



Steering Inspection

Introduction

Having seen internet posts where people are asking how to adjust tyre pressures to stop shimmying on road runs and prettily painted tractors at shows that would be unsafe to drive at speed, it seems that many people don't know how to inspect steering and identify problems. Some issues can be very easy to fix while the more complex will be the subject of another article.

This description uses IH Bradford built tractors (B275, B414 and B434) as examples but most of the steps will apply to any tractor.

As this whole process can take less than a couple of minutes, it is also very useful when looking at a potential purchase.

Part Identification

To avoid confusion over names, the following pictures identify various components mentioned in the later steps.

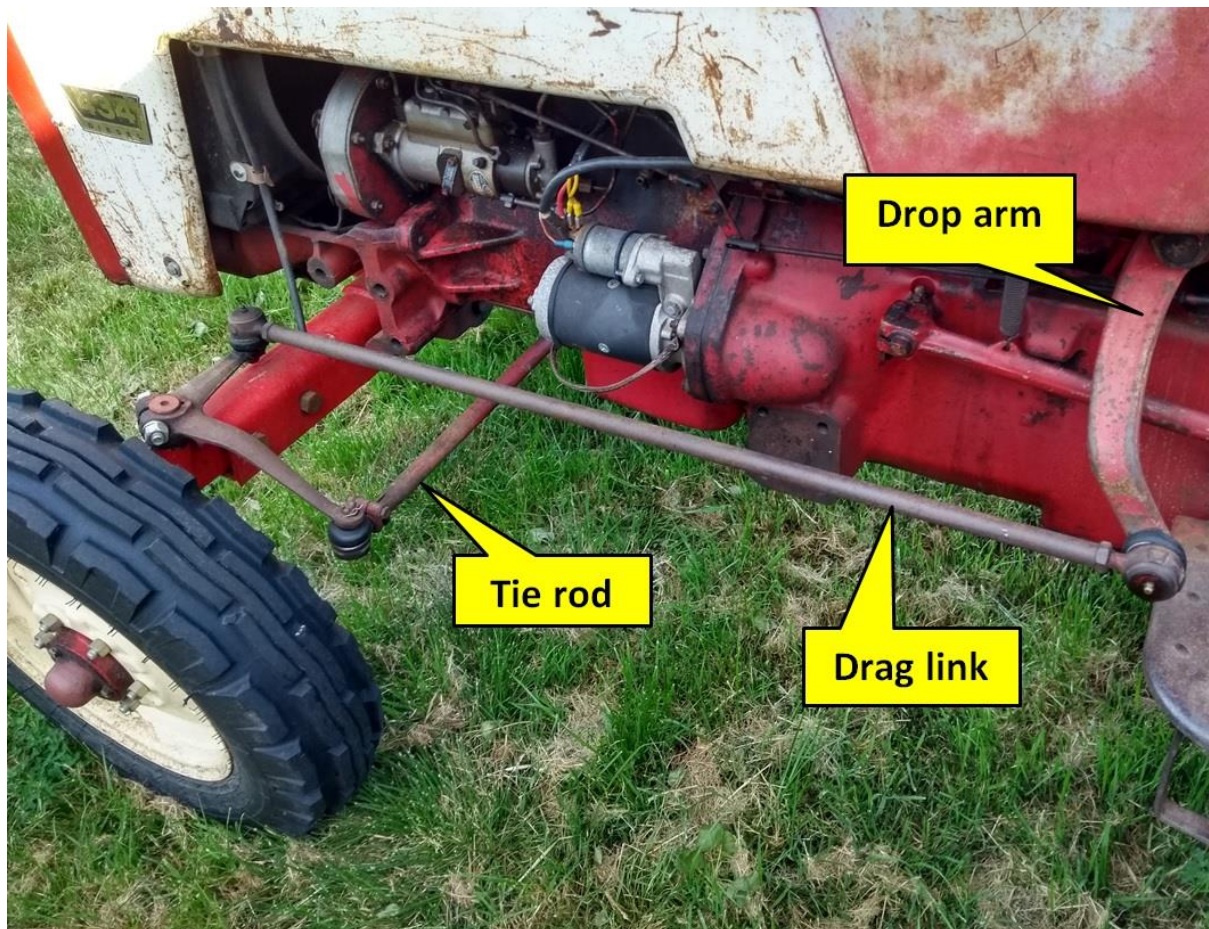


Figure 1 IH 434 steering arms



The tie rod and drag link have four swivel joints in total and, in the design engineers' effort to minimise the number of different spares needed (joking), no two are the same!

Both tie rod and drag link can be reversed end for end so be sure to identify the correct part before ordering spares.

The tie rod has an extended swivel joint with notches at one end – when the axle extensions are moved in and out to adjust the track, the notches allow the tie rod to be easily adjusted in equal amounts without impacting on the tracking. The swivel joint at the other end is threaded and adjusted to set the tracking.

The drag link has both left and right hand threaded swivel joints. When adjusting its length to ensure that the steering "straight ahead" position matches the wheels when straight, the lock nuts are released and the drag link simply turned in the same manner as the 3-point top link.

Early swivel joints have grease nipples and replacement gaiters are available. The later swivel joints are sealed for life and don't seem to have replacement gaiters so always take care whenever the joints are removed.

Anglo Agriparts list all four swivel joints with the later parts being direct replacements for the earlier versions

Anglo ref	Description	OEM number		
		B275	B414	434
A60104	Drag link steering joint, left hand thread	3040921R91	3040921R92	3071055R91
A65445	Drag link steering joint, right hand thread	3040922R91	3040922R92	3071056R91
A51296	Tie rod steering joint, without extension	3040920R91	3040920R92	3071097R91
A46124	Tie rod steering joint, with extension	3040919R91	3040919R92	3071096R91

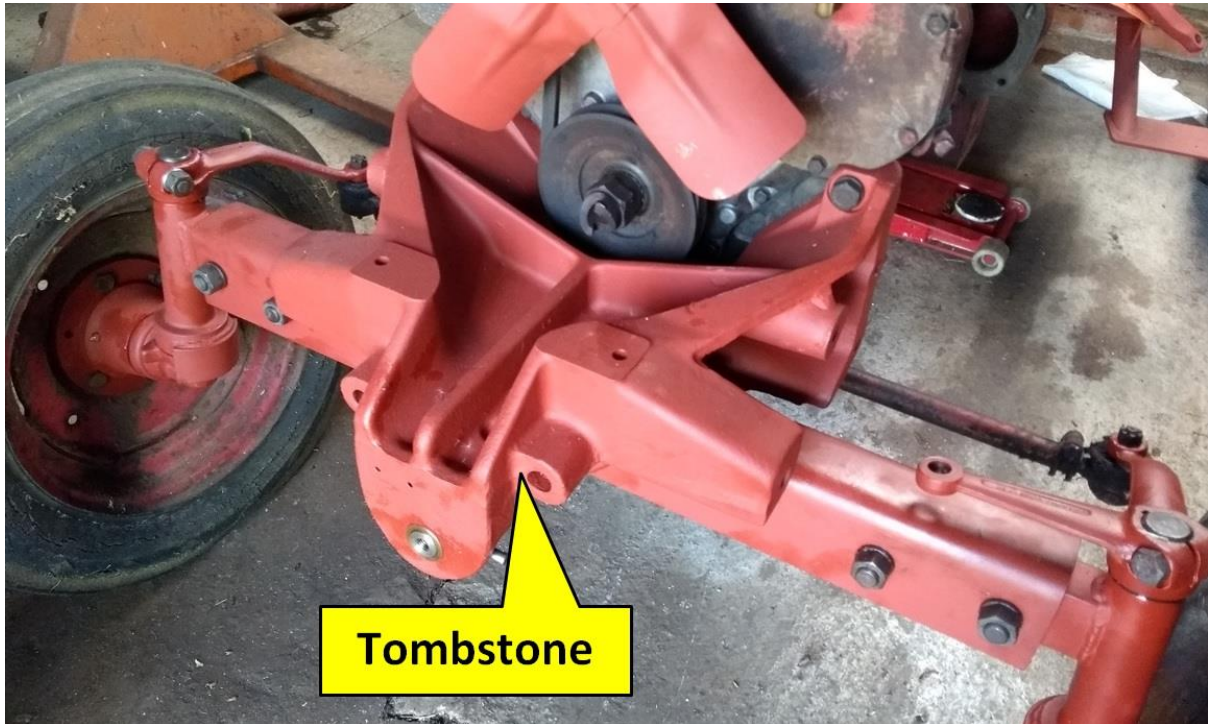


Figure 2 Tombstone or front axle support casting

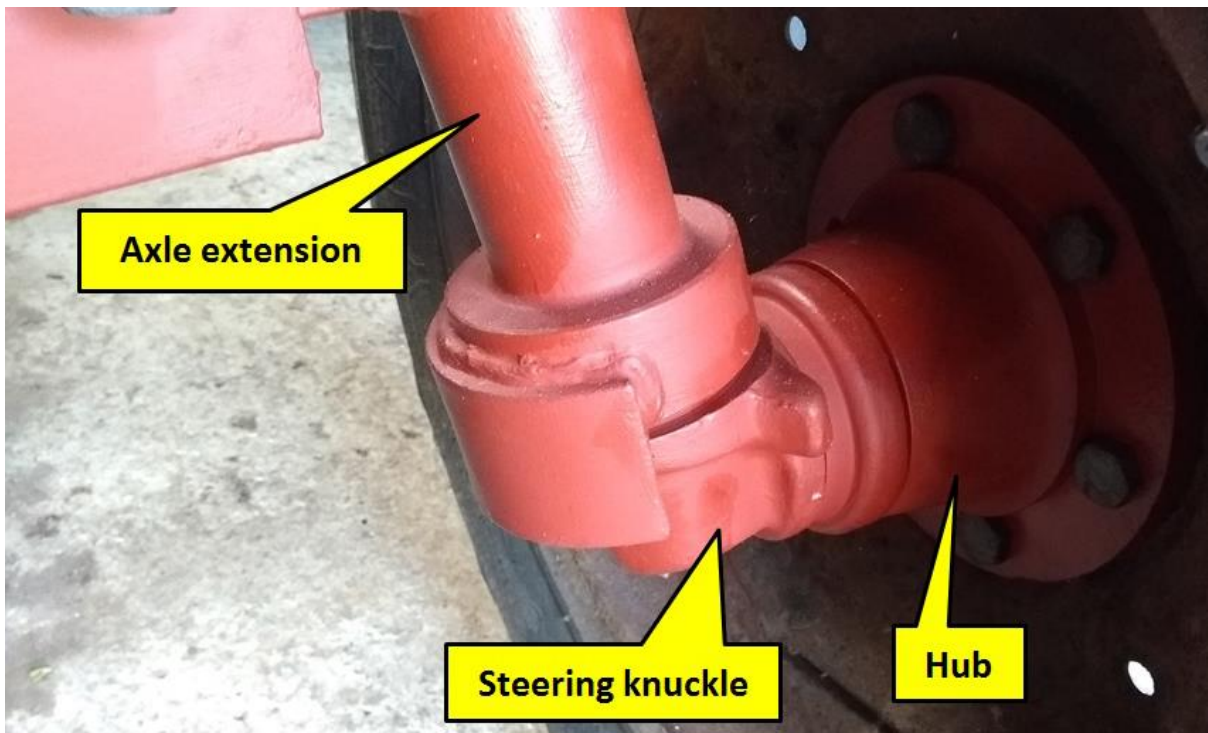


Figure 3 Front wheel, hub, steering knuckle and axle extension

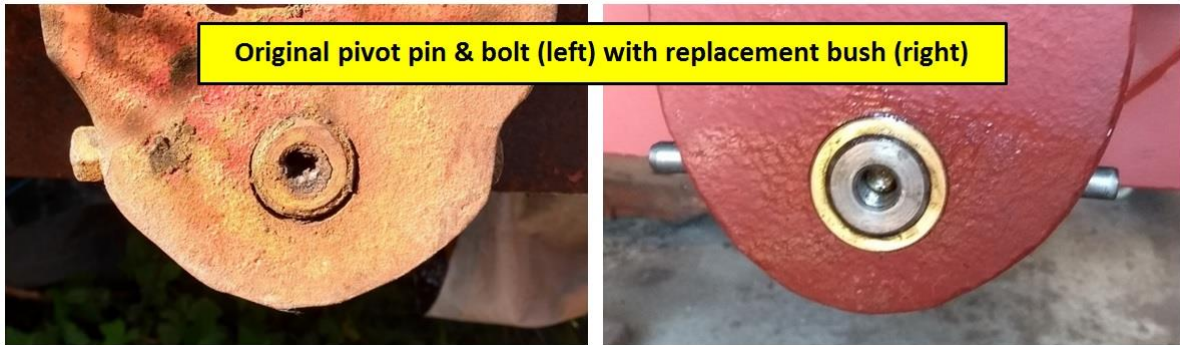


Figure 4 Two B414 front axle pivot pins

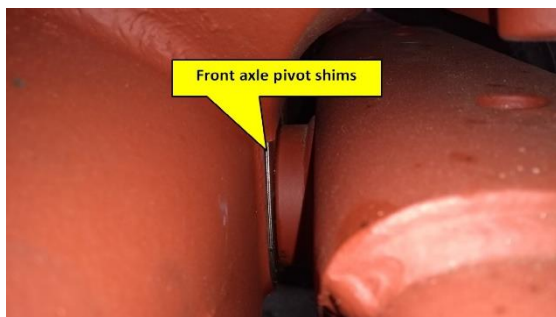


Figure 5 Front axle (right), shims and tombstone (left)



Figure 6 Underside of front axle showing the important grease nipple

Step by Step

With the tractor on its wheels and while sitting in the driving seat the following steps move from the steering wheel to the front wheels checking each potential problem area.

1. Grip the steering wheel and try to rock it from side to side and fore and aft.
 - a. Is the fixing nut loose? If so, tighten it! *Or replace with Anglo ref: A56749 which fits B275, B414 etc. and B275, B434 etc. if replacing with an earlier style steering wheel.*
 - b. Is there play between the steering wheel shaft and column? If so the top bush needs changing. *On the IH tractors (post B250) just take the wheel off (**don't lose the woodruff key**), lever out the old bush and fit Anglo ref: A68063.*
 - c. Does the whole steering column move? The most likely cause is that the steering box mounting bolts are loose.
2. While watching the drop arm, gently rotate the steering wheel from side to side to see how far it will turn before the arm moves. This is an indication of the wear in the steering pin and worm inside the steering box. On a perfect tractor there is no movement but a badly worn steering box could have $\frac{1}{4}$ to $\frac{1}{2}$ a turn of play. Fixing this isn't a 5-minute job so will be covered in another article.
3. Using a little more force, turn the wheel so the drop arm moves.



- a. Does the shaft move in and out? The early B275 steering boxes had no adjustment but later tractors have an adjustable end thrust on the opposite side of the steering box – simply slacken the lock nut, take up the slack on the adjusting screw and tighten the nut then repeat test 2.
 - b. Does the shaft move up and down? The steering box bush is worn and needs replacing as part of a steering box overhaul.
 - c. Is oil leaking from the steering box (or is there any oil in the box?) If so the seal will need changing, again a more major task.
 - d. Is the drop arm loose on the shaft? Tightening the nut is the obvious first step here but if the tractor has been used a lot with it loose then the drop arm and/or steering box rocker shaft may be worn and need replacing... which probably means contacting a breaker.
4. Again while moving the steering wheel to and fro, watch the drag link where connected to the drop arm. If there is any movement, check that the nut is tight and if it is, the joint needs replacing.
 5. Repeat the process while watching the joint at the other end of the drag link.
 6. Repeat the process while watching the joint on the joints at both ends of the tie rod.
 7. Using more force, turn the steering wheel to and fro hard enough to move the front wheels while watching the front axle. If the axle moves then there is wear in the axle bushes and/or thrust washers. This will also be covered in another article.
 8. Get off the tractor and with each front wheel in turn, try to rock the wheel sideways (i.e. towards and away from the nosecone) and look for any movement between hub and front axle extension. Also check that the extension doesn't move in the main axle – if it does then the fixing bolts should be tightened to 250->280 ft lb for the square axle tractors, there doesn't seem to be a figure for the round axle tractors. If the bolts are tight and there is still play, the hub and steering knuckle need overhauling – again to be covered in another article.
 9. Next look under the centre of the axle – there should be a grease nipple (see Figure 6), but sometimes this falls out or is broken off. **THIS IS ARGUABLY THE MOST IMPORTANT GREASE NIPPLE ON THE TRACTOR** but is regularly ignored with costly consequences as the pivot pin can seize in the bushes, shear the locating pin/bolt and wear the tombstone.
 10. Finally look under the front of the nosecone for where the front axle pivot pin fits into the tombstone. The pivot pin is held in place by a tapered pin (early tractors) or a long bolt which should be present and tight in the casting. If the securing pin/bolt is sheered then the pivot pin is almost certainly seized in its bushes due to lack of lubrication and the tombstone holes will have worn oversize and need machining, not a trivial job.

A final check would be to jack up the front of the tractor and check the wheel bearing for smoothness of running and possibly a more detailed diagnosis of bearing and steering knuckle wear.

The 434 in the first picture has had all the issues described here fixed and there is no discernible steering play, just as it left the factory. It is very popular for road runs.



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