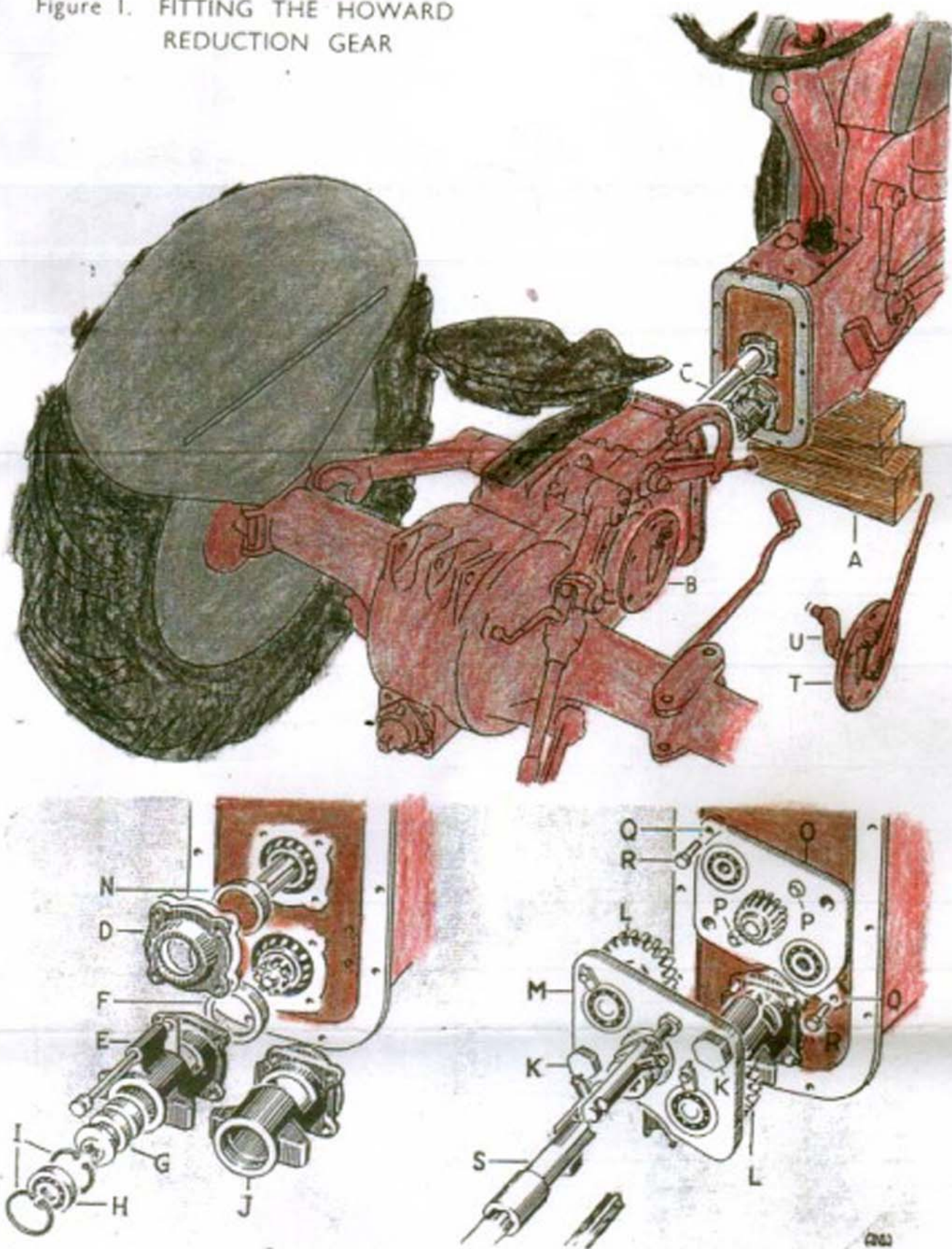


Howard Gear Reduction Transmission

Figure 1. FITTING THE HOWARD REDUCTION GEAR



INSTRUCTIONS FOR FITTING THE HOWARD REDUCTION GEAR

(See Figure 1)

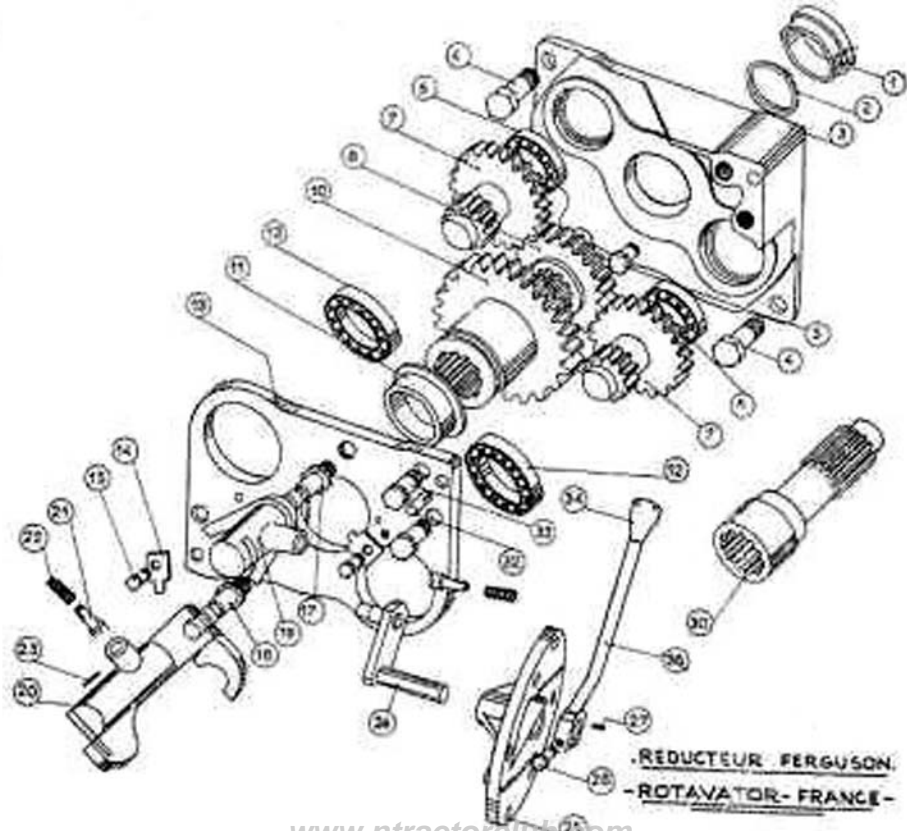
1. Drain the oil from the tractor gearbox.
2. Remove the footboards.
3. Remove the exhaust pipe.
4. Pack blocks of wood 'A' under the gearbox to support it whilst the tractor body is divided.
5. Remove the circular Cover Plate 'B' on both sides of the rear body.
6. Remove the ten bolts in the rear body joint flange and divide the tractor, withdrawing the splined shafts carefully.
7. Remove the coupling shaft 'C'.
8. Remove the upper Bearing Housing 'D' and its shims.
9. Remove the lower casting 'E' containing the Gearbox Roller Bearing Outer Ring 'F', the Sliding Dog 'G', the Ball Bearing 'H' and the Circlips 'I'.
10. Dismantle and reassemble F, G, H and I in the casting 'J' supplied.
N.B.—Do not forget the bearing ring 'F'.
11. Fit the assembly to the tractor. Shimming is required for bearing adjustment.
12. Remove the two large Retaining Bolts 'K' of the Reduction Gearbox supplied and divide the unit, keeping the Layshaft 'L' mounted in the Rear End Plate 'M'.
13. From the Bearing Housing 'D' remove the Roller Bearing Outer Ring 'N' and refit this into the Bearing Housing in the front of the Reduction Gearbox Front End Plate 'O'.
14. Fit the plate 'O' to the tractor, using two of the bolts and washers 'P' which held the Bearing Housing, and sufficient of the original shims to prevent over-tightening of the Roller Bearing Ring 'N' when bolts 'P' are tightened. Note the thickness of the shims required.
15. Tighten bolts 'P' whilst keeping the plate 'O' turned as far clockwise as the bolts will allow, then drill the tractor gearbox through the holes 'Q' and tap $\frac{1}{2}$ " A.N.C. for bolts 'R'.
16. Fit the bolts 'R' placing the supplied spacers and sufficient of the laminated shims between the plate 'O' and the tractor gearbox face. Lock the bolts with the tab washers supplied.
17. Reassemble the Reduction Gearbox and wire up the two bolts 'K'. It is imperative that the driven gear (Illus. No. D10) is in mesh with the small layshaft gears, ensuring correct timing.
18. Fit the supplied replacement Coupling Shaft 'S' to the rear half of the tractor.
19. Rejoin the tractor body, ensuring that the splines of both shafts fit correctly. (To register those of the upper shaft it may be necessary to turn the engine starting handle slightly whilst in gear.)
20. Fit the supplied right-hand side Cover Plate 'T' in place of the original, making sure that the Crank 'U' engages the selector inside the tractor body.
21. Refit the original left-hand side Cover Plate, engaging its crank with the power take-off selector inside the tractor body.
22. Jack up one rear wheel and test by running the engines slowly to ascertain that all the gears are correct and that the selectors are working properly.
23. Fill up the gearbox and replace the exhaust pipe and footboards.

N.B.—All parts removed should be greased and stored carefully.

INSTRUCTIONS FOR FITTING THE HOWARD ROTAVATOR TRACTOR ATTACHMENT

(See Figure 2)

1. First place the Attachment on level ground and fully raise the rear shield 'A'.
2. Procure a baulk of timber 'B', 6-ft. long of 3" x 2" or thereabouts and place it over the Rotor Tube 'C', and under the Centre Tube 'D' of the Attachment.
3. Lift up the forward end until the gearbox 'E' of the unit is level with the Power Take-off of the tractor.
4. Push the timber forward to keep the Attachment in that position.
5. Remove from the Tractor all the Power Lift and Drawbar parts, except the right-hand side Lifting Arm 'F' and Connecting Rod 'G'.
6. Remove the Right-hand Wing and the bolts attaching it to the Axle and fit the Staytube Support Assembly 'H' supplied. Refit the wing and bolts, leaving the nuts loose.
7. Remove the cover cap over the Power Take-off Shaft 'I' and screw in the locating ring 'J'.
8. Fit the Drive Dog 'K' and its retaining pin. When fitting the Fixed Dog (Illus. No. D35) and Pin (Illus. No. D36) to the Tractor P.T.O. shaft, care must be taken to have the Fixed Dog (Illus. No. D35) so shimmed that the play between the end of the spline and the large diameter of Pin (Illus. No. D36) is reduced to a maximum of .008". To do this, first assemble with the Pin fitted the wrong way round and then adjust with the shims (Illus. No. D33 .010" thick) and the spacing washer (Illus. No. D34) provided for this purpose. The pins should then be inserted correctly and the pin fitted.
9. Reverse the Tractor to the Attachment and loosely fit in the four bolts 'L' in the front end flange of the gearbox and the two $\frac{1}{2}$ " bolts 'M' to the staytube end plate and the support assembly.
10. Fit the gearbox Support Arms 'N' to the lugs on top of the rear body using the small bushes 'O' to fill the holes to the size of the bolts supplied.
11. Tighten up all bolts, commencing at the front end of the gearbox.
12. Fit the Clutch Control Lever assembly 'P' to the right-hand wing, using existing bolt holes.
13. Put lever in the front notch and withdraw the split pin and eye bolt 'Q' on the gearbox Clutch Lever and, moving the Rotor by hand force the lever back far back as possible to ensure that the driving dogs are fully engaged.
14. In this position the lock nuts on the control rod 'R' should be so adjusted that the eye bolt lines up with the hole in the lever.
15. Replace the eye bolt and insert the split pin.
16. Fit the Connecting Saddle 'S' to the Lifting Arm 'F' placing the locating bolt through the rearmost hole in the arm, then attach the Connecting Rod 'G'.
17. Connect the arm to the links 'T' on the attachment, using the bush 'U' in the socket joint.
18. Fit the lug ends of the two gearbox tension bolts 'V' to the existing holes in the base of the tractor power-take-off housing by means of the two bolts provided. Each tension bolt should have two locknuts in front of the flange of the attachment gearbox, and two behind. The rear pair should be lightened first to tension the bolt then the front pair also locked against the flange. Tension both bolts together.







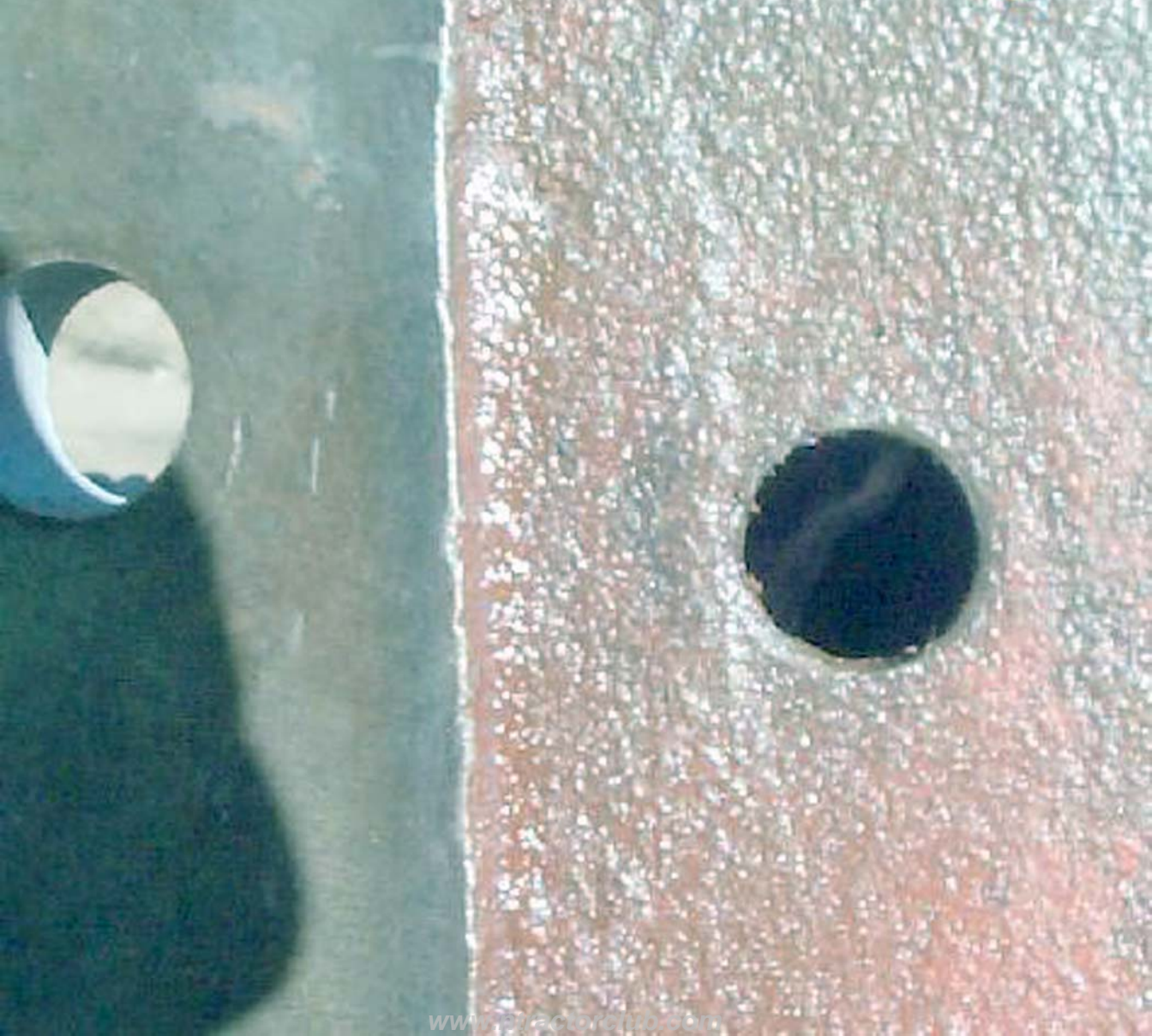
Howard Gear Reduction Transmission Mounting Holes

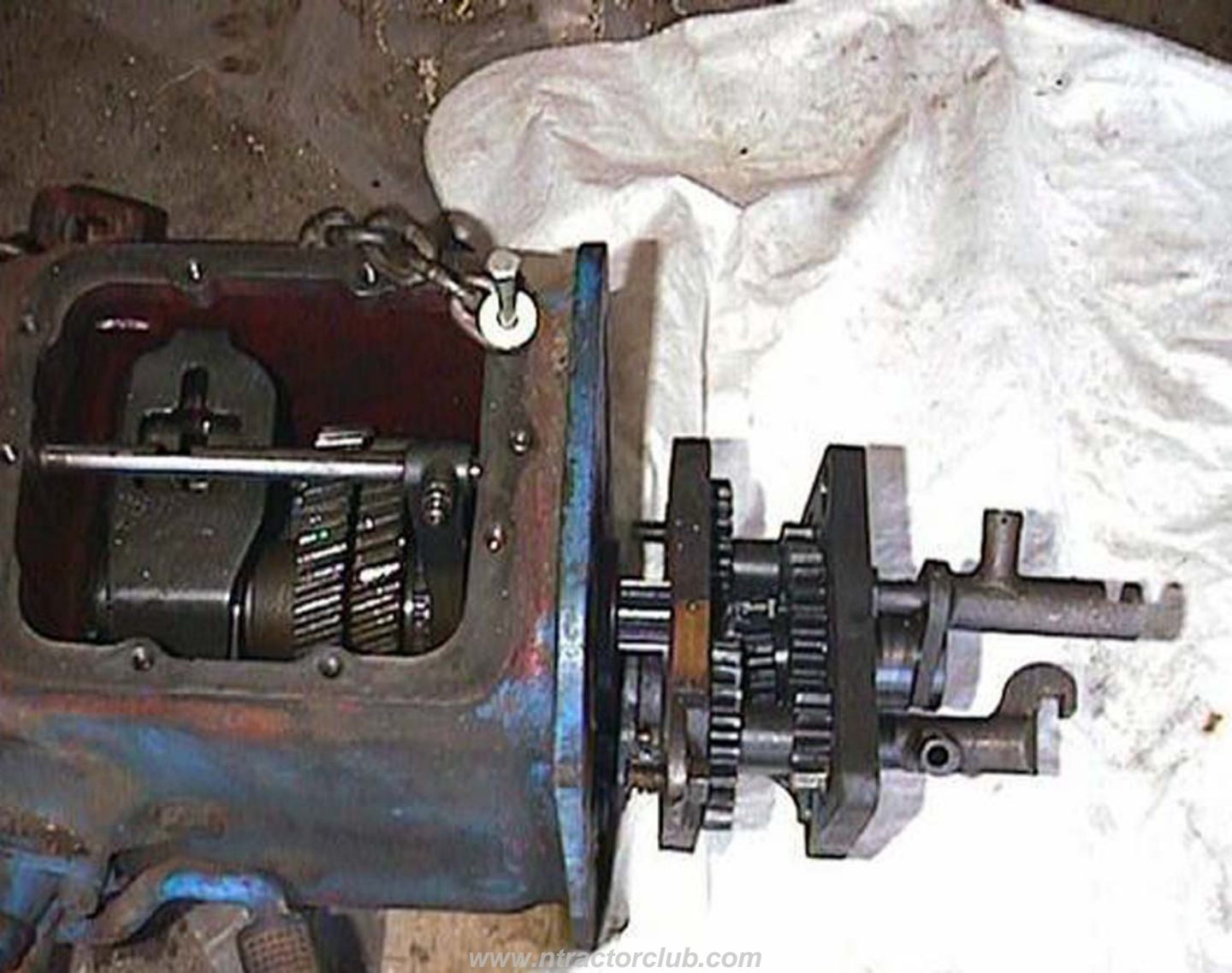


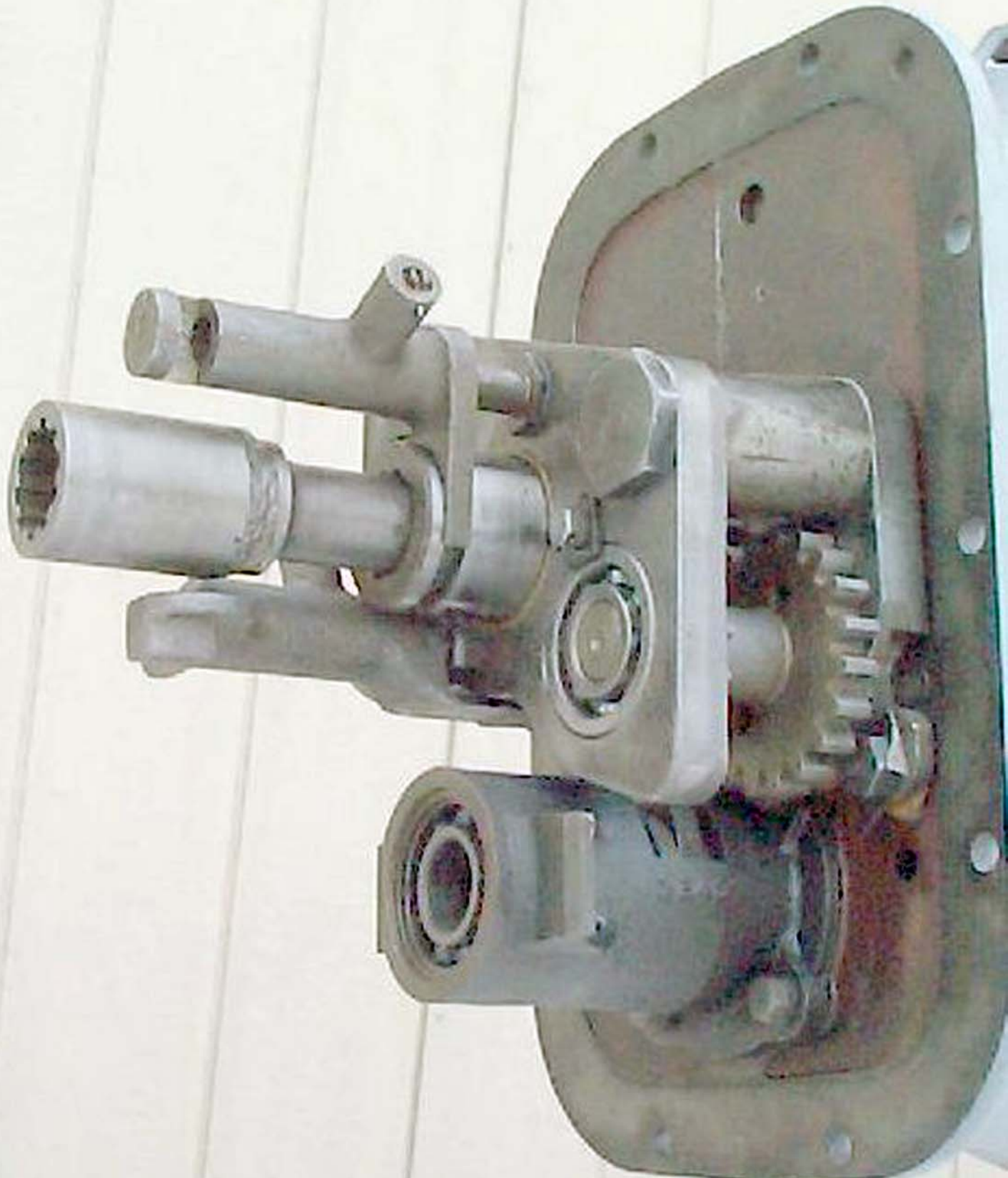
Howard Gear Reduction Transmission Mounting Holes



Howard Gear Reduction Transmission Mounting Holes











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