



CASINJAC PRIMER

What is a Casinjac?

A Casinjac is a hydraulic jack used to lift and or lower strings of casing.

Where did the term Casinjac come from?

The term Casinjac is derived from two words: casing (as in oil well casing) and jack (as in a lifting device).

It is a word made by combining two words and leaving off the last letter of each word.

What is a Casinjac used for?

A Casinjac's principle use is to lift and lower heavy strings of oil well casing and/or tubing.

A Casinjac is used to stretch a string of pipe by applying a known stretch force. The amount of stretch force, the resulting stretch, and the pipes weight per foot are used as variables in a free point formula to determine the number of pipe that is being stretched.

A Casinjac is used to strain the pipe by applying an external force thereby creating a corresponding internal stress. The internal stress facilitates parting the pipe with explosive and other types of pipe cutters.

A Casinjac is used to apply the necessary lifting force to (1) finish parting the pipe or (2) start the pipe moving upward by overcoming the pipe strings weight and frictional forces.

A Casinjac is used to jack the pipe string up and remove joints of pipe until the load is within the safe pull force of a workover or drilling rig.

A Casinjac is used to lower pipe strings when the weight of the string of pipe is more than the safe capacity of a workover or drilling rig.

A Casinjac is used to "work pipe" by alternately raising and lowering a pipe string to condition the hole thereby potentially freeing up pipe that is stuck.

What is the lift capacity of a Casinjac?

Casinjac's are available in different models; current models have lift capacities of:

- 125 tons
- 196 tons
- 212 tons
- 282 tons
- 385 tons
- 424 tons
- 500 tons
- 1000 tons

A Casinjac's lift capacity is determined by;

- The number of cylinders used
- The bore of each cylinder
- The amount of hydraulic pressure applied (pounds per square inch)

Example:

Model 500 – 60 – 13 3/8 – 10.75 – 8.625 - 2

Max. Lift Capacity: 500 tons

Stroke: 60 inches

Pipe Capacity: 2 3/8" to 13 3/8"

Speeds: 2

Working Pressure: 5,000 psi

Cylinder Bore: 8 ins.

Cyl. Bore Area: 50.266 sq. ins. $(8/2)^2 * 3.1416$

4 – Cyl. Area: 201.12 sq. ins. $(4 * 50.266)$

2 – Cyl. Area: 100.56 sq. ins. $(201.12/2)$

4 – Cyl. Lift Cap. 1,005,500 lbs. $(201.12 * 5,000)$

2 – Cyl. Lift Cap. 502,750 lbs. $(1,005,500/2)$

How do you determine the lifting or jacking speed?

The lifting or jacking speed is usually expressed in feet per hour.

The lifting speed is dependent upon the rate of flow of hydraulic fluid to the Casinjac. Higher rates of flow produce higher the lifting speeds.

Example:

A Model 196 – 60 – 10.75 - 8.625

Cylinder Bore (ins.): 5

Cyl. Rod Diameter (ins.): 3.5

Stroke (ins.): 60

Cyl. Bore Area (sq. ins.): 19.635 $((5/2)^2 * 3.1416)$

Cyl. Rod Area (sq. ins.): 9.621 $((3.5/2)^2 * 3.1416)$

4 – Cyl. Extend Volume (cu. Ins.): 4,712.4 $(19.635 * 60 * 4)$

4 – Cyl. Extend Volume (gals): 20.4 $(4,712.4/231)$

4 – Cyl. Retract Volume (cu. Ins.): 2403.4 $((19.635 - 9.621) * 60 * 4)$

4 – Cyl. Retract Volume (gals): 10.4 $(2,403.4/231)$

4 – Cyl. Extend-Retract Vol. (gals): 30.8 $(20.4 + 10.3)$

Using a 50 gpm pump the above described Casinjac will extend and retract 97 inches per minute. (30.8:60::50:97)

4 Cyl. Jacking Speed: 485 ft. /hr.

2 Cyl. Jacking Speed: 970 ft. /hr.

OPERATING USING TWO CYLINDERS:

PROCEDURE

1. Fully retract the cylinder rods.
2. Close the ball valves (2) on diagonally opposite cylinders.
3. Pull pins attaching cylinder rods to sleeves on valved off cylinders.

RETURNING TO FOUR CYLINDERS

1. Fully retract the cylinder rods.
2. Place the pins in the cylinders (all)
3. Open the ball valves (fully).

INSTALLING HOSES TO CONNECT CASINJAC TO HPU

1. Refer to HPU operating Instructions to determine what connection on the HPU connects to the Top Manifold and what connection connects to the bottom manifold and connect the hose assemblies accordingly.
2. There are two bleed valves on the HPU. These needle valves are to be used to bleed the pressure off the hose assemblies **before disconnecting them**. The quick disconnects on each end of the hose assemblies, the casinjac manifolds, and the HPU **should not be connected or disconnected under pressure**. The Quick Disconnects should be fully made up before using. Connecting or disconnecting under pressure and/or not fully making up can cause damage to the quick disconnects and cause them to act like check valves.

PIPE CAPACITY OF 500 – 60 – 13.375 – 10.75 – 8.625

TOP BOWL	13 3/8 – 11 3/4
BOTT. BOWL	13 3/8 – 11 3/4
LARGE INSERT BOWL (2)	10 3/4 - 9 5/8
SMALL INSERT BOWL (2)	8 5/8 – 2 3/8

The taper of all bowls is 4/12 and all slips used in them should have 4/12 taper

A good quality of thread dope should be used to coat the tapered surfaces of the bowls and slips.

Operating a Casinjac

Extend the rods 18 – 24 inches before placing slips in top bowl. This will assure that you will always be able to “get off “the pipe string.

It is a good practice to stop the upstroke before the rods are fully extended and to stop the down stroke before the rods are fully retracted.

Casinjac Counter Balance Valve

The counterbalance valve is installed on the lower manifold of the Casinjac. The counterbalance valve on Model 500 – 60 – 13.375 has a KFF/S steel body and a CBIG-LCN cartridge manufactured by Sun Hydraulics Corporation.

- 4.5 :1 pilot ratio, load holding to 4000 psi (with 5000 psi settings)
- Load reactive pilot assist for over center load control
- 25 psi cracking pressure
- Adjustment range 2000 – 5000 psi
- 3000 psi Standard Setting
- Standard Screw adjustment (turn screw adjustment clockwise to reduce setting and release load. Complete adjustment range in 3 turns.
- Setting should be 1.3 times max. load induced pressure (Since it is difficult to set the other than on a bench the factory setting at 3000 is usually maintained.)

The bottom plate (WAP) on a Casinjac should be used at all times. In some Models this place has holes drilled and tapped to fit wellhead flange bolt circles and bolts. Placing flange bolts in the WAP holes assists in centering the Casinjac over the wellhead.