PROTO DIAL WRENCH CALIBRATION PROCEDURES:

1. Each Proto dial type torque wrench has a removable cover on the back side of the wrench, behind the dial scale.
On wrenches up to 50 ft.1b. (600 in.lb.) the cover is a round plug which can be removed by using a flat tip screw
driver (see fig. 1). On wrenches up to 2000 ft.1b. the cover is held into place with a phillips screw.

Carefully remove the cover to expose the movement assembly. You will see a movement with a pushrod inserted into a slot,
on the arm of the movement.
Calibration of dial torque wrenches is tricky and takes practice. It is recommended that only qualified personnel try to
calibrate and adjust dial type torque wrenches.
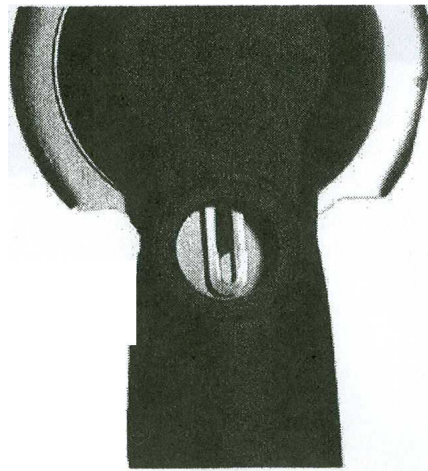

Remove plug or cover
to expose movement

Fig. 1

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Testing Procedure:

1. Always load the wrench to full scale, three times, in the direction to be tested prior to taking

readings. .

2. After loading three times, remove the wrench from the tester and zero the memory needle by rotating the follower shell, zero the tester as well.

3. Attach the wrench to the tester and apply torque to FULL SCALE.

 IMPORTANT! If the wrench is in a loader make sure the wrench is not binding on the reaction pin at the handle. This is very important and can cause FALSE out of tolerance conditions (especially on very low in.-Ib..wrenches). Friction at the handle creates side loads that do not exist when an operator uses the wrench. It is recommended that there be a linear bearing on the reaction pin of the loader so the wrench handle will "float" on the reaction pin, minimizing friction. Simply putting a bubble on the wrench is not good enough, the wrench must be allowed to find its center point. You can see the effect of this by slightly pulling up or pushing down on the handle of the wrench when under load (in a loader).

4. Load to full scale, note the readings. If the reading is low move or bend the pushrod out. If the reading is high move or bend the pushrod in. If the reading is good most likely the readings at 20,40,60°A> will also be good. Test at these locations. Adjust the pushrod accordingly to bring the readings in tolerance.

 5. If a counterclockwise test is also required repeat the above procedure in the counterclockwise direction. If the wrench passes clockwise but not counterclockwise the problem is with the pushrod alignment. Make sure the pushrod is perpendicular to the top plate and is on the centerline of the

wrench (as shown if figures 5,6,7). 2004

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To change the torque readings on the wrench move the position of the pushrod inward, towards the drive, or outwards, away from the drive (see Fig. 3). Moving the pushrod inward will drop the wrench readings. Moving the pushrod outward will increase the readings. If the adjustment needed is small (within 4-6%) the best way to move the rod is to BEND it in or out using an adjusting tool. Make sure the pushrod does not interfere with any parts and that it does not rub against the top plate or on the inside of the movement arm (see fig 4). You will notice jumpy readings or the wrench will not zero if the pushrod is hitting any other parts (it must be free to slide in the movement arm).

If the adjustment is large (greater than 6-10%) you will need to remove the top plate assy. from the housing to expose the movement assy. Adjust the pushrod in or out by loosening the two screw that secure the pushrod. KEEP THE PUSH ROD PERPENDICULAR TO THE TOP PLATE ASSY.
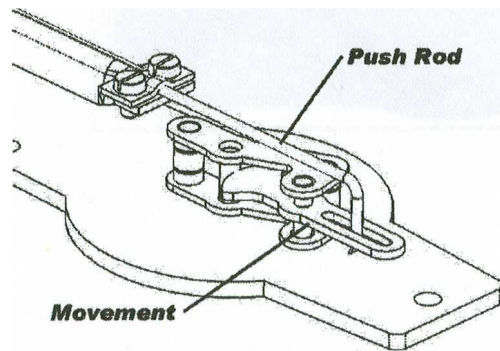
Push Rod

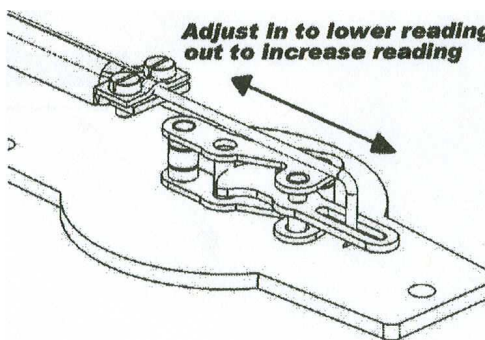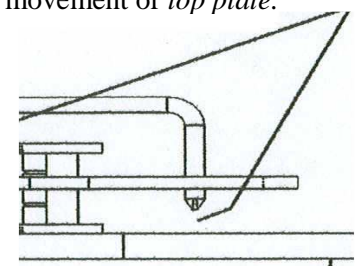Movement
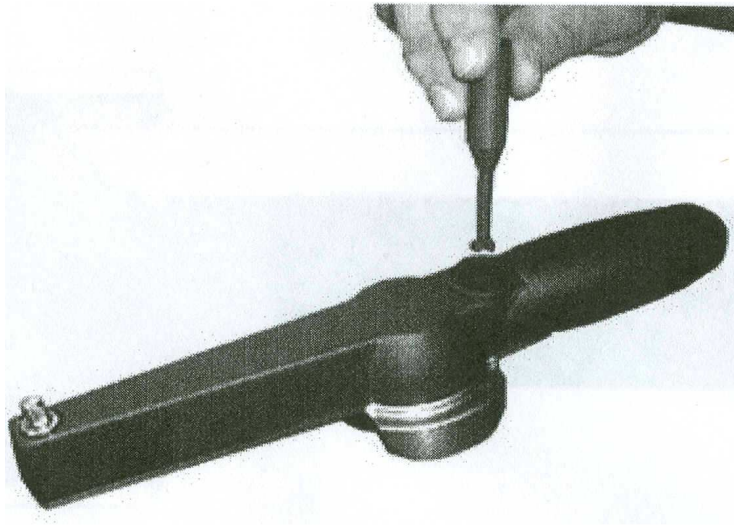
Fig. 2

Adjust in to lower reading
out to increase reading

Fig. 3

Make *sure push* rod does
not *Interfere with* movement or *top plate*.

Fig. 4

Top Plate

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You can use the adjusting tool to bend the pushrod slightly in or out to adjust the dial torque wrench when it is within 4-6%.

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Make sure the movement arm is in-line with the wrench centerline. If the pushrod is off to one side the wrench may not calibrate in one direction or the other (see Fig. 5 and 6 below). The pushrod must also be perpendicular to the top plate or non-linear results may occur (Fig. 7).

Pushrod should be **perpendicular to** *plate In* **BOTH planes**
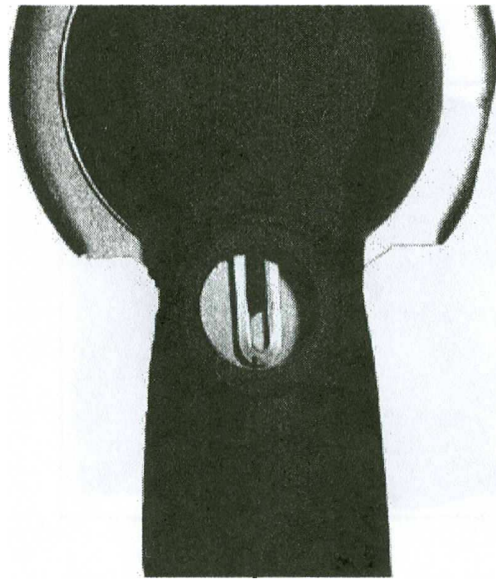
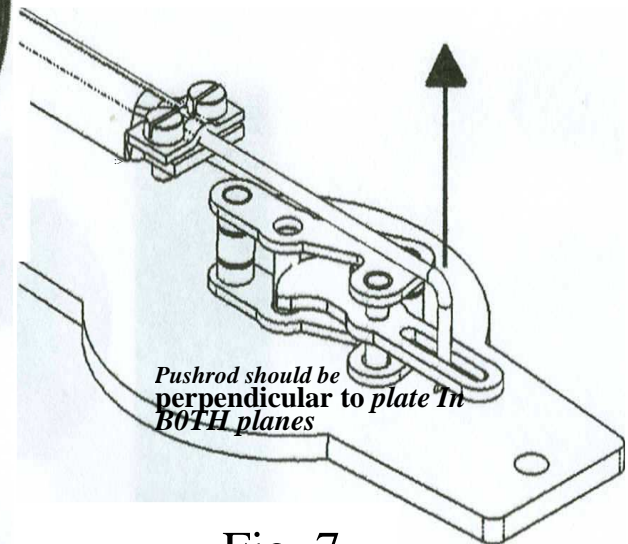Fig. 7

Properly aligned
Fig. 5
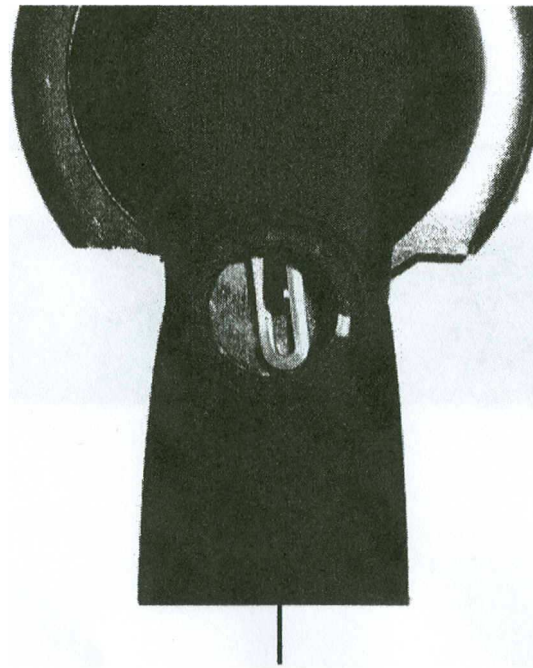
Improperly aligned
Fig. 6

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Troubleshooting:
1. Problem: Wrench is non-linear.
    Make sure the pushrod is absolutely perpendicular and is free to float inside the movement. Make sure the pushrod is on centerline with the wrench.
    Make sure the handle of the wrench is not binding on the reaction pin of the loader (if used).
    Make sure you are not creating side load when applying torque to the handle.
    Make sure the wrench has not been overtorqued (usually can be seen by a bent channel, pushrod or a ding on the inside of the movement slot where the pushrod rubs.
2. Problem: Needle jumps when applying torque.
    There is friction inside the wrench. This is caused by the following:
    1. The pushrod is too high and the end is rubbing on the movement under load (can be caused by improper alignment in the loader).
    2. The pushrod is too low and is rubbing on the top plate under load (can be caused by improper alignment in the loader).
    3. The channel that holds the pushrod has been pulled out and is rubbing on the inside of the case.
    4. The pointer needle is too high and may be rubbing on the clear bezel.

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