



Waterloo Specialties

TRUCK DIVISION

Owner: Tom Bauer

(410) 549-6649

<mailto:waterloospecialties@gmail.com>

STEERING UPGRADES: POWER STEERING CONVERSION FOR M35-SERIES TRUCKS

These are the instructions for using the IH steering box

Thank you for purchasing our Power Steering Conversion kit. This kit uses a **Saginaw Model 710IH** steering box. This kit is made with all new parts and is supplied with a rebuilt box.

This power steering conversion is strongly recommended for Off-Road Use ONLY; if you drive your truck on a public road or highway with this steering conversion installed, you do so at your own risk. While we have successfully used this kit on 3 of our trucks for more than 15 years with no issues, there are factors beyond our control when you install this kit, so please understand that Waterloo Specialties assumes neither risk nor liability once your purchased steering kit is shipped to you.

Please read these instructions before you begin, it will give you a better understanding of the installation process.

Price includes unlimited technical support. If you can remove the radiator or fender and drill holes in the frame, you can install this kit.

Tools you will need:

1/4" drill bit

1/2" drill bit

5/8" drill bit

1 1/2" metal hole saw

wrenches and sockets 7/16, 1/2, 9/16, 5/8, 11/16, 3/4, etc.

POWER STEERING CONVERSION KIT: INSTALLATION INSTRUCTIONS



FIG 2

- Remove left front fender. By doing this you avoid removing the radiator. The only down side to this is the 3 bolts that hold the fender to the cab may be rusty but this is by far the best choice. Trim the fan shroud now FIG 2, pattern included. Radiator shown removed for clarity.
- Remove the left front wheel/tire, old drag link, and old Pittman arm. After removing the old drag link, it is **very important** you re-torque the 4 nuts holding the steering arm to the knuckle. Torque is 130 – 140 ft lb.
- Remove the steering wheel next, while the column and box are still in place.
- Remove the old manual steering box.
You can take the cover off the box while in the truck, and then pull out the Pittman arm shaft, making more room to get to get the box housing and column out. Tip: Back out the cover bolts as far as room will allow and then cut off the bolt between the cover and box so you can more easily get the cover off.
- With the old steering box out of the truck, remove the cover on front of timing case of engine. Clean the old gasket off and install the pump with supplied gasket and some good gasket sealer. **Do not use any of the silicone gasket makers, something like Permatex 3H is recommended.**

- The new steering box mounts on the outside of the frame with the mounting bracket on top of the frame and the large reinforcement inside the frame rail. The next steps shows you how to mount the bracket and reinforcement.



FIG 3



FIG 4

- Remove any bolts, rivets, etc., that may be in the way of the frame reinforcement; this includes the plate on the outside of the frame that was for the old steering box.

TIP: Shown in FIG 3, grind a flat area on the head of all the rivets , yellow circle, then center punch the rivet right in the center and drilling a 5/16" hole, red circle, but not all the way through: drill only to the far side of the frame, this will be about 3/4 inch. Then with a 5/8" drill, drill off the head of all the rivets, black circle . With a 1/4" punch, drive the rest of the rivet out, brown circle . Do this for all 8 rivets and remove the plate. The rivits are put in red hot and when they are rivited it makes them very tight in the frame. Drilling a hole in them releases the pressure and they will punch out easily. Frame will look like FIG 4. Remove the bracket for the grill brace from the top of the frame.



FIG 5



FIG 6

- Place the large reinforcement inside the frame, with the front edge just behind the rivets that hold the fender support FIG 5. Be sure there is nothing between it and the frame, then clamp the inner plate tightly in place before drilling, both up against the top of the frame and also against the frame. You can mark these 6 holes and then drill them in a drill press, or drill them in place. Also mark and drill the 1 1/2" hole shown in FIG 6. Bolt the plate in place with the 6 bolts

provided, (bag #1) the front upper bolt must be placed with the head of the bolt inside the frame. The bolts go in the locations shown in yellow FIG 6.

- Measure back from the rear edge of the fender support, FIG 6 2-7/16" and draw a vertical line, measure **down** from the top of the frame 3" to locate and drill the front 5/8" mounting hole.

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- Almost ready to mount the box. A small change must be made to the box, remove the block shown in FIG 8A.

- Now mount the box with the front long bolt and the top long bolt into the upper bracket. Do this with the top bracket just sitting on top of frame. Tighten these 2 bolts by hand and confirm that the box is tight against the frame. The front of the top mounting bracket should be 1/2" behind the rear of the fender mounting bracket FIG 7. If it is 1/2" +/- 1/8" or less you are good, this is just a checking point. Drill the two 1/2" holes into the top of the frame for the top bracket. First drill using a 1/4" drill in the holes provided, and then finish with a 1/2" drill. Install these bolts coming up thru the frame and install nylock nuts. (bag #2) The last box bolt, (rear lower box) can then be located and drilled through the hole of the box after it is mounted to be accurate. Steering box bolts are 5/8" grade 8 and are included with kit. Torque these bolts to 150 ft lbs.



FIG 7



FIG 8



FIG 8A



FIG 9



FIG 10

- In FIG 8 you see the grill brace mounting tab to the right and the throttle return spring connection to the left.

- FIG 9 shows the lines attached to the box, they can only go one way because of the size of the nuts.

- FIG 10 shows the proper way to mount the straps that secure the lines to the top bracket. (bag #3)



FIG 11



FIG 12

- Mount reservoir on firewall. It mounts using the captive nuts that were for the voltage regulator in a previous life. FIG 11 (Note: some newer cabs may not have these holes, see picture for location.) (bag #5)

- Attach new mount included in kit, to new column as shown with 2" sticking out past rubber FIG 12. It goes in the same orientation as the one on the dash FIG 14. Put the column in the hole in firewall and secure at dash temporarily. Hold lower end in center of hole and mark bolt holes, then remove column and drill 1/4" holes. Now install column and secure. (bag #4)

NOTE: Before final installation of the column mount the wheel to it. Remove the plastic shipping spacer and discard. While handling the upper column, use care so that the shaft stays towards the top end so the horn contact does not get broken. If you feel any resistance in the shaft, turn it very gently while letting it move back up into position.

- Installation of the upper steering column is pretty straightforward with the exception of the option of lowering the hole where it goes through the firewall. Try it with the existing hole first unless you are sure you want more belly room. In that case you can lower it where it goes thru the firewall up to 6 1/2" by removing the top rivet from the cab mount plate and cutting away the upper part of the mount FIG 11. This will raise the steering wheel a few inches. **Do not punch out the round stamped area of the firewall**, it is for when this cab was used on a 5 ton and will not line up correctly. You can adjust the upper column in and out since the lower shaft has a sliding connection.

- Install lower steering shaft and tighten bolts to specified torque. 3/8" bolts are 48 ft lbs, 7/16" bolts are 75 ft lbs. The upper joint of the lower shaft can be used to adjust the position of the rotational position of the steering wheel.



FIG 13



FIG 14

- FIG 13 shows the cutout of the inner fender, template provided.

- Run suction hose from the bottom of the reservoir to the pump, fitting on pump should be at about 4 o'clock position. **(this hose is meant to lay inside frame)** Use teflon tape where the suction hose fitting (3/4" pipe thread) goes into the pump. Short pressure hose goes from the smaller port of the pump to the line with the big nut. Put some oil on the "O" ring of this fitting at the pump. Return line goes from the line on the box with the smaller nut, to the side of the reservoir. The return line fitting on reservoir can face either side, but reservoir and bracket should be able to be used in the position they are right out of the box. All hoses should now be on and you can fill the reservoir so that air will begin to come out of system.



FIG 15



FIG 16

- Install Pittman arm so that the diamond mark on the shaft is lined up with the chisel marked line FIG 15. Torque the pinch bolt to 150 ft lbs.

- System should hold about 2-3 quarts of power steering fluid (ATF), check it often and do not overfill (about 1 1/2" below top), the 710 box is hard to get all the air out of. Keep enough fluid in the tank and before putting the drag link on and with the engine off, cycle the box from stop to stop at least 10 times. Next check the reservoir tank fluid level and add, start the engine, (keep cap on with engine running) and cycle it another 10 times. This will get most of the air out and driving it will eventually get the rest.

- Steering should perform OK now but will be at its best after about 1 week of driving. If the pump seems hard to prime, just loosen the fitting where the pressure line attaches to the steel tubing. Just crack it open a little and let some air out then tighten. (Carefully, pressure)

- Now install drag link. It is adjustable, but is set where it should be and you should not have to change it. Torque nuts to 75 – 105 ft lbs and then turn nut to next cotter pin slot.

NOTE: Mount the drag link so that the slots on the adjusting sleeve are on the bottom so it does not hold water. FIG 16

You will need to extend the horn wire from the front into the cab to the contact. Grounding of the column will be also necessary.

If you have any problems or questions, feel free to give me a call at (410) 549-6649.