

6. Electric Pressure Gauge (dia. 52 mm)

Contents	Page
6.1 General informations	6 - 2
6.2 Technical data	6 - 4
6.3 Pressure sensors	6 - 6
6.4 Wiring diagrams	6 - 12
6.5 Testing instructions	6 - 13
6.6 Instruments survey	6 - 15
6.7 Installation instructions	6 - 17

6. Electric Pressure Gauge (dia. 52 mm)

6.1 General Informations

The electric pressure gauge has been designed for land-bound vehicles or stationary systems only (exception: motorcycles).

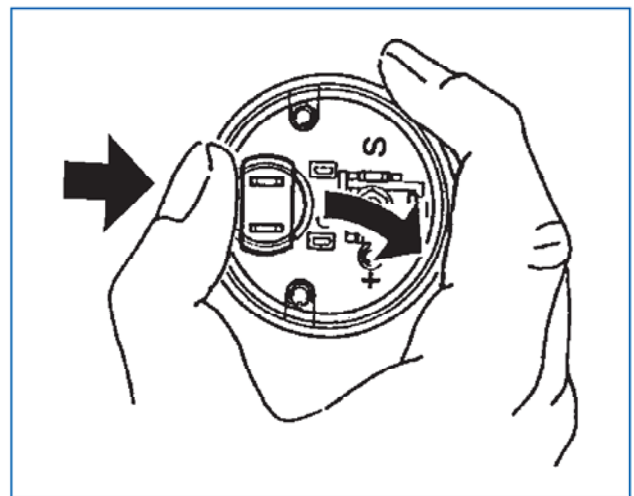
The instrument has an analog pressure display graduated in bar or kPa.

Pressure sensors of the following types, adapted to the indicator pressure range, can be used:

negative earth,
insulated earth,
negative earth with warning contact.



The lamp socket is clipped in.
To replace the light bulb, carefully, with the thumb,
push the lamp holder out to the side.



6. Electric Pressure Gauge (dia. 52 mm)

6.1 General Informations

Designation of functions

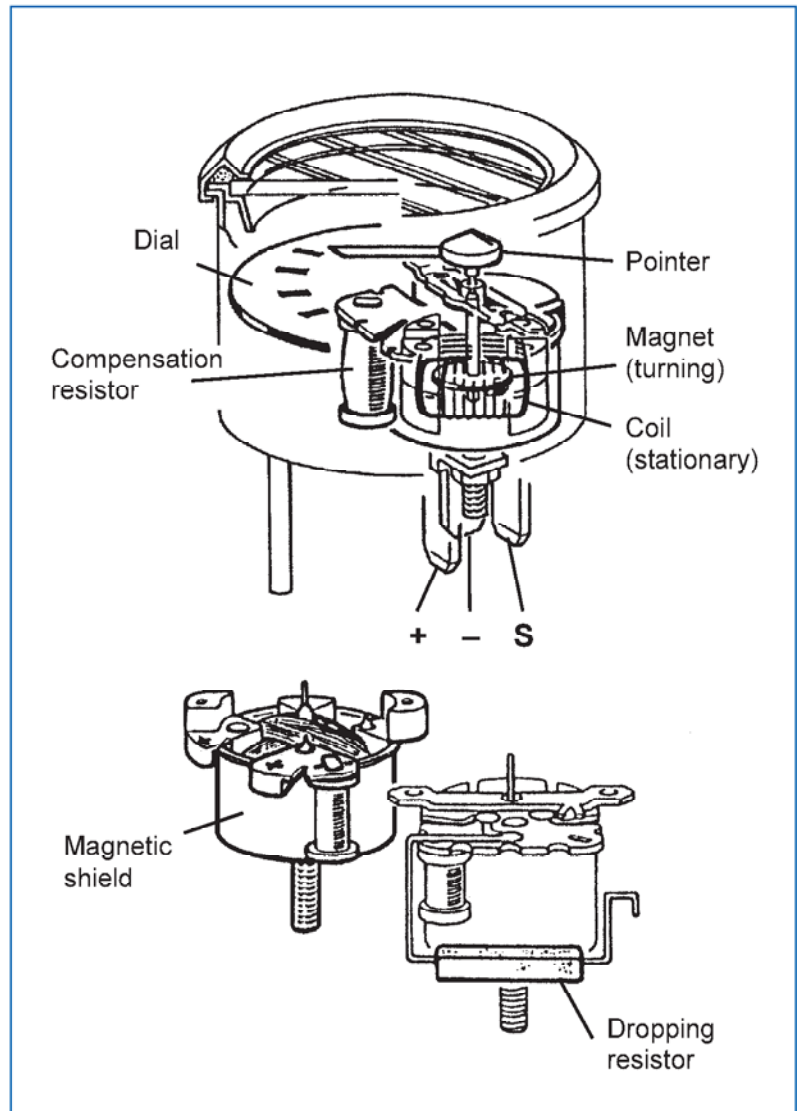
Movement: System Ke (90°)

(Turning magnet movement for ratio indication, maximum pointer travel 90°)

The pressure indicator applies the resistance measurement principle. A sensor converts the measured pressure to a corresponding resistance value. A turning magnet ratio measuring movement measures this resistance value. This value is displayed by a pointer moving over a dial graduated in pressure units. The turning magnet movement for ratio measurement comprises three stationary coils wound at 90° against each other, and a rotating permanent magnet disk in these coils. The coils are connected in a circuit for ratio measurement, so that the instrument is insensitive to on-board voltage fluctuations.

This means that the pointer travel is only a function of the magnitude of the current flowing through the measuring system.

A magnetic shield prevents effects of external magnetic fields, indication errors due to temperature changes are corrected by a compensating resistor. A dropping resistor is used to adapt the measuring movement to higher operating voltages (e. g. 24V).



6. Electric Pressure Gauge (dia. 52 mm)

6.2 Technical Data

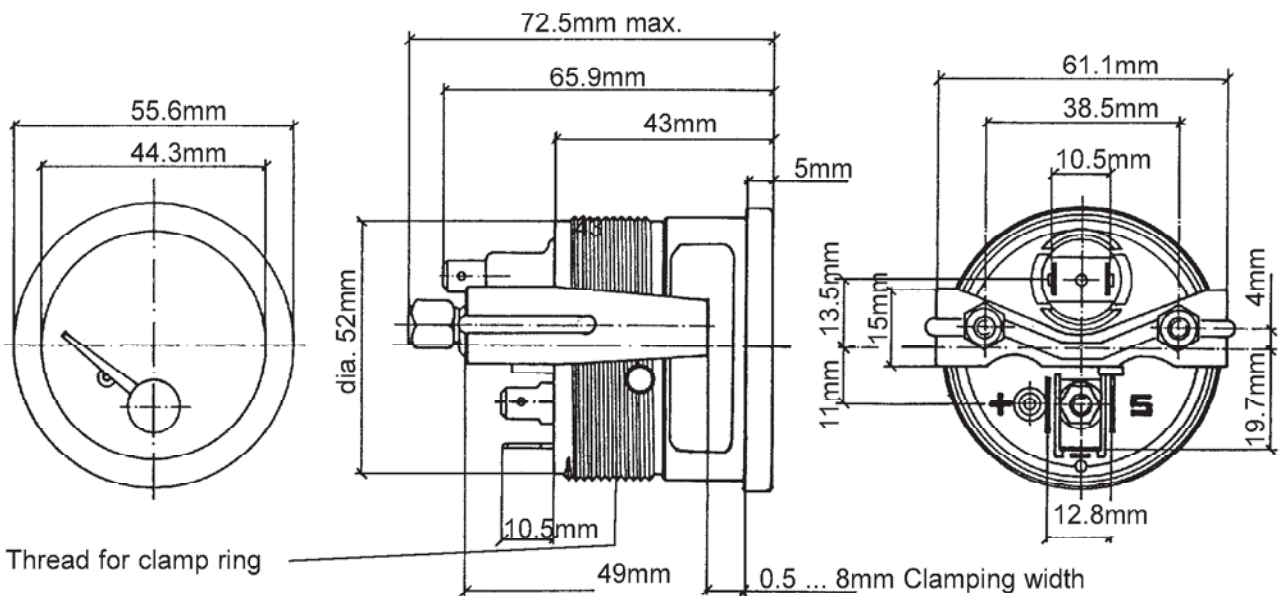
Operating voltage:	11 ... 16 V or 21.5 ... 30 V
Movement:	System Ke (90°)
Current consumption:	82 mA (without illumination)
Operating temp.:	- 30°C ... + 85°C
Storage temperature:	- 40°C ... + 90°C
Illumination:	1 light bulb 14 V, 3.4 W or 24 V, 3 W, 2 colour caps (only at 12 V)
Protection:	IP64 DIN 40050 from the front reverse-polarity protection
Vibration resistance:	max. 1g eff., 25 ... 2000 Hz, duration 8h, f: 1 octave/min.
Nominal position:	NL 0 to NL 90, DIN 16257

VDO cockpit vision
dia. 52 mm Backlight

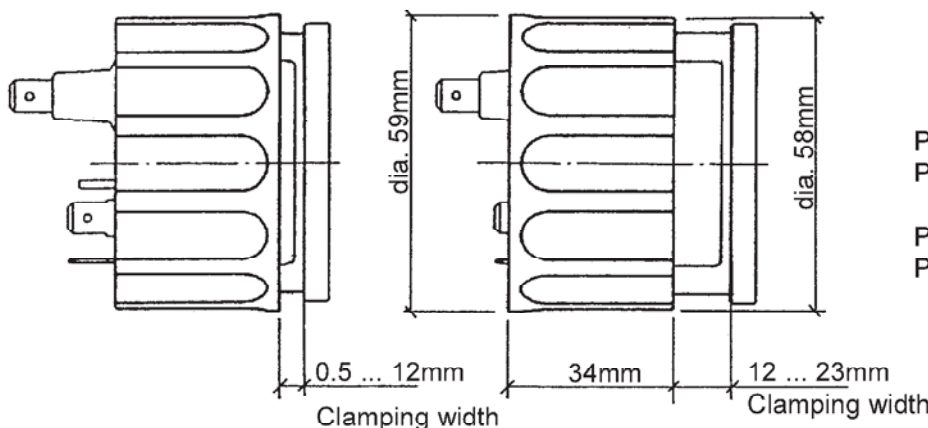


Mounting hole: dia.53mm

Sensor:
pressure sensor (diaphragm),
not included.



Thread for clamp ring



Pin assignment:

Pin +: + 12 V or + 24 V,
terminal 15

Pin -: Ground, terminal 31

Pin S: Sensor

6. Electric Pressure Gauge (dia. 52 mm)

6.2 Technical Data

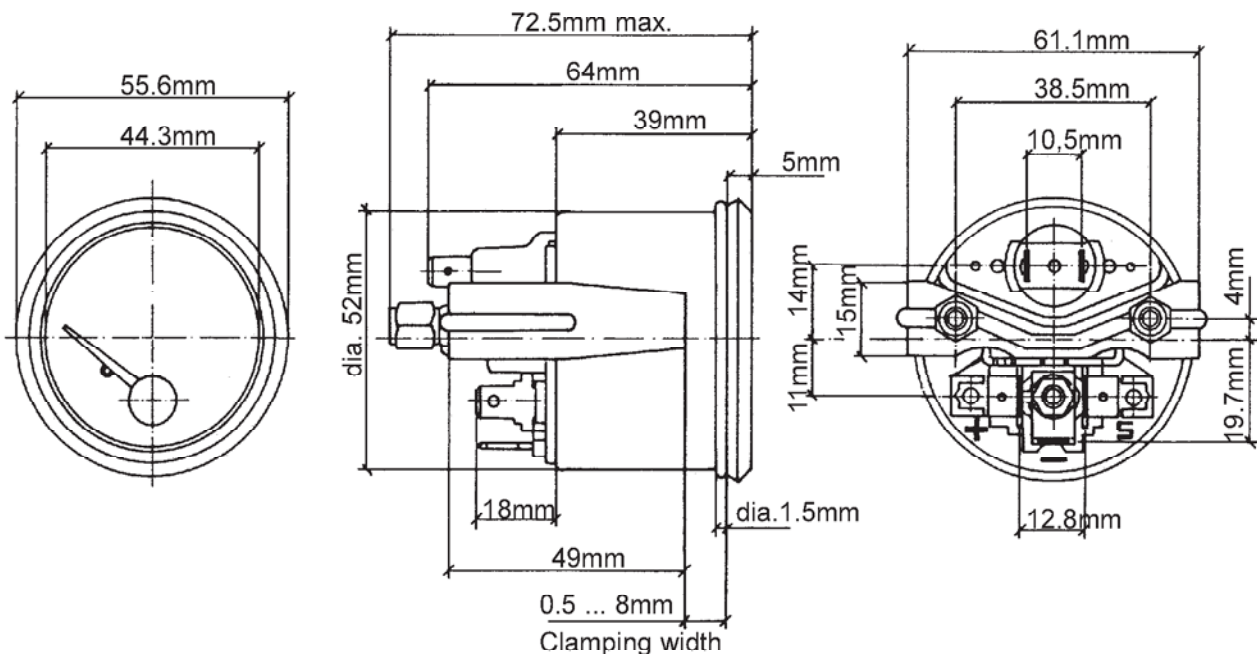
Operating voltage:	11 ... 16 V or 21.5 ... 30 V
Movement:	System Ke (90°)
Current consumption:	82 mA (without illumination)
Operating temp.:	- 30°C ... + 85°C
Storage temperature:	- 40°C ... + 90°C
Illumination:	1 light bulb
	14 V, 3.4 W or 24 V, 3 W
Protection:	IP64 DIN40 050 from the front
	reverse-polarity protection
Vibration resistance:	max. 1g eff., 25 ... 2000 Hz, duration 8h, f: 1 octave/min.
Nominal position:	NL 0 to NL 90, DIN 16257

VDO cockpit international
dia. 52 mm Floodlight



Mounting hole: dia. 53mm

Sensor:
 pressure sensor (diaphragm),
 not included.



Pin assignment:

Pin +: + 12 V or + 24 V,
 terminal 15

Pin -: Ground, terminal 31

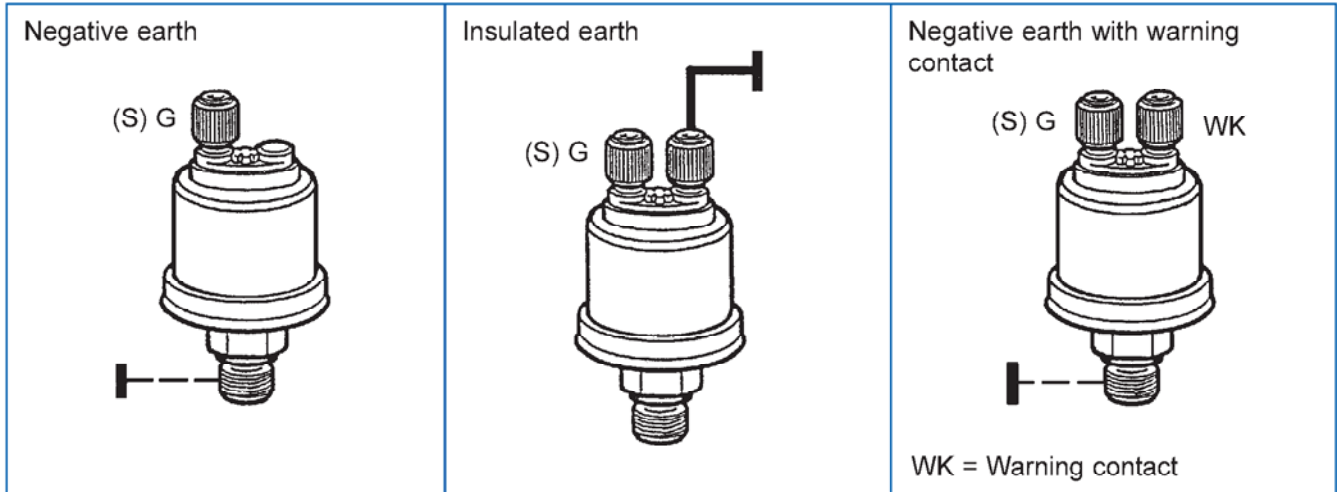
Pin S: Sensor

6. Electric Pressure Gauge (dia. 52 mm)

6.3 Pressure Sensors

The pressure sensors needed to operate the instrument is not included with the instrument.

The following pressure sensors (see data sheets for sensors) adapted to the instrument indicating range, can be used:




The sensor is installed in the oil circuit at a position specified by the vehicle manufacturer (e.g. oil pressure switch). Use an adequate parts kit if a direct installation is not possible at this location.

To mount the pressure sensor it is absolutely only to use the hexagon nut.

If the connection thread is cylindrical, a sealing washer or a sealing ring made of copper must be fitted.

The values mentioned in the following table for the maximum tightening torque (Nm max.) refer exclusively to the load-bearing capacity of pressure sensors.

 Prior to using the pressure sensor, it is important to ask the manufacturer of the vehicle, equipment system or engine in each instance for the maximum torque [? Nm max.] value for the threaded hole into which the pressure sensor is to be screwed. Non-observance of the maximum thightening torque specified for the threaded hole in each instance can result in damage to the vehicle, engine or equipment system.

Thread	max.
M 10 x 1	30 Nm
1/8 in. BSPF	30 Nm
1/8 - 27 NPTF	30 Nm
R 1/8 DIN 2999	30 Nm
M12 x 1.5	40 Nm
M12 x 1	50 Nm
M14 x 1.5	60 Nm
1/4 in. BSPF	60 Nm
1/4 - 18 NPTF	60 Nm
3/8 - 18 NPTF	60 Nm
M 16 x 1.5	80 Nm
3/8 - 18 Dryseal NPTF	80 Nm
M 18 x 1.5	100 Nm

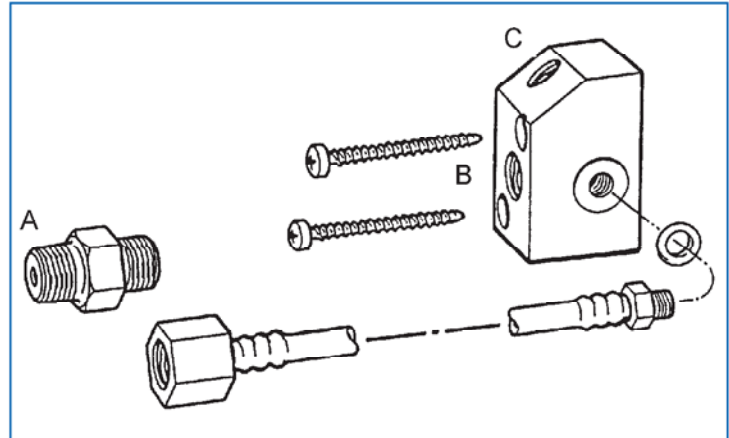
6. Electric Pressure Gauge (dia. 52 mm)

6.3 Pressure Sensors

Adaptor kits for oil pressure sensors

Adaptor kit with pressure hose

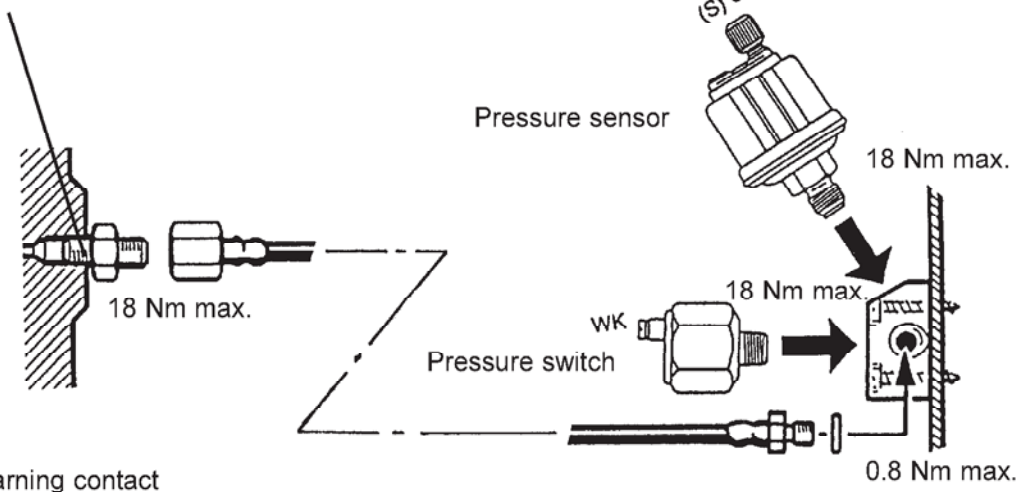
Kit includes: coupling, pressure hose (1000 mm long), adaptor, gasket and 2 screws.



Part No.	Thread A	Thread B	Thread C
X11.360/004/023	M12 x 1.5 con.	M12 x 1.5	M10 x 1
X11.360/004/024	M14 x 1.5 con.	M14 x 1.5	M10 x 1
X11.360/004/025	14 - 18 PTF SEA SHORT	1/4 - 18 NPTF	M10 x 1
X11.360/004/026	R1/8 DIN 2999	R 1/8 DIN 2999	M10 x 1

Ask for the maximum torque (? Nm max.) from the engine manufacturer, equipment manufacturer or car manufacturer.

 ? Nm max.



6. Electric Pressure Gauge (dia. 52 mm)

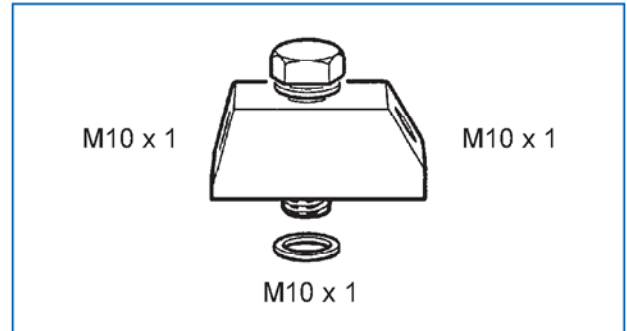
6.3 Pressure Sensors

Adaptor kits for oil pressure sensors

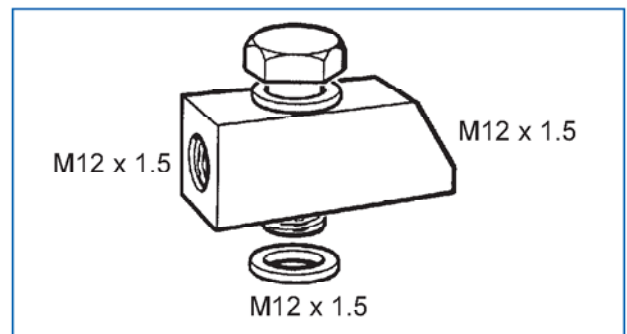
Adaptor kit with 2 connections

Kit includes: hollow screw, adaptor and 2 gaskets

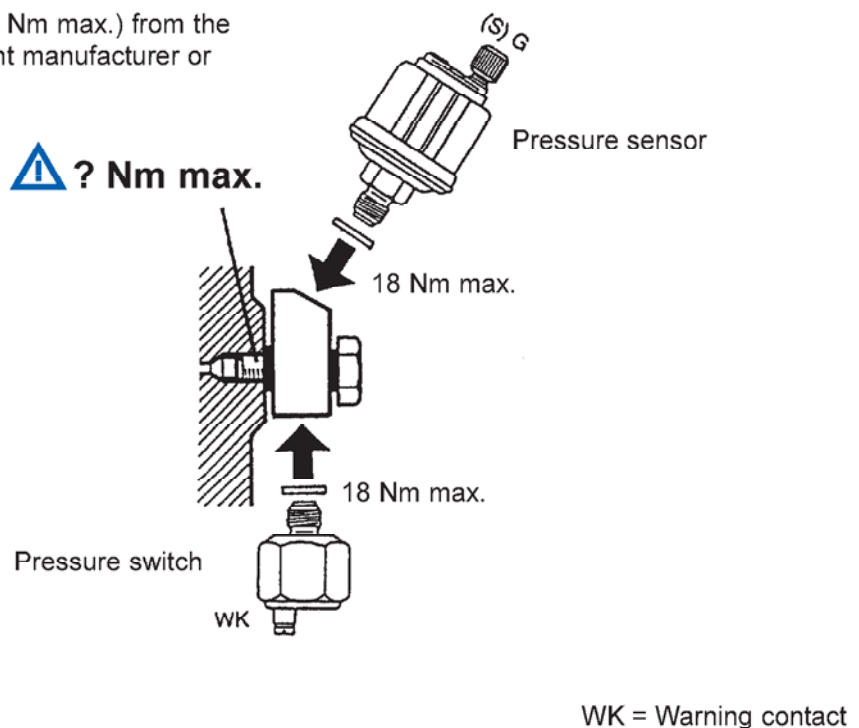
Part No. X11.360/004/020



Part No. X11.360/004/021



Ask for the maximum torque (? Nm max.) from the engine manufacturer, equipment manufacturer or car manufacturer.



6. Electric Pressure Gauge (dia. 52 mm)

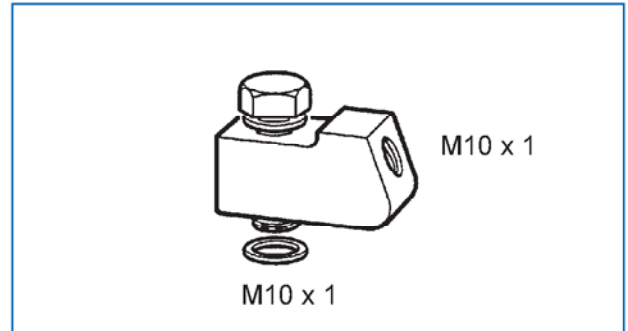
6.3 Pressure Sensors

Adaptor kits for oil pressure sensors

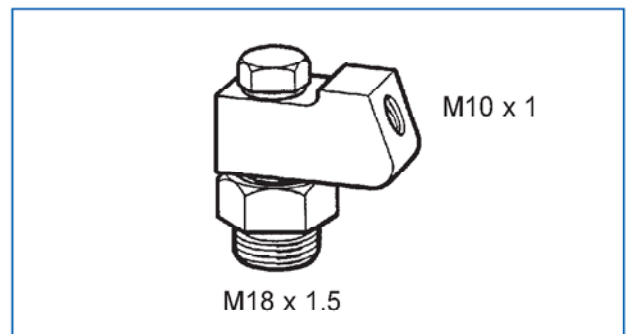
Adaptor kit with 1 connection

Kit includes: hollow screw, adaptor and 2 gaskets

Part No. X11.360/004/005

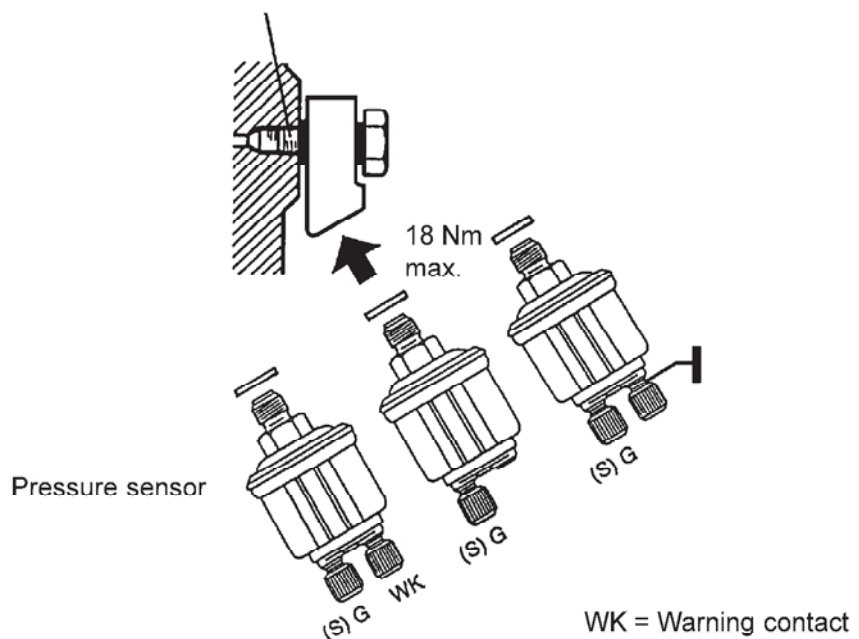


Part No. X11.360/004/027



Ask for the maximum torque (? Nm max.) from the engine manufacturer, equipment manufacturer or car manufacturer.

 ? Nm max.



6. Electric Pressure Gauge (dia. 52 mm)

6.3 Pressure Sensors

Adaptor kits for oil pressure sensors

Coupling

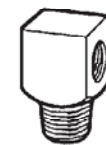
Part No. X11.360/004/011

M10 x 1



M16 x 1.5

Part No. X11.360/004/029

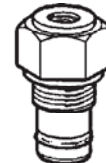


M12 x 1.5

M14 x 1.5 con.

Part No. X11.702/002/044

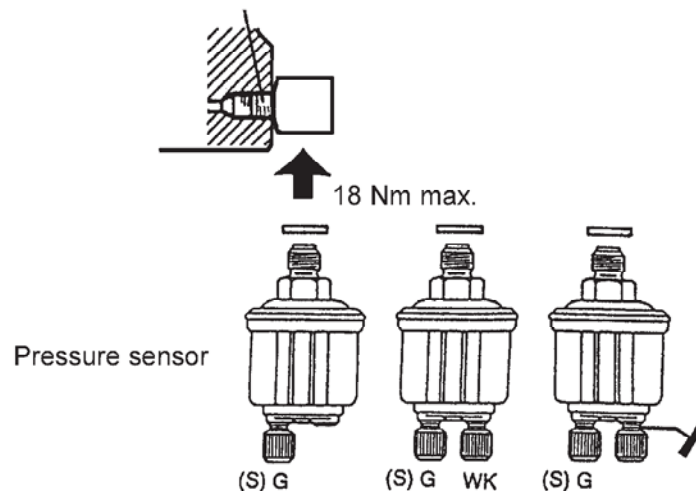
M10 x 1



M18 x 1.5

Ask for the maximum torque (? Nm max.) from the engine manufacturer, equipment manufacturer or car manufacturer.

 ? Nm max.



WK = Warning contact

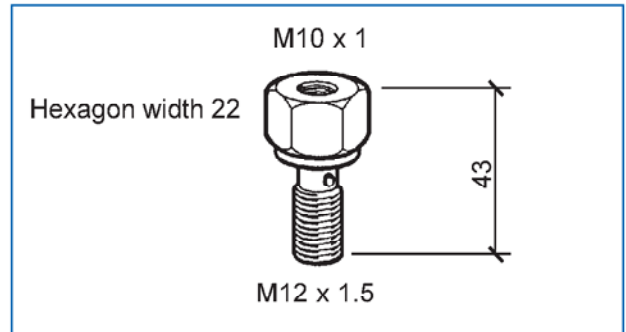
6. Electric Pressure Gauge (dia. 52 mm)

6.3 Pressure Sensors

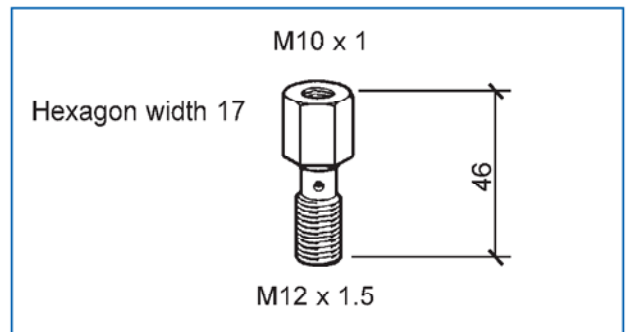
Adaptor kits for oil pressure sensors

Coupling (hollow screw)

Part No. X11.360/004/016



Part No. X11.360/004/019



Coupling (hollow screw)

Pressure hose

Pressure sensor

18 Nm max.

(S)G

(S)G

(S)G WK

WK = Warning contact

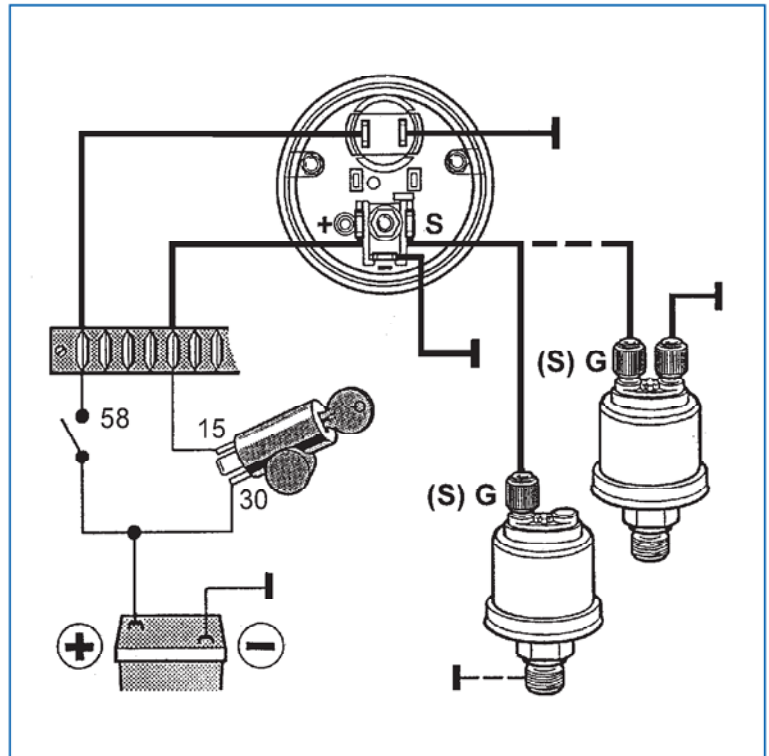
Ask for the maximum torque (? Nm max.) from the engine manufacturer, equipment manufacturer or car manufacturer.

6. Electric Pressure Gauge (dia. 52 mm)

6.4 Wiring Diagrams

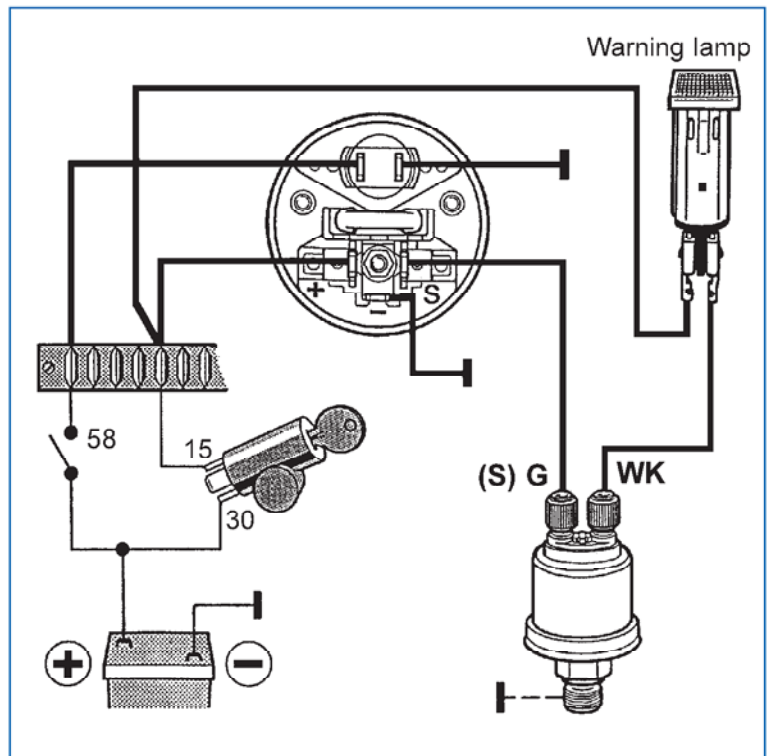
Pressure sensor:

negative earth
or
insulated earth



Pressure sensor with warning contact:

negative earth



WK = Warning contact

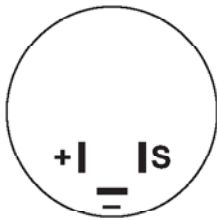
6. Electric Pressure Gauge (dia. 52 mm)

6.5 Testing Instructions

Test accessories

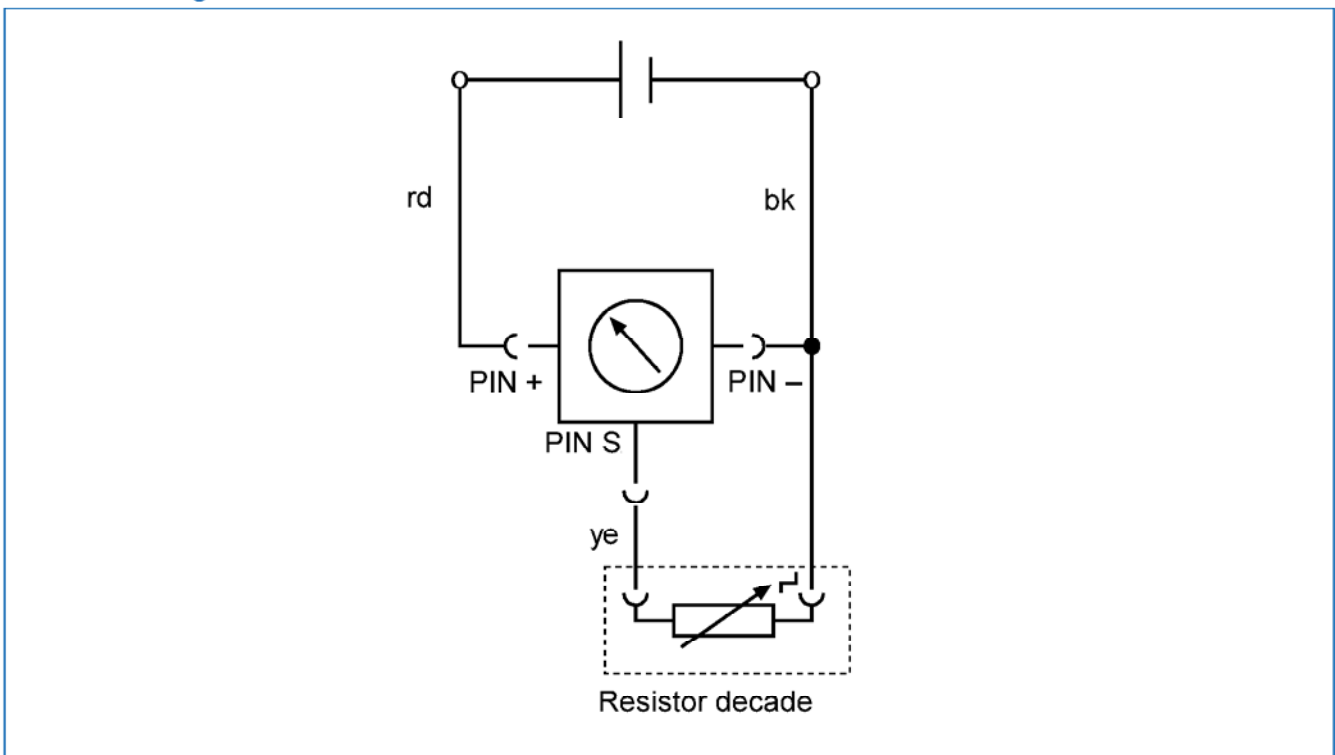
1x Power supply	} contained in test cables kit X12.019/101/001
1x Test cable No. 3	
1x Measuring cable	
1x Resistor decade	

Pin allocation



Pin + + 12V or + 24V
Pin - Ground
Pin S Sensor signal input

Test circuit diagram



Test method description

Basic settings:	12 V instruments	»»»»	14 V
	24 V instruments	»»»»	28 V

Start the pointer position test with the highest resistance value!

6. Electric Pressure Gauge (dia. 52 mm)

6.5 Testing Instructions

Test of the movement

Connect the instrument as shown in the test circuit diagram, using test cable 3.

The indication can be tested with the resistor decade 'sensor simulator'.

The pointer moves to full scale deflection if the resistor decade is not connected.

The following tables shows the resistance values and the indication in angular degrees.

0 to 2 bar

Indication (bar)	0	1	2
Resistance (Ω)	10	99	184
Deflection ($^\circ\angle$)	0	41,4	87,4

0 to 5 bar

Indication (bar)	0	0,5	1	1,5	2	2,5	3	3,5	4	4,5	5
Resistance (Ω)	10	30	48	65	82	99	116	134	151	168	184
Deflection ($^\circ\angle$)	0	6,4	13,4	21,3	30,6	41,4	53	64,6	74,2	81,6	87,4

0 to 10 bar

Indication (bar)	0	1	2	3	4	5	6	7	8	9	10
Resistance (Ω)	10	31	52	71	88	106	124	140	155	170	184
Deflection ($^\circ\angle$)	0	6,8	15,2	24,4	34,3	46,2	58,3	68,2	76,1	82,4	87,4

0 to 25 bar






Indication (bar)	0	2,5	5	7,5	10	12,5	15	17,5	20	22,5	25
Resistance (Ω)	10	32	53	73	92	109,1	125	143	155	169	184
Deflection ($^\circ\angle$)	0	7,1	15,6	25,5	36,8	42,7	58,9	69,9	76,1	82	87,4

6. Electric Pressure Gauge (dia. 52 mm)

6.6 Instruments Survey


VDO cockpit vision (Backlight) dia. 52 mm

Part No. 350 010 . . .

Dial		Special feature	Part No.
Range	Imprint		
0 ... 5 bar	bar 	Clamp ring 12 V	008 K
0 ... 5 bar	bar 	Stud bolts 12 V	014 K
0 ... 10 bar	bar 	Clamp ring 12 V	007 K
0 ... 10 bar	bar 	Stud bolts 12 V	015 K
0 ... 150 PSI 0 ... 10 bar	PSI, bar 	Dual scale, clamp ring 12V without colour caps	019 C

VDO cockpit vision (Backlight) dia. 52 mm

Part No. 350 020 . . .








Dial		Special feature	Part No.
Range	Imprint		
0 ... 10 bar	bar 	Clamp ring 24 V without colour caps	001 C

6. Electric Pressure Gauge (dia. 52 mm)

6.6 Instruments Survey












VDO cockpit international (Floodlight) dia. 52 mm

Part No. 350 030 . . .

Dial		Special feature	Part No.
Range	Imprint		
0 ... 5 bar	bar 	12 V	003 C 003 G
0 ... 10 bar	bar 	12 V	004 C 004 G
0 ... 25 bar	bar 	12 V	005 C 005 G
0 ... 10 bar	bar 	12 V	011 C 011 G
0 ... 5 x 100 kPa	kPa x 100 	12 V	016 C
0 ... 10 x 100 kPa	kPa x 100 	12 V	017 C
0 ... 80 psi 0 ... 5 bar	psi, bar 	12 V Dual scale	020 C

VDO cockpit international (Floodlight) dia. 52 mm

Part No. 350 040 . . .

Dial		Special feature	Part No.
Range	Imprint		
0 ... 2 bar	bar 	24 V	001 C
0 ... 5 bar	bar 	24 V	003 C 003 G
0 ... 10 bar	bar 	24 V	004 C 004 G
0 ... 25 bar	bar 	24 V	005 C 005 G
0 ... 10 bar	bar 	24 V	011 C 011 G
0 ... 5 x 100 kPa	kPa x 100 	24 V	016 C
0 ... 10 x 100 kPa	kPa x 100 	24 V	017 C
0 ... 80 psi 0 ... 5 bar	psi, bar 	24 V Dual scale	020 C
0 ... 10 bar 0 ... 150 psi	bar, psi 	24 V Dual scale	015 C
0 ... 400 psi 0 ... 25 bar	psi, bar 	24 V Dual scale	029 C 029 G
0 ... 5 bar	bar 	24 V	023 C

6. Electric Pressure Gauge (dia. 52 mm)

6.7 Installation Instructions

999 161 011: VDO cockpit vision

999 161 003: VDO cockpit international

See file 'Installation Instructions'. ▼

▼ will follow