INSTRUCTION FOR ONBOARD INSTALLATION

APPLICATION:

Mounting platform:

The machine installation can be done in differently desired directions, for this purpose an iron or sound wood Mounting Platform must be prepared and fixed firmly to the hull at the required height and perfectly square with the rudder stock.

A : Fastening of the iron base:

Before drilling the mounting platform, with the base (already drilled), make sure that:
1) The rudder is in a symmetrical position with the boat
2) The cylinder rod is in the intermediate position of its course (1/2 way)
3) The support base axis in parallel with the boat axis.
4) The support base is at the correct distance from the rudder centre; **"Distance between Centres"** to be **respected** after which the mounting platform may be drilled and the support base tightened with bolts.

B: Alignment between rudder axis and cylinder axis:

Before tightening the bolts, suitable thicknesses of packing should be used, (if the mounting platform could not be planed before) in a way that the inclination between the cylinder axis and the two gudgeon pins (tiller arm base), is not above 2°; errors within this range are compensated for by the ball joints on the cylinder rods.
A good alignment is to be preferred as well as the welded stops at the base angles, after tightening the bolts.

TUBING

Rigid tubing:

It is advisable to use steel tubing without welding (Mannesman) of different diameters as indicated in the drawing "Hydraulic Scheme"
The various connections must be made with steel flanges to be welded electrically to the tube, or threaded steel pipe fittings or welded steel pipe fittings; do not use hemp on the threaded pipe fittings but an appropriate Teflon tape, found on sale.
Check to see that the tubes are internally clean before assembling, fasten well with brackets so that they will not vibrate and do not pass inside the cold stores, even if the oil used is at a low freezing point.
The position of the tube connections "1" and "2" which go from the hydraulic transmitter to the device and then to the actuator must not be inverted.

Flexible tubing:

The flexible tubing should be mounted with the external fitting, using two spanners so no deformation occurs.
They should be free of any contact, so no rubbing occurs during working.

GENERAL DESCRIPTION

Hydraulic transmitter:

The transmitter consists of an axial piston pump, mounted on a pedestal or directly on the consolle using an anodized aluminium plate; manually operated by a wooden steering wheel, which sends oil to the actuator.

Electric joystick:

The **"fixed"** type of joystick, consists of a water-tight aluminium box in which are mounted two micro switches, these work by a spring lever which returns to the centre.
The **"portable"** type of joystick, consists of a water-tight aluminium casting with handle where the red and green operating buttons are installed.

Pumping set:

It provides the actuator with the hydraulic power necessary to steer the rudder within the conditions and time regulated by RINA or as agreed upon at time of order.
The execution of the pumping sets are as follows:
"W" transmission from onboard motor;
"X" transmission with indipendant electric motor;
"Y" transmission with compact electric motor;
The **"Y"** version represents the standard version, the tank acts as a base for the electric motor and is complete with filters, control and safety valves; the rudder control is obtained by an a electro-valve controlled by the electric joystick on the bridge.

Actuator: Steering gear type CL……..

One power cylinder with double effect and identical chambers mounted on one frame or base connect with a clevis to the tiller arm keyed on the rudder shaft.
A by-pass exclusion interception valve is supplied.

CONTROL SYSTEMS

Manual hydraulic system "A":

By turning the steering wheel the hydraulic pump/transmitter sends oil to the actuator/cylinder which moves the tiller arm, and thus the rudder shaft in the desired direction.

The power sent to the actuator is supplied by the operator and depends upon the diameter of the wheel, the ratio between the delivery of the hydraulic transmitter and c.c. of the actuator (the number of turns is decided on by this ratio), as well as the tube dimensions for reasons of friction.

NON PROPORTIONAL Electric system:

The electric joystick on the bridge, commands the opening of the pumping set control valve, oil is pressurized by the hydraulic pump of the pumping set, and moves the rudder actuator/cylinder until the lever or button of the electric tiller/joystick is left, in this case energy is required by the electric motor; but the control of the angular movement of the rudder happens by means of a rudder angle indicator.

EMERGENCY:

In case of an electric power failure the manouvre is always possible with the hydraulic transmitter. In case of the manual hydraulic system **"A"** failure proceed by opening the actuator/cylinder by-pass, and manouvre with the emergency tiller arm.

FILLING THE PLANT

1 Fill the pumping set tank, start the electric motor and check that it turns in the same direction as the hydraulic pump, if not stop the motor immediately and invert the elecctri cables.

2 Open the actuator/ cylinder by-pass valve, start the electric motor and electro-valve with the push button, it doesn't matter which of the two, but it's important to verify the direction; close the interception valve cocks mounted at the tube junctions (right and left) of the plant; check that the tank is full and close with a breather-less screw cap.

3 If provided, fill the compensation tank and its tubing until all the air has risen out the tank. Check that no air remains in the hydraulic pump/ transmitter, by unscrewing the filler cap and seeing if oil comes out, close with breather-less screw cap.
If no compensation tank is provided with the plant, it means that the transmitter/pump acts as a tank (in case of a double command station, the control must be done before on the first station which is the lowest with breather-less cap, and the second station which is higher must be filled).

4 The filling of the main tubing, must be done in the following way:
* Take off the hydraulic pump/transmitter tubing (always the highest if a double station) insert a small plastic hose onto the pump connection and place the other end in a bucket;
* Close with a cap the unsrewed hydraulic pump/ transmitter tubing;
* Fill the hydraulic pump/transmitter or compensation tank with oil and turn the steering wheel in the same direction as the other tubing connected to the pump.
* Continue turning and filling with oil until all the air is bled from the system by checking the hose in the bucket.
* Check that the oil comes out clean and without air bubbles, stop turning the wheel and stop filling with oil, now reconnect the tubing to the pump.

NB: The recuperated oil in the bucket may be reused, but must be left to decant for the elimination of dirt and oil emulsion obtained during its movement in the tubing.

5 Move to the rudder actuator/cylinder:
* Take off the air-bleeder screw and wait until oil comes out, check and fill the hydraulic pump/ transmitter or compensation tank.
* Close the air bleeder screw and the by-pass valve opened at point **2** and reopen the interception valve cocks of pumping set closed at point **2** of this filling procedure.

TESTING THE PLANT

Check list:

* By-pass: **closed**
* Interception tubing of pumping set: **open**
* Interception tubing of compensation: **open**
* Air bleeder screw actuator/cylinder: **closed**
* Oil level: **O.K.**
* Breather cap: **on highest station or compensation tank.**

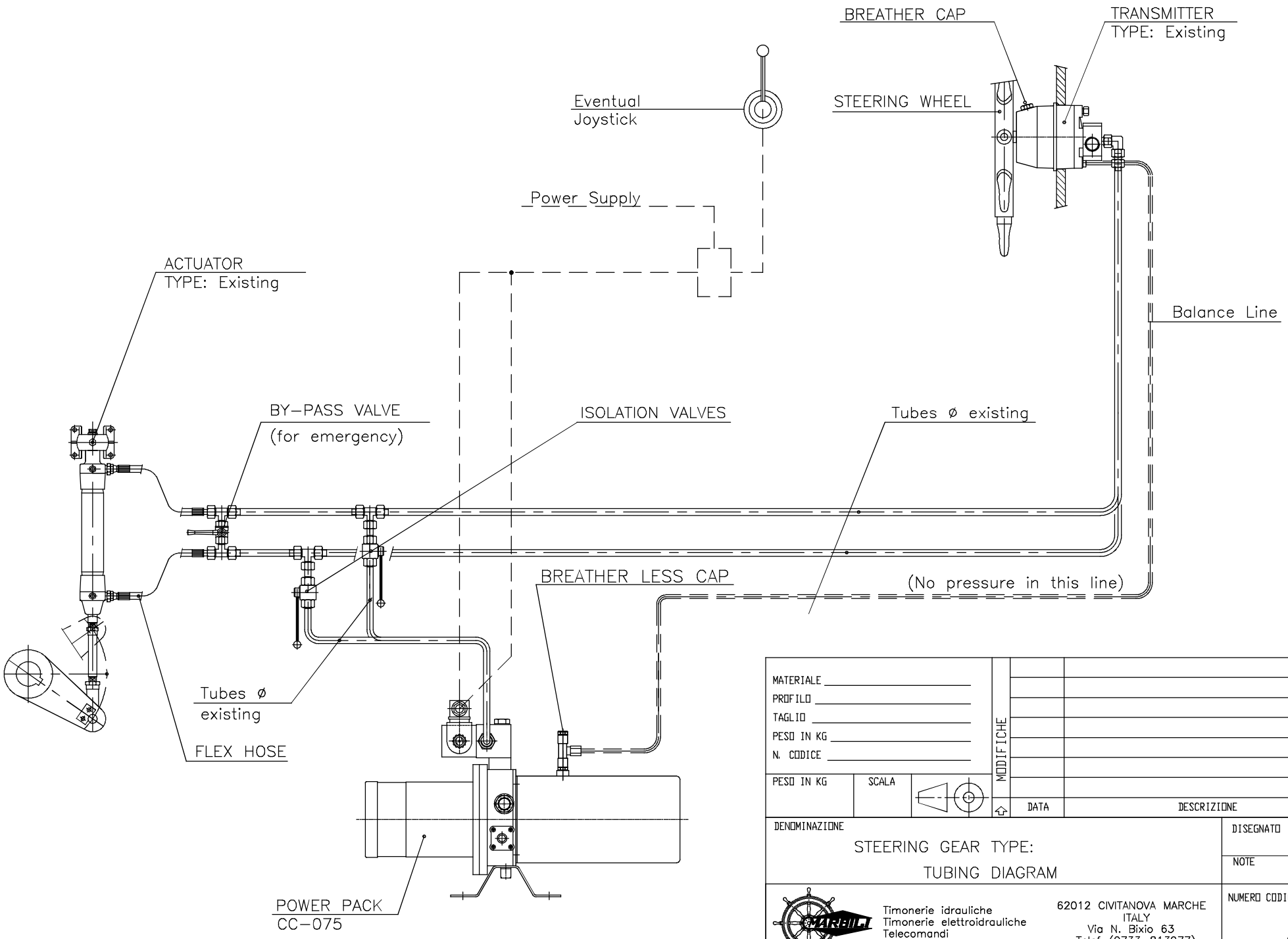
At this point, test the manoeuvre by turning the wheel from side to side counting the number of turns that should result from the ratio between the hydraulic transmitter/helm pump displacement and actuator/cylinder displacement.
Start the pumping set and test the electric tiller/transmitter and autopilot if supplied.

OIL TO BE USED

It is advisable to use an hydraulic oil with the following characteristics :

API	**CIS 32**
SHELL	**Tellus OIL 32**
ESSO	**ESSO H 32**
MOBIL	**Mobil DTE 24**
CASTROL	**Hyspin AWS 32**
AGIP	**OSO 32**
IP	**Hydrus OIL 32**
TOTAL	**Azolla ZS 32**
BP	**Energol HLP 32**
ELF	**ELFOLNA 32**
Q8	**HAYDN 32**

Viscosity "Engler"1,8 - 2,5 °E a 50° C



MATERIALE					
PROFILO					7
TAGLIO					6
PESO IN KG					5
N. CODICE					4
PESO IN KG	SCALA				3
		MODIFICHE			2
					1
			DATA	DESCRIZIONE	DISEGNATORE

DENOMINAZIONE

STEERING GEAR TYPE:

TUBING DIAGRAM

DISEGNATO IL 21-Maggio-2009

DA S.Dybon

NOTE

Timonerie idrauliche
Timonerie elettroidrauliche
Telecomandi

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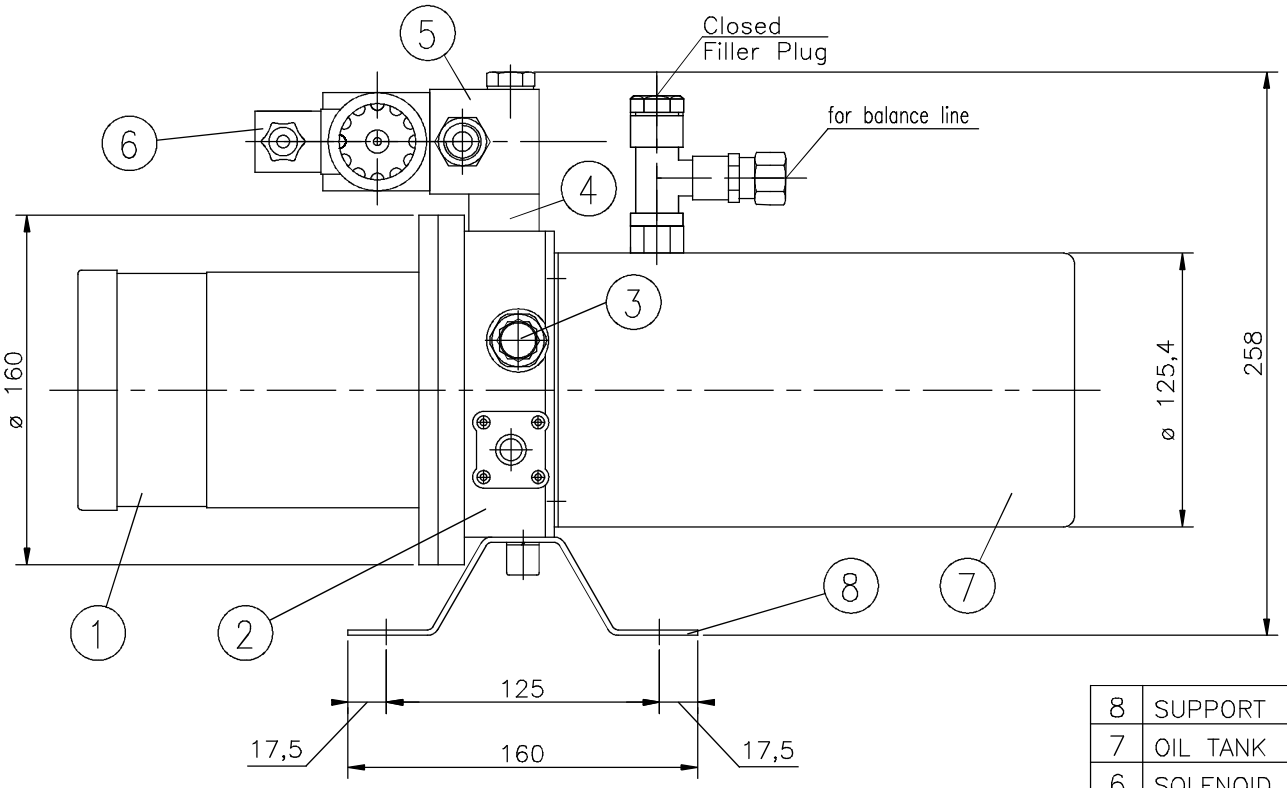
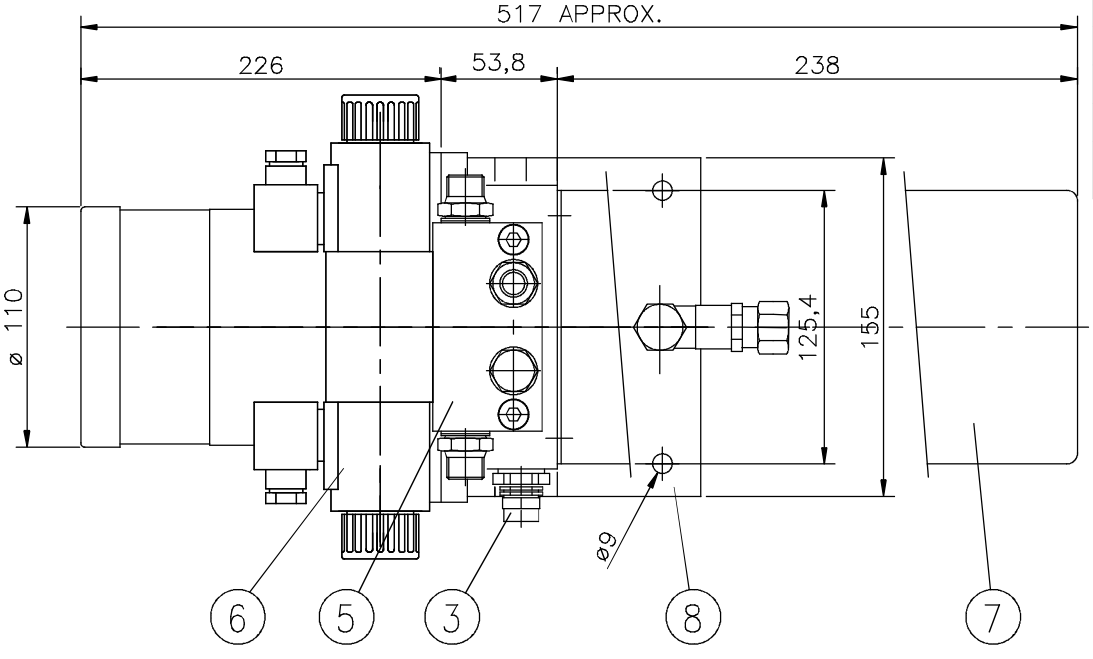
NUMERO CODICE

MA 4187





POS	DESCRIZIONE	QT	CODICE	MATERIALE	DIM. TAGLIO	PESO KG
8	SUPPORT	1	G07 L			Oil Sistem
7	OIL TANK	1	S02	2,5 litres		Oil Sistem
6	SOLENOID VALVE	1	SDHE-0714	12 V DC		ATOS
5	CHECK VALVE	1	N12			Oil Sistem
4	DISTANCE PIECE	1	N09 05/01			Oil Sistem
3	MAX PRESSURE VALVE	1	VM15	V3.889.04.A3Z		Oil Sistem
2	CENTRAL MANIFOLD	1	A1Y			Oil Sistem
1	MOTOR	1	MP 71 M4	12V.-0,37kw-19A	1500 rpm	Gianneschi

MATERIALE
PROFILO
TAGLIO
PESO IN KG
N. CODICE

PESO IN KG | SCALA 1:2,5

MODIFICHE

DATA	DESCRIZIONE	DISEGNATORE	
			7
			6
			5
			4
			3
25-06-2013	Aggiornato valvola solenoide	S.Dybon	2
28-10-2008	Aggiunto T per 3" tubo	S.Dybon	1

DENOMINAZIONE
POWER PACK Type: CC-075 (12V)
DETAILS & OVERALL DIMENSIONS

DISEGNATO IL 06.Giugno.2005
DA Mauro

NOTE

Timonerie idrauliche
Timonerie elettroidrauliche
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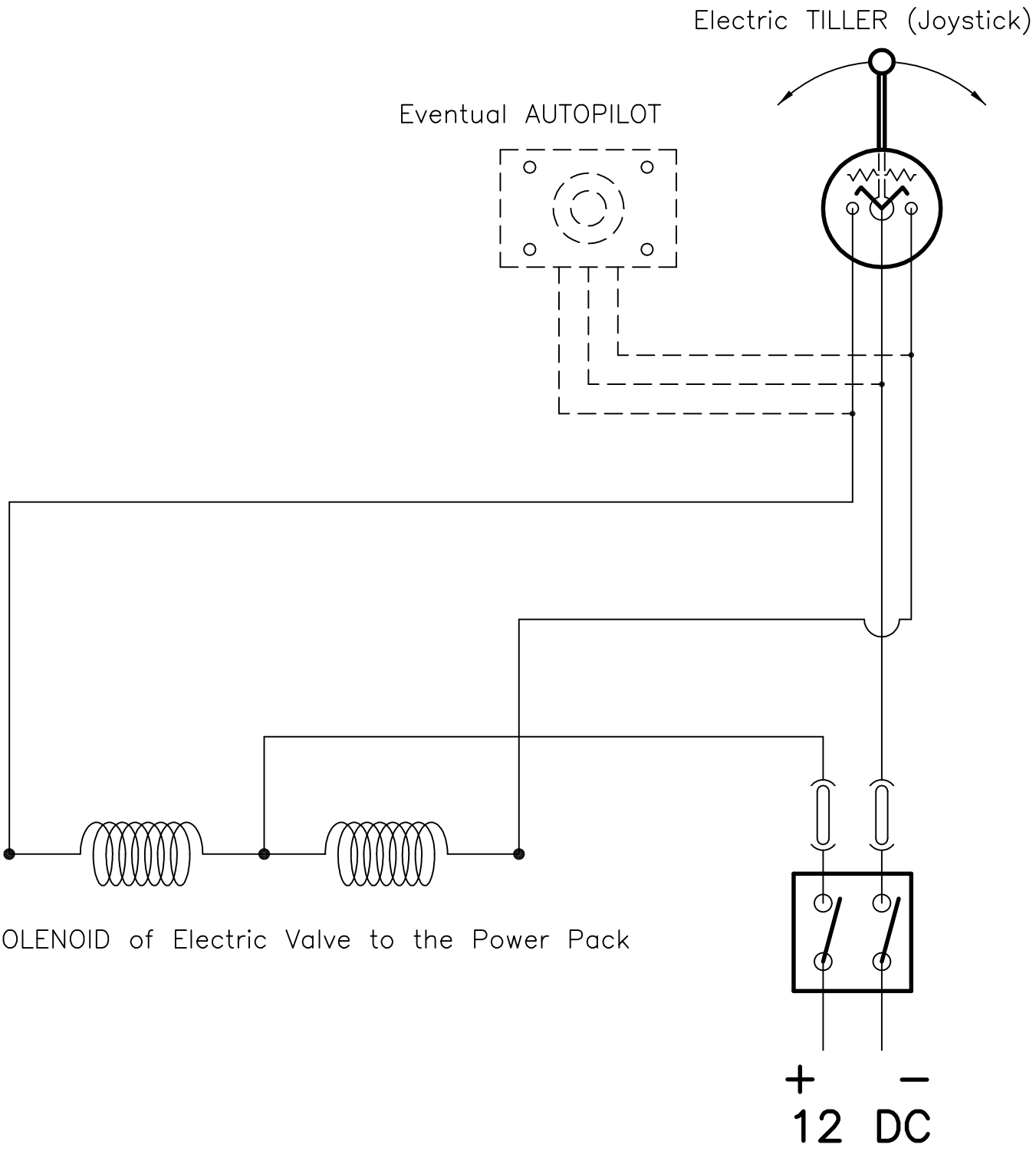

				7
				6
				5
				4
				3
				2
				1
DATA	DESCRIZIONE		DISEGNATORE	

MODIFICHE

MATERIALE _____
PROFILO _____
TAGLIO _____
PESO IN KG _____
N. CODICE _____

PESO IN KG	SCALA

DENOMINAZIONE

Electrohydraulic Steering gear
Type: B Control System with Power Pack
Electric Diagram – Solenoid Control

DISEGNATO IL 09 Aprile 2004
DA Falaschini

NOTE

MARBILI
Timonerie idrauliche
Timonerie elettroidrauliche
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