 3 - Maintenance**

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Pre-start Cold Checks, Service Points and Fluid Levels

	Operation	10	50	100(1)	125	250	500	1000	2000
ENGINE									
Engine Mount - Security	- Check			☐	☐	☐	☐	☐	☐
Engine Oil and Filter(2)	- Change			☐	☐	☐	☐	☐	☐
Engine Oil	- Check	☐	☐	☐	☐	☐	☐	☐	☐
Engine Valve Rocker Arms - Clearance(3)	- Check/ Adjust							☐	☐
Injector Settings(3)	- Check/ Clean							☐	☐
Coolant - Level and Antifreeze Strength	- Check			☐	☐	☐	☐	☐	☐
Coolant(4)	- Change							☐	☐
Air Cleaner and Pre-cleaner	- Clean	☐	☐	☐	☐	☐	☐	☐	☐
Air Cleaner Outer Element(5)	- Check and Change if necessary				☐	☐	☐	☐	☐
Air Cleaner Inner Element	- Check and Change if necessary				☐	☐	☐	☐	☐
Air Cleaner Dust Valve	- Clean	☐	☐	☐	☐	☐	☐	☐	☐
Alternator Drive Belt - Tension/Condition	- Check			☐	☐	☐	☐	☐	☐
Alternator Drive Belt(6)	- Change						☐	☐	☐
Fuel Filter	- Change			☐	☐	☐	☐	☐	☐
Cooling System Hoses - Condition/Security	- Check			☐	☐	☐	☐	☐	☐
Air Cleaner and Intake Manifold Hose - Condition/ Security	- Check			☐	☐	☐	☐	☐	☐
Fuel System - Leaks and Contamination	- Check		☐	☐	☐	☐	☐	☐	☐
External Oil Leaks	- Check		☐	☐	☐	☐	☐	☐	☐
Radiator	- Clean		☐	☐	☐	☐	☐	☐	☐
Fuel Pipes	- Change							☐	☐
Engine Timing Belt(7)(3)	- Change								
Accelerator Linkage	- Grease			☐	☐	☐	☐	☐	☐
Injectors	- Clean and Test							☐	☐
Crankcase Breather System	- Check and Clean							☐	☐
ELECTRICS									

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Safety Check List

Safety - Yours and Others

INT-1-3-1_3

All machinery can be hazardous. When a machine is correctly operated and properly maintained, it is a safe machine to work with. But when it is carelessly operated or poorly maintained it can become a danger to you (the operator) and others.

In this manual and on the machine you will find warning messages. Read and understand them. They tell you of potential hazards and how to avoid them. If you do not fully understand the warning messages, ask your employer or JCB distributor to explain them.

But safety is not just a matter of responding to the warnings. All the time you are working on or with the machine you must be thinking what hazards there might be and how to avoid them.

Do not work with the machine until you are sure that you can control it.

Do not start any job until you are sure that you and those around you will be safe.

If you are unsure of anything, about the machine or the job, ask someone who knows. Do not assume anything.

Remember

BE CAREFUL
BE ALERT
BE SAFE

General Safety

T1-043

⚠ WARNING

To operate the machine safely you must know the machine and have the skill to use it. You must abide by all relevant laws, health and safety regulations that apply to the country you are operating in. The Operator Manual instructs you on the machine, its controls and its safe operation; it is not a training manual. If you are a new operator, get yourself trained in the skills of using a machine before trying to work with it. If you don't, you will not do your job well, and you will be a danger to yourself and others.

INT-1-4-1

⚠ WARNING

Care and Alertness

All the time you are working with or on the machine, take care and stay alert. Always be careful. Always be alert for hazards.

INT-1-3-5

⚠ WARNING

Clothing

You can be injured if you do not wear the proper clothing. Loose clothing can get caught in the machinery. Wear protective clothing to suit the job. Examples of protective clothing are: a hard hat, safety shoes, safety glasses, a well fitting overall, ear-protectors and industrial gloves. Keep cuffs fastened. Do not wear a necktie or scarf. Keep long hair restrained. Remove rings, watches and personal jewellery.

INT-1-3-6_2

⚠ WARNING

Alcohol and Drugs

It is extremely dangerous to operate machinery when under the influence of alcohol or drugs. Do not consume alcoholic drinks or take drugs before or while operating the machine or attachments. Be aware of medicines which can cause drowsiness.

INT-1-3-9_2

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Notes:

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Fuel Sensor Unit

Test Procedures

Sensor Unit Display

1 Remove the sensor unit. ⇒ *Removal and Replacement (B-13)*

2 Move the float **A** to the bottom (Reserve) position **C**.

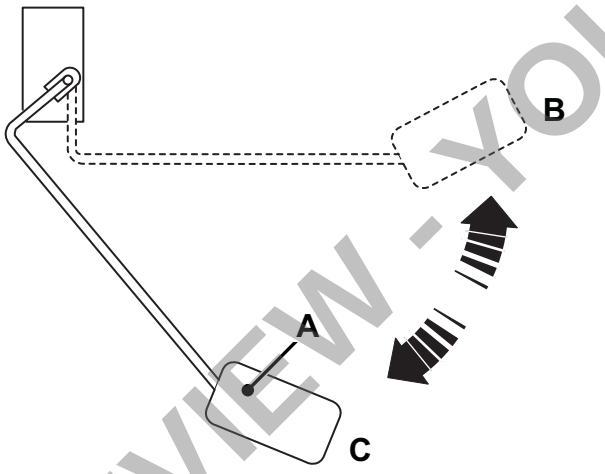
3 Turn the ignition switch to “ON” and check the fuel gauge, the lowest segment should blink as shown at **D**.

4 Move the float **A** to the top (Full) position **B**.

5 Turn the ignition switch to “ON” and check the fuel gauge, all segments up to the top segment should come on as shown at **E**.

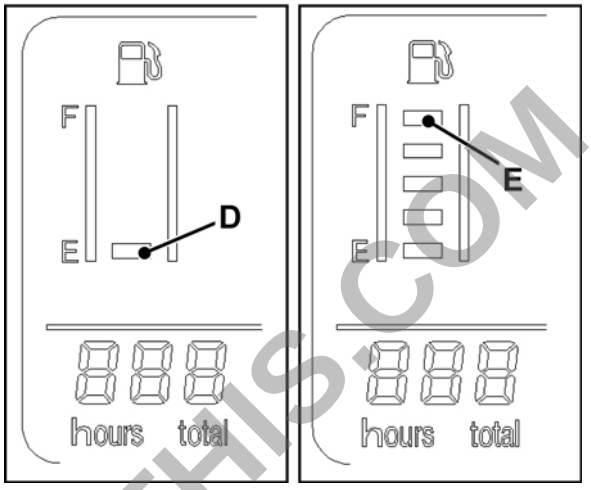
If the fuel gauge does not function properly check the fuel level sensor. ⇒ *Sensor Unit (B-12)*

If the fuel level sensor is ok, replace the LCD meter.



C105100

Fig 2.



C105110

Fig 3.

Sensor Unit

1 Disconnect the fuel level sensor 2p Green connector.

2 Connect the Ohm meter to the sensor side connector terminals.

3 Measure the fuel level sensor resistance with the float **A** at the top **B** (Full) and bottom **C** (Reserve) positions.

Table 1.

Float Position	Resistance (Ohms) at 20ºC/68ºF)
Top **B** (Full)	4-10
Bottom **C** (Reserve)	100-110

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Fault Finding

Gear Position Indicator Switch Test

1 Check the voltage:

a Connect the electrical tester (DC20V) to the relevant electrical pin.

The connections will change depending on which position is being tested.

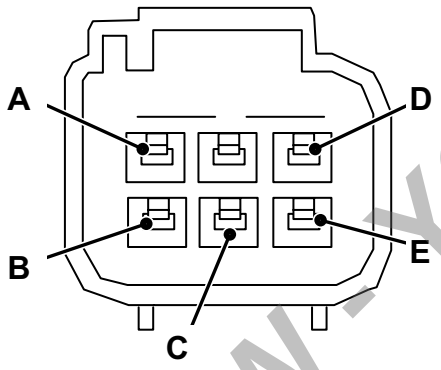
b Turn the main switch to “on”.

c Select the correct gear position on the switch.

d Check for voltage (12V) at the corresponding connector.

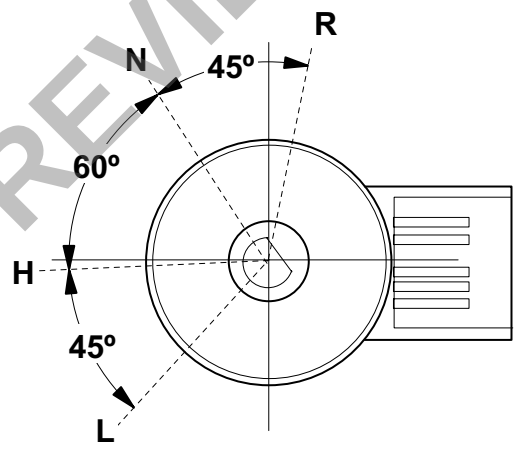
Table 1.

Gear Position	12V at Pin A	12V at Pin B	12V at Pin C	12V at Pin D	12V at Pin E
High (H)	●				●
Low (L)		●			●
Neutral (N)			●		●
Reverse (R)				●	●



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Fig 1. Switch connector pins

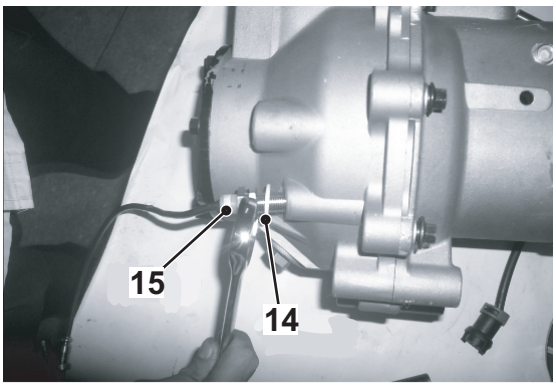


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Fig 2. Switch position

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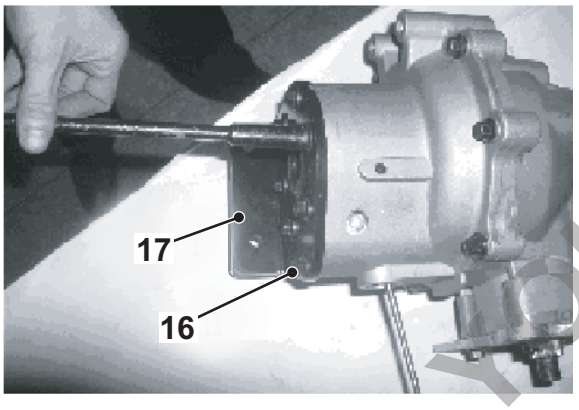
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C108360

Fig 25.

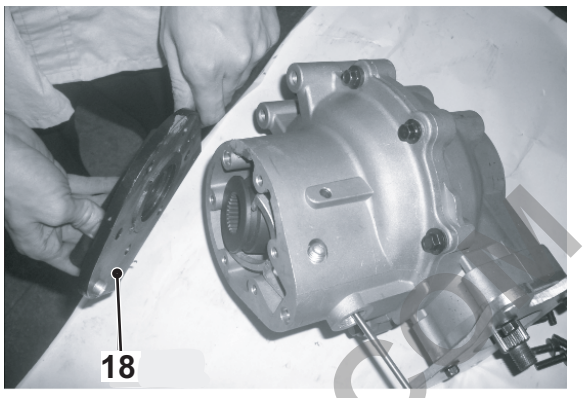
8 Remove the speed sensor **14** and its sealing washer **15** from the casing.



C108370

Fig 26.

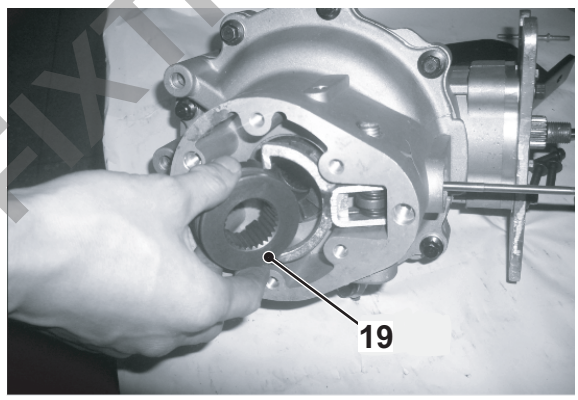
9 Remove seven screws **16** to release stop bracket **17**.



C108380

Fig 27.

10 Remove seven screws to release opposite stop bracket **18**.



C108390

Fig 28.

11 Remove differential lock shift hub **19**.

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System Description

Specifications

Steering type	Rack and pinion

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