CLAAS

PNEUMATIC ARCHITECTURE CLAAS COMPONENT NUMBER (CCN)

Technical support	CCN
Axion 850-810	00 1136 265 1 – Edition 08.2010

CLAAS

ELECTRONIC ARCHITECTURE
CLAAS COMPONENT NUMBER

Technical support	CCN
Axion 850-810	00 1136 265 1 – Edition 10.2010

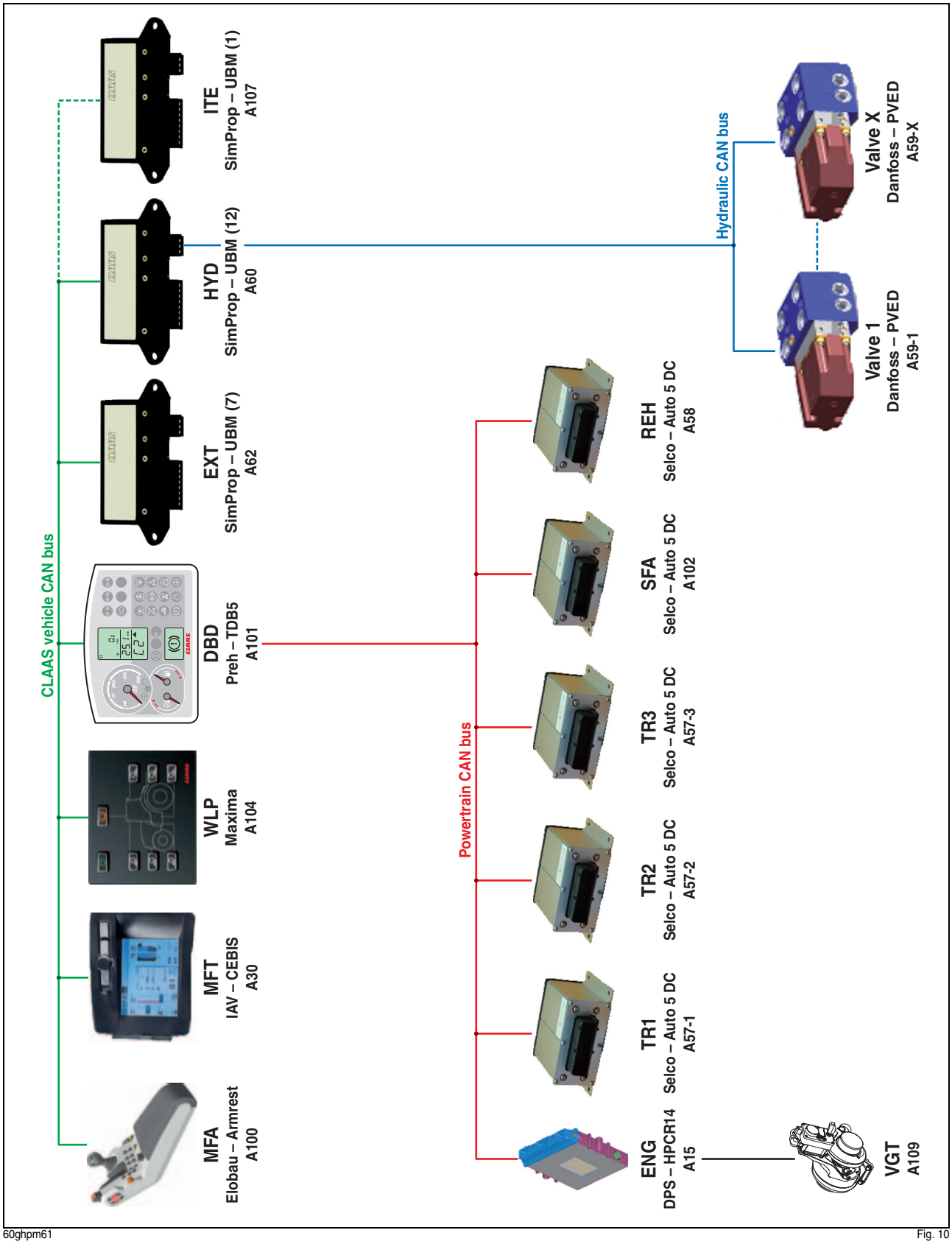
Electronic architecture

Designation

Name	CCN	Main functions supported by the module
AC	A6	Automatic A/C
ENG	A15	Engine speed
MFT	A30	User settings Display of running data Display of active error codes
TR1	A57-1	"Revershift" Robot-driven ranges Slow range Accelerator pedal Theoretical speed Dashboard alarms (diagnostic lamp, buzzer, transmission oil pressure)
TR2	A57-2	"Hexashift" Differential locking 4 wheel drive High pressure braking Engine speed setting Running mode (work/transport mode) Monitoring of transmission oil pressure(s) Transmission oil temperature monitoring Seat safety "CLAAS power management" (boost) Dashboard alarms (transmission oil temperature)
TR3	A57-3	Rear power take-off (speed selection, controls, solenoid valve, lamp) Power take-off automation system linked with the rear lifting position Power take-off brake Proportional PTO Automatic parking brake
REH	A58	Rear lift Timed supply of the "UBM" modules
Valve X	A59-X	Hydraulic distribution
HYD	A60	Solenoid valve external actuators 3rd and 4th functions of the cross commands
EXT	A62	ISO socket "CLAAS sequence management" Sequencing
MFA	A100	Engine speed commands Gearbox controls Auxiliary hydraulic commands Rear lifting commands "CLAAS sequence management" sequencing commands Commands of the "F1", "F2", "F3", "F4" functions
DBD	A101	Display of running data (engine speed and temperature, power take-off speed, transmission statuses, etc) Alarms display (stop warning lamp, pressures)
SFA	A102	Front suspended axle
BDG	A103	Engine speed memories Timed supply of the "HYD" and "EXT" modules
WLP	A104	Can interior and exterior lighting (working lights, dome light, etc.) Visibility (rearview mirror defrosting, etc) Rotating beacons
VGT	A109	Angle of the turbo blades

Electronic architecture (E)

Overall view



60ghpm61

Fig. 10

Engine speed setting [Architectures (A) and (B)]

Description

Component mark	Name	Designation
A	—	Accelerator pedal position signal
A15	ENG	Engine module
A30	MFT	"Cebis" terminal module
A57-1	TR1	Transmission module
A57-2	TR2	
A100	MFA	Multifunction armrest module
A103	BDG	Communication module for CAN networks

CAN messaging

Message mark	Message content
1	Hand accelerator set point Engine speed memory set points Engine speed memory adjustments
2	Engine speed memory adjustments
3	Engine speed set point from the "CLAAS vehicle CAN bus"
4	Accelerator pedal set point
5	Engine speed set point for the "ENG" module

Functional logic

Message 3: Engine speed set point from the "CLAAS vehicle CAN bus". The set point issued by the "BDG" module on the Powertrain is the highest set point of those issued in the "CLAAS vehicle CAN bus".

Note: The values for engine speed memory are stored in the "BDG" module.

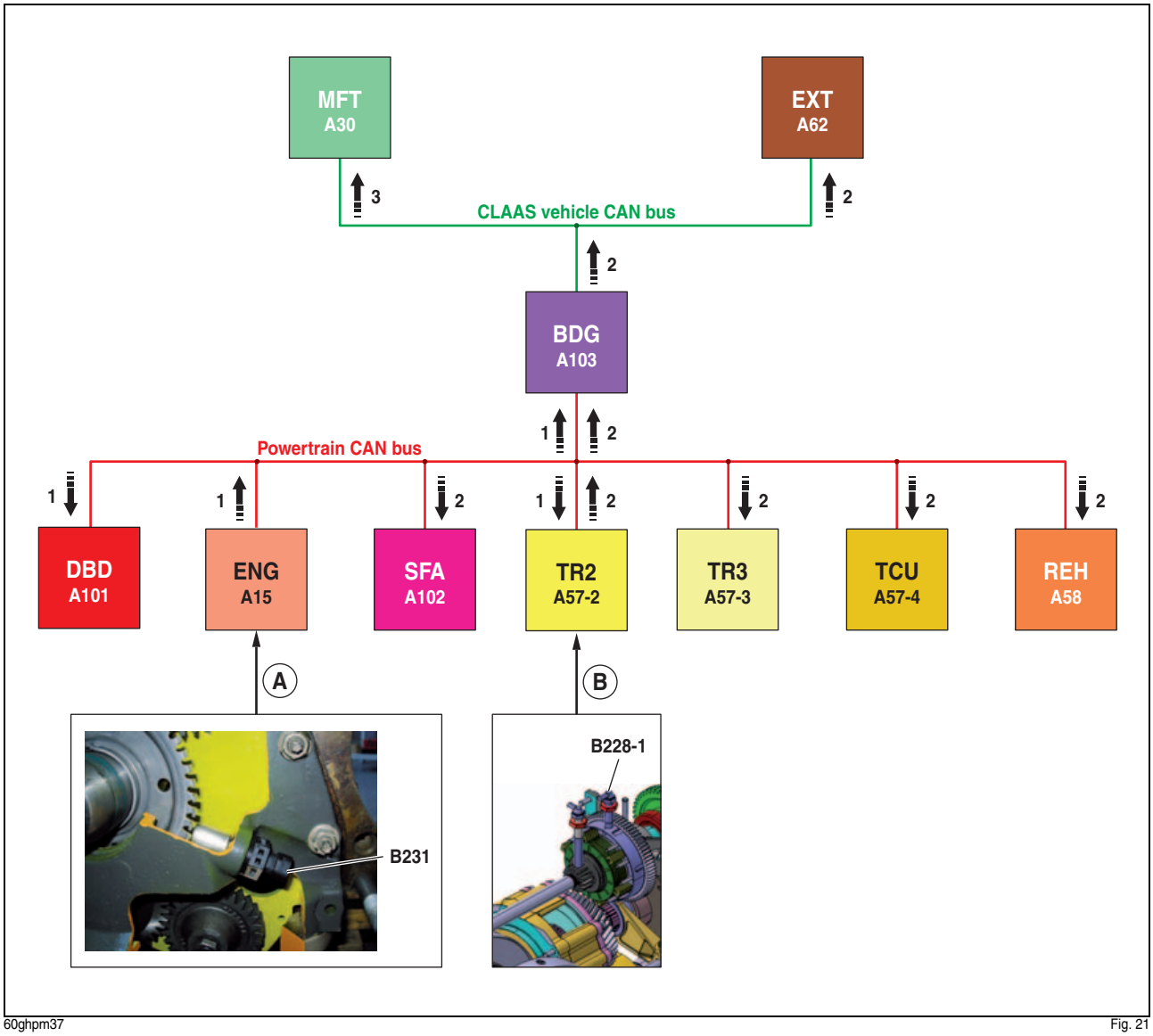
Message 5: Engine speed set point for the "ENG" module. The set point issued on the Powertrain by the TR2 module is the highest set point between the set point issued by the "BDG" module and the set point issued by the TR1 module (accelerator pedal).

Display of engine rpm [ARCHITECTURE (C)]

Description

This function allows transmitting the engine speed.

Schematic diagram



60ghpm37 Fig. 21

Forward speed information [ARCHITECTURE (C)]

Description

This function allows transmitting the forward speed.

Gearbox oil temperature [Architectures (C) and (F)]

Description

This function transmits the gearbox oil temperature.

Schematic diagram

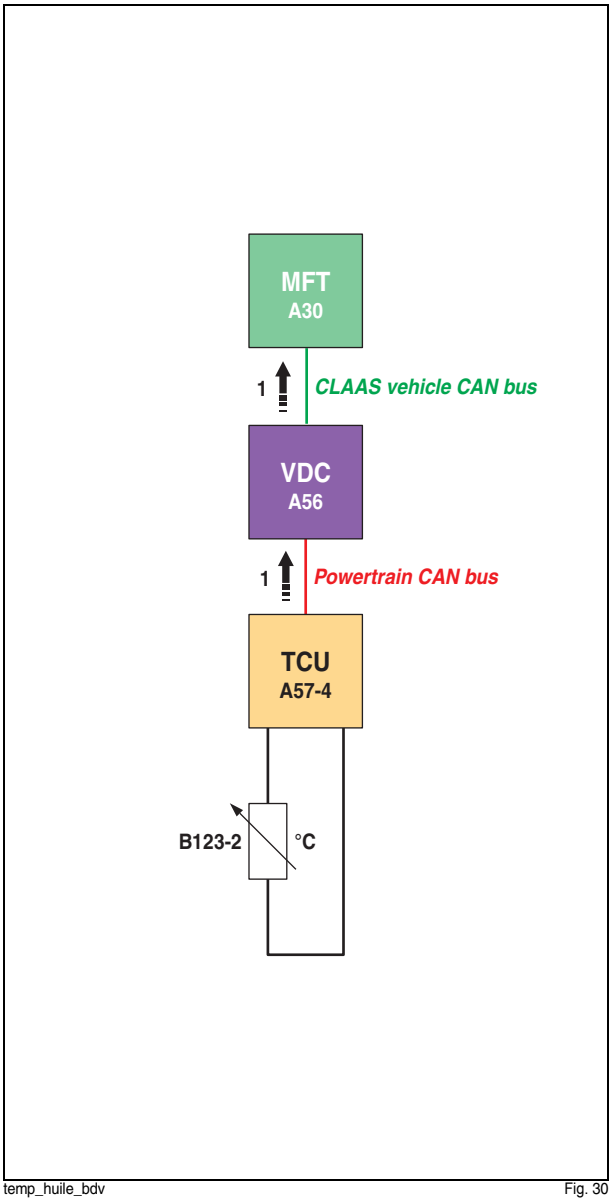
Component mark	Name	Designation
A30	MFT	"Cebis" terminal module
A56	VDC	CAN network communication and gearbox management module
A57-4	TCU	Gearbox module
B123-2	—	Gearbox oil temperature sensor

CAN messaging

Message mark	Message content
1	Gearbox oil temperature information

Functional logic

Message 1: This information is used to display the gearbox oil temperature on the "Cebis" terminal.

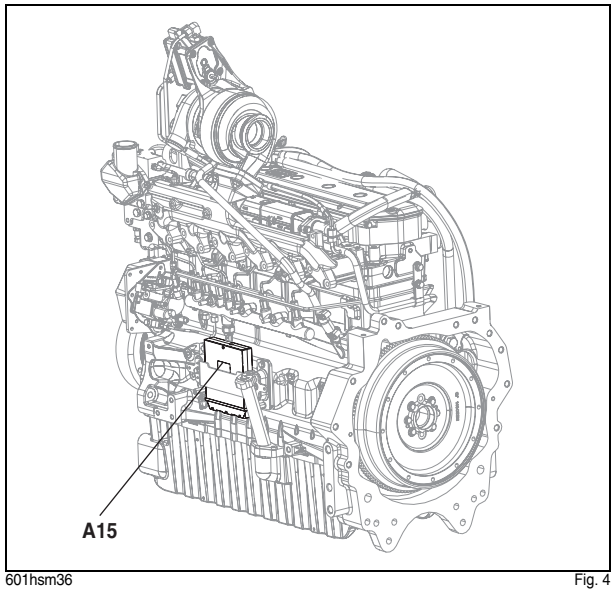


temp_huile_bdv Fig. 30

"ENG A15" engine module

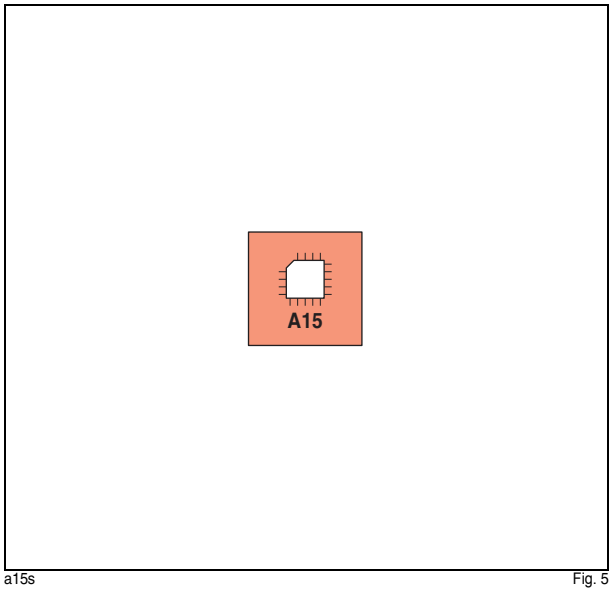
Description

The "ENG A15" engine module is an electronic unit of the "HPCR 14" type. It has 3 connectors, with respectively 9 terminals, 32 terminals, and 48 terminals.



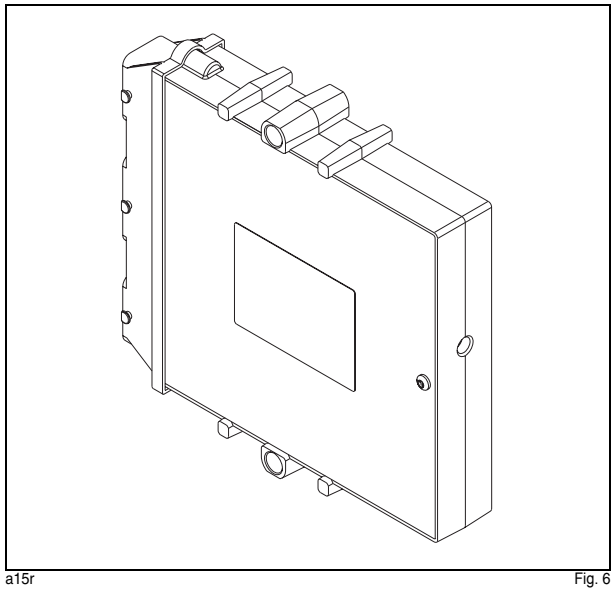
601hsm36 Fig. 4

Schematic diagram



a15s Fig. 5

Representation



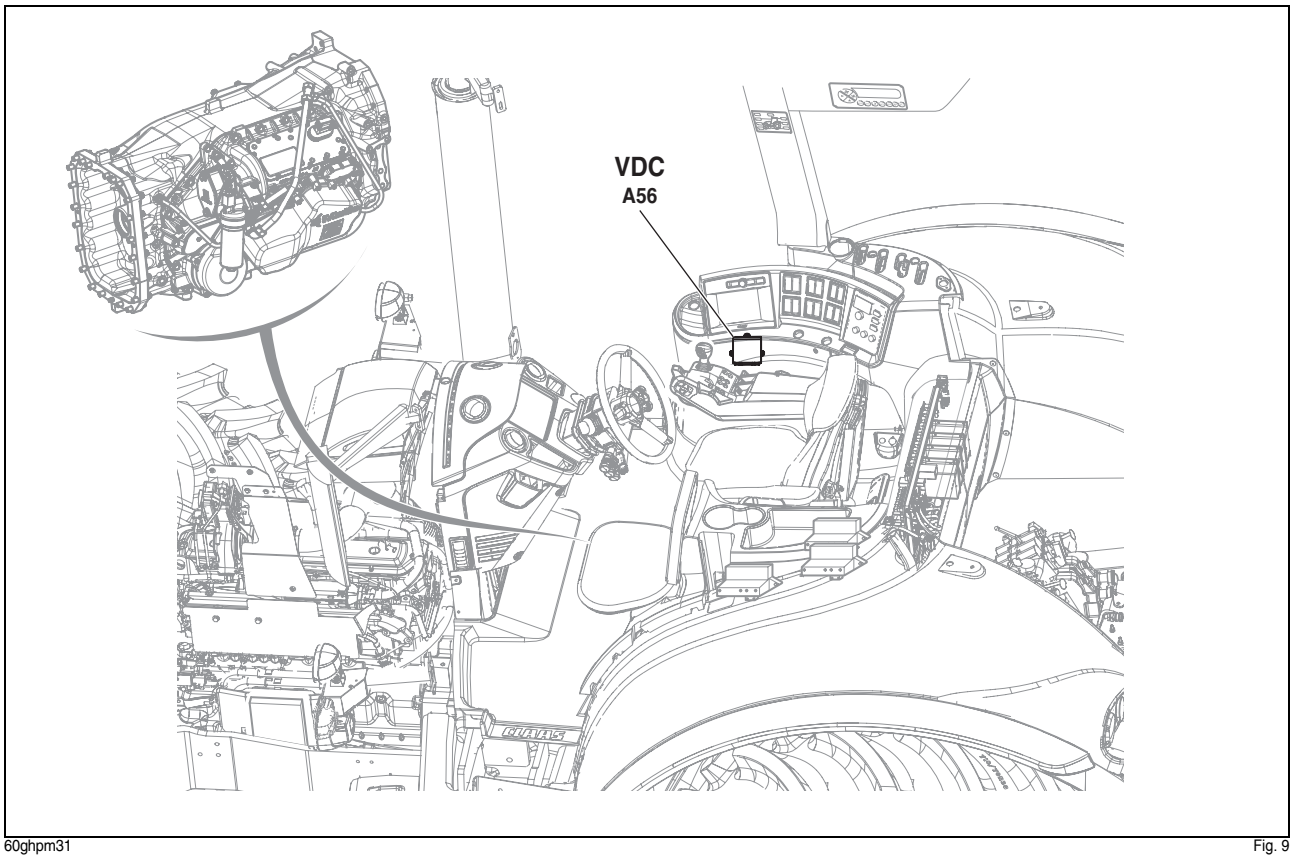
a15r Fig. 6

Functions

Component mark	Name	Functions managed by the module
A15	ENG	Engine speed management. Intake and exhaust circuit management ("EGR" valve, variable geometry turbo). Common rail injection management. Engine power management.

"VDC A56 CMatic" transmission module

Description



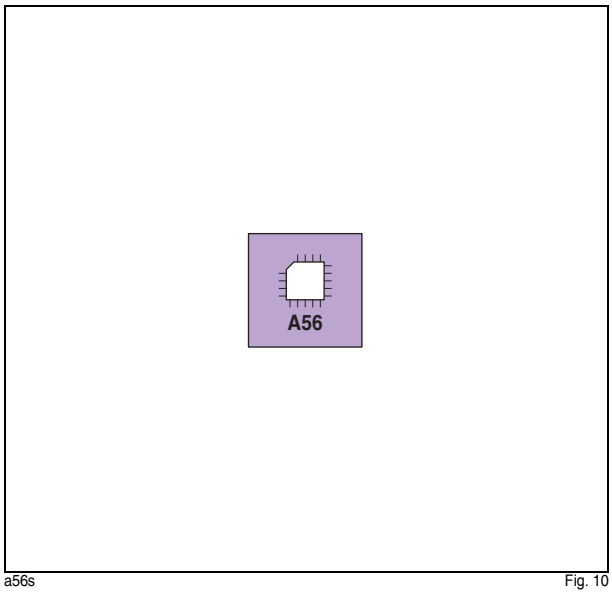
60ghpm31 Fig. 9

The "VDC A56" transmission module is located under the "Cebis" module, under the right-hand console. The module has 4 connectors:

– 3 18-pin connectors.

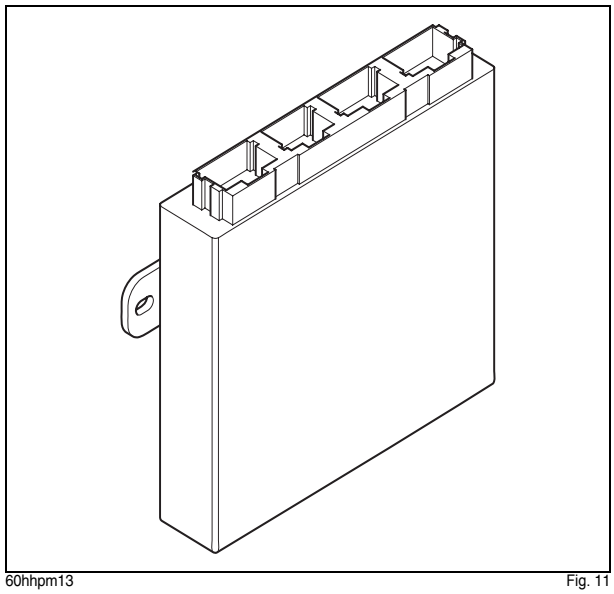
– 1 15-pin connector.

Schematic diagram



a56s Fig. 10

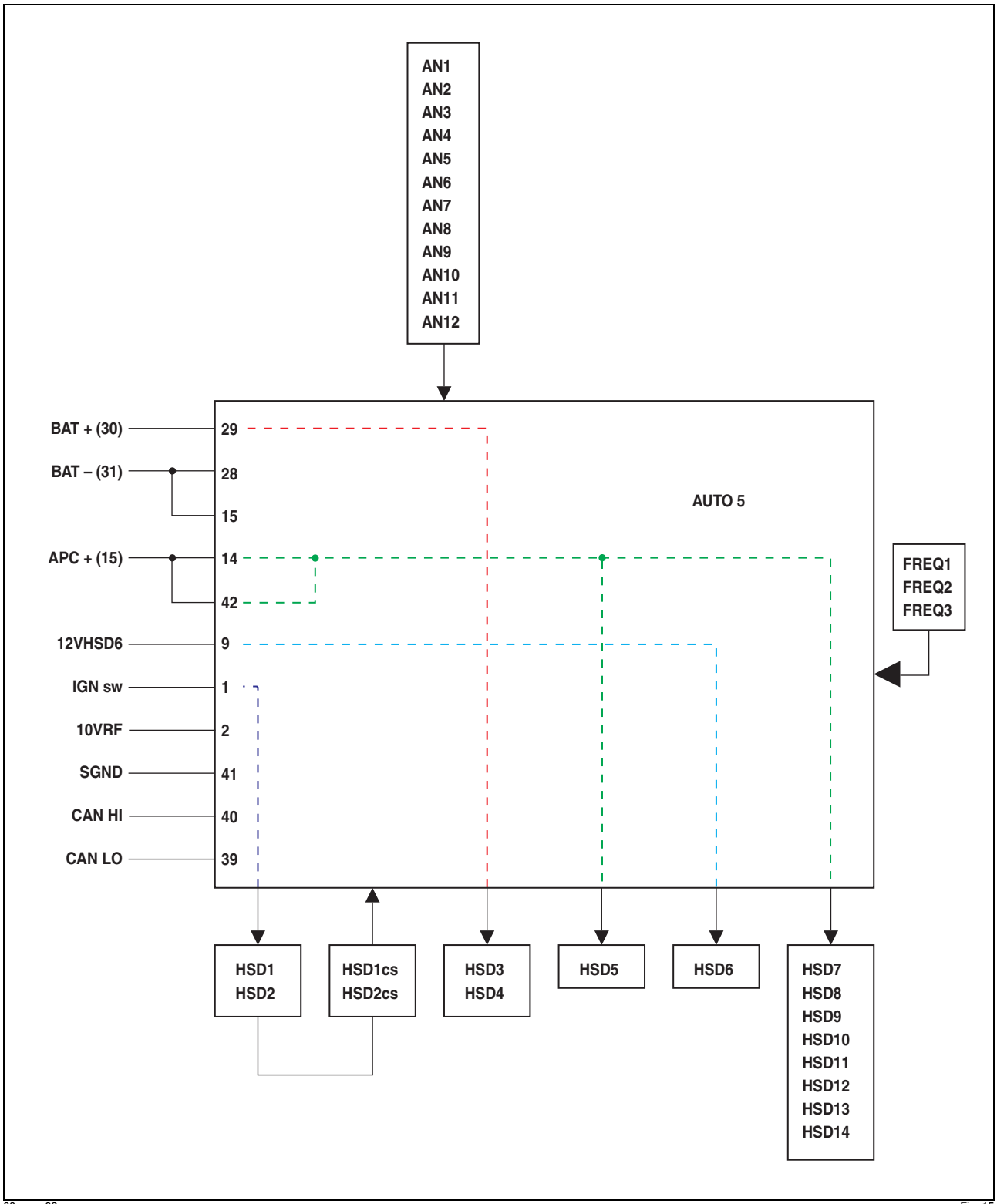
Representation



60hhpm13 Fig. 11

"TR1 A57-1" transmission module

Schematic diagram

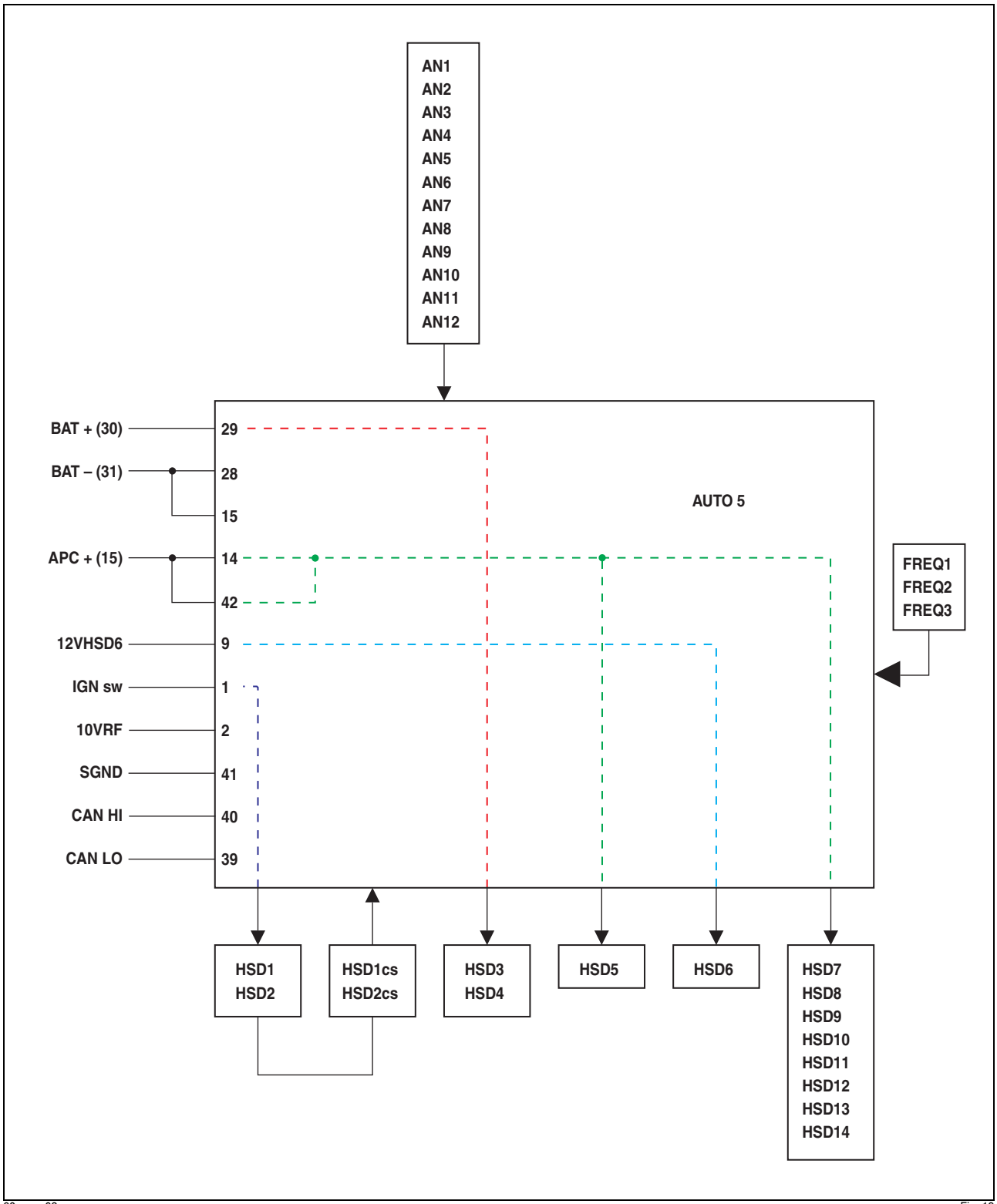


60cmsm08

Fig. 15

"TR2 A57-2 Hexashift" transmission module

Schematic diagram

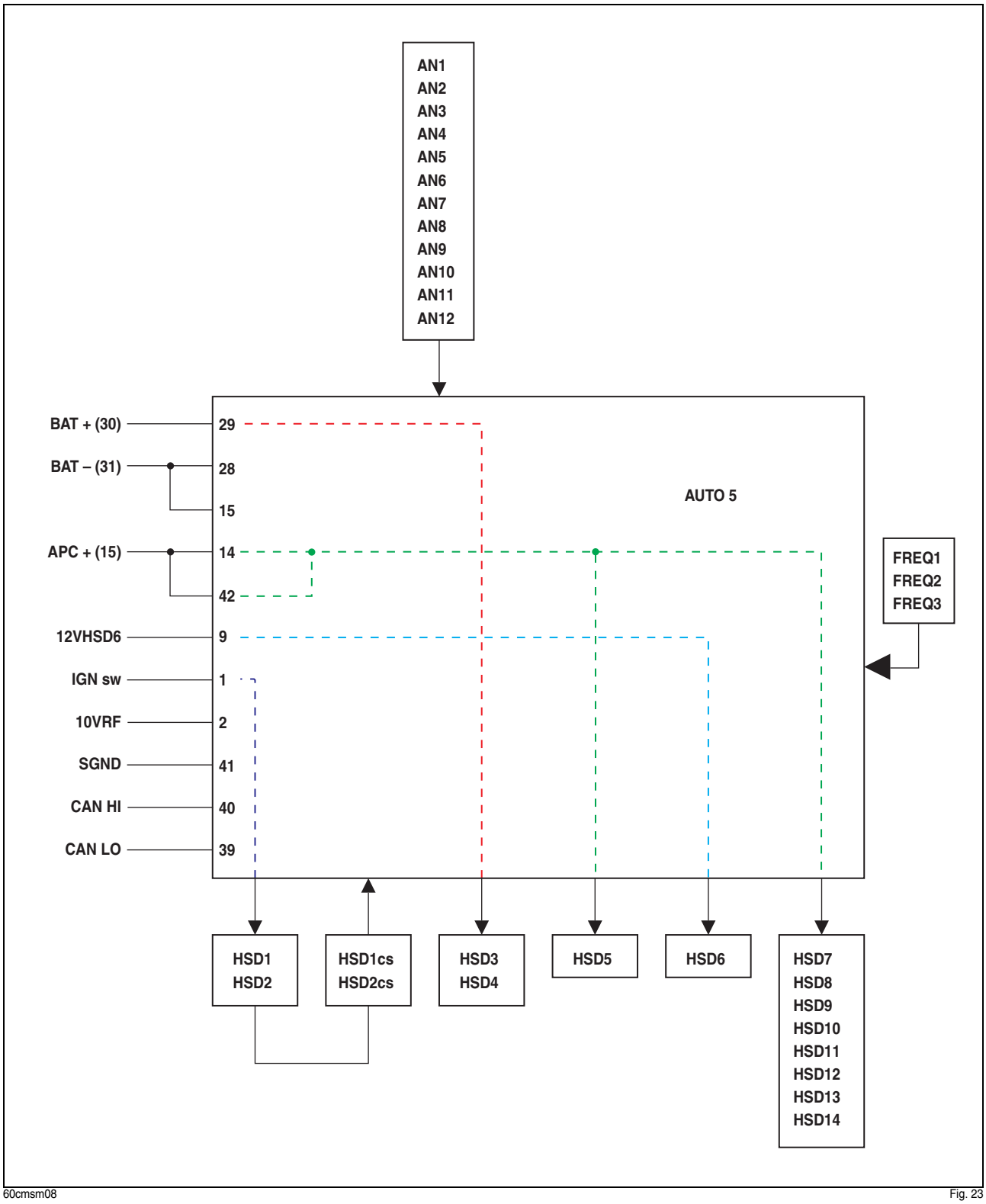


60cmsm08

Fig. 19

"TR2 A57-2 CMatic" transmission module

Schematic diagram



60cmsm08 Fig. 23

"TR3 A57-3" transmission module

Inputs/outputs

Module connector		Type	Nature	Function	Nature of the component	Component mark	State	Test conditions	
Ref	Terminal							Condition 1	Condition 2
JTR3	1	Supply	—	Power supply of the 5, 6 pins	Control	S113	12 V	Master switch on	Front power take-off engaging command actuated
					Relay	RL10			Relay in auto maintain status
					—	—	0 V		Engaging command non actuated and relay non maintained
	2	—	Wired	Unused					
	3								
	4	Input	Activated	Front power take-off	Solenoid valve	Y326	0,4 V	Engine running	Front power take-off actuated
							0 V		Front power take-off non actuated
	5	Output					12 V		Front power take-off actuated
							0 V		Front power take-off non actuated
	6		Information		Instrument panel	A101	12 V		Front power take-off actuated
							0 V		Front power take-off non actuated
	7		Activated	Supply of the automatic parking brake engaging solenoid valve	Solenoid valve	Y323	12 V		Automatic parking brake in engaging phase
							0 V		Automatic parking brake engaged
	8			Automatic parking brake		Y324	12 V		Automatic parking brake released
							0 V		Automatic parking brake engaged

"TCU A57-4 CMatic" transmission module

Module connector		Type	Nature	Function	Nature of the component	Component mark	State	Test conditions	
Ref	Terminal							Condition 1	Condition 2
A21/2	1	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—
	3	Input	Information	Oil temperature	Temperature sensor	B123	—	—	See the test procedure
	4	Output	Regulated	Auxiliary oil pressure	Pressure sensor	B298	5 V	Master switch on	—
	5	Input	Information	Lubrication oil pressure		B143	0,25 V		Lubrication pressure equals about 0 bar
							0,9 V	Engine running	Lubrication pressure equals about 3 bar
	6			Auxiliary oil pressure		B298	0,25 V	Master switch on	Auxiliary pressure equal to about 0 bars
							3 V	Engine running	Auxiliary pressure equal to about 30 bars
	7	Output	(31) earth				0 V	Permanent	—
	8		(31) earth	Lubrication oil pressure		B143			—
	9	—	—	—	—	—	—	—	—
	10	Output	(31) earth	Oil temperature	Temperature sensor	B123	0 V	Permanent	—
	11		Regulated	Lubrication oil pressure	Pressure sensor	B143	5 V	Master switch on	—
	12	—	—	—	—	—	—	—	—

"A58" rear lifting module

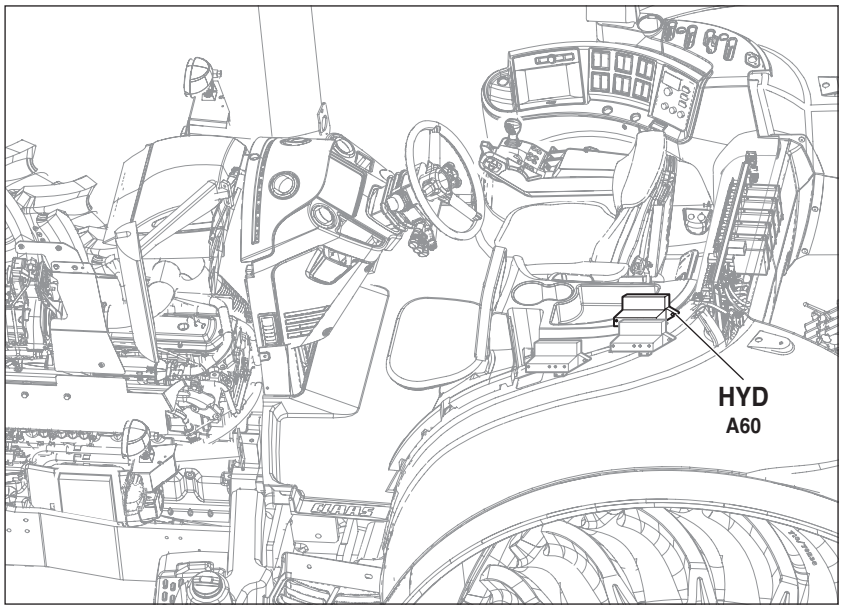
Name	Terminal	Type	Specification
SGND	41	Output	0 V for sensor
BAT "–"	15/28	Supply	0 V battery (31)
BAT "+"	29		12 V battery (30)
APC "+"	14/42		12 V after contact (15)
IGN sw	1		12 V
12VHSD6	9		

Inputs/outputs

Module connector		Name	Type	Function	"PSC" Connector		Nature of the component	Component mark	State	Test conditions
Ref	Terminal				Ref	Terminal				
REH	1	IGN sw	Input	Power supply of the 5, 6 pins	"PSC" internal	—	Fuse	F25	12 V	Master switch on
	2	10VRF	Output	Supply in 10 volts of the sensors / controls	J37	11	Right lifting external control	U58-1	10 V	"REH" module operational
						12	Left lifting external control	U57-1		
					J28	6	Position sensor	B139-2		
						18	LH draft sensor	B144-1		
						19	RH draft sensor	B144-2		
					J29	19	Lifting console	V22		
	3	HSD2cs	Input	Monitoring of the DOWN solenoid valve	J28	4	DOWN solenoid valve	Y337	Current = 1,8 A	Lift in floating position
					REH	4	UP solenoid valve	Y336		
	4	HSD1cs		Monitoring of the UP solenoid valve	J28	3			Current < 3 A	Lift to start stroke upper stop
					REH	3	DOWN solenoid valve	Y337		

"HYD A60" hydraulic module

Description



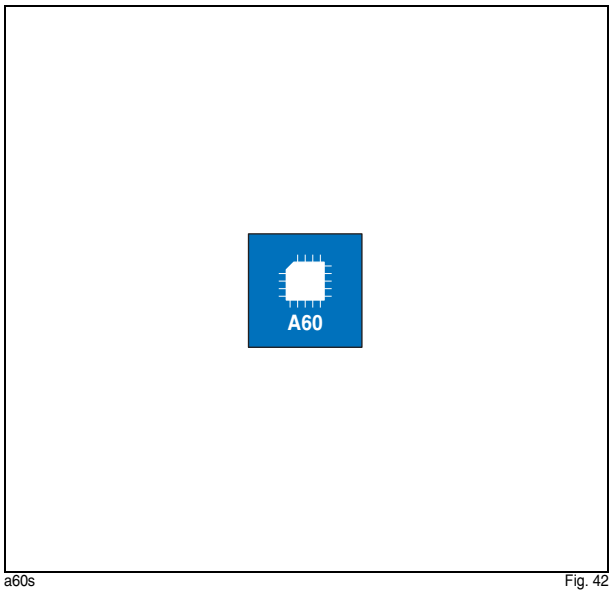
60hhsm08 Fig. 41

The "HYD A60" auxiliary hydraulic module is of the standard "UBM" type. The module is integrated to the left console. It has:

– 1 6-pin connector.

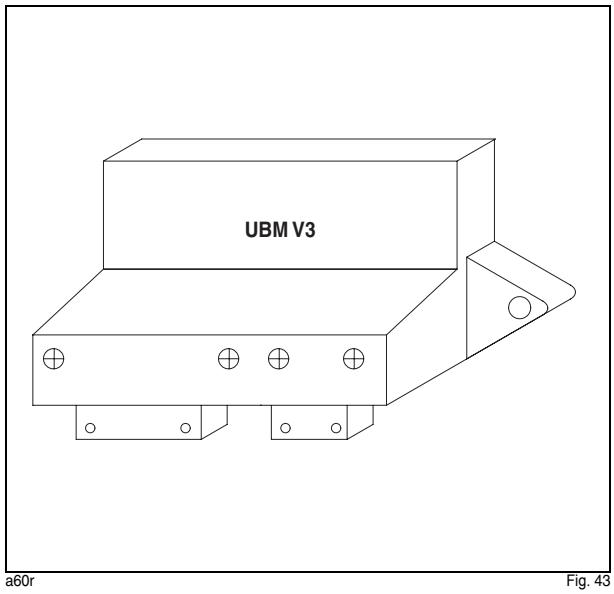
– 1 16-pin connector.

Schematic diagram



a60s Fig. 42

Representation



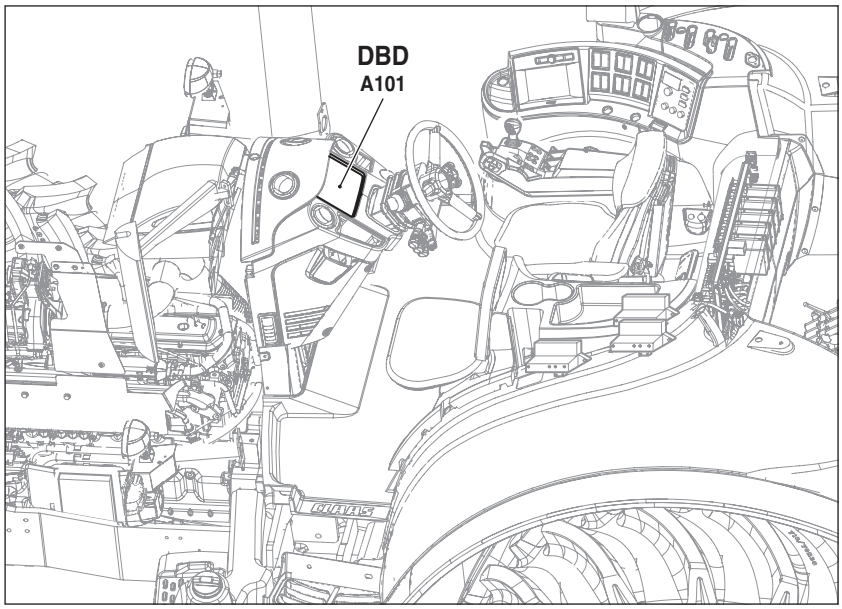
a60r Fig. 43

"MFA A100" multifunction armrest module

Module connector		Name	Type	Function	"PSC" Connector		Nature of the component	Component mark	State	Test conditions
Ref	Terminal				Ref	Terminal				
x2	3	P01	Input	Information/monitoring of rear lifting up contact	—	—	Rear lifting up contact	V27	Contact pressed 2,5 at 4,7V Contact released 0,2 at 2V	Ignition on, lifting released, signal voltage according to position of the rear lifting rising contact
	4	P02		Information/monitoring of the rear lifting down contact	—	—	Rear lifting down contact			Ignition on, lifting released, signal voltage according to the position of the rear lifting lowering contact
	5	P30		Information/monitoring of the sequence stop contact	—	—	Sequence stop contact			Ignition on, signal voltage according to the position of the sequence stop contact
	6	P31		Information/monitoring of sequence 1 contact	—	—	Sequence 1 contact			Ignition on, signal voltage according to the position of sequence contact 1
	7	P32		Information/monitoring of sequence 2 contact	—	—	Sequence 2 contact			Ignition on, signal voltage according to the position of sequence contact 2
	8	P00 P01 P02 P30	Output	Night lighting lamp lit for rear and sequence lifting contacts	—	—	Night lighting lamp of rear and sequence lifting contacts	—	Night lighting lamp for rear lifting and sequences lit contacts	Contact On, pilots On
	9	P31		Night lighting lamp lit for sequence 1 contact	—	—	Night light lamp of 1 sequence contact	V27	Night lighting lamp of 1 sequence contact lit	

"DBD A101" (TDB4) dashboard module

Description



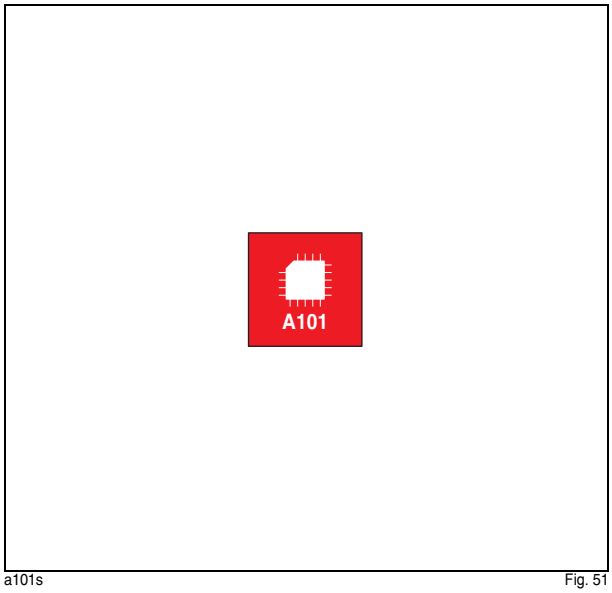
60ghpm19 Fig. 50

The dashboard module "DBD A101" is of the "TDB4" type. The module is integrated to the combined dashboard. The module has 2 connectors:

– 1 blue connector with 15 pins.

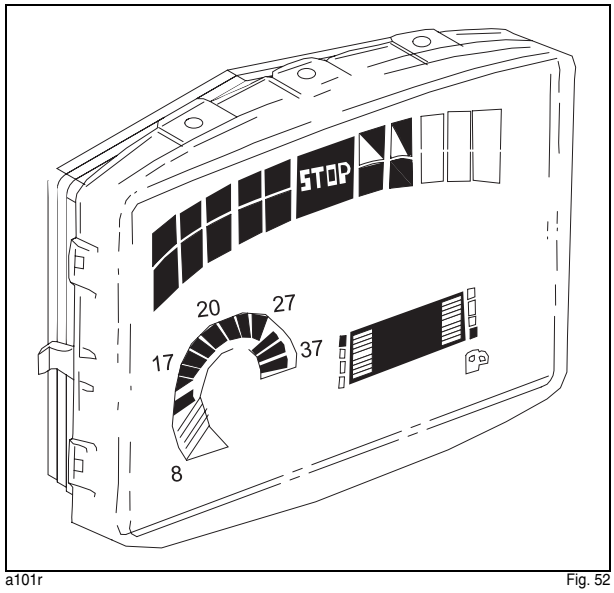
– 1 red connector with 30 pins.

Schematic diagram



a101s Fig. 51

Representation



a101r Fig. 52

Dashboard and "DBD A101" (TDB5, TDB6) CAN network communication module

Module connector		Type	Nature	Function	Nature of the component	Component mark	State	Test conditions	
Ref	Terminal							Condition 1	Condition 2
J328	12	Input	Information	High pressure braking fault	Relay	—	12 V	Engine running	No fault observed
							0 V		Fault observed
				Brake fluid level	Switch	Z76	12 V	Master switch on	Level sufficient
							0 V		Level insufficient
	13	—	—	—	—	—	—	—	—
	14	—	—	—	—	—	—	—	—
	15	—	—	—	—	—	—	—	—
	16	Input	Information	Transmission oil temperature fault	Module "TR2"	A57-2	12 V	Master switch on	Temperature OK
							0 V		Temperature too high
	17	—	—	—	—	—	—	—	—
	18	—	—	—	—	—	—	—	—
	19	Input	Information	Clogging of the transmission filter	Pressure switch	Z102	12 V	Master switch on	No clogging detected
							0 V		Clogging detected
	20			Forward speed calibration	Switch	S197	12 V		Calibration command active
							0 V		Calibration command non active

A102 front axle and suspended cab module

Module connector		Name	Type	Function	PSC Connector		Nature of the component	Component mark	State	Test conditions
Ref	Terminal				Ref	Terminal				
	28	BAT "–"	Supply	Module ground supply	—	—	Battery	G1	0 V	Permanent
	29	BAT "+"		12V power supply of the module	—	—	Battery via "F23" fuse		12 V	
	30	AN1	Input	Information from the suspension position sensor	J26	3	Suspension Hall effect sensor	B234	0,5 < ... < 2,25 V	Engine running, shift from suspension deactivated to activated position (low to median)
	31	AN3		Information of the front axle suspension switch	J27	13	Front axle suspension switch	S195	12 V	Ignition on, pulse on the suspension switch
	32*	AN5		Activation of the suspended cab 'soft' mode	J27	17	Switch	S235	0 V	'Soft' mode switch not actuated
									12 V	'Soft' mode switch activated
SFA	33	AN7	Not used							
	34	AN9								
	35	AN11								
	36	FREQ3								
	37	FREQ2								
	38	FREQ1								
	39	CAN lo	Communication	CAN Powertrain low	—	—	—	—	—	—
	40	CAN hi		CAN Powertrain high	—	—	—	—	—	—
	41	SGND	Input	Ground supply of the position sensor	J26	21	Suspension Hall effect sensor	B234	0 V	Engine running, suspension from deactivated to activated position
	42	+ APC	Supply	12V power supply after ignition	—	—	Key operated ignition	S64	12 V	Master switch on via "F22" fuse

** Only with the 'Z-Activ' option.*

Module "Isobus ITE A107"

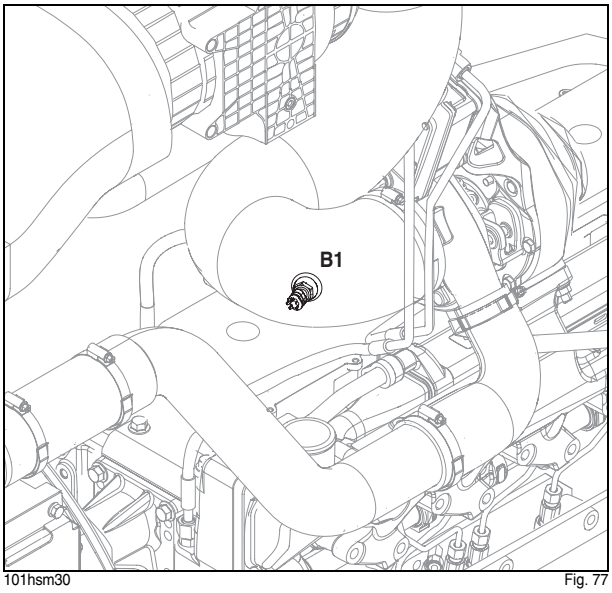
Inputs/outputs

Module connector		Name	Type	Function	"PSC" Connector		Nature of the component	Component mark	State	Test conditions
Ref	Terminal				Ref	Terminal				
J123	1	CAN 1 low	Communication	CAN low from CLAAS vehicle CAN bus	—	—	"UBM" base plate	V23	2,4 V	Master switch on
	2	Supply	Supply	12V (15) supply of the module (via relay)	—	—			12 V	Contact On and a few seconds after contact Off
	3	CAN 2 low	Communication	CAN low of ISO CAN bus	—	—			2,4 V	Master switch on
	4	CAN 1 high		CAN high from CLAAS vehicle CAN bus	—	—			2,9 V	
	5	GND	Supply	Module ground supply	—	—			0 V (31)	Permanent
	6	CAN 2 high	Communication	CAN high of ISO CAN bus	—	—			2,9 V	Master switch on
J124	1	Output power supply	Supply	12 volt power supply of the outputs	—	—			12 V (15)	
	2	Output 6	—	—	—	—	—	—	—	—
	3	Output 5	—	—	—	—	—	—	—	—
	4	Output 4	—	—	—	—	—	—	—	—
	5	—	—	—	—	—	—	—	—	—
	6	Output 2	Output	Relay command	—	—	Relays	KL14	12 V	Master switch on
	7	Output 1			—	—		K6		
	8	Input 9	Supply	Module ground supply	—	—	"UBM" base plate	V23	0 V (31)	Permanent

Intake air temperature sensor "B1"

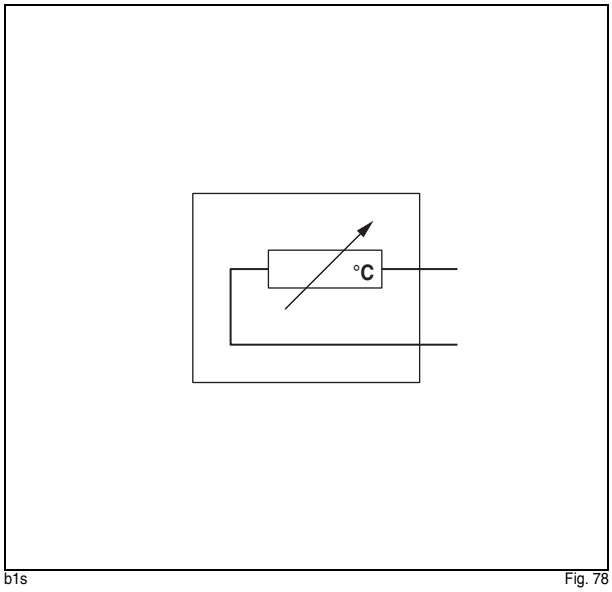
Description

The intake air temperature sensor "B1" is a thermistance with a negative temperature ratio. It is composed of 2 wires, a 5 V supply and a ground. Voltage varies with temperature.



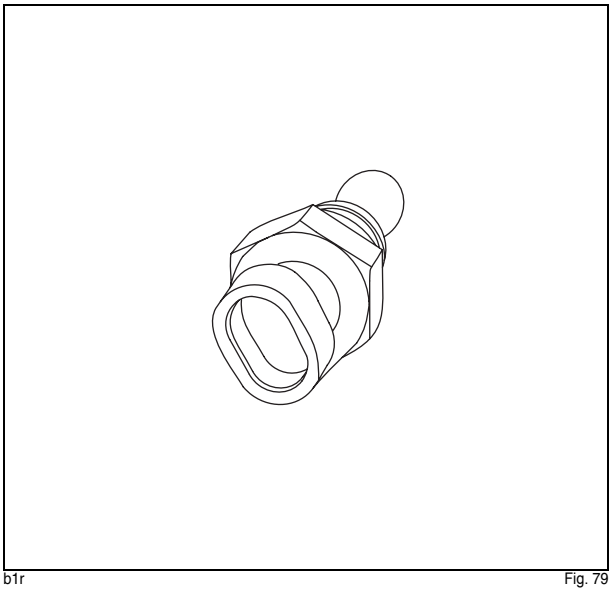
101hsm30 Fig. 77

Schematic diagram



b1s Fig. 78

Representation

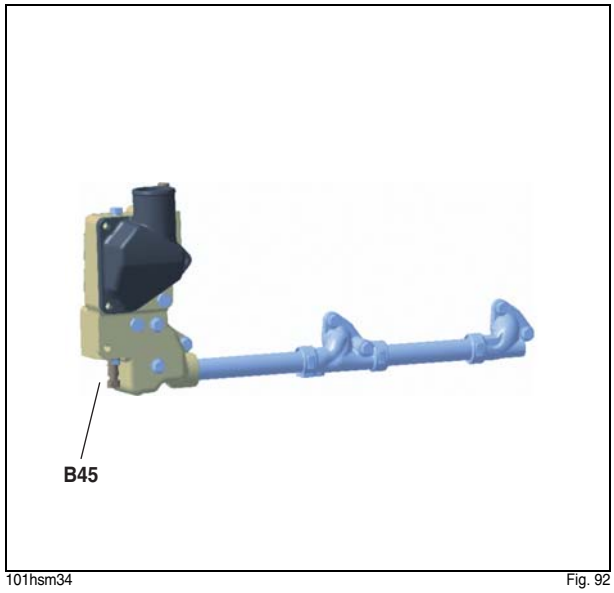


b1r Fig. 79

"B45" coolant temperature sensor

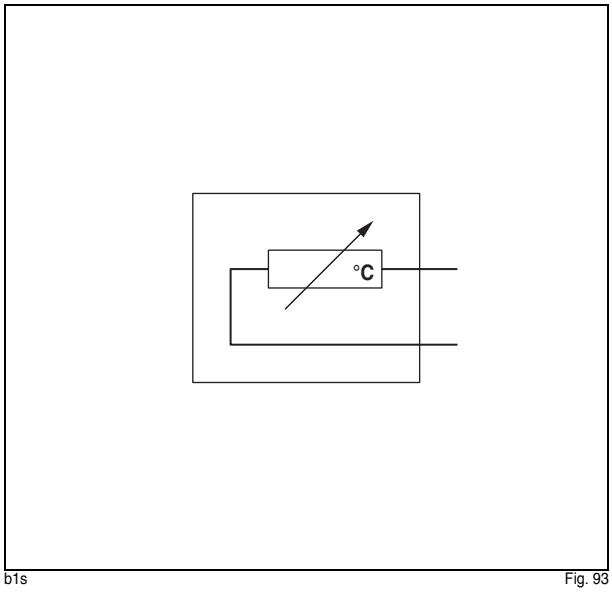
Description

The "B45" coolant temperature sensor is a negative temperature ratio thermistance. It is composed of 2 wires, a 5 V supply and a ground. Voltage varies with temperature.



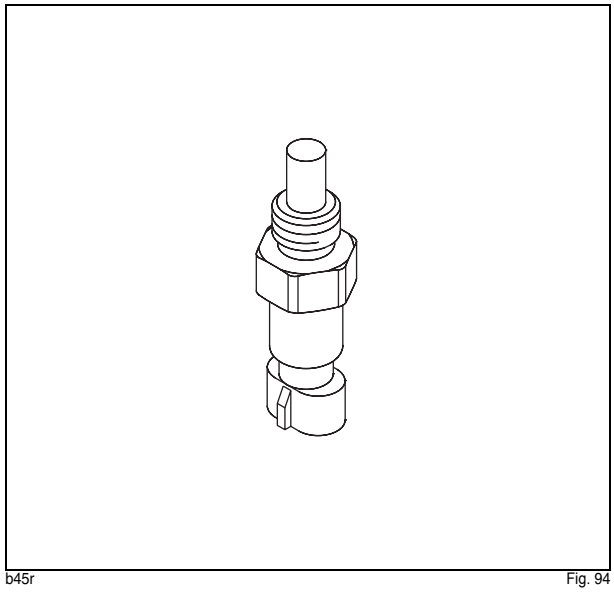
101hsm34 Fig. 92

Schematic diagram



b1s Fig. 93

Representation



b45r Fig. 94

Measurements and checks

See 'Temperature sensor' test method.

Power check

Test condition: Power on.

Connect the multimeter (voltmeter function) in bypass onto the connector of the electronic injection harness (see electric diagram for pin allocation). The supply voltage must be 5 V.

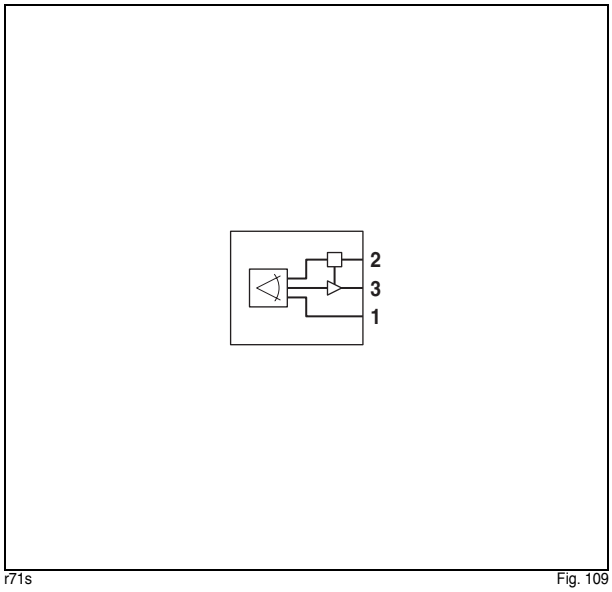
"B117" steering angle sensor

Description

– The "B117" steering angle sensor is of the rotating Hall effect type. The steering angle sensor is located on the front axle shaft, on the left-hand side. The steering angle sensor is controlled by the "TR2 A57-2" module.

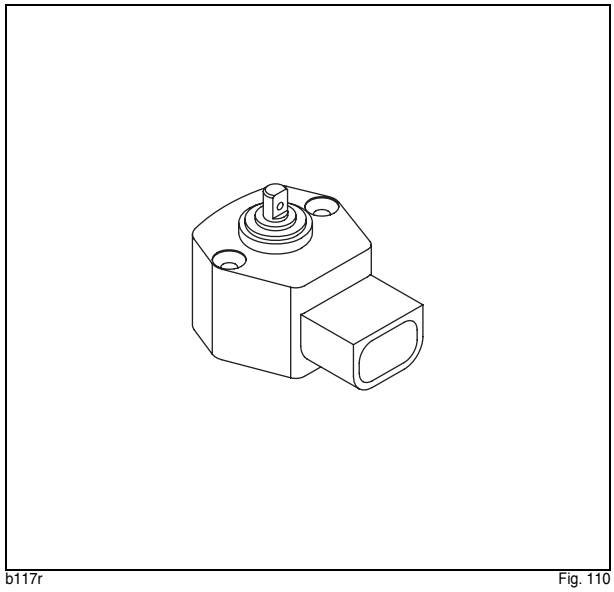
455hsm96 Fig. 108

Schematic diagram



r71s Fig. 109

Representation



b117r Fig. 110

Position sensor for rear lifting "B139-2"

Measurements and checks

See 'Hall effect sensor' test method.

Voltage test

Test conditions:

– With the engine stopped.

– Connect multimeter n° 00 1135 095 0.

– Start the engine.

– Rear lifting in active position command(s).

– Lift the arms in the upper stop position.

Note: The supply voltage measured between the "1" and "2" pins must be 10V.

– Adjust the sensor's position to obtain a signal voltage of 7,5 V ± 0,01 V on the multimeter (Also refer to the section on 'Adjustments of the rear lifting position sensor').

Position of the rear lifting arms	Output voltage
Lifting up to high mechanical stop	7,5 V
Lifting at low mechanical stop	3,1 V

Warning: The upper mechanical stop is controlled from the external controls. The upper electronic stop is controlled from the cab.

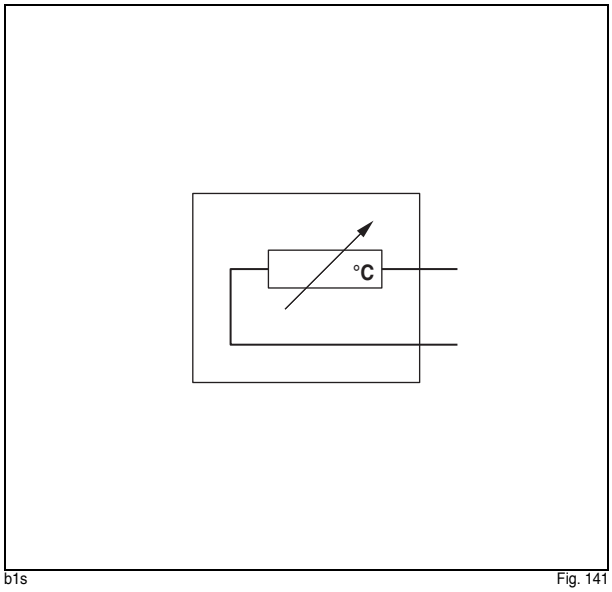
"B222" intake fresh air temperature sensor

Description

The "B222" intake cold air temperature sensor is a negative temperature ratio thermistance. It is composed of 2 wires, a 5 V supply and a ground. Voltage varies with temperature.

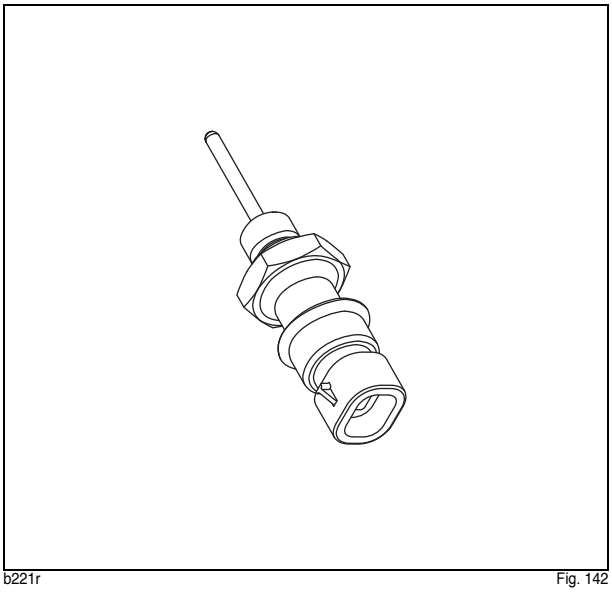
101hsm49 Fig. 140

Schematic diagram



b1s Fig. 141

Representation

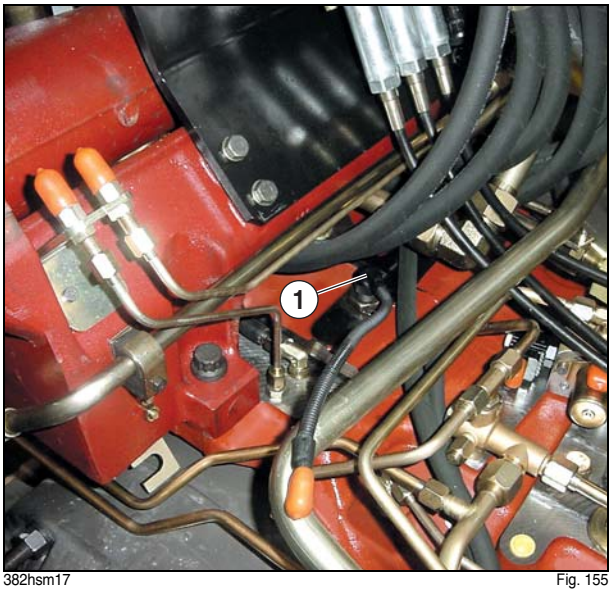


b221r Fig. 142

Theoretical speed sensor "B227"

Description

The "B227" theoretical speed sensor on rear axle crown gear is of the 2-wire inductive type with variable reluctance. The theoretical speed sensor is fitted in front of the crown gear of the tractor's rear axle. The output signal is of the sine type. The theoretical speed sensor on rear axle crown gear is cotnrolled by the "TR1 A57-1" module.



382hsm17 Fig. 155

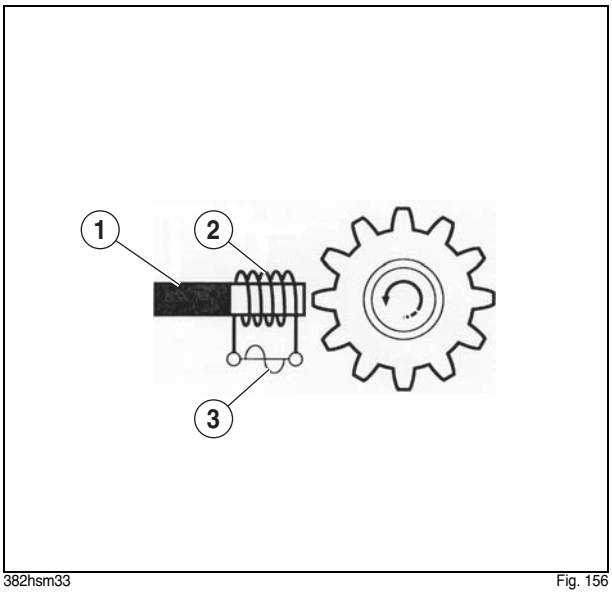
Description

1 Permanent magnet.

2 Coil.

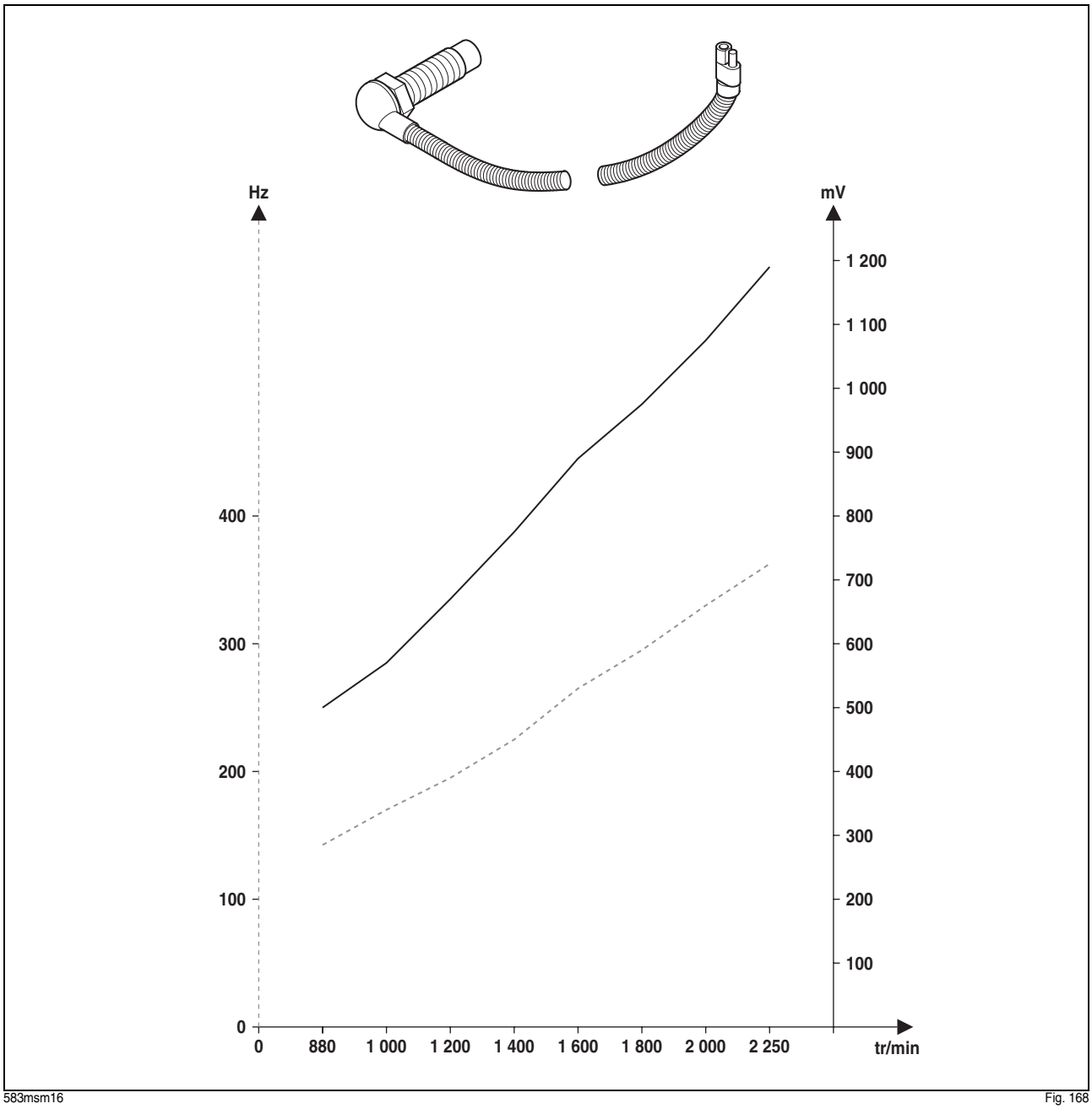
3 Output.

The teeth of the rotating crown gear pass in front of the magnet (1), creating a variation in the magnetic flow producing induced current in the coil (2). This current is alternate and its frequency identical to that of the passage of the crown gear teeth.



382hsm33 Fig. 156

"B229" gearbox speed intermediate sensor



583msm16

Fig. 168

"B234" suspended front axle position sensor

Measurements and checks

Voltage test

Test condition: Power on.

– Connect the sensor using the multimeter #60 0500 674 4.

– Measure the variation of the sensor supply voltage between the low and median positions of the suspended axle.

Test conditions	Value
Ignition on, supply voltage measured between pin "1" and "2".	10 V
Engine running, shift from suspension deactivated to activated position (low to median)	1,05V...2,30V

Current test

Test condition: Power on.

– Connect the sensor using the multimeter #60 0500 674 4.

– Switch on the ignition.

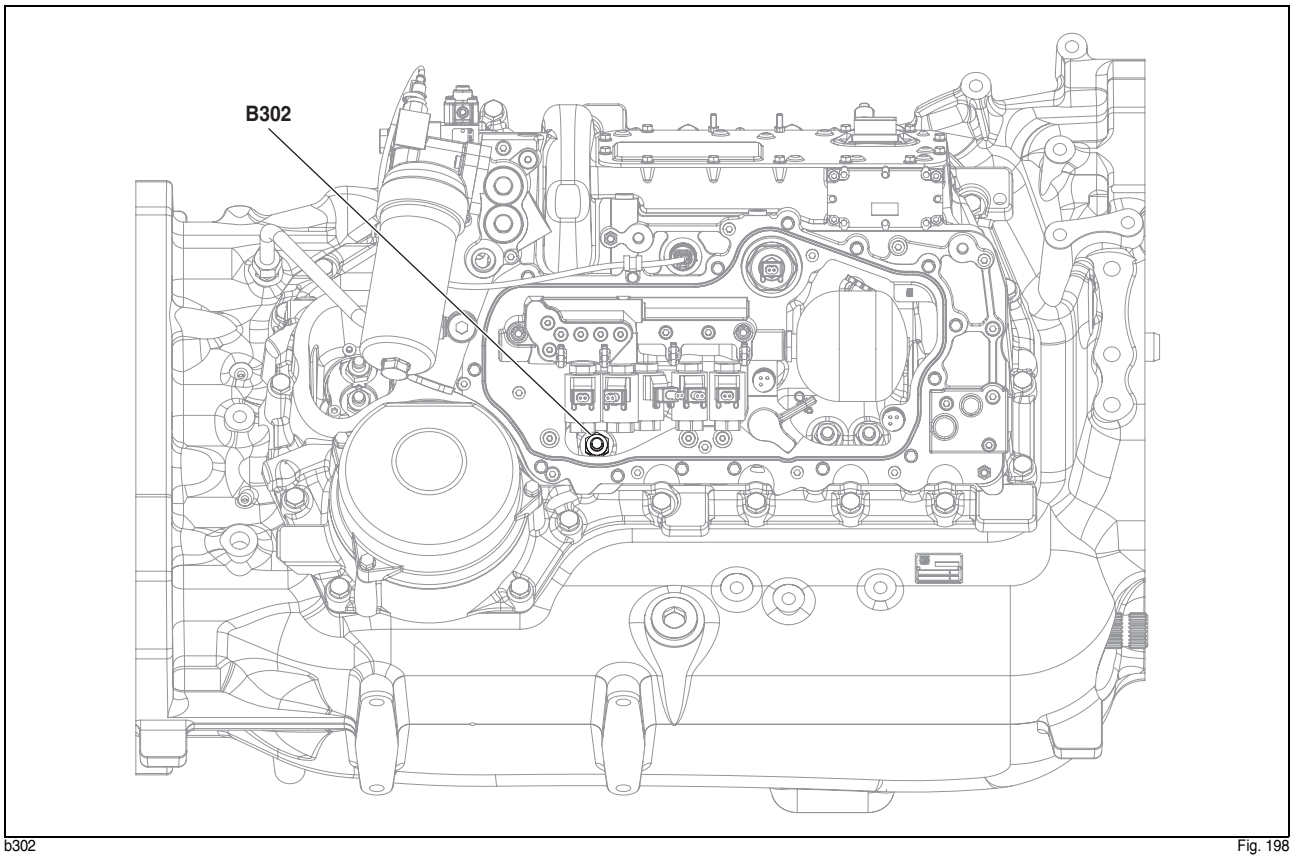
– Measure the intensity of the electric current for suspension in high position.

– Measure the intensity of the electric current for suspension in low position.

Test conditions	Value
Suspension in the high position	15,5 A
Suspension in the low position	11,5 A

Rotation speed sensor of the "B302 CMatic" gearbox (range output)

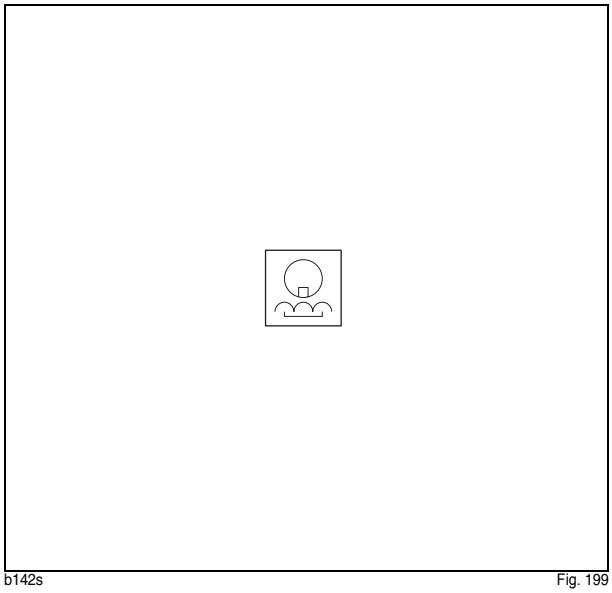
Description



b302 Fig. 198

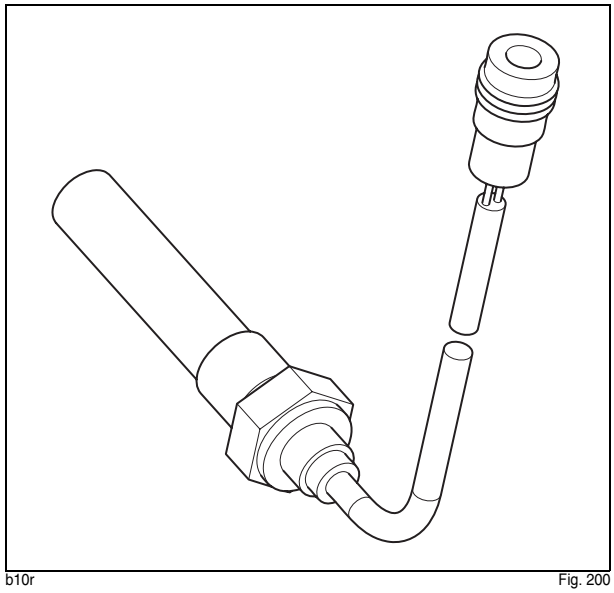
The "B302" gearbox rotation speed sensor is an inductive sensor.

Schematic diagram



b142s Fig. 199

Representation

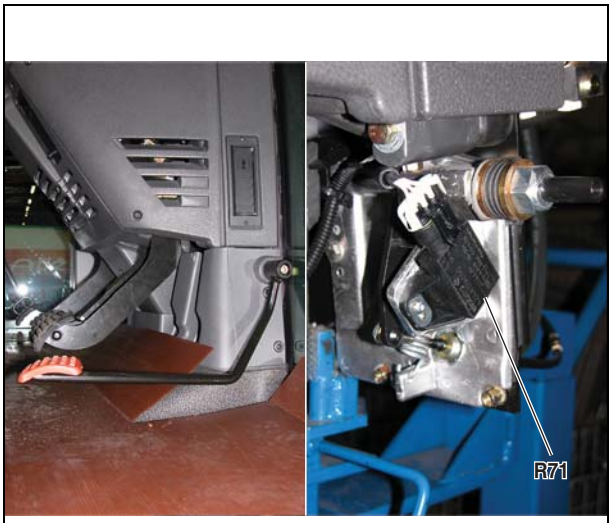


b10r Fig. 200

"R71" Accelerator pedal position angular sensor

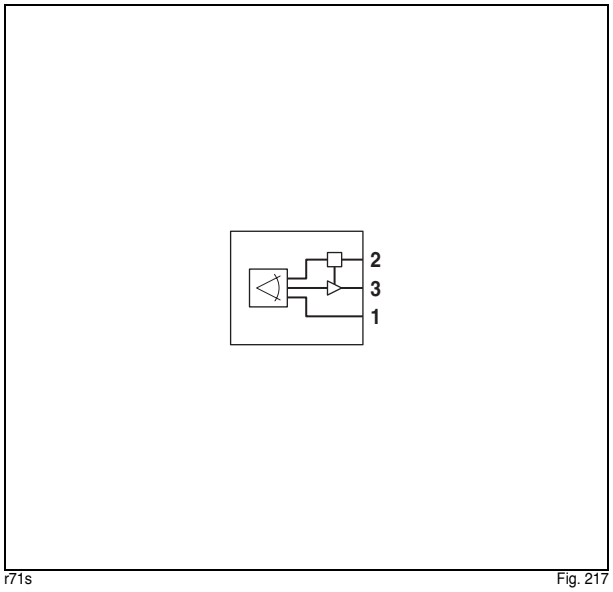
Description

The "R71" accelerator pedal position angular sensor is a Hall effect sensor. It is composed of 3 wires, a 10V supply, a ground, and a signal varying between 0,75V and 3,8V according to the pedal's position.



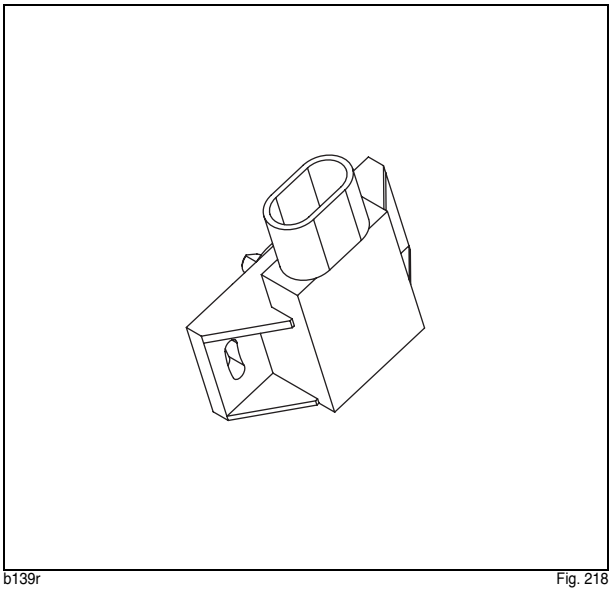
60ahsm65 Fig. 216

Schematic diagram



r71s Fig. 217

Representation

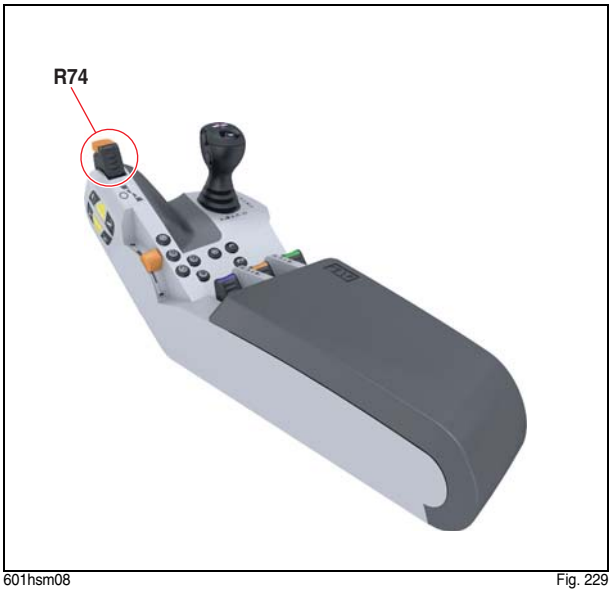


b139r Fig. 218

"Drivestick R74" control

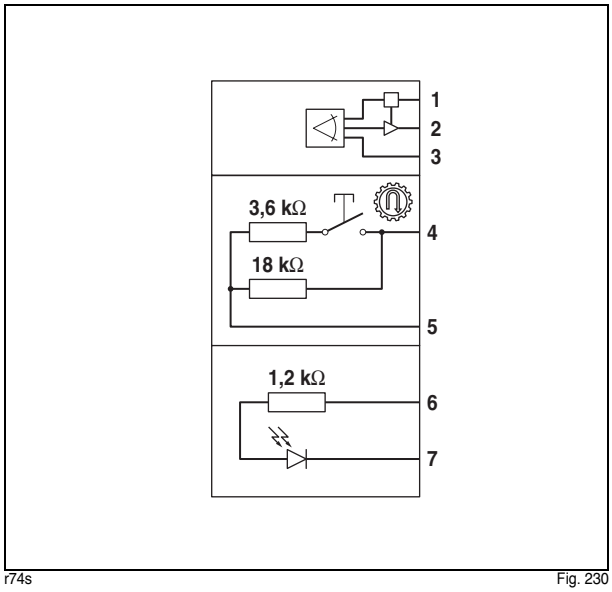
Description

The "Drivestick R74" is of the Hall effect sensor type and located on the "MFA A100" multifunction armrest.



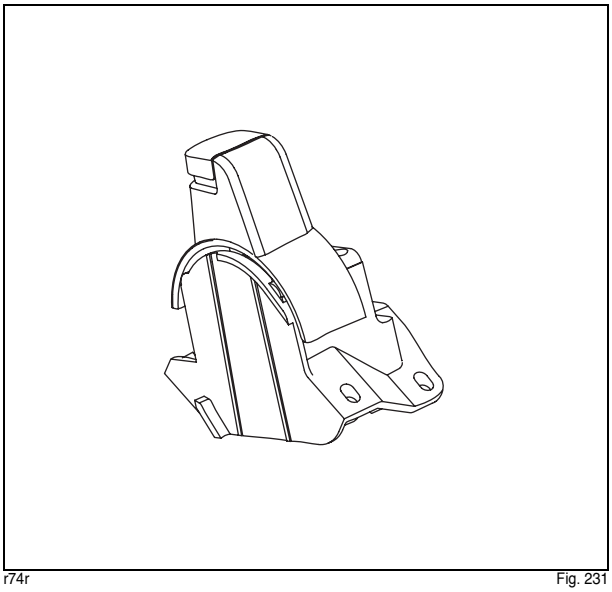
601hsm08 Fig. 229

Schematic diagram



r74s Fig. 230

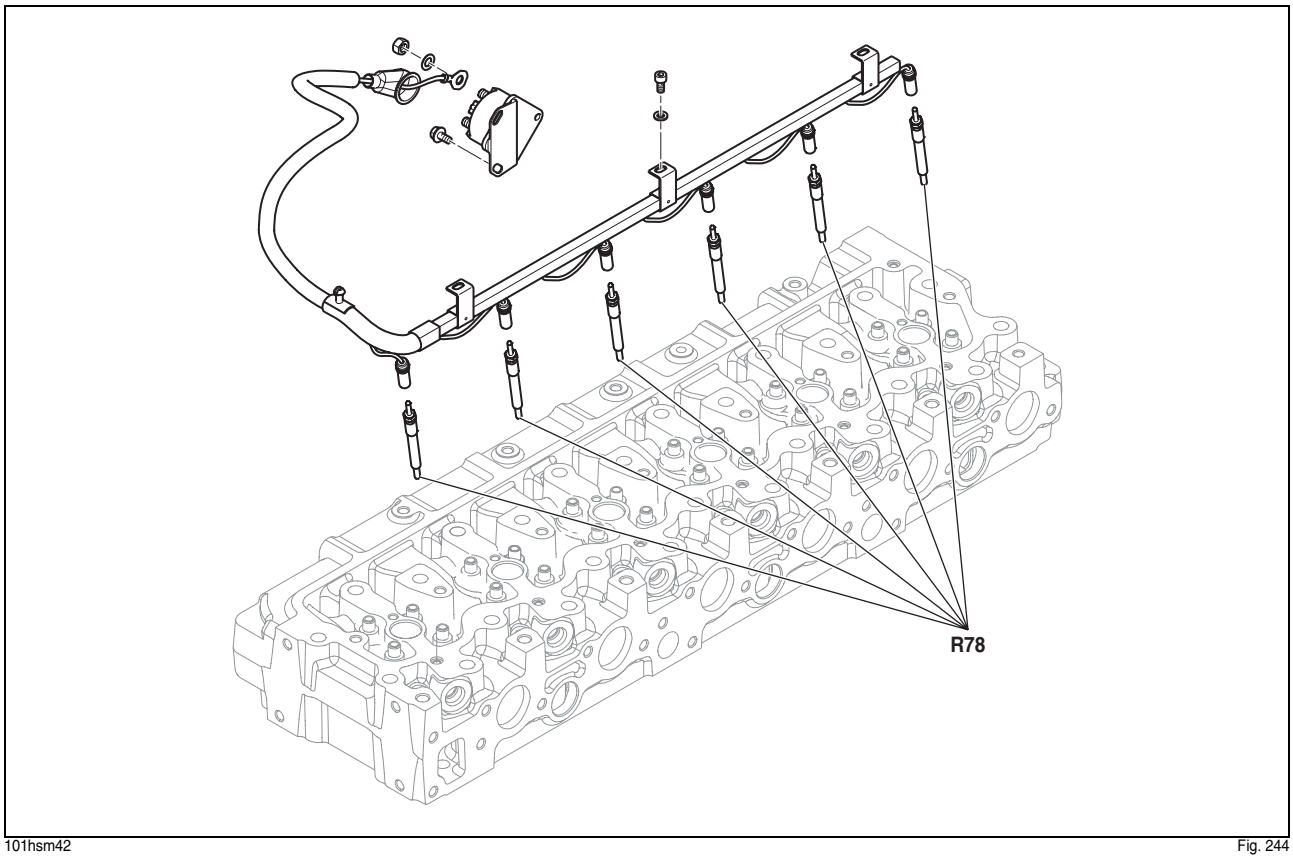
Representation



r74r Fig. 231

"R78" glow plug

Description

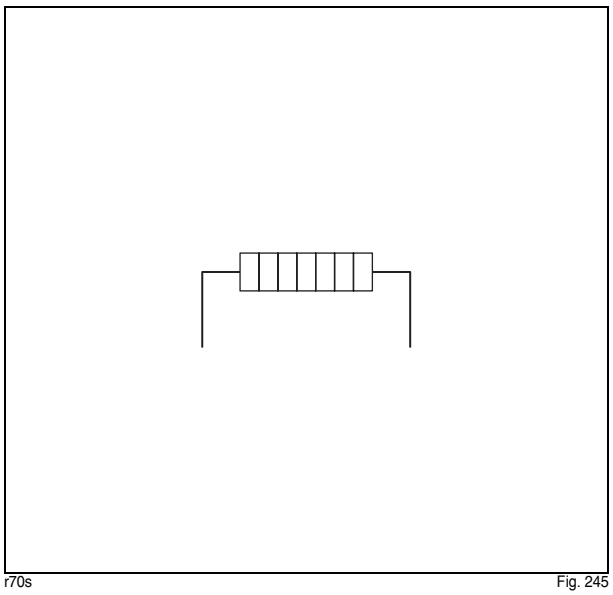


101hsm42 Fig. 244

The "R78" glow plugs are resistors. The "ENG" module determines the pre and post heating time using the fuel temperature sensor.

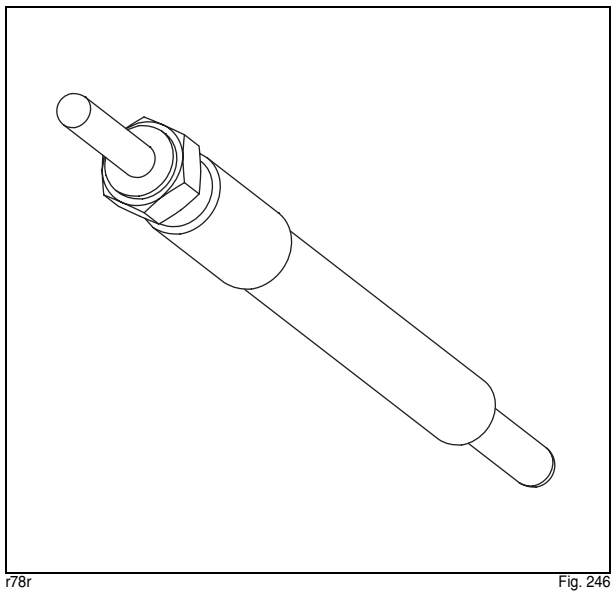
Note: Preheating occurs only when battery voltage is not between 6 and 14 volts.

Schematic diagram



r70s Fig. 245

Representation



r78r Fig. 246

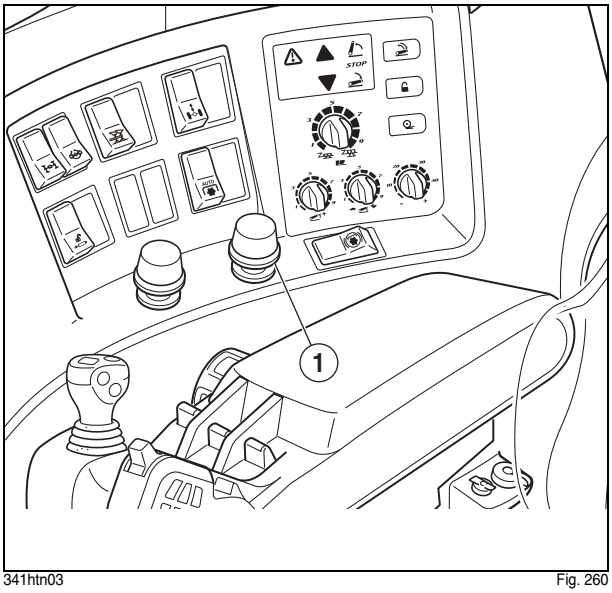
"S114" power take-off on/off contact

Description

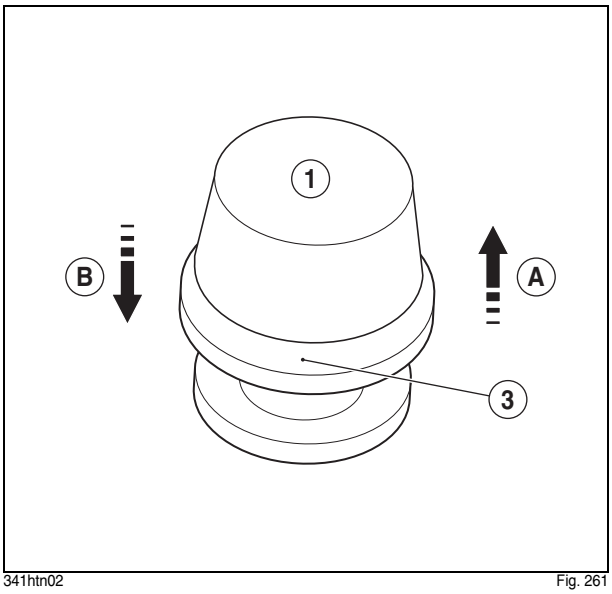
The "S114" (1) cab rear power take-off on/off contact is a double pulse 3-position switch.

Description

1 Switch.
3 Locking flange to engage the rear power take-off.
A Direction to engage the power take-off.
B Direction to disengage the power take-off.



341htn03 Fig. 260

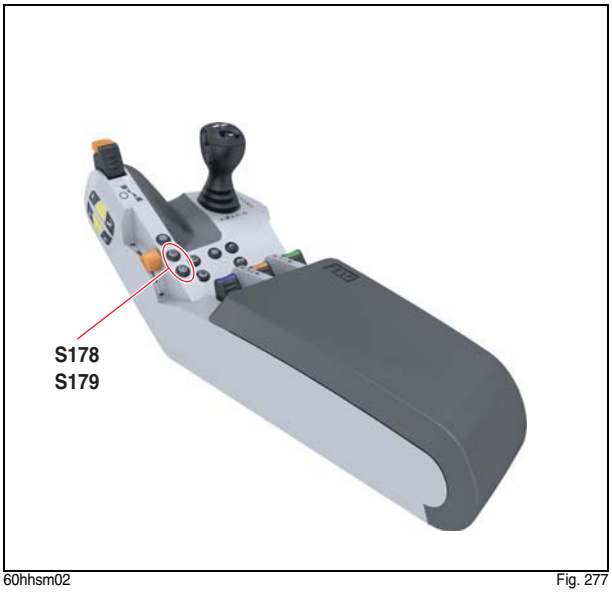


341htn02 Fig. 261

"S178" and "S179" engine speed memory contact

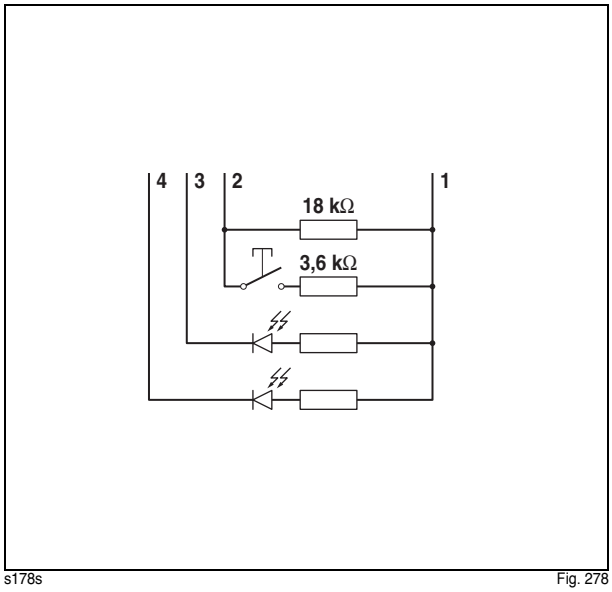
Description

The "S178" and "S179" engine speed memory contacts are located on the multifunction armrest. A pulse on the (1) or (2) button calls the engine speed memorized. Each button is made of a switch, 2 light-emitting diodes and 4 resistors.



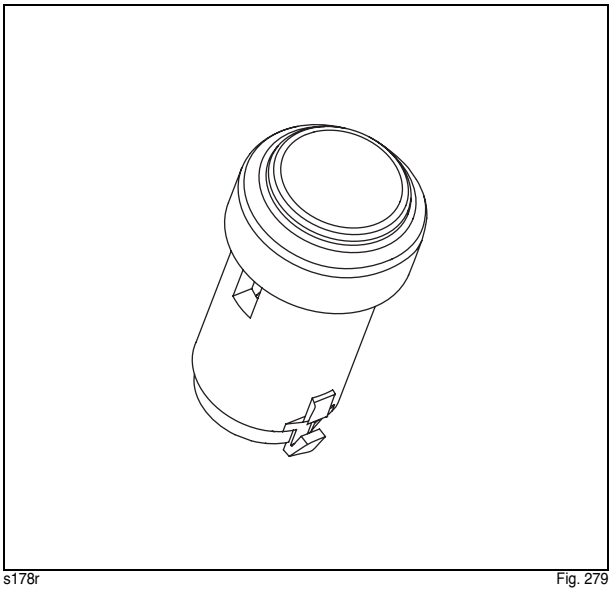
60hhsm02 Fig. 277

Schematic diagram



s178s Fig. 278

Representation



s178r Fig. 279

Measurements and checks

See 'Detection contact' test method.

Power check

Supply voltage: 5 V.

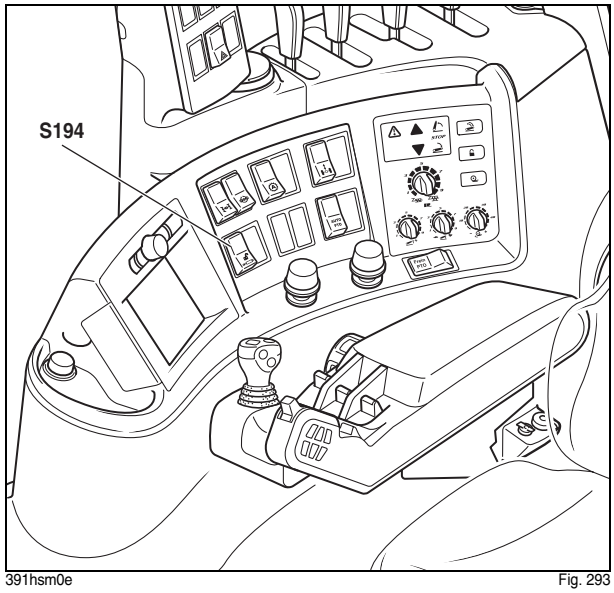
Resistance check

Contact open	18 kohm
Contact closed	3 kohm

"on/off S194" hydraulic switch

Description

The "on/off S194" hydraulic switch is a 2 internal contact indexed switch.



391hsm0e Fig. 293

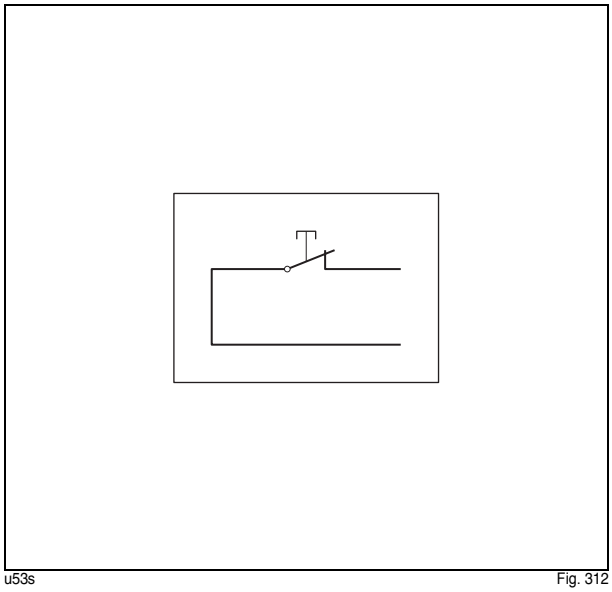
"U53" rear power take-off emergency stop contact

Description

The "U53-1" left fender and "U53-2" right fender contacts allow stopping the power take-off from the back of the tractor. They are of the pulse contact type and normally closed.

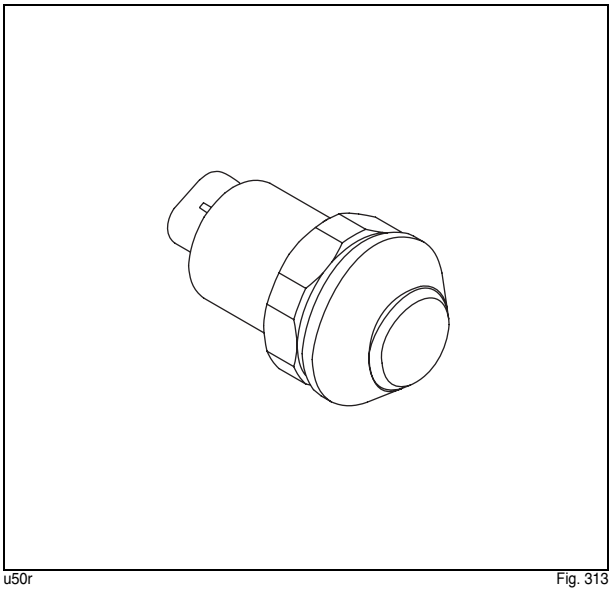
341hsm1k Fig. 311

Schematic diagram



u53s Fig. 312

Representation



u50r Fig. 313

Measurements and checks

See 'Contacts on supply circuit' test method.

Power check

Test conditions:

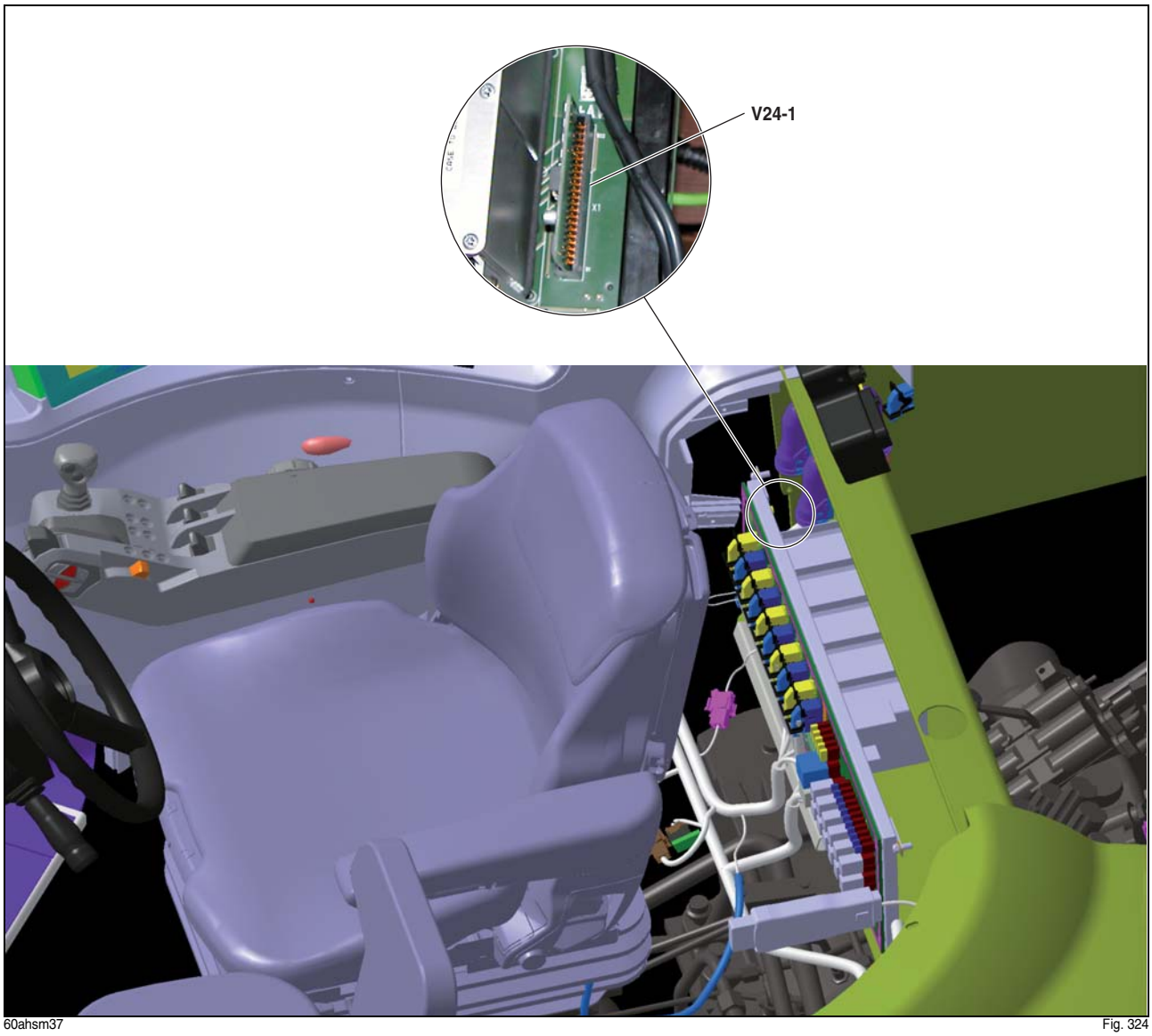
– Power on.

– Engine running.

Selector state	Nominal voltage
Contact pressed	0 V
Contact released	12 V

Electronic adaptation plate "PAE V24-1"

Description

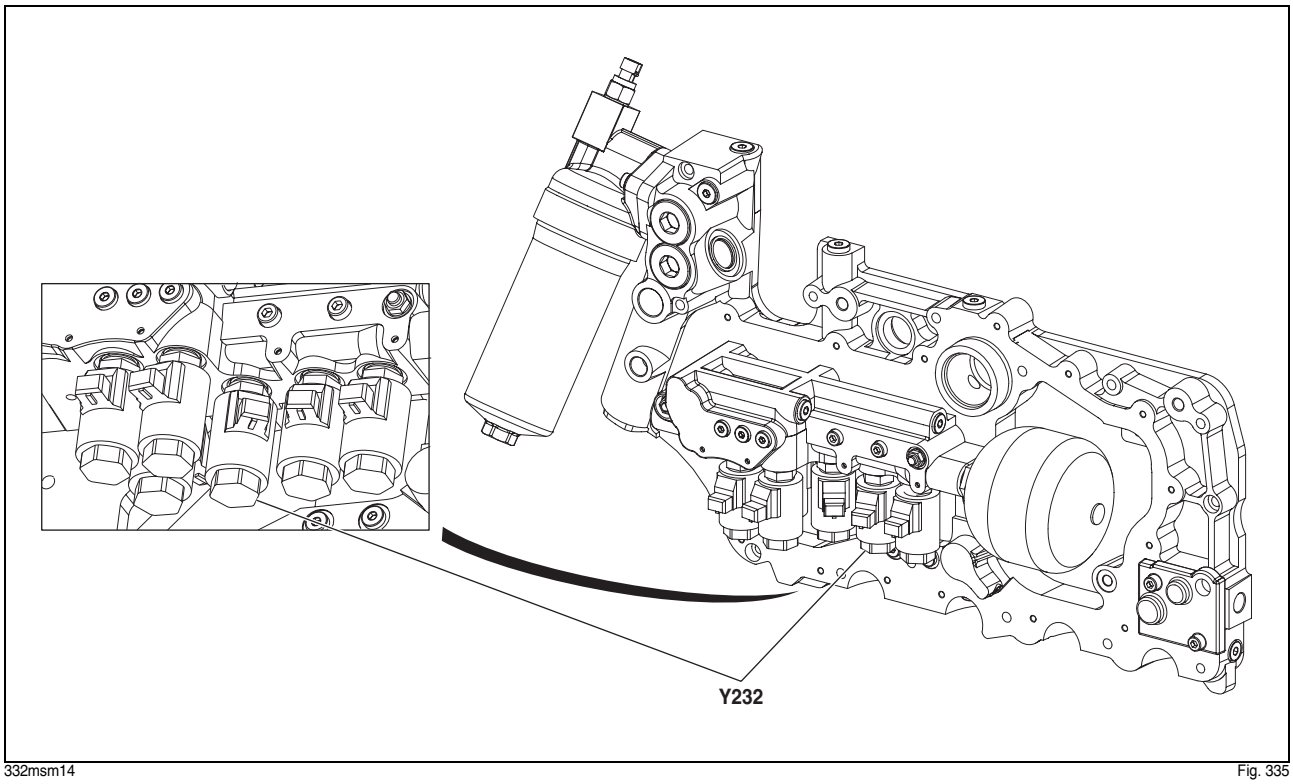


60ahsm37 Fig. 324

The "PAE V24-1" voltage adaptation plate is a compact module fitted with a voltage regulator. It can adapt a 10V voltage into 5V.

Solenoid valve of the forward pawl clutch "KV Y232 CMatic"

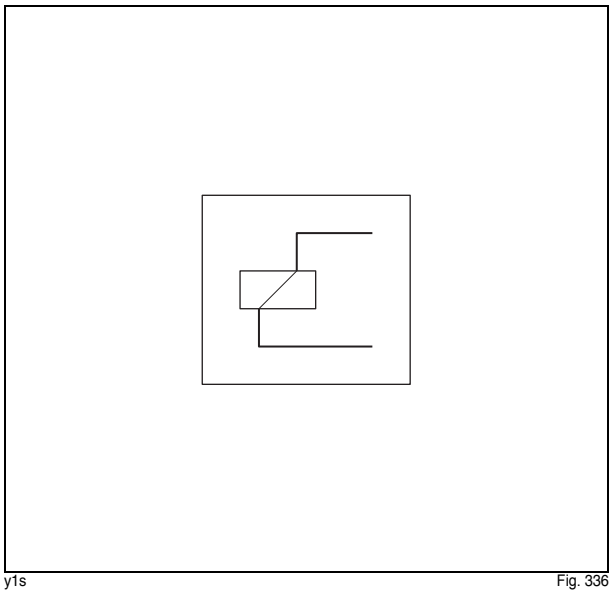
Description



332msm14 Fig. 335

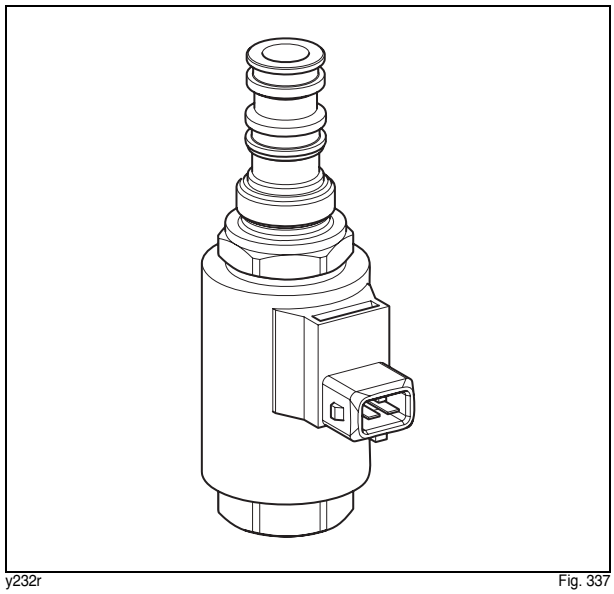
The "KV Y232" forward drive solenoid valve is an all or nothing solenoid valve. The solenoid valve is supplied with "PWM" hashed current by the "A57-4 TCU" gearbox module.

Schematic diagram



y1s Fig. 336

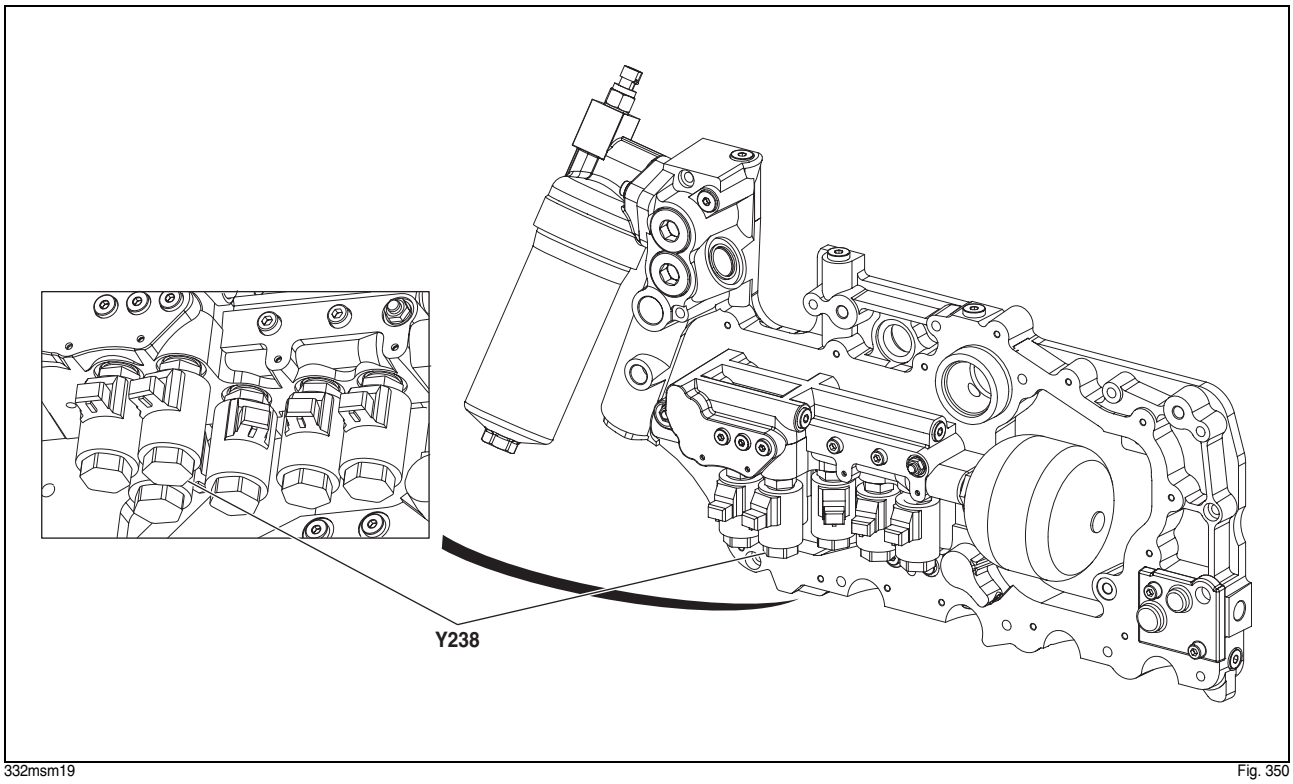
Representation



y232r Fig. 337

Solenoid valve of the 'K4 Y238 CMatic' pawl clutch

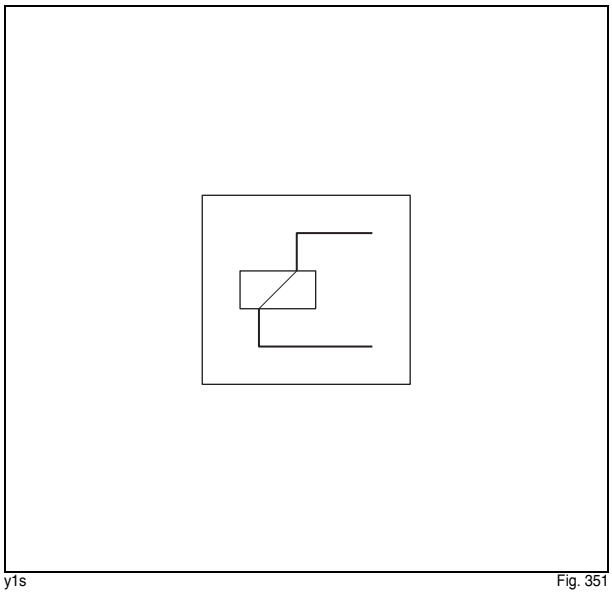
Description



332msm19 Fig. 350

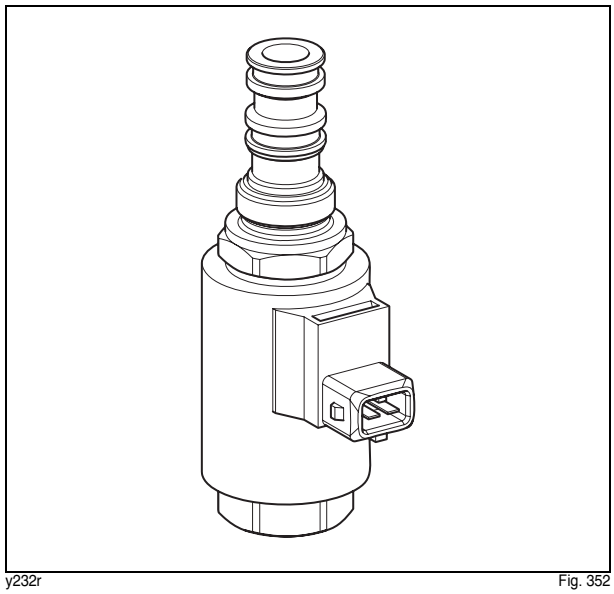
The 'K4 Y238' jaw clutch solenoid valve is an On/Off solenoid valve. The solenoid valve is supplied with "PWM" hashed current by the "A57-4 TCU" gearbox module.

Schematic diagram



y1s Fig. 351

Representation

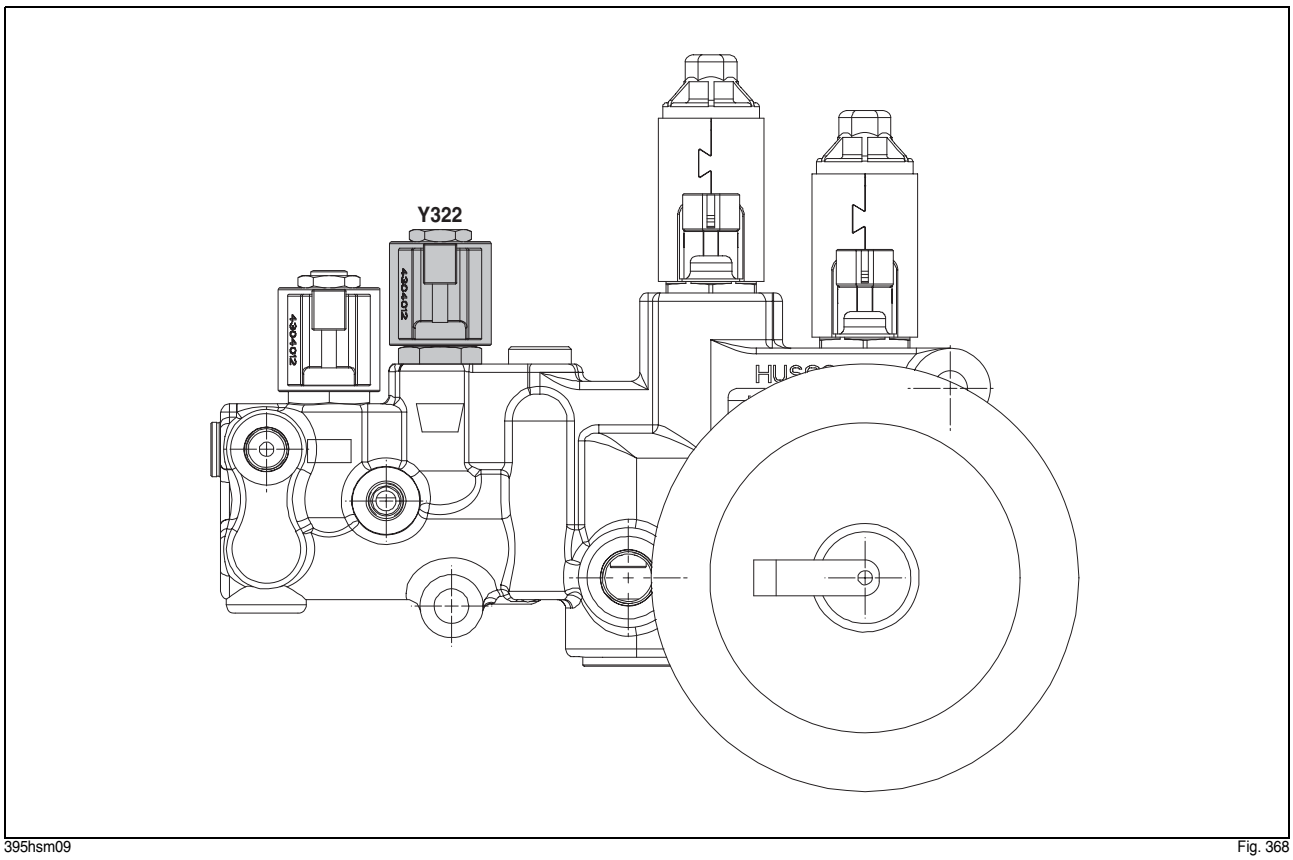


y232r Fig. 352

"Y322" lowering solenoid valve

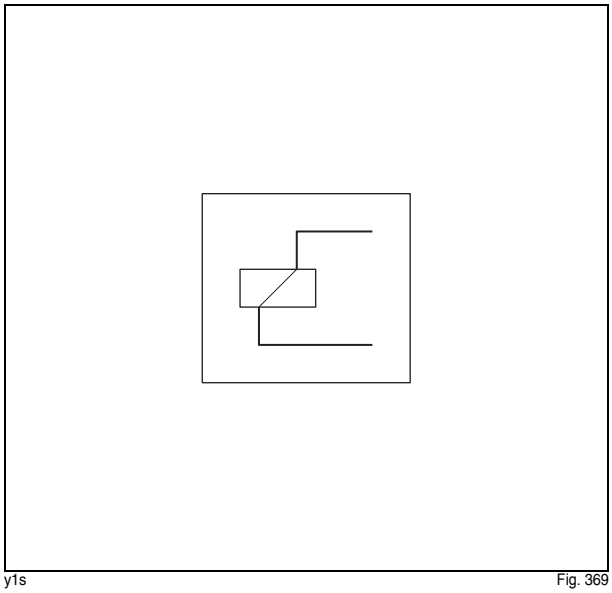
Description

The "Y322" lowering solenoid valve is of the all or nothing type. Control of the lowering solenoid valve is ensured by the "SFA A102" module.



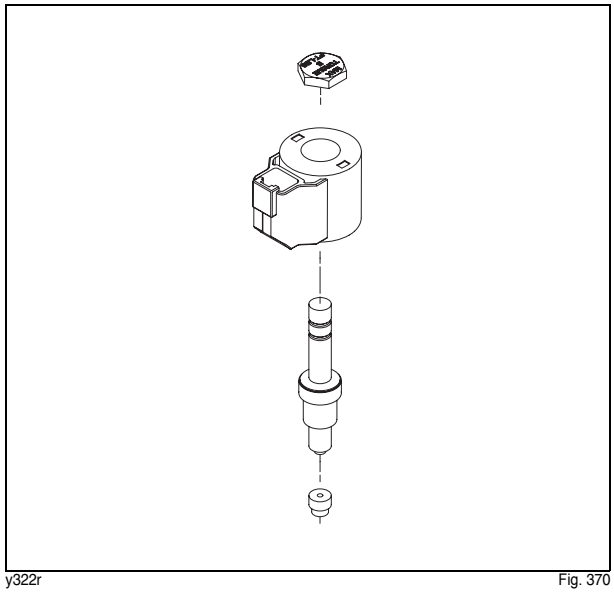
395hsm09 Fig. 368

Schematic diagram



y1s Fig. 369

Representation

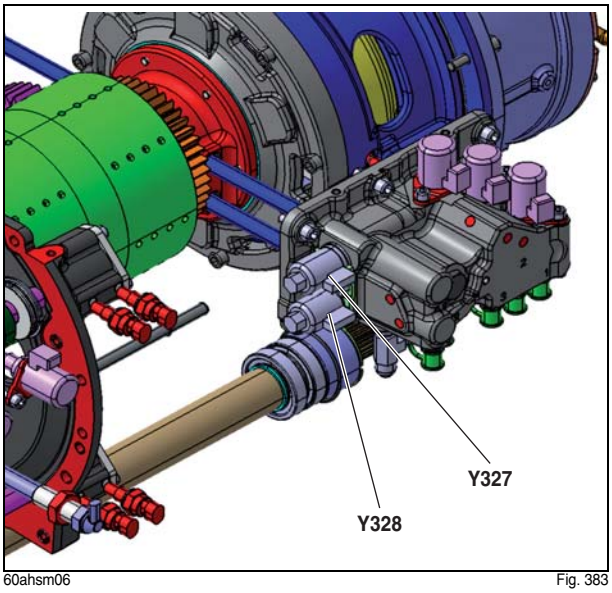


y322r Fig. 370

Solenoid valve of the "Revershift", "Y327", and "Y328"

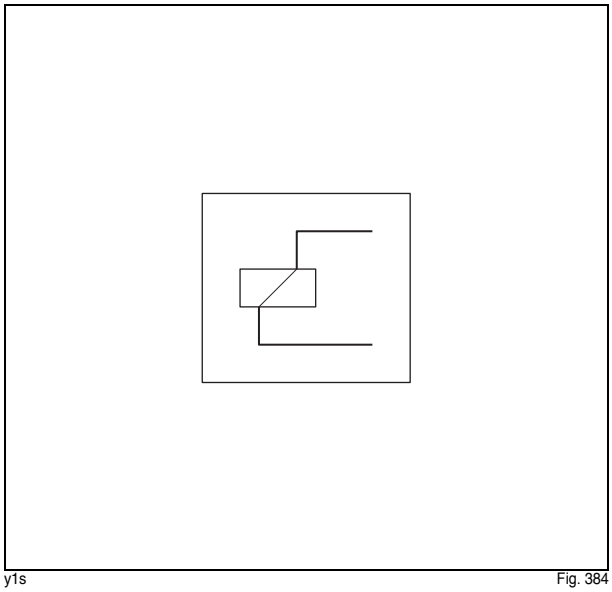
Description

The "PSVF Y327" forward driver and "PSVR Y328" reverse solenoid valves are of the proportional type. Solenoid valve control is ensured by the "TR1 A57-1" transmission module.



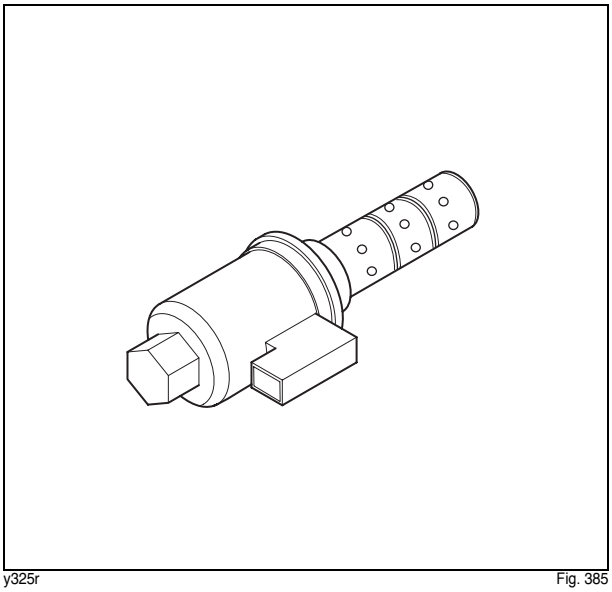
60ahsm06 Fig. 383

Schematic diagram



y1s Fig. 384

Representation



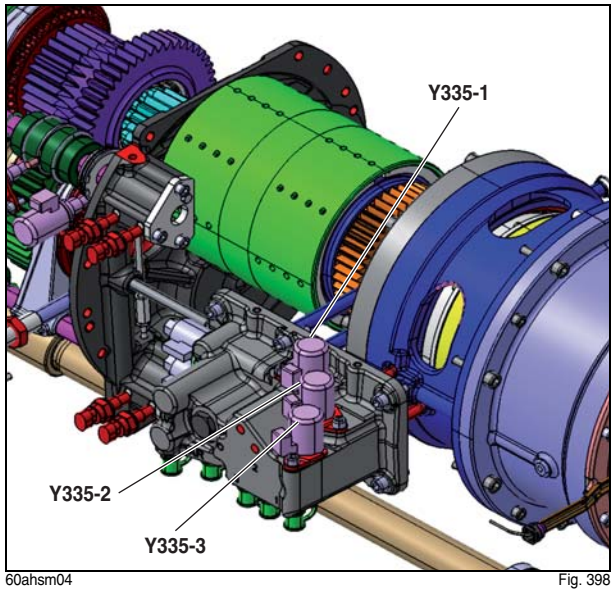
y325r Fig. 385

"Y335" gear under torque solenoid valve

Description

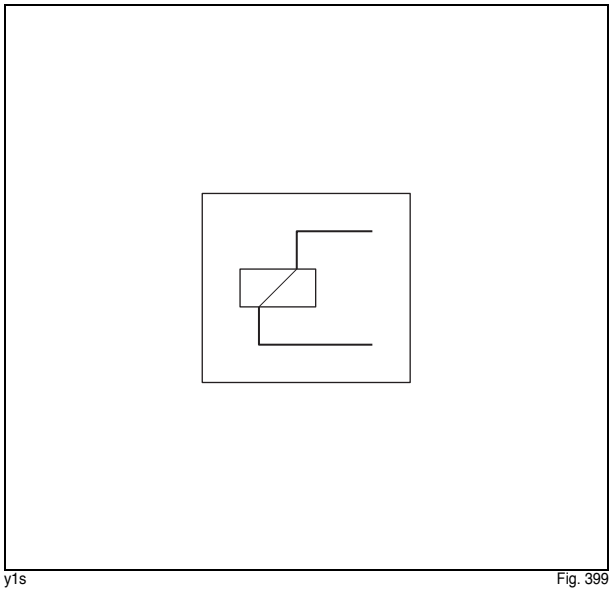
– The 3 "Y335-1", "Y335-2" or "Y335-3" gear under torque solenoid valves are of the all or nothing type.

– The solenoid valves are supplied with "PWM" hashed current, and controlled by the "TR2 A57-2" transmission module.



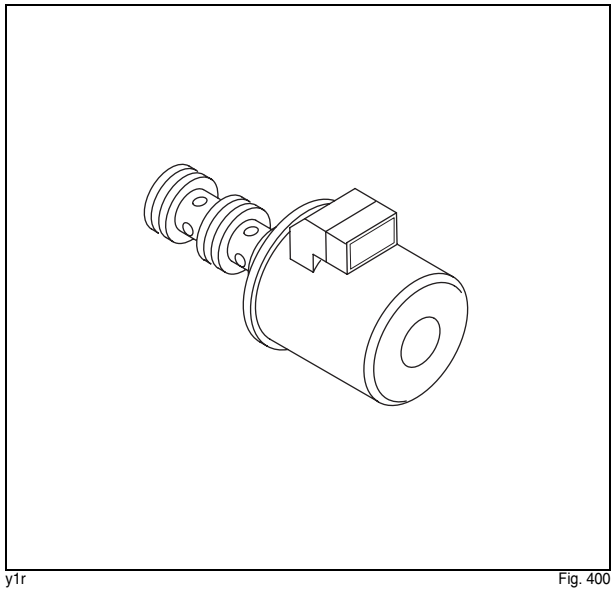
60ahsm04 Fig. 398

Schematic diagram



y1s Fig. 399

Representation



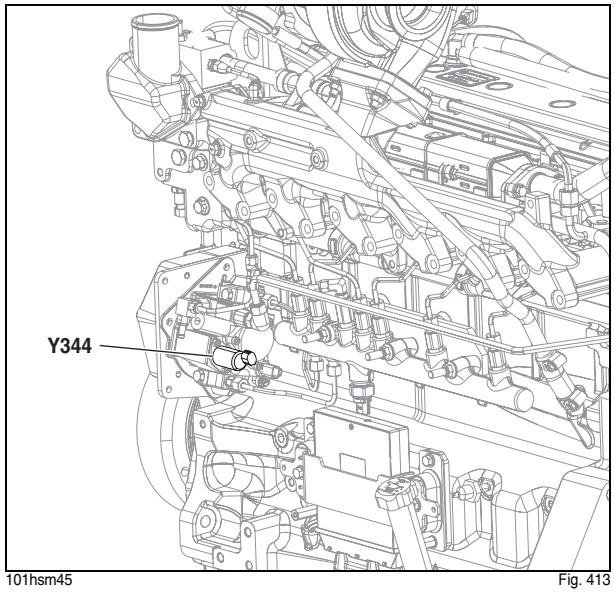
y1r Fig. 400

"Y344" dosage solenoid valve (high pressure pump)

Description

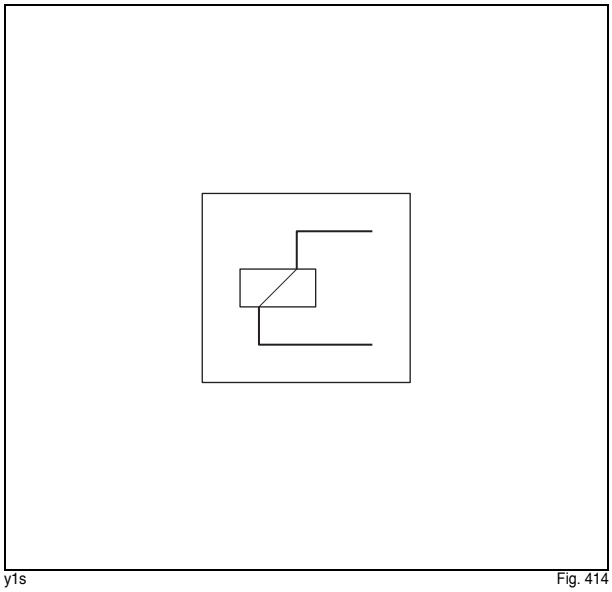
The electrovalve of the high pressure pump "Y344" is an On/Off electrovalve. The "ENG" module sends a "PWM" signal to the solenoid valve.

Important: The pump solenoid valve is at full flow rate when not supplied or disconnected.



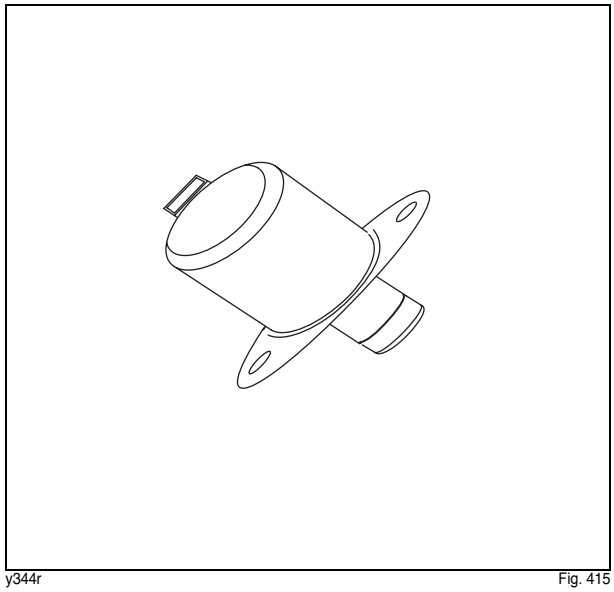
101hsm45 Fig. 413

Schematic diagram



y1s Fig. 414

Representation



y344r Fig. 415

Measurements and checks

See 'Solenoid' test method.

Checking the resistance of the solenoid valve

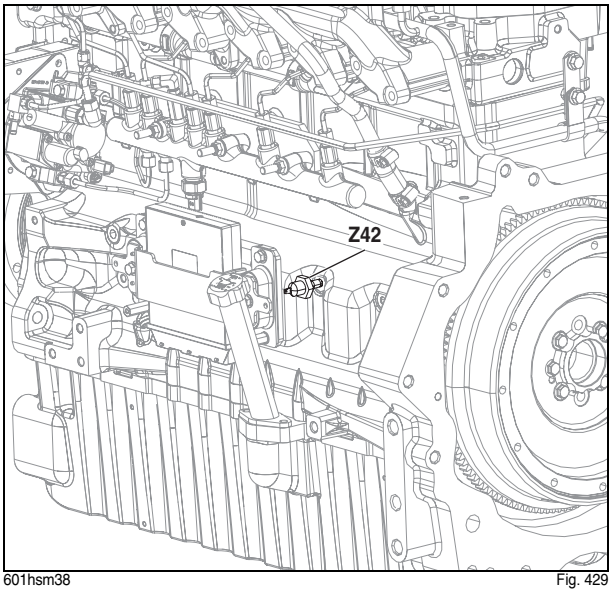
Test condition: Power off.

Connect the multimeter (ohmmeter function) in bypass on the solenoid valve. The resistance must be about 2 ohms.

"Z42" engine oil pressure switch

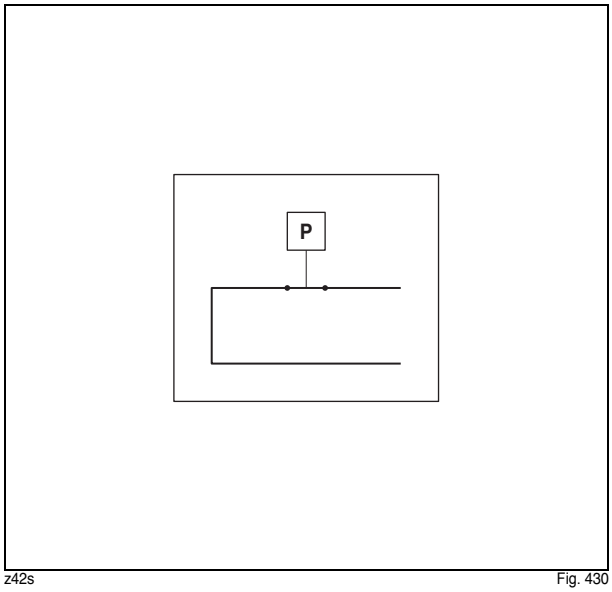
Description

The "Z42" engine oil pressure switch is a grounding contact.



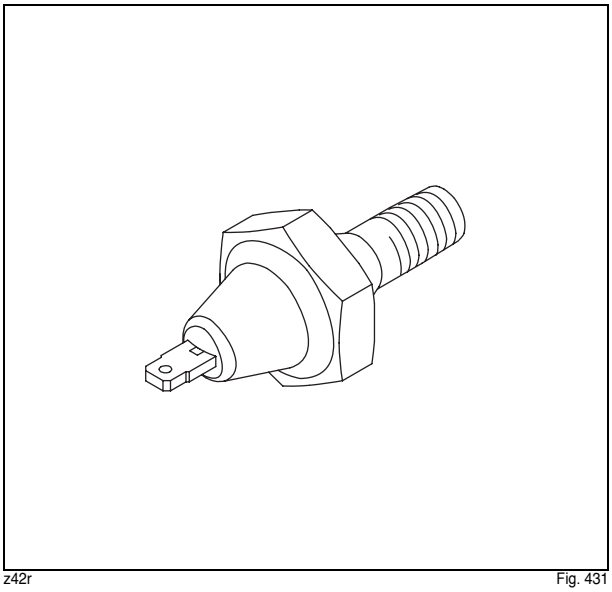
601hsm38 Fig. 429

Schematic diagram



z42s Fig. 430

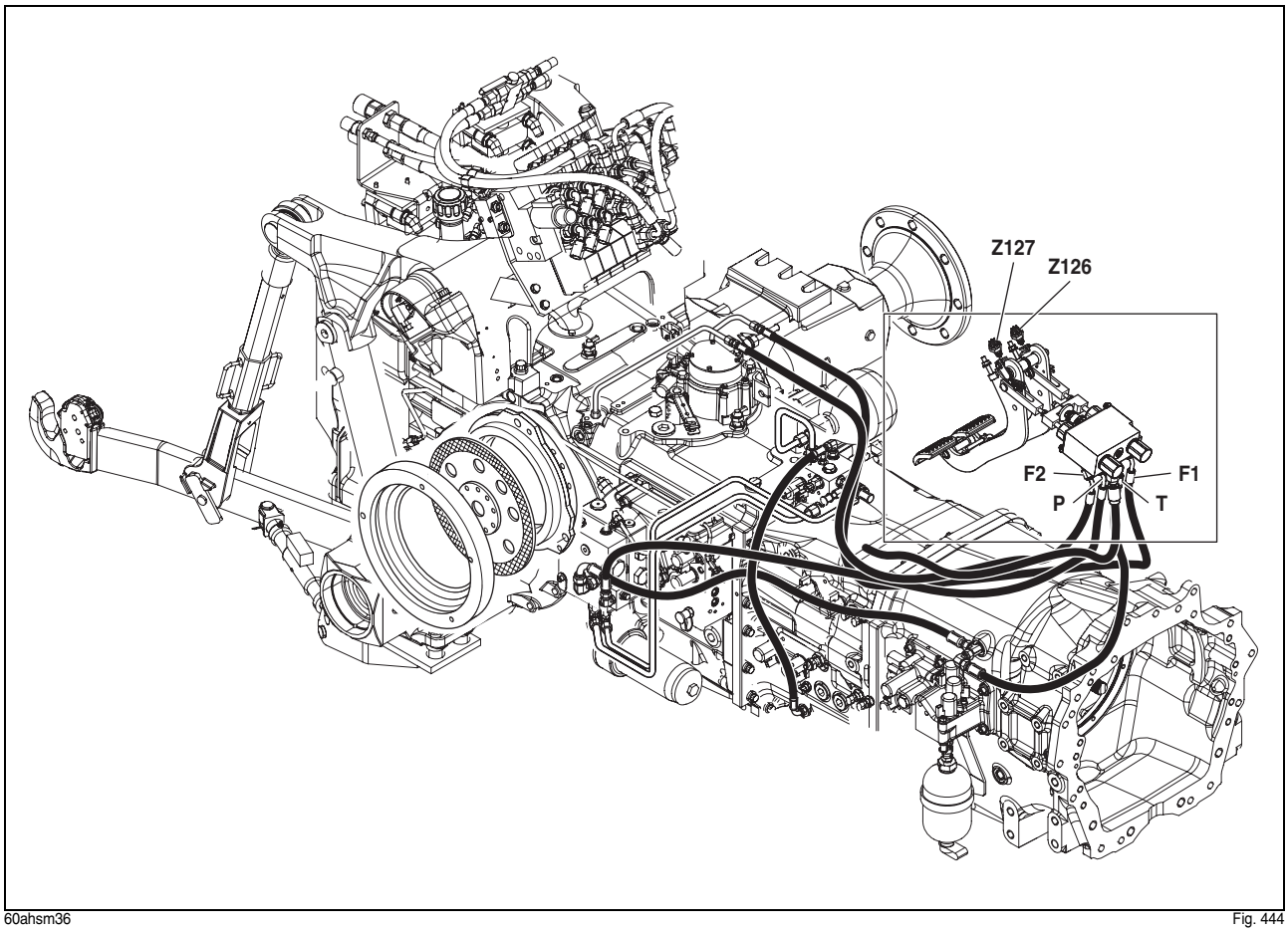
Representation



z42r Fig. 431

"Z126" left brake pedal contact

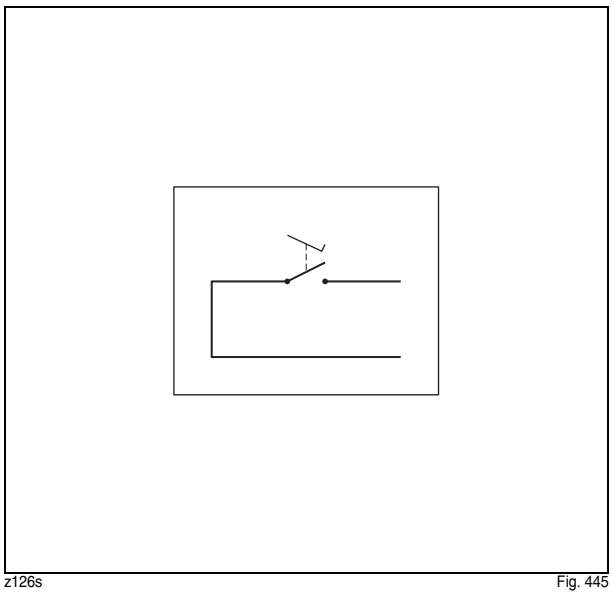
Description



60ahsm36 Fig. 444

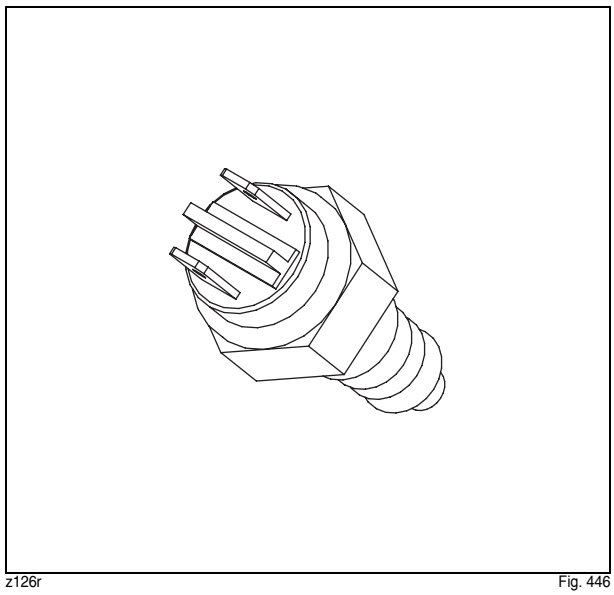
– The "Z126" left brake pedal contact is of the normally open type. It is controlled mechanically.

Schematic diagram



z126s Fig. 445

Representation



z126r Fig. 446

"Z152" pedal in low position contact

Measurements and checks

See 'Supply circuit contact' test method.

Voltage test

Test condition:

– Sensor connected.

– Tractor running.

– Reverser in neutral.

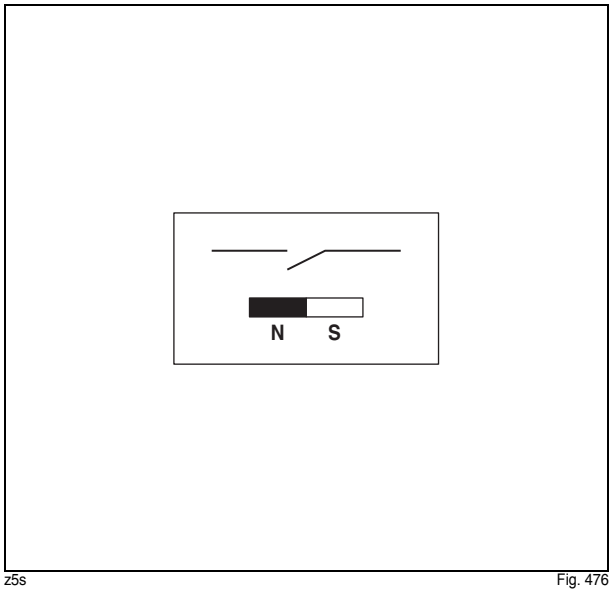
Connect a multimeter at the input and output of the contact to check the supply voltage and voltage of the output signal. With the pedal in high position, the supply votllge must be 12V and the voltage of the output signal 12V. With the pedal in the low position, the supply voltage must be 12V and the voltage of the output signal 0V.

"Z159" economic 540 power take-off contact

Description

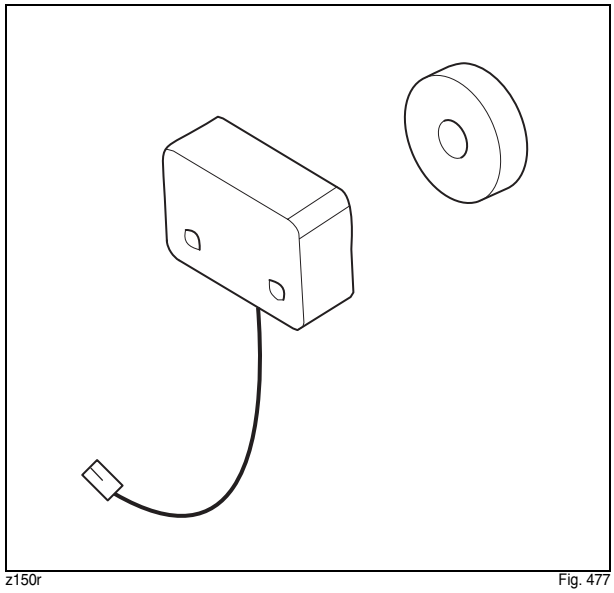
The "Z159" economic 540 rev/min power take-off engaged contact has flexible blades. The economic 540 rev/min power take-off speed command lever features a magnet closing the contact upon its approach.

Schematic diagram



z5s Fig. 476

Representation



z150r Fig. 477

Measurements and checks

See 'Flexible blade contacts' test method.

Continuity check

Test conditions: Power off.

Test condition with power off	Contact state	Continuity
Control lever in the economic 540 position	Closed	Yes
Control lever in the 540/1 000 position	Open	No

Power check

Test conditions:

– Power on.

– Engine running.

Test conditions with power on	Nominal voltage
Control lever in the economic 540 position	12 V
Control lever in the 540/1 000 position	0 V

CONTENTS

TEST METHODS

Test methods

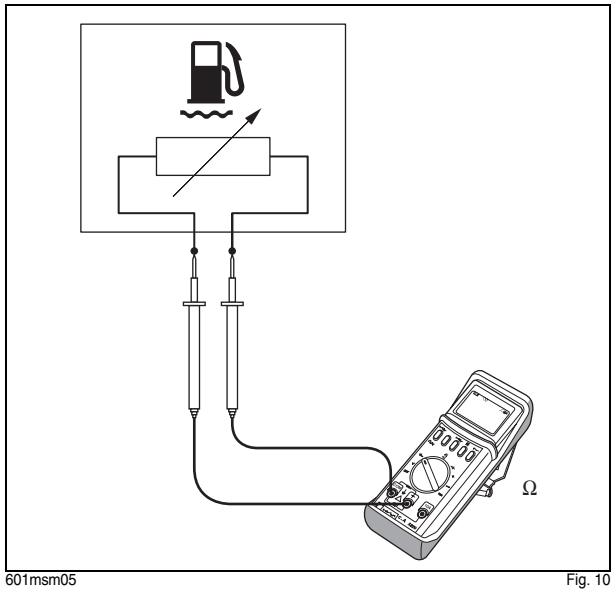
Water detector

Resistance test

Test conditions: sensor immersed in water or not.

– Check the evolution of resistance according to the presence of water.

– With the sensor disconnected, connect a multimeter (ohmmeter function) in branch joint.



601msm05 Fig. 10

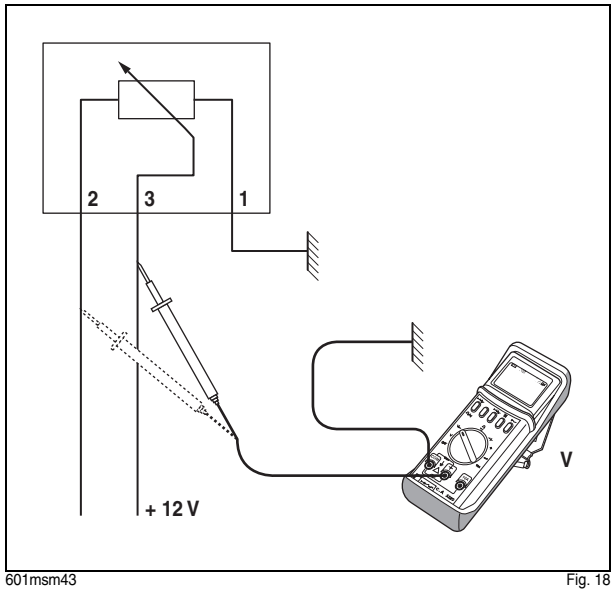
Pressure sensor (Rheostat)

Voltage test

Test conditions: power on.

– Check the sensor supply voltage. With the sensor connected, connect a multimeter (voltmeter function) in branch joint.

– Check the voltage variation of the signal according to pressure variation. With the sensor connected, connect a multimeter (voltmeter function) in branch joint.



601msm43 Fig. 18

Proportional solenoid valve

Current test

– Test conditions:

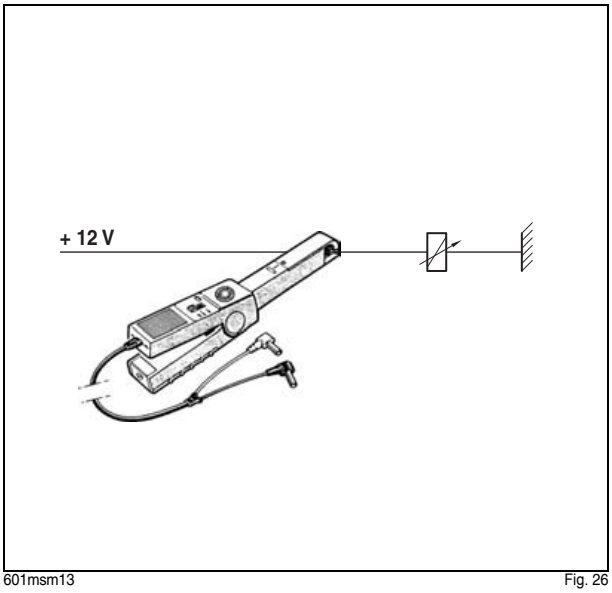
– Power on.

– Power supplied to solenoid valve.

• Check increase in current consumed by the solenoid valve.

• Connect a multimeter n° 60 0500 674 4 (ammeter function) in series.

• Use cable n° 60 0500 573 4 or an amperometric clamp on the solenoid valve supply wire.



601msm13 Fig. 26

Resistance test

Test conditions:

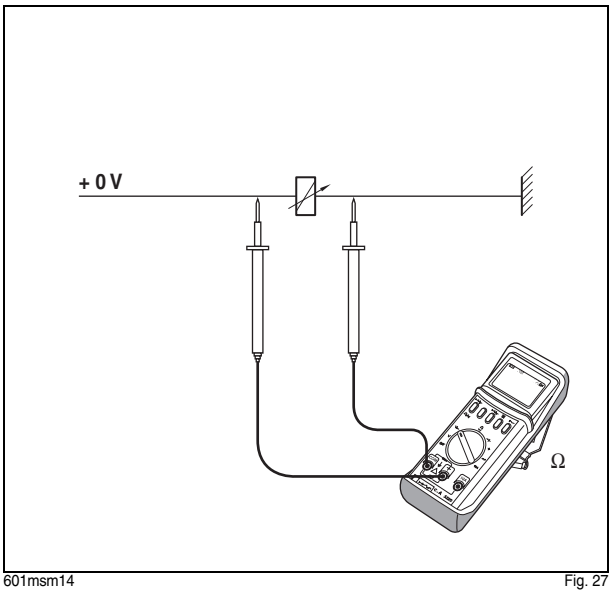
– Power off.

– Solenoid valve disconnected.

• Check coil resistance at the solenoid valve terminals.

• With the solenoid valve disconnected, connect a multimeter n° 60 0500 674 4 (ohmmeter function) in parallel.

• Use cable n° 60 0500 573 4.



601msm14 Fig. 27

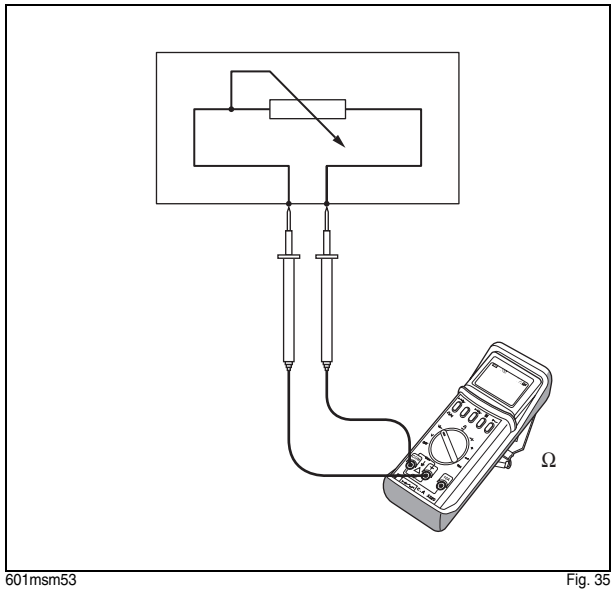
Potentiometer

Resistance test

Test conditions: controlled rotation of the potentiometer.

– Check the progress of resistance according to the rotation angle.

– With the potentiometer disconnected, connect a multimeter (ohmmeter function) onto the terminals.



601msm53 Fig. 35