

OPERATING AND MAINTENANCE MANUAL
FOR
17T HYDRAULIC HOSE REELER
COFLEXIP STENA

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Section:- 1.2

Revision:- "0"

NIM Job No:- 500-3228

SECTION 1.2

GENERAL DESCRIPTION

The Reeler consists of a drum with plummer block bearing housings fitted at either end of the drum shaft. Installed in the plummer block bearing housings are spherical roller bearings. A spur gear wheel is mounted to the drive end drum flange by socket cap screws and location dowels. The spur wheel is driven by two pinions mounted on the output shafts of two right angle planetary gearbox drives. Each gearbox is equipped with an auto fail safe brake and a radial piston hydraulic motor. The gearboxes and drive end plummer bearing are mounted on a fabricated stool which is bolted onto the reeler frame structure. The reeler frame is constructed from box section with a universal column base. Lifting eyes are positioned at each corner of the frame.

The drum has an inner flange at the drive end, which provides a compartment for accommodation of the umbilical connection.

SPOOLING GEAR

A spooling gear assembly is supplied with the Reeler, the spooling gear consists of a rolled steel channel frame which is bolted directly onto the Reeler frame. The spooling gear is chain driven from the drum shaft by a wheel and sprocket arrangement, sized to provide even spooling of 125.4mm diameter umbilical regardless of reeler speed. The sprocket is fitted to the scroll shaft by means of a taper bush. Should the spooling gear ever need to be re-synchronised then releasing the socket grub screws between the taper bush and the sprocket will allow the sprocket to rotate freely, thereby permitting re-alignment of the umbilical between drum and spooling gear. The spooling gear consists of a diamond pattern scroll shaft and two support shafts housed within the frame. A spooling carriage traverses the scroll shaft as it is driven by the drum shaft, by means of a bronze follower located in the diamond pattern scroll. Between the spooling carriage and guide block are two removable guide plates, secured by quick release bolts. Fitted to the guide plates are radiused devlon liners, these guide the umbilical on/off the drum. Phosphor bronze bushes are fitted to the carriage and guide blocks to allow smooth linear movement of the blocks over the scroll and support shafts. Grease nipples are provided in the body of the carriage for lubrication. A jockey wheel is mounted to an adjustable bracket on the drive stool to maintain chain tension.

GEARBOX

The gearbox is heavy duty 2 stage right angled planetary reduction unit. Planetary gearboxes are particularly suitable for winch drives owing to the safety factors inherent with the planetary system of multiple gear tooth engagement. The output shaft is chosen to be very conservatively rated against its application and wear characteristics together with maintenance are generally minimal.

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BRAKING SYSTEM

The gearboxes are equipped with automatic fail safe brakes, with a static brake holding capacity of 1.5 x SWL. The brakes are held on by a series of coil springs pressing together alternate fixed and rotating plates. The application of hydraulic pressure compresses the springs thereby dis-engaging the brake.

HYDRAULIC MOTOR

The hydraulic motor is a heavy duty fixed displacement radial piston type. This type of motor is widely used in winch and reeler drives owing to the high mechanical and volumetric efficiencies which gives high starting torque characteristics and smoothness of operation particularly at slow speeds, (See Section 9.0 for further details).

POWER PACK

The power to the Reeler comes from a self contained 75KW power pack. The unit is housed within a box section frame with lifting eyes for ease of moving.

An electric motor is connected to an axial piston pump by an anti static coupling and bell housing. The electric motor is equipped with thermistors and anti-condensation heaters.

The pump provides constant pressure to the system and is set to deliver pressure at approximately 10 bar above system pressure, this is set at the pump pilot valve. The pump will automatically destroke at pressures exceeding this

The 500 litre hydraulic tank is equipped with a removable top, filler breather, sight level/temperature gauge, low level indicator switch, and drain plugs. An immersion heater is located inside the tank. It also has a return line filter with a visual blockage indicator and a bypass section. Separate drain lines are provided for the pump, brake drain, and motor case drain. The low level indicator switch is of the float type. When the float of the gauge contacts the reed switch incorporated in the tube at the predefined distance, (approx 150mm) the contacts controlled by a magnet contained in the float open, and send a signal to the starter panel which illuminates a lamp on the panel door giving a visual warning of a low oil level. An immersion heater with an integral thermostat is fitted into the side of the hydraulic tank. The heater may be switched on at the starter panel with temperature set at 40 deg C.

A sea water cooler is installed under the hydraulic tank in the hydraulic oil return line (for sea water supply requirements refer to drawing 3228g3--)

Located within the power pack frame is the cast iron starter panel which is rated to IP65 with a 75KW Direct On Line starter. The panel door houses 4 indication lamps:- Supply On, Tripped Lamp, Heater On, Low Oil Level, and, 6 switches:- Tank Heater, Start, Stop, Isolator, Reset and Emergency Stop.

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HYDRAULIC CIRCUIT EXPLANATORY

(This is to be read in conjunction with Hydraulic Circuit Drawing No:- 3228C1--)

Supply pressure from the pump enters a 2 bank lever operated directional control valve located on the control station. The valve has an integral relief section which is used to set system pressure on the pressure gauge also mounted on the control station. With both control levers in the neutral position the oil will simply circulate through the service port and return to tank. Operating the lever marked "A frame control" will supply oil to the A frame cylinder and isolate supply to the reeler. This lever must be returned to the neutral position to allow operation of the reeler by reeler control lever. Both valve banks have finely metered spools to provide accurate speed control.

By selecting either PAY IN or PAY OUT on the reeler control lever pressurized oil will be supplied to the overcentre valve in either A or B lines. The dual overcentre valve (Item 24), complete with brake shuttle, which is mounted close to the motor. The purpose of this valve is to give dynamic locking and therefore braking effect to the circuit, and at the same time smooth operation of the reel particularly at low load. The principle of operation is that the oil can flow freely from the control valve to the motor but the oil cannot return from the motor until an internal pilot from the opposite line opens the overcentre valve and allows oil to pass. This ensures that when the Reeler is running at light load the pressure reading shown will be the minimum pilot pressure. The valve contains a brake shuttle which permits a pressurized supply of oil to the brake sequence valve (Item 25) on selection of PAY IN or PAY OUT at the control valve.

The brake sequence valve is a two position valve which in the de-energized state will allow the brakes to drain hydraulic oil to tank and therefore the brakes will be applied. On pressurizing the brake supply line an integral pilot port within the valve applies pilot pressure to the spool and the valve energizes thereby allowing pressurized oil to enter the brake

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SPECIFICATIONS

LINE PULL	17 Tonne (1st LAYER)
LINE SPEED	15metres/min (1st LAYER)
DRUM CAPACITY	700 metres of 125.4MM Dia. Umbilical
BRAKING SYSTEM	Auto Fail-safe on gearbox
BRAKE HOLDING CAPACITY	25500KG
DRUM SPEED	2.62 RPM
DRUM CORE DIA.	1700mm
DRUM OVERALL DIA.	3581mm
DRUM BETWEEN FLANGES	2600mm
HYDRAULIC MOTOR	M2 SAI
GEARBOX	Right Angle with Output Ratio 15.3:1
OIL PRESSURE	210 BAR
FLOW RATE	165 Litres/min
POWER REQUIREMENTS	75KW @ 1750 RPM
CONTROL (Reeler)	Hand Control Valve (PAY-IN / NEUTRAL / PAY OUT)
CONTROL (A-Frame)	Hand Control Valve (LOWER / NEUTRAL / RAISE)

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TECHNICAL DATA AND CAPACITIES

ELECTRIC MOTOR

Type:- 280 frame, foot and flange mounted Power Output:- 75KW
75 kw, 440v/3ph/60hz, 4 pole zone 1 motor with increased safety terminals, class F insulation
IP56 protection

HYDRAULICS

Pump Displacement:- 100cc/rev.
Main System Relief Valve setting:- 210 BAR
Hydraulic Oil Tank Capacity:- 500 Litres.
Hydraulic Oil type:- Shell Tellus 32 (or equivalent) recommended.

GEARBOX/BRAKE

Oil Capacity:- 6.3 Litres
Ratio:- 15.3:1
Torque Rating:- 15700 Nm Continuous
Torque Rating:- 31400 Nm Peak
Oil Type:- VG150
(See Section 9.0 for further details)
Static Brake Torque - 1570 NM

HYDRAULIC MOTOR

Displacement - 346cc/rev
Continous Pressure Rating - 250 Bar
Peak Pressure Rating - 420 Bar
Continous Power - 27.5KW
Peak Power:- 55KW
Continous Speed - 390 RPM
Peak Speed:- 600 RPM

(See Section 9.0 for further details)

SEA WATER COOLER

Flow Rate:- 30 Litres/min
Pressure:- 10 BAR (Maximum)