Controls

Service Manual - Teletruk

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Notes:

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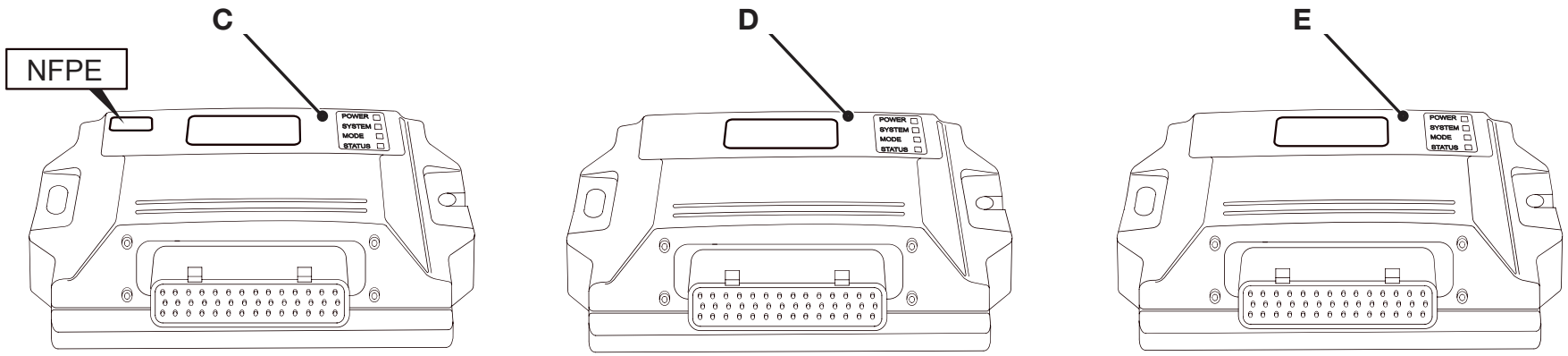
Technical Data

Torque Convertor Response

Susmic Controller

Item	Machine	Part No.	Ident No.	Type	Software Version
C	TCR 2.5 T/3.0 T	728/80088	512243	Susmic S1X-11	1.0
D	Anti-Slip Controller (ASC)	728/80092	515610	Susmic S1X-26	1.0
E	4X4 NFPE Transmission Controller (TCR) with electric unloader control.	728/80089	517804	Susmic s1X-11	1.0
	TCR 3.5 T	728/80090		Susmic S1X-11	
	TCR 3.5 T	728/80091		Susmic S1X-11	



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Introduction

Safe Maintenance Practices

1 Lifting, jacking and blocking procedures are detailed in Section B of this manual.

2 Only trained and authorised personnel shall be permitted to maintain, repair, adjust, and inspect the JCB Teletruk, work should be performed in accordance with this service manual.

3 Properly ventilate the work area, vent exhaust fumes, and keep shop clean and the floor dry.

4 Before starting work on the truck, raise the drive wheels off the floor and use chocks or other positive truck positioning devices.

5 Operation of the truck to check performance must be conducted in an authorised, safe, clear area.

6 Before starting to drive the truck:

- **a** Sit in operating position.
- **b** Ensure parking brake is engaged.
- **c** Put forward/reverse lever in neutral
- **d** Start engine.
- **e** Check functioning of steering and speed controls, brakes. warning devices, and any load handling attachments.

⚠ WARNING

Arc Welding

To prevent the possibility of damage to electronic components, disconnect the battery and the alternator before arc-welding on the machine or attached implements.

If the machine is equipped with sensitive electrical equipment, i.e. amplifier drivers, electronic control units (E.C.U.s), monitor displays, etc., then disconnect them before welding. Failure to disconnect the sensitive electrical equipment could result in irreparable damage to these components.

Parts of the machine are made from cast iron; welds on cast iron can weaken the structure and break. Do not weld cast iron. Do not connect the welder cable or apply any weld to any part of the engine.

Always connect the welder earth (ground) cable to the same component that is being welded, i.e. boom or dipper, to avoid damage to pivot pins, bearings and bushes. Attach the welder earth (ground) cable no more than 0.6 metres (2 feet) from the part being welded.

INT-3-1-15_2

Safe Parking

1 Before working on truck:

- **a** Park truck on a hard, level, and solid surface such as a concrete floor with no gaps or breaks
- **b** Fully lower the forks or attachment.
- **c** Put all controls in neutral. Turn key switch OFF and remove key.
- **d** Apply the parking brake and chock the wheels.
- **e** Ensure there is sufficient overhead clearance for raising the boom.

Introduction

Torque Convertor Response

This is a hydrostatic transmission that mimics a true torque convertor. Two proportional solenoids (electrically operated) control the pump output. The throttle is cable operated to provide operator "feel" and a direct engine response.

A dashboard mounted optional Mode switch gives the operator two responses - work and travel, these are preset and non adjustable.

Depressing the inching/ brake pedal reduces the pump displacement to slow the vehicle speed, there are no service requirement for the brake components other than calibration.

The system has a basic fault diagnosis ability. In the event of a transmission breakdown the red "error light" on the Susmic controller flashes in a sequence of four long and short flashes identifying the failure. A Laptop computer and connection lead will be required for brake sensor calibration.

Some of the benefits of the system are:-

1 Torque convertor response with hydrostatic efficiency.

2 Simple error identification.

3 Mechanical throttle linkage for improved throttle response.

4 Simple sensor replacement procedures.

5 Optional Mode switch to allow operator adjustment of drive response "in cab".

3.0D 4 x 4 Anti-Slip Control System

Note: *The machine is also available in 4x4, incorporating a wheel anti-spin control system.*

The 4x4 Anti-slip Control (ASC) system is based upon the normal 2WD hydraulics, with the addition of an extra pair of wheel motors and a susmic controller, located under the cab floor. The controller, coupled with speed sensors in each wheel motor and a steering potentiometer located on the top of the rear, left hand steering trunnion controls wheel speeds through four anti-slip valves mounted between the forward motors.

Detection of Slipping. ⇒ ***Fig 2. (D-6)***.

1 Wheel 4 starts to spin.

2 Wheel 4 exceeds upper tolerance band.

Note: *The reference speed is based upon the slowest wheel (wheel 1)*

3 Flow to the motor of wheel 4 is reduced proportionally to the percentage of slippage.

4 The speed of wheel 4 is controlled to the upper tolerance speed.

5 Full traction, within the given tolerance band is achieved.

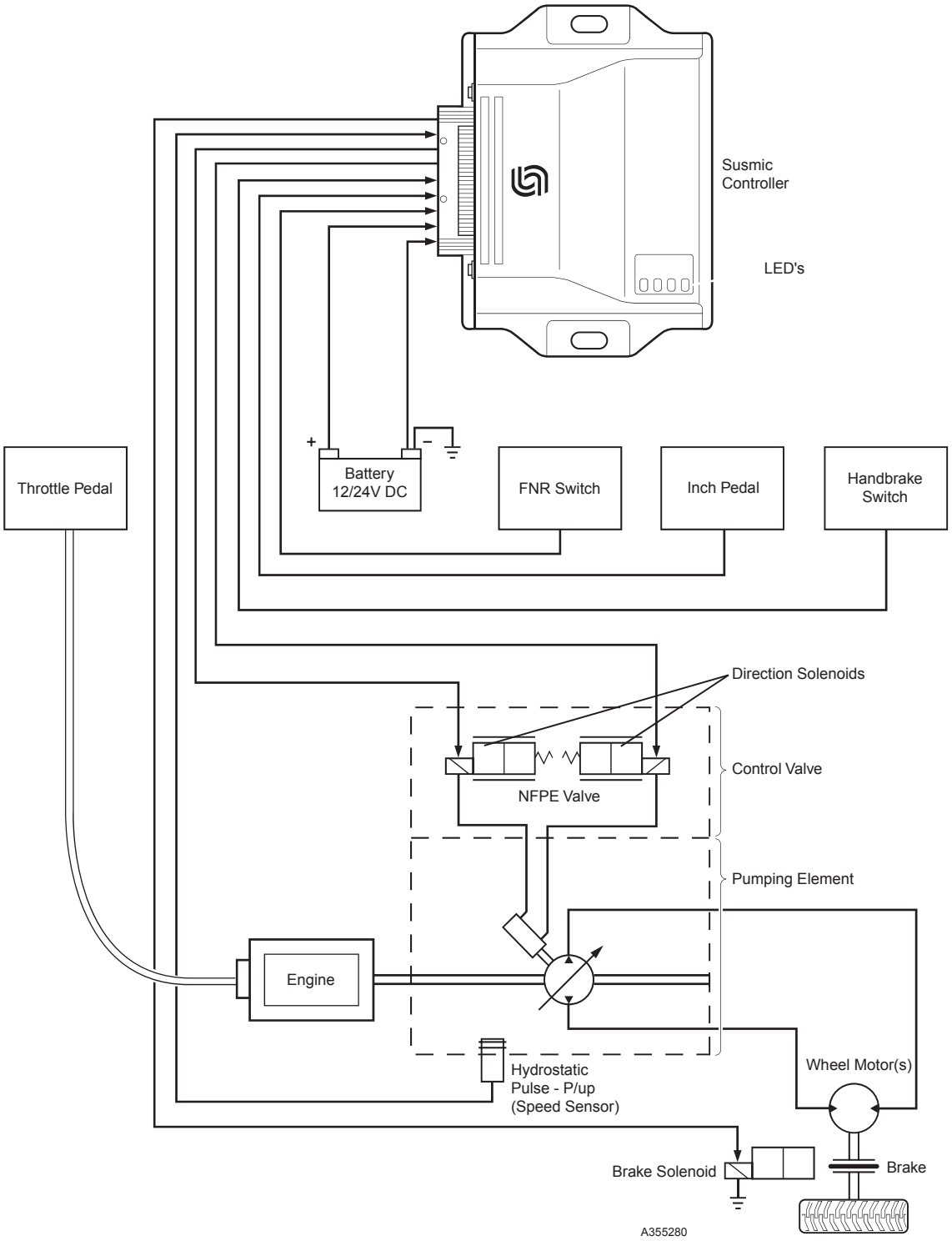
Susmic
Controller
LED's
+
−
Battery
12/24V DC
Throttle Pedal
FNR Switch
Inch Pedal
Handbrake
Switch
Direction Solenoids
Control Valve
NFPE Valve
Pumping Element
Engine
Hydrostatic
Pulse - P/up
(Speed Sensor)
Wheel Motor(s)
Brake Solenoid
Brake
A355280

Fig 1.

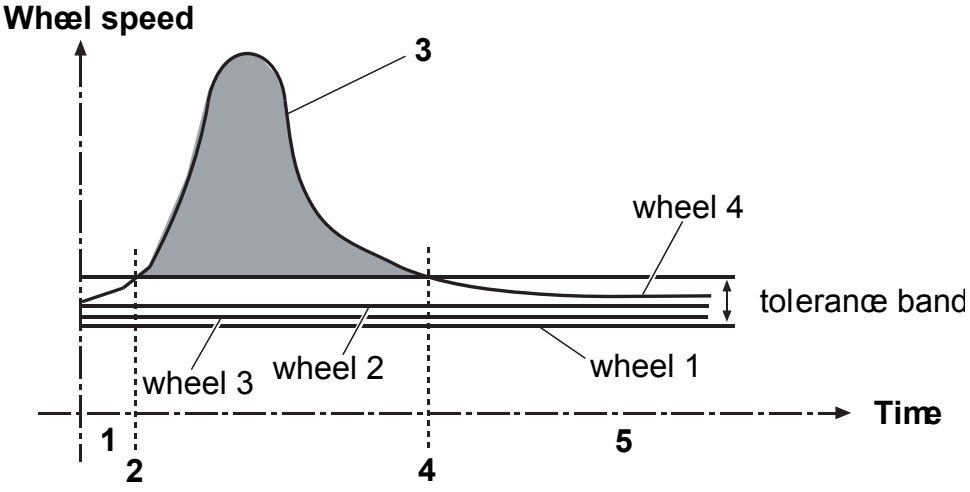
Wheel speed
3
wheel 4
tolerance band
wheel 3
wheel 2
wheel 1
Time
1
2
4
5

Fig 2.

Susmic Controller

Removal and Repacement

Removal

⇨ *Fig 1. (D-7)*.

1 Remove screws **1-A** and lift cover **1-B** clear.

2 Disconnect ITT plug.

3 Remove both screws **1-C** and lift controller **1-D** clear.

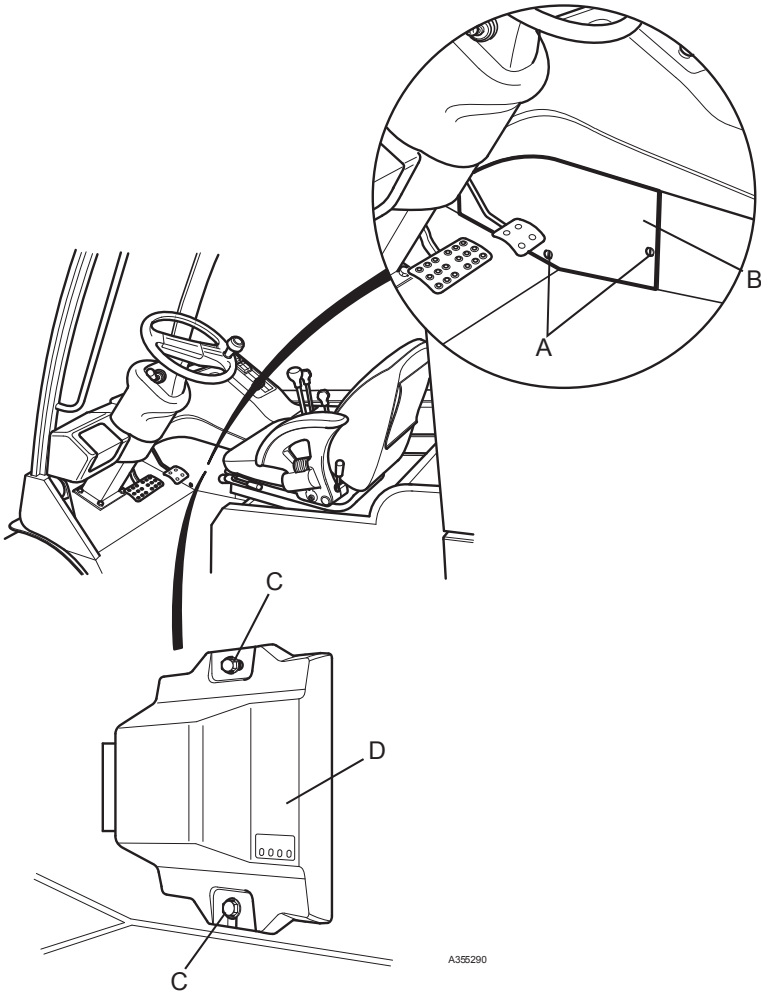

Fig 1.

Replacement

Replacement is a reversal of the removal procedure.

Diagnostic LED's

The controller incorporates four LED's which indicate the condition of the transmission control system. The LED's and their function are as follows:

POWER (Green) Monitors the external voltage (after the starter switch) when the engine is running. If the voltage is correct this LED will be permanently lit.

SYSTEM (Green) Monitors the controllers internal 5V DC supply. If the voltage is within limits this LED will be permanently lit.

MODE (Yellow) Software check. Normally flashes continuously at a rate of approximately one flash per second.

Status (Red) System error indicator This LED is normally not lit. If the controller detects a fault in the system the LED will flash. It will flash in a pattern determined by the nature of the fault. The pattern is based on a repeating sequence of four flashes, which are either long (_) or short (.)(rather like Morse Code). The actual pattern of flashes indicates the nature of the fault. (See following page.)

The LED error signals and their causes are described overleaf. Note that two or more LED's may be indicating errors at the same time.

3.0D 4 x 4

The additional controller used for the 4x4 machines is mounted under the cab floor, with a remote LED located in the cab providing fault indication. The remote LED is **permanently on** and flashes when a fault is detected.

Sensors and Actuators

2.5DG, 3.0DG, 3.5D 2WD and 3.5D 4 x 4

Table 1. Key

Item No.	Component
1	Engine
2	NFPE (Direction Solenoids)
3	Pulse Pick-up (Speed Sensor)
4	Forward/reverse lever (3.5D 4 x 4 2SP Gear selector)
5	Brake Pedal
6	Brake Valve
7	Parkbrake Switch
8	Susmic Controller
9	Mode Switch (2.5D, 3.0D, 3.5D 2WD)
10	Transmission Pump

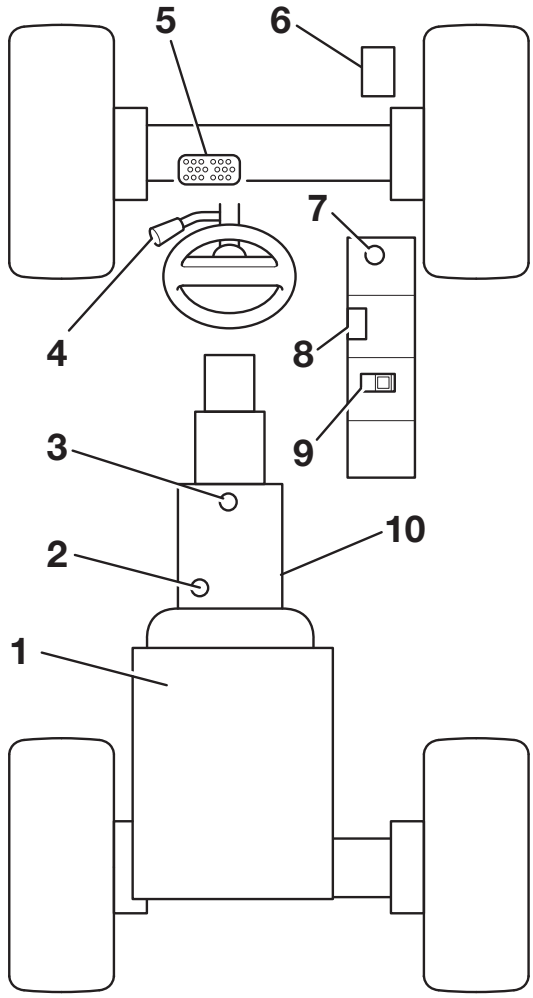

Fig 1.

3.0D 4 Wheel Drive

Table 2. Key

Item No.	Component
1	Steer Sensor
2	Speed Sensors
3	Gear Selector (3SP)
4	4 x 4 Anti-Slip Controller (ASC)
5	4 x 4 Transmission Susmic
6	2 Speed and Brake Valve

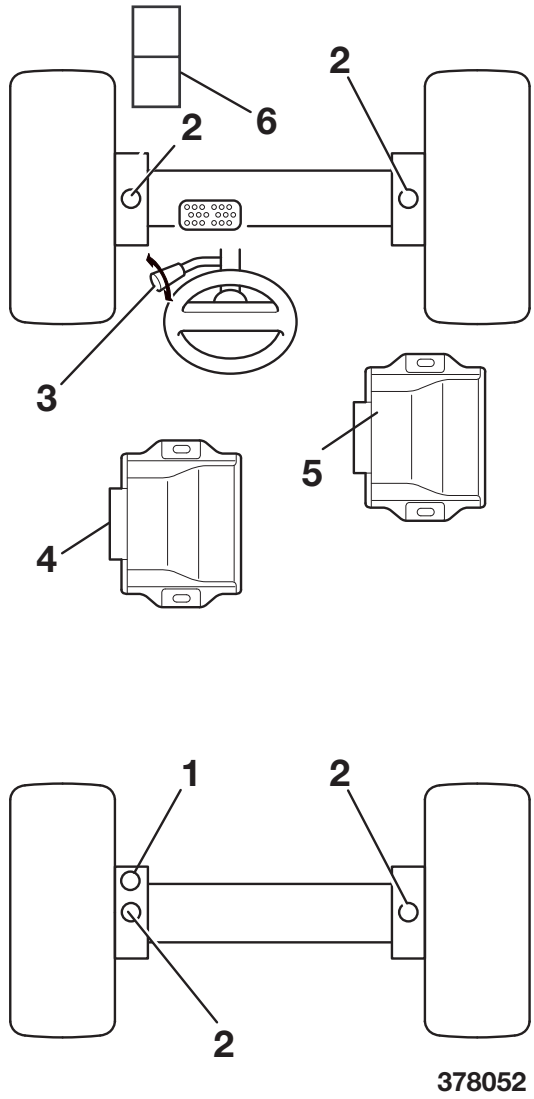

Fig 2.

Error Codes

NFPE Controller Error Codes

POWER Error

If this LED remains unlit, the controller has lost its supply from the ignition switch (engine running).

Remedy - check the ignition switch wiring and connections.

SYSTEM Error

If this LED remains unlit, there is an internal error.

MODE Error

If this LED flashes at a rate of approx. 10 flashes per second, or remains unlit, there is a software fault. The programming may have been lost or there may be a short-circuit in the external wiring.

Remedy - Check external wiring for short circuits.

STATUS Error

Table 1. Key to flash patterns

_ _ _ _	Long Flashes
. . . .	Short Flashes
----------	LED Stays On

The following table lists the various flash patterns of this LED and their related errors.

Flash Pattern	Error	Action
_ . . .	Sensor supply voltage out of range	Check sensor supply voltage (5 Volt) at sensors, sensor wiring and sensors.
----------	Susmic controller internal error	Renew controller (Parts must be returned if under warranty)
_ _ . .	Brake sensor signal incorrect	Check sensor, sensor wiring and connections. Check sensor supply voltage (5 Volt) at sensor. Check brake sensor set-up procedure.
. . _ .	Speed sensor signal not picked up(1)	Check sensor, sensor wiring and connections. Check sensor supply voltage (5 Volt) at sensor. Check speed sensor set-up procedure.
_ . _ .	Control current error	Check pump control valve solenoid wiring and solenoid control circuits for open or short circuit.
. _ _ .	Forward/Reverse switch short circuit	Check Forward/Reverse switch and wiring.
_ _ _ .	Speed sensor signal interrupted	Check sensor, sensor wiring and connections. Check sensor supply voltage (5 Volt) at sensor. Check speed sensor set-up procedure.
. . . _	Unloader control	Check sensor supply (pins 9 and 22), short circuit (+) - min. volume flow, short circuit (-) - max volume flow, open circuit - max volume flow.
. _ . _	Internal error (Kernel) software	Download latest software or replace controller.

(1) The speed sensor error will flash when the engine is not running and the ignition is switched on.

3.0D 4 x 4 STATUS Error (ASC Controller)

The following table lists the various flash patterns of the 4 wheel drive LED and their related errors. All Errors are displayed instantaneously, except for those related to speed sensors. These are shown after 30 second of driving.

Note: *Note: The error code is continuously repeated, if there is more than one error the first error is displayed then there is a pause before the next error is displayed i.e.: . _ . . pause _ . _ _. Check the complete sequence before beginning rectification.*

Flash Pattern	Error	Action	Pin
. _ . .	Front left anti-slip voltage out of range.	Check sensor supply voltage, short circuit (+) - min. volume flow, short circuit (-) - max volume flow, open circuit - max volume flow.	6 & 8
_ _ . .	Front right anti-slip voltage out of range.	Check sensor supply voltage, short circuit (+) - min. volume flow, short circuit (-) - max volume flow, open circuit - max volume flow.	7 & 9
. . _ .	Rear left anti-slip voltage out of range	Check sensor supply voltage, short circuit (+) - min. volume flow, short circuit (-) - max volume flow, open circuit - max volume flow.	23 & 26
_ . _ .	Rear right anti-slip voltage out of range	Check sensor supply voltage, short circuit (+) - min. volume flow, short circuit (-) - max volume flow, open circuit - max volume flow.	25 & 27
. _ _ .	Front left speed sensor voltage out of range.	Check sensor supply (1), check signal wire (Green Wire)	1, 14 & 16
_ _ _ .	Front right speed sensor voltage out of range.	Check sensor supply (1), check signal wire (Green Wire)	1, 14 & 17
. . . _	Rear left speed sensor voltage out of range.	Check sensor supply (1), check signal wire (Green Wire)	1, 14 & 18
_ . . _	Rear right speed sensor voltage out of range.	Check sensor supply (1), check signal wire (Green Wire)	1, 14 & 19
_ . _ _	Rear steer angle sensor voltage out of range	Check sensor supply (1), check signal wire (Wire 518)	1, 14 & 32
. _ . _	High current demand	Check speed and steer sensor supply voltage (5 V), short circuit (+) - min. volume flow, short circuit (-) - max volume flow.	1, 14, 15 & 29
. . . .	Supply voltage	Check 12 V supply to susmic	15, 28, & 42

(1) Machine cannot reach full speed. Machine reacts as if brakes are applied.

Throttle Cable Control

Diesel Engine

⚠ WARNING

Make the machine safe before working underneath it. Park the machine on level ground, lower the attachments to the ground. Apply the park brake, put the transmission in neutral and stop the engine. Block both sides of all four wheels.

Disconnect the battery, to prevent the engine being started while you are beneath the machine.

GEN-4-1_1

Removal

1 Retract boom and lower to its lowest position.

2 Make the machine safe by stopping the engine, removing the key, and chocking the wheels.

3 Open daily inspection cover and tip cab.(See ***Section B***).

4 Remove Battery.

At Pedal End

5 Release spring clip and remove clevis **1-3**.

6 Release "E" clip and remove cable from bracket **1-2**.

At Injection Pump End

7 Slacken nut **1-6** and release overload spring **1-5**.

8 Slacken hub nuts **1-4** and remove cable from bracket.

9 Note cable route, release cable ties and remove cable.

Replacement

At Pedal End

(No adjustment is made at this end.)

1 Thread cable through "P" clip **1-1**.

2 Remove seal from end of cable.

3 Slide cable onto bracket **1-2** and secure with "E" clip.

4 Refit seal.

5 Fasten clevis to pedal with spring clip.

6 Route cable across front of bellhousing and secure to electrical harness with cable ties. Follow route noted during removal, ensuring cable is not trapped/kinked when lowering cab.

At Injection Pump End

7 With hub adjuster nuts **1-4** approx. central on thread (position of mid adjustment), slide cable into bracket slot.

8 Screw overload spring **1-5** onto cable end until loop is in line with hole in throttle lever.

9 Loop overload spring **1-5** into hole and secure by tightening nut **1-6**.

10 Replace and reconnect the battery.

11 Start engine and adjust hub nuts so that engine returns to idle after revving.

12 Tighten hub nuts to lock cable in position.

13 Close daily inspection cover and tip cab. (See ***Section B***).

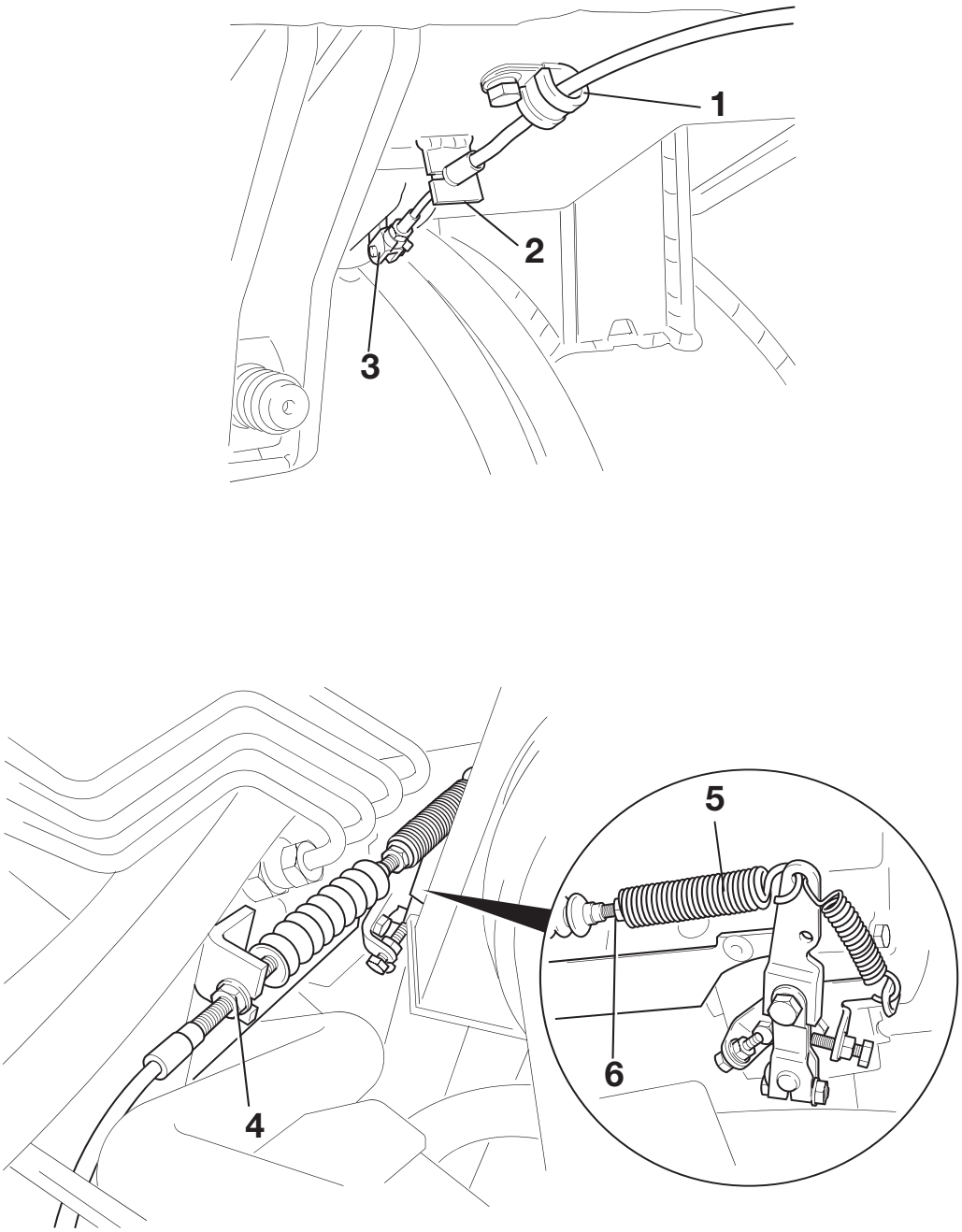

Fig 1.

LPG Engine

⚠ WARNING

Make the machine safe before working underneath it. Park the machine on level ground, lower the attachments to the ground. Apply the park brake, put the transmission in neutral and stop the engine. Block both sides of all four wheels.

Disconnect the battery, to prevent the engine being started while you are beneath the machine.

GEN-4-1_1

Removal

1 Retract boom and lower to its lowest position.

2 Make the machine safe by stopping the engine, removing the key, and chocking the wheels.

3 Open daily inspection cover and tip cab. (See ***Section B***).

4 Remove battery.

At Pedal End

5 Release spring clip and remove clevis **2-3**.

6 Release "E" clip and remove cable from bracket **2-2**.

At Carburettor End

7 Slacken nut **3-6** and release overload spring **3-5**.

8 Slacken hub nuts **3-4** and remove cable from bracket.

9 Note cable route, release cable ties and remove cable.

Replacement

At Pedal End

(N0 adjustment is made at this end.)

1 Thread cable through "P" clip **2-1**.

2 Remove seal from end of cable.

3 Slide cable onto bracket **2-2** and secure with "E" clip.

4 Refit seal.

5 Fasten clevis to pedal with spring clip.

6 Route cable across front of bellhousing and secure to electrical harness with cable ties. Follow route noted during removal, ensuring cable is not trapped/kinked when lowering cab.

At Carburettor End

7 With hub adjuster nuts **3-4** approx. central on thread (position of mid adjustment), slide cable into bracket slot.

8 Screw overload spring **3-5** onto cable end until loop is in line with hole in throttle lever.

9 Loop overload spring **3-5** into hole and secure by tightening nut **3-6**.

10 Refit and reconnect the battery.

11 Start engine and adjust hub nuts **3-4** so that engine returns to idle after revving.

12 Tighten hub nuts to lock cable in position.

13 Close daily inspection cover and tip cab. (See ***Section B***).

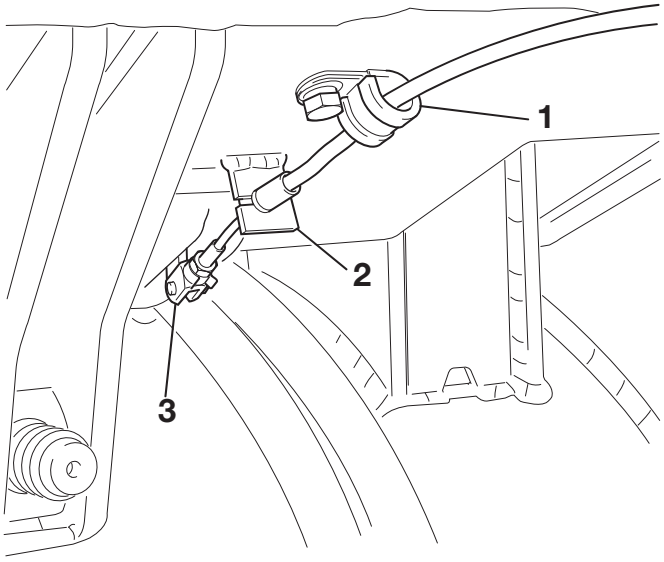

Fig 2.

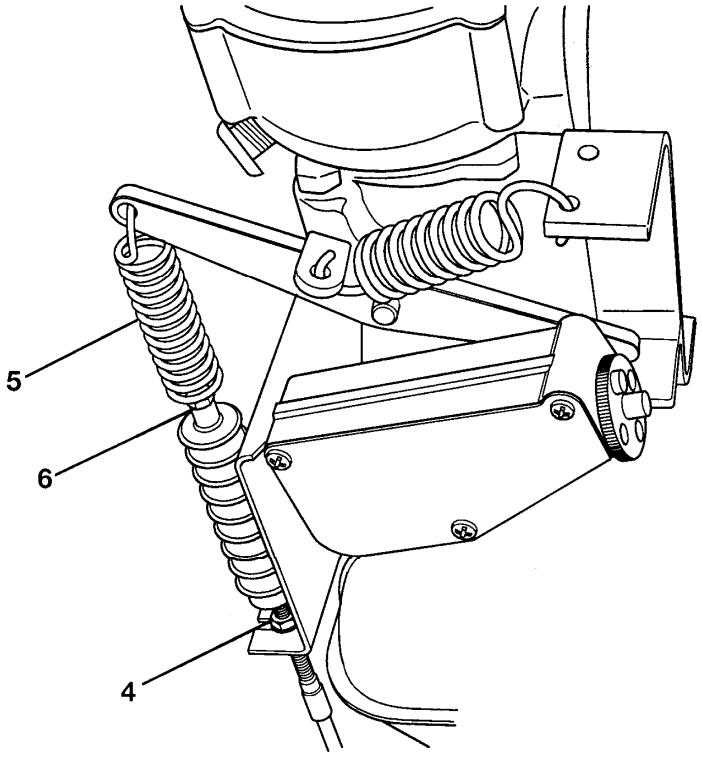

Fig 3.

Brake Pedal Sensor

Removal and Replacement

Removal

⚠ WARNING

Make the machine safe before working underneath it. Park the machine on level ground, lower the attachments to the ground. Apply the park brake, put the transmission in neutral and stop the engine. Block both sides of all four wheels.

Disconnect the battery, to prevent the engine being started while you are beneath the machine.

GEN-4-1_1

1 Extend the boom to 1.5 M (59 in).

2 Make the machine safe by stopping the engine, removing the key, and chocking the wheels.

3 Disconnect the electrical connector. Its type depends on the machine:

- **a** Shown at **1-E** for machines up to serial number M1175624.
- **b** Shown at **1-F** for machines from serial number M1175625

4 Remove the clevis from the accelerator cable to the pedal arm.

5 Remove the front trim panel.

6 Remove the two 10mm bolts which attach the pedal box to the cab.

7 Remove the pedal box from the inside of the cab. Make sure to retain the brake pedal return spring.

8 Remove two bolts **1-B** and lift sensor **1-C** clear.

Replacement

Replacement is the opposite of the removal procedure.

During the replacement procedure do this work also:

Fit the brake pedal spring as the last step.

Using Servicemaster Diagnostics calibrate the brake pedal sensor.

If a fault code is indicated (**_ _ . .**) (see ***Section D - Error Codes***) adjust the potentiometer.

Adjusting the Potentiometer

1 Park the machine on firm level ground, apply the park brake. Lower the boom, switch OFF the engine.

Note: *Do not disconnect the electrical connector **1-E / 1-F**.*

2 Using Servicemaster Diagnostics calibrate the potentiometer. The correct figures are shown below.

Maximum Position	At Rest
660	115

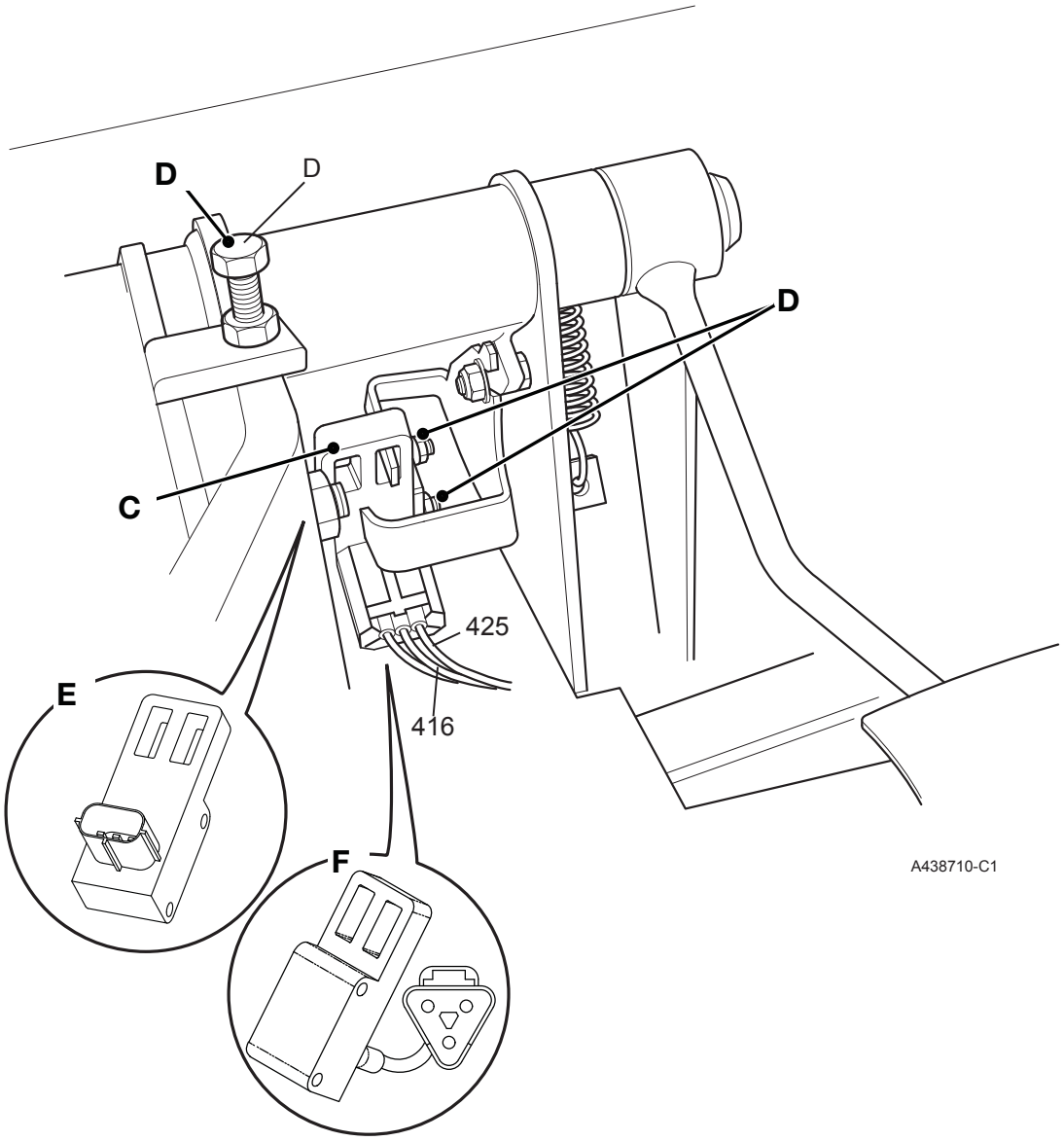

Fig 1.

Control Valve

Early Type

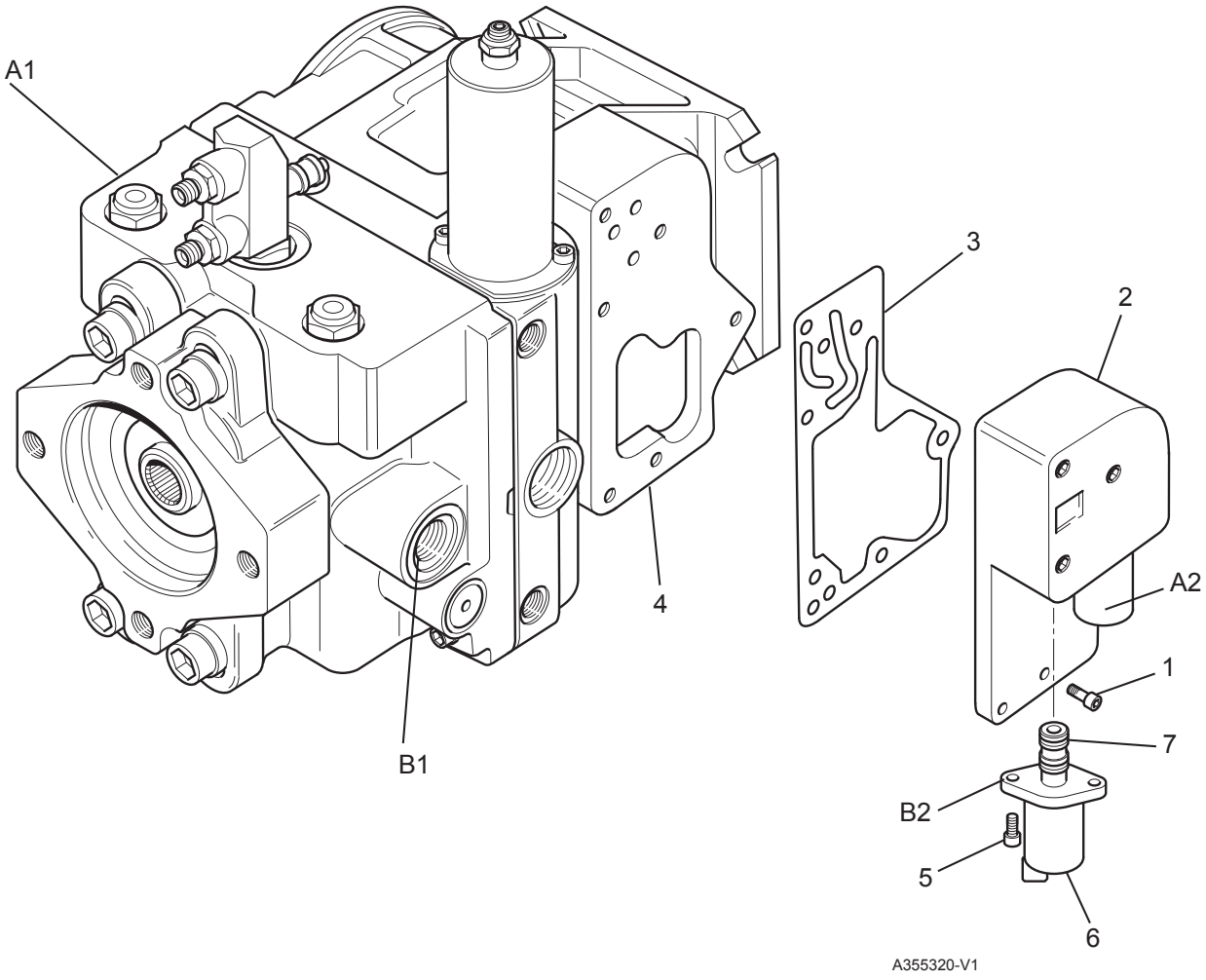

Fig 2.

Table 1. Port Identification

B1	Forward high pressure outlet
A1	Reverse high pressure outlet
B2	Proportional direction control solenoid
A2	Proportional direction control solenoid

Table 2. Current Measured at Solenoid A1 and B1

Drive Position	**Current (mA)**
Neutral	0
Idle forwards/reverse	400
Flight (forwards/reverse)	1100

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Parts of the machine are made from cast iron; welds on cast iron can weaken the structure and break. Do not weld cast iron. Do not connect the welder cable or apply any weld to any part of the engine.

Always connect the welder earth (ground) cable to the same component that is being welded, i.e. boom or dipper, to avoid damage to pivot pins, bearings and bushes. Attach the welder earth (ground) cable no more than 0.6 metres (2 feet) from the part being welded.

INT-3-1-15_2

Removal

⚠ WARNING

Make the machine safe before working underneath it. Park the machine on level ground, lower the attachments to the ground. Apply the park brake, put the transmission in neutral and stop the engine. Block both sides of all four wheels.

Disconnect the battery, to prevent the engine being started while you are beneath the machine.

GEN-4-1_1

1 Retract boom and lower to its lowest position.

2 Make the machine safe by stopping the engine, removing the key and chocking the wheels.

3 Jack the machine, open daily inspection cover, remove the front cover and tilt the cab. (see ***Section B***).

4 Ensure that all hydraulic pressure is released from the system.

⚠ WARNING

It is not possible to vent all residual pressure. Loosen the connection one full turn and allow the pressure to dissipate. Keep face and hands well clear of pressurised hydraulic oil and wear protective glasses.

HYD-4-3

5 Mark solenoid valve connectors (to ensure correct replacement), unplug and tie back cable.

6 Remove caphead screws **2-1** (6 off), carefully lift off the control valve **2-2**.

7 Remove gasket **2-3** and discard.

8 Check condition of gauze filters inside the pump body **2-4**.

Note: *These gauze filters cannot be removed without destroying the gauze. Do not remove unless absolutely necessary and spares are available.*

9 Remove caphead screws **2-5** (2 per solenoid) and remove solenoids **2-6**.

10 Make sure to retain ‘0’ rings **2-7**.

Note: *Protect exposed surfaces and cavities from damage and foreign material.*

Replacement

Replacement is a reversal of the removal procedure. Torque tighten bolts 5 to 5.4 Nm (3.9 lbf ft, 0.5 kgf m), bolts 1 to 16 Nm (11 lbf ft, 1.63 kgf m).

Later Type

⚠ WARNING

Arc Welding

To prevent the possibility of damage to electronic components, disconnect the battery and the alternator before arc-welding on the machine or attached implements.

If the machine is equipped with sensitive electrical equipment, i.e. amplifier drivers, electronic control units (E.C.U.s), monitor displays, etc., then disconnect them before welding. Failure to disconnect the sensitive electrical equipment could result in irreparable damage to these components.

Parts of the machine are made from cast iron; welds on cast iron can weaken the structure and break. Do not weld cast iron. Do not connect the welder cable or apply any weld to any part of the engine.

Always connect the welder earth (ground) cable to the same component that is being welded, i.e. boom or dipper, to avoid damage to pivot pins, bearings and bushes. Attach the welder earth (ground) cable no more than 0.6 metres (2 feet) from the part being welded.

INT-3-1-15_2

Removal

⚠ WARNING

Make the machine safe before working underneath it. Park the machine on level ground, lower the attachments to the ground. Apply the park brake, put the transmission in neutral and stop the engine. Block both sides of all four wheels.

Disconnect the battery, to prevent the engine being started while you are beneath the machine.

GEN-4-1_1

1 Retract boom and lower to its lowest position.

2 Make the machine safe by stopping the engine, removing the key and chocking the wheels.

3 Jack the machine, open daily inspection cover, remove the front cover and tilt the cab. (Refer to Section B).

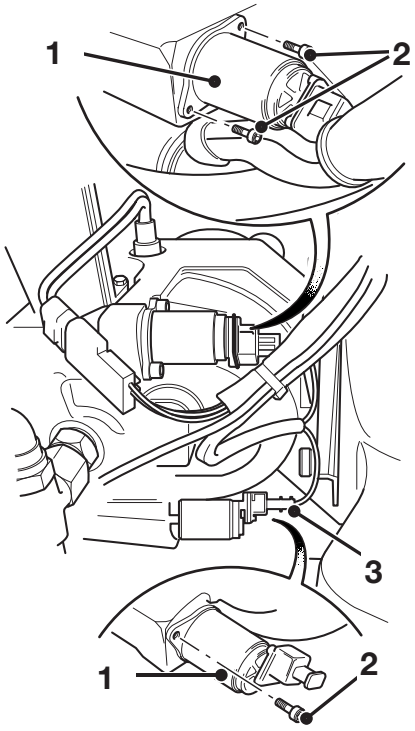

Fig 3. Later Type

4 Ensure that all hydraulic pressure is released from the system.

⚠ WARNING

It is not possible to vent all residual pressure. Loosen the connection one full turn and allow the pressure to dissipate. Keep face and hands well clear of pressurised hydraulic oil and wear protective glasses.

HYD-4-3

5 Mark solenoid valve connectors **3-3** (to ensure correct replacement), unplug and tie back cable.

6 Remove caphead screws **3-2** (2 per solenoid) and remove solenoids **3-1**.

7 Make sure to retain ‘0’ rings.

Note: *Protect exposed surfaces and cavities from damage and foreign material.*

Replacement

Replacement is a reversal of the removal procedure. Torque tighten bolts 5 to 5.4 Nm (3.9 lbf ft, 0.5 kgf m), bolts 1 to 16 Nm (11 lbf ft, 1.63 kgf m).

Parkbrake Switch

Removal and Replacement

Removal

The parkbrake switch **1-A** is located on the main console switch plate **1-B**.

⚠ WARNING

Make the machine safe before working underneath it. Park the machine on level ground, lower the attachments to the ground. Apply the park brake, put the transmission in neutral and stop the engine. Block both sides of all four wheels.

Disconnect the battery, to prevent the engine being started while you are beneath the machine.

GEN-4-1_1

1 Retract boom and lower to its lowest position.

2 Make the machine safe by stopping the engine, removing the key, and chocking the wheels.

3 Remove the bolt **2-C** and the screws **2-D** from the switch plate **2-E**.

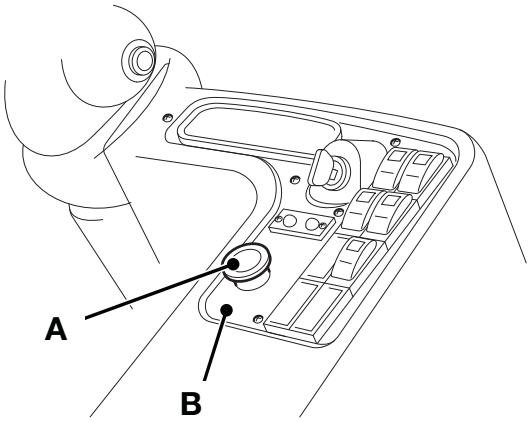

Fig 1.

4 Lift the plate **2-E** and disconnect the electrical connectors **3-A**, **3-B**, **3-C** and **3-D**.

5 Unscrew the locknut back to the switch.

6 Hold knob and switch and pull apart.

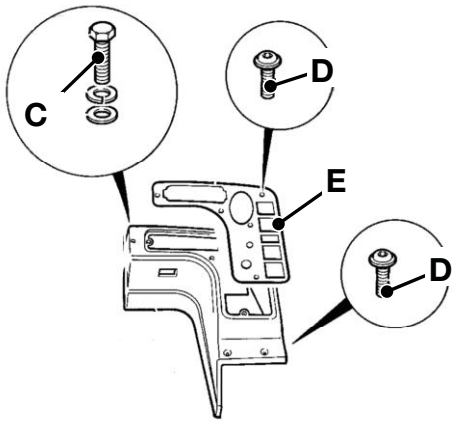

Fig 2.

Replacement

Replacement is the opposite of the removal procedure.

During the replacement procedure do this work also:

Make sure to that the electrical connectors **3-A**, **3-B**, **3-C** and **3-D** are replaced in the correct position.

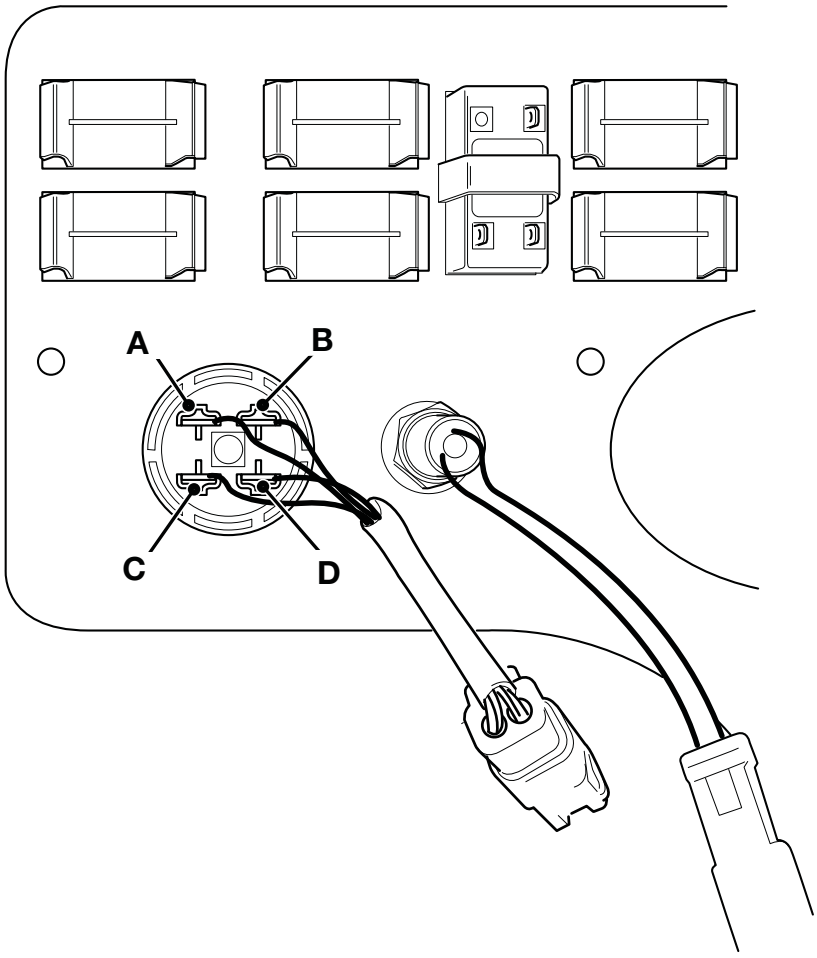

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Fig 3.

⇨ *Fig 3. (D-24)*.	**Wire Number**
A	444
B	418
C	122B
D	401A

Pulse Pick-up (Speed Sensor)

Removal and Replacement

Removal

⚠ WARNING

Make the machine safe before working underneath it. Park the machine on level ground, lower the attachments to the ground. Apply the park brake, put the transmission in neutral and stop the engine. Block both sides of all four wheels.

Disconnect the battery, to prevent the engine being started while you are beneath the machine.

GEN-4-1_1

1 Retract boom and lower to its lowest position.

2 Make the machine safe by stopping the engine, removing the key, and chocking the wheels.

3 Open daily inspection cover, and tilt the cab. (See ***Section B***).

4 Ensure that all hydraulic pressure is released from the system.

5 Disconnect connector **1-A**.

6 Unscrew speed sensor **1-B** and remove.

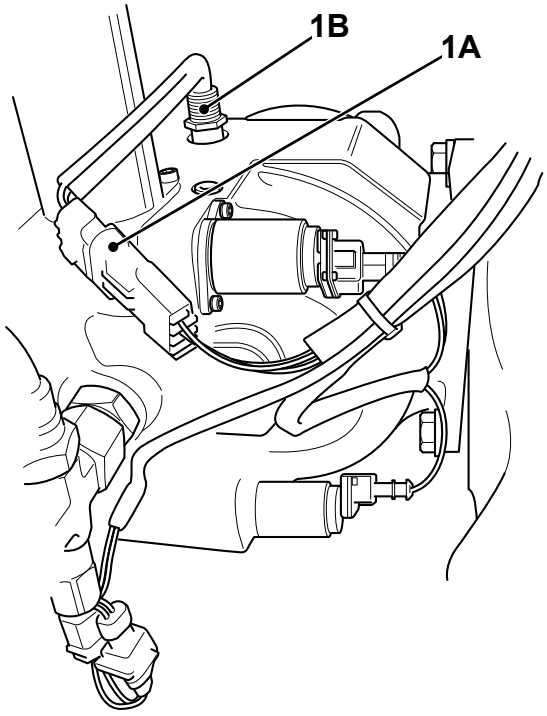

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Fig 1.

Replacement

1 Finger tighten the speed sensor **1-B**.

2 Unscrew speed sensor 1/4 of a turn and tighten the lock nut (ensuring speed sensor does not rotate).

3 Replace connector **1-A** ensuring the location key is correctly aligned.

3.0D 4 x 4 Option

Testing

To assist with fault finding on 4 wheel drive Teletruk machines, use Servicemaster Diagnostics software. A Laptop PC and Connector lead will be required.

1 Park the machine on firm level ground, apply the park brake. Switch OFF the engine and remove the starter key

2 Connect the test harness to the in line electrical connectors. For ease of identification the electrical connections are colour coded:

A Green - left hand rear. Blue - right hand rear

B Red - right hand front. Yellow - left hand front

3 Drive the machine at slow walking pace, the LED should flash. If the LED does not flash fit a new speed sensor.

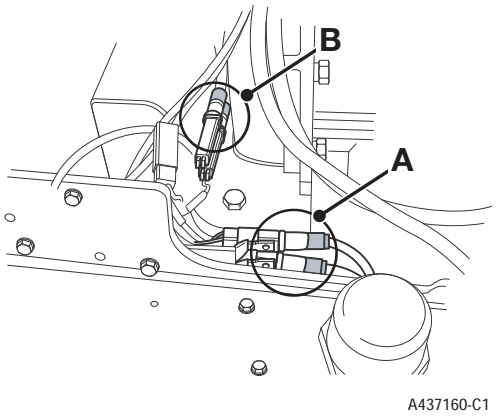

Fig 2.

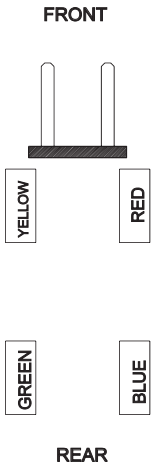

Fig 3.

Removal of Front Speed Sensor

⚠ WARNING

Make the machine safe before working underneath it. Park the machine on level ground, lower the attachments to the ground. Apply the park brake, put the transmission in neutral and stop the engine. Block both sides of all four wheels.

Disconnect the battery, to prevent the engine being started while you are beneath the machine.

GEN-4-1_1

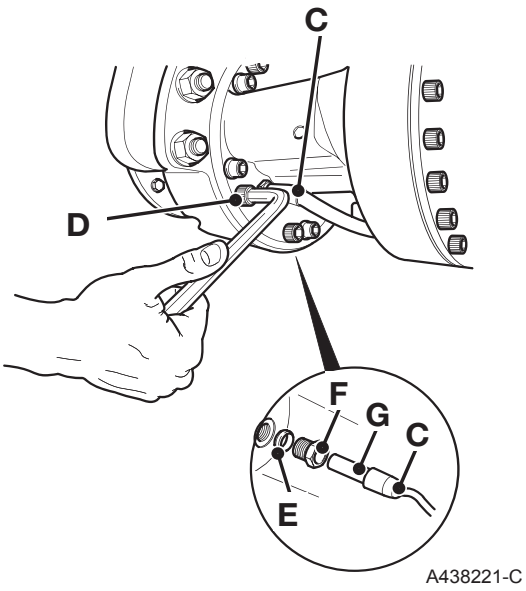

Fig 4.

1 Retract boom and lower to its lowest position.

2 Make the machine safe by stopping the engine, removing the key, and chocking the wheels.

3 Disconnect the speed sensor fly lead.

4 Remove the heat shrink insulation from the speed sensor **4-C**.

5 Remove the wheel motor bolt **4-D**.

6 Remove the speed sensor **4-C** using a 17 mm spanner.

Replacement of Front Speed Sensor

1 Use a new olive **4-E** when fitting the speed sensor.

2 Push the sensor **4-C** into the case until it contacts the target disc.

Note: *There is a wax disc on the end of the sensor of a new sensor which will dissolve in the motor oil and set the correct sensing distance. If fitting the old speed sensor push in until it contacts the target disc then withdraw until just clear of the target disc.*

3 Rotate the sensor until the black spot **4-G** is positioned radially outwards from the centre of the motor.

4 Torque tighten nut **4-F** to 19Nm (14 lbf ft). Ensure that the black dot does not turn when tightening **4-F**.

5 Replace the heat shrink insulation using a heat gun.

6 Apply JCB Threadlock to the wheel motor bolt **4-D** and tighten to 159 Nm (117 lbf ft).

7 Reconnect the sensor fly lead.

8 Colour code the sensor using the correct colour of cable tie.

Removal of Rear Speed Sensor

To assist with the removal and fitting of the rear sensors a flank dive socket is required (see ***Service Tools***).

⚠ WARNING

Make the machine safe before working underneath it. Park the machine on level ground, lower the attachments to the ground. Apply the park brake, put the transmission in neutral and stop the engine. Block both sides of all four wheels.

Disconnect the battery, to prevent the engine being started while you are beneath the machine.

GEN-4-1_1

1 Retract boom and lower to its lowest position.

2 Make the machine safe by stopping the engine, removing the key, and chocking the wheels.

3 Disconnect the speed sensor fly lead **5-A**.

4 Remove the heat shrink insulation from the speed sensor **5-E**.

5 Remove speed sensor using flank drive socket (see Service Tools).

Replacement of Rear Speed Sensor

1 Use a new olive **5-F** when fitting the speed sensor.

2 Push the sensor **5-E** into the case until it contacts the target disc.

Note: *There is a wax disc on the end of the sensor of a new sensor which will dissolve in the motor oil and set the correct sensing distance. If fitting the old speed sensor push in until it contacts the target disc then withdraw until just clear of the target disc.*

3 Rotate the sensor until the black spot **5-G** is positioned radially outwards from the centre of the motor.

4 Torque tighten nut **5-F** to 19Nm (14 lbf ft). Ensure that the black dot does not turn when tightening **5-F**.

5 Replace the heat shrink insulation using a heat gun.

6 Reconnect the sensor fly lead. Ensure electrical harness is not taut, see ***Section C - Electrics***.

7 Colour code the sensor using a blue cable tie.

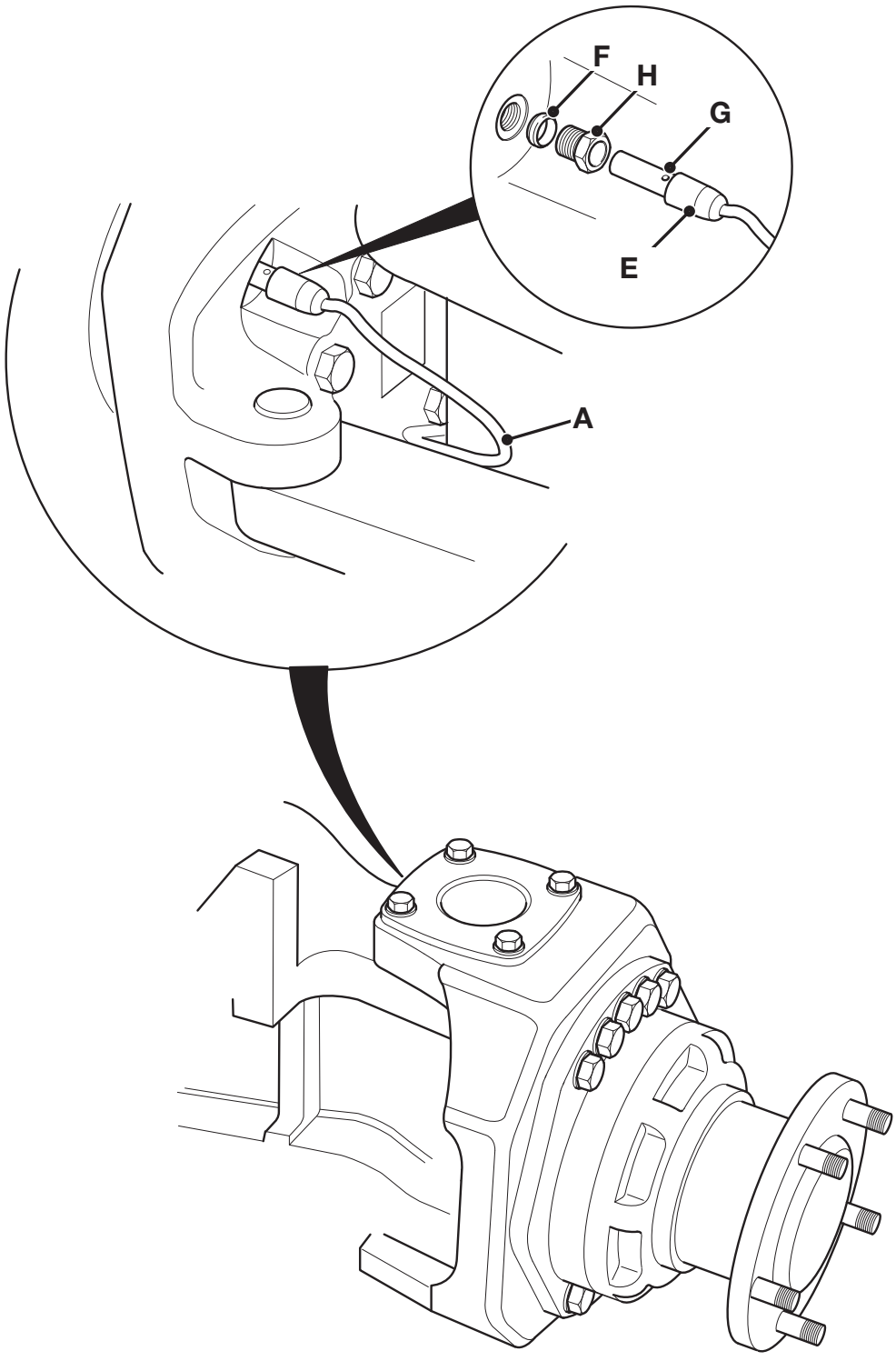

Fig 5.

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