

Series 5/6 Integral Adjusters (1979-1984/1984-1989)

# NAVTEC

## INTEGRAL ADJUSTER

Series 6 SEAL KITS  
A360-SK-010  
A360-SK-017

### INSTALLATION AND OPERATING INSTRUCTIONS

#### INSTALLATION

In most cases, you will have to shorten the backstay to accommodate the adjuster. However, if there is a Navtec turnbuckle with an extra long screw in the backstay, this may not be necessary. The backstay should be long enough to allow easy hook-up with the cylinder approximately 2/3's open.

The cylinder must be mounted with the rod end up. Since the adjusters are shipped fully contracted, you must extend the rod prior to final installation. This is most easily done by attaching the base of the adjuster to the chainplate and, using a halyard and winch, extending the rod. A WORD OF CAUTION. Do not scratch or ding the piston rod. This will lead to seal failure and leakage.

#### OPERATING INSTRUCTIONS

To reduce tension (slack off stay), open the valve marked release. (See A Figure 2) It is a very sensitive needle valve and a gradual release can be obtained by opening the valve slightly. When the desired tension or position has been reached, close the release valve. This valve has been designed to seal tightly when the valve is closed gently. Do not over-tighten the valve as this will reduce its life.

To increase tension, work the pump handle back and forth with the release valve closed (its normal position) until the desired tension or position is reached. The pump works on just one stroke; the other stroke is an intake stroke.

#### RELIEF VALVE

The integral adjuster has a relief valve built into the pump to guard against over tensioning the rig while pumping.

When the pump pressure exceeds the relief valve setting, the valve opens preventing further pressure increase due to over-pumping.

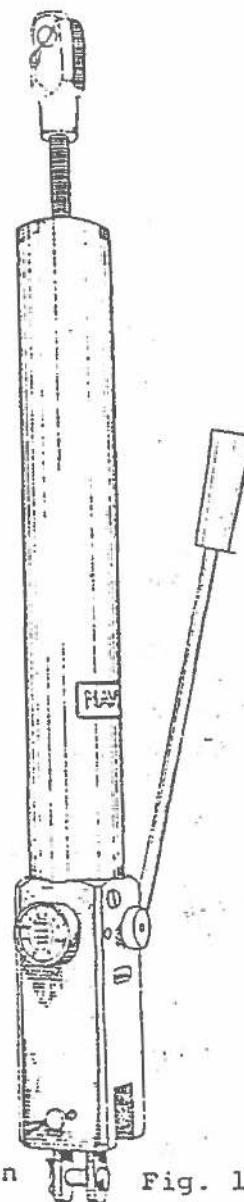


Fig. 1

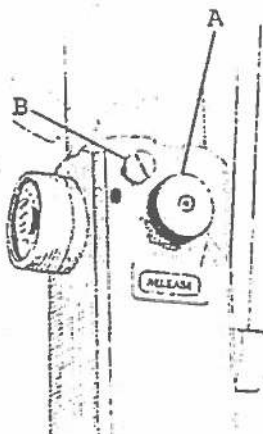


Fig. 2

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The relief valve is factory set at approximately 4,000 psi. At that pressure, the maximum force of a -10 integral is 4,625 pounds, a -17 is 8,670 pounds, and a -22 is 11,000 pounds. That relief valve can be adjusted as follows:

1. Lay the unit down so that release valve (A in Fig. 2) is up. Put a rag under the unit as there will be some oil leakage.
2. Open release valve to depressurize unit and close release valve.
3. Remove plug B (see Fig. 2) next to release valve. A slotted screw under this plug controls the relief valve tension.
4. To increase relief valve setting, rotate screw clockwise. To reduce setting, rotate counterclockwise. After making a small adjustment, replace plug B and pump up unit until pressure fails to rise further while pumping. This pressure is the new relief valve setting. If further relief valve pressure change is desired, repeat steps 1 - 4.
5. Replace plug. Oil loss will probably be slight if plug is not left off for long periods. If oil loss exceeds about  $\frac{1}{2}$  cup, refill following oil filling procedure below.

#### GAUGE

The Navtec gauge has a double ended needle so that two scales can be used. The top scale, which reads in thousands of pounds per square inch, indicates the pressure within the cylinder. The lower scale which reads in thousands of pounds force, indicates the force being exerted by the cylinder. The pressure within the system and the actual force exerted by the cylinder relate according to the following formula:

Pressure (pounds/square inch) x Cylinder Area (square inches) = Tension (pounds). This formula disregards friction which can cause minor inaccuracies in figuring actual tension in the rig.



Fig. 3

#### BLEEDING

If the cylinder fails to retract when operating the pump with the release valve shut, the likely cause is an air lock which can be solved by bleeding the pump as follows:

1. With the rod end up, fully extend the cylinder (the best way is to use a halyard and winch).
2. Open the release valve fully and pump for approximately one minute. The pump and cylinder are now bled.

## OIL LEVEL

The reservoir (between the outer jacket and the cylinder tube) is filled at the factory and should not need refilling. However, if the cylinder fails to respond to bleeding instructions, or if excessive oil is lost changing relief valve pressure, you may wish to check the level. The correct oil level is to have the jacket  $\frac{1}{2}$  full when the cylinder is fully retracted. **IMPORTANT:** Over filling can cause the outer jacket to burst.

Checking the level can only be done by going through the complete filling procedure described below. The oil fill hole and reservoir are not in a direct line making the use of a dip stick impossible.

### FILLING THE RESERVOIR

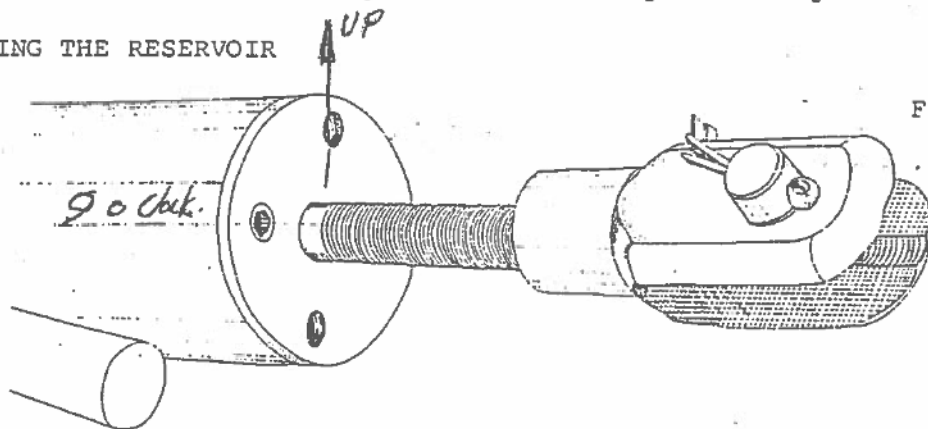


Fig. 4

- 1) Go through the bleeding procedure described above once. Then pump until the piston stops retracting..
- 2) Remove the stainless steel pipe plug in the top cap and remove all pipe tape from the plug and female threads in the top cap. Use tweezers to remove all tape and be sure not to allow any cause of malfunction of the adjuster requiring factory disassembly.
- 3) Orient the adjuster with the rod axis level and with the open fill hole at 3 or 9 o'clock.
- 4) Insert the nozzle of a clean squeeze bottle filled with clean 10 weight hydraulic or non-detergent engine oil into the fill hole making as good a seal as possible. Maintaining the cylinder in the orientation of Figure 1 alternately squeeze and release the bottle. Continue until no more air returns to the bottle. It is necessary to keep the squeeze bottle more than half full so that the hole leading to the nozzle is continuously flooded. When no more air returns to the bottle from the adjuster, the oil level inside is even with the top of the fill hole and the adjuster is correctly filled.