



# High-rise development

An upsurge in demand for specialised high-clearance conversions has seen one of the most famous names in the agricultural industry – County – return to four-wheel drive tractor production. Stuart Gibbard reports exclusively on news of the latest developments at Countytrac Limited in Kent.

COUNTY  
EXCLUSIVE!

**W**HEN IT COMES to four-wheel drive developments, whether agricultural or automotive, there is no name more famous than that of County. From its first involvement with the Four-Drive tractor in 1954, County Commercial Cars Ltd remained at the forefront of 4x4 technology until its demise in 1983. The company was then reformed as County Tractors Ltd by David Gittins, before passing into the hands of the Benson Group. Under Benson's ownership, the last County four-wheel drive tractors, the Series 40 machines, were completed in July 1995.

That was some 17 years ago; and yet the following for County tractors is undiminished and grows stronger with each passing year. However, despite this continuing interest from enthusiasts and a not inconsiderable number of users, few people realise that County is still very much alive and kicking. Furthermore, it's heavily involved with ground-breaking developments in automotive technology and, we can exclusively reveal, is poised to release the first new four-wheel drive County tractor for nearly two decades.

County exists today as Countytrac Ltd, specialising in driveline systems. It is part of the M. J. Allen Group based at Ashford in Kent. Its skilled development team is headed up by project engineering manager Max

**County has returned to four-wheel drive production. This Hi-Crop conversion is based on a New Holland T6030 Elite tractor.**

Sheppard and engineering director Eric May.

Eric needs no introduction to those of you that read the October issue of CLASSIC TRACTOR as he is the man responsible for the Ford 8401 tractor. A gifted engineer, he has been credited with many leading automotive and tractor developments, including the conception of the six-cylinder Ford 7810 when he was engineering director of South Essex Motors (SEM) during the 1980s.

Eric's involvement with County dates back to 1994 when the name was licensed to SEM for a high-speed haulage tractor that it was developing for sugar-cane plantations in Africa. At the time, County was in Benson's ownership and was located at Knighton in Powys. Tractor production at Knighton had lapsed in early 1990 after the last 1884 Super-Q model was supplied to Lafarge Aggregates. However, the company was still very much involved with the four-wheel drive County Transit, which was still a firm favourite with the utility companies, emergency services and armed forces.

After the haulage tractor was launched as the County HSH 140, Benson asked Eric to redesign the County four-wheel drive system to accommodate the Ford 40 Series skid unit to meet an order from the Falkland Islands, St Helena and Canada for 10 tractors. Work on the new County tractors commenced at SEM's Basildon factory, but the firm unfortunately went into receivership in February 1995 and manufacturing was transferred to Knighton, with Eric being offered a new position with the Benson Group.

## Resources

These 10 Ford 40 Series machines marked the end of County tractor production at Knighton. Eric's work then centred on the Transit developments until he was offered the opportunity to acquire the County business in 2000. To give him the resources he needed, he joined forces with the M. J. Allen Group and moved the operation to Ashford.

M. J. Allen's core business is producing castings and machinings. The organisation started out as pattern makers before acquiring its own foundry. Its link with County dates back to when it supplied castings and components for four-wheel drive systems to Benson at Knighton. By a remarkable coincidence, the group's chairman, Mike Allen, was born only doors away from where the original County Commercial Cars concern established its first factory at Balham in south-





**Above:** Launched in 2007, the four-wheel drive Ford AWD Transit was the result of a joint venture between Countytrac and Ford.

**Top Left:** Not quite the end of the 'old guard' of County tractors, this 1884 Super Q model was supplied to British Steel in February 1989 while the company was under the ownership of the Benson Group. A second 1884 Super Q, delivered to Larfarge Aggregates in February 1990, was the last of the old designs.

**Above Left:** Eric May, who is engineering director of Countytrac Limited, handled the development of the County 40 Series models, which brought an end to tractor production at Knighton in 1995. This 1184-40 model, based on the Ford 8340, was supplied to the Falklands.

**Left:** This six-cylinder 1162-H model, based on a Ford TW-15, was one of the last of the County Hi-Drive tractors built at Knighton in the late 1980s.

**Bottom Left:** Mike Rianda, the proprietor of Coastal Tractors in Salinas, with the prototype two-wheel drive County high-clearance tractor. Based on a New Holland TS110A, it was sent to California for trials in June 2006.

west London in the 1920s.

Operating under M. J. Allen's wing, the County concern was renamed Countytrac to reflect the scope of its activities. It continued to supply 4x4 systems along with a full spare parts programme for the County Transit, which remained in production

until 2001. Eric and his team continued to solve customer's engineering problems and design issues across a wide range of vehicle applications and derivations, undertaking sub-assembly, kitting and installation. The association with Allen enabled Countytrac access to the group's pattern-making, casting and machining facilities, which meant that prototypes could be quickly built and the designs

swiftly proved in-house.

In 2001 Eric May began working in partnership with the Ford Motor Company to develop the All-Wheel Drive Transit, which was launched in September 2006 at the Hanover Commercial Vehicle Show in Germany. Based on the rear-wheel drive Transit with the 140hp, 2.4-litre Duratorq diesel engine and six-speed manual transmission, the AWD model incorporated a mechanical system that operated automatically, increasing the drive to the front wheels in slippery conditions. The system was housed in a modified gearbox with drive to the front axle being taken off the transmission main-shaft via a helical gear. A system of mechanical multi-plate clutches combined with a hydraulic freewheel mechanism sensed rear-wheel slip and fed power forward when required.

Launched in early 2007, the AWD Transit was an instant success; offering improved off-road capability without raising the ground clearance or load heights. The system has been acknowledged as contributing towards Ford's new Transit range being awarded the prestigious 2007 International Van of the Year trophy. As Eric says: "You wouldn't know there was a County connection until it ran you over and then you would see our name cast into the gearbox casing!"

The AWD Transit is still going strong and remains Countytrac's mainstay project, accounting for sales of a few thousand vehicles each year. It's good business for the company, which continues to supply aluminium castings and components for the

**Right:** The prototype County Hi-Crop based on a Case IH MXU100 Maxxum, pictured in 2006. These Hi-Crop tractors were fitted with drop-casings to raise the rear axle and had a new front axle with extended forks. The front axle has been strengthened on current models.

**Below Right:** A CAD view of the Hi-Crop transmission and rear axle with the drop-casings fitted for 1.524m (60in) track widths and, inset, a CAD drawing showing the train of three gears.

**Bottom Right:** A CAD drawing of the front axle assembly for the new four-wheel drive Hi-Crop tractor conversion from Countytrac, inset, the front drop-casing showing the upper drive, centre idler and lower output gears.

transmission and is currently working on future models.

Automotive developments may have kept Eric occupied, but he was keen that Countytrac should not forsake its roots in agricultural engineering. A return to tractors was on the cards as early as 2002 following an approach from CNH's product manager in the USA, Paul Trella, for the All-Purpose Heavy (APH) range of medium-horsepower (up to 150hp) Case IH and New Holland tractors.

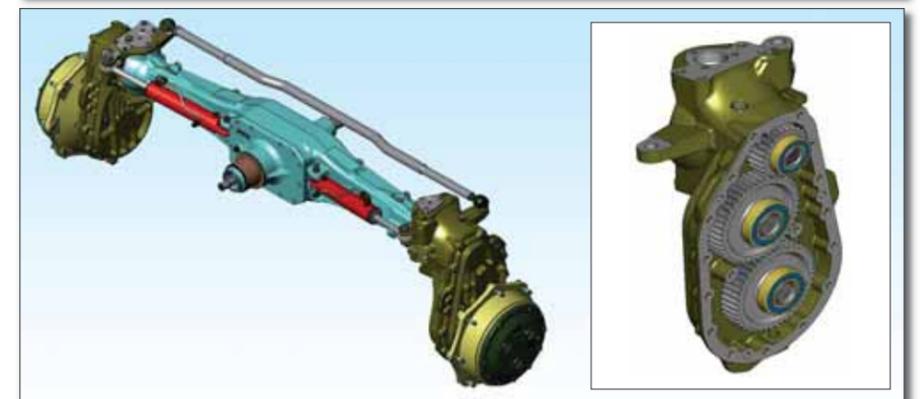
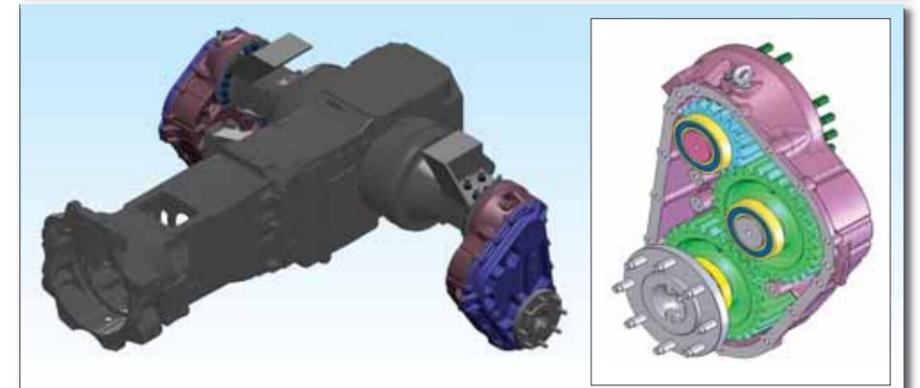
CNH was looking for a specialised high-clearance design with a smaller turning circle than the equal-size four-wheel drive and 'mudder' tractors commonly used in North America at the time. He remembered County's earlier high-clearance designs and wondered if that could be adapted to suit the current Case IH/New Holland range. Both two- and four-wheel drive versions were discussed.

## High-clearance

The County high-clearance arrangement was a tried and trusted design. The first County Hi-Drive, based on a Fordson Diesel Major adapted for sugarcane work in the West Indies, appeared in 1958, and examples were still in production under Benson's ownership in the late 1980s. The rear axle was raised using a drop-housing incorporating a vertical train of gears, while the front axle featured extended forks.

Following the approach from CNH, Eric revisited the County Hi-Drive layout and looked at ways of developing it for the latest Case IH and New Holland tractors. With the AWD Transit occupying most of the engineering team's valuable time, it was 2006 before the project got fully underway after interest in a two-wheel high-clearance tractor was received from California.

The conversion was developed to suit the largely similar common platform Case IH MXU Maxxum and New Holland TS-A ranges. Drop-casings were fitted to the outer ends of the rear axles to raise the axle centreline by 350mm and give up to 900mm of crop clearance. The casings contained a vertical train of three gears (drive, idler and output gears) giving a reduction-ratio of 1.666:1. Designed to be used with the 40kph transmission option, this reduced the road speed to 30kph, which was done at the request of CNH to give lower creep speeds.



From the outset, two track widths, 1.524m (60in) and 2.032m (80in), were developed. The 2.032m (80in) track was achieved by inserting a 'cotton-reel' spacer between the ends of the County trumpet-housing and the drop-casings. The rear axle system was designed to be 'dry break', allowing the spacer to be fitted or removed without the need to drain down the axle/transmission oil. This was something that CNH insisted upon to allow clean in-

field changes and thus avoid potentially contaminating oil spills. Further adjustment was available by turning the dished wheel centres. A new front axle with extended forks was also fabricated with extendable beams to alter the track width.

Two high-clearance prototypes based on four-cylinder Case IH MXU100 and New Holland TS110A tractors were built for evaluation. In June 2006, the TS110A model, proudly bearing the County name on





Left: A worm's eye view of the four-wheel drive County Hi-Crop conversion based on a New Holland T6030 Elite tractor showing the front axle layout.

Main Picture: A four-wheel drive County Hi-Crop model based on a New Holland T6030 Elite tractor pictured during trials in Holland this August.

used with the hub/yoke assembly being removed and replaced with a drop-housing. Again, the housing incorporates a train of three gears with the output gear driving the epicyclic gears in the reduction hub. The front drop-housings give a 1.8:1 reduction ratio to maintain the 30kph road speed.

Once again, both 1.524m (60in) and 2.032m (80in) versions are offered – the different track widths on the front axle being achieved by altering the wheel centres. With the track set at 1.524m, there is approximately 30cm (10in) of front hub protrusion on each side.

## Prototype kit

The first prototype kit was shipped to Coastal Tractors in California and fitted to a six-cylinder Case IH Maxxum 125. A second prototype was sent to Countytrac's European agent, the Dutch New Holland distributor, Intrak bv, and assembled using a New Holland T6030 Elite.

Following successful trials, the four-wheel drive conversion is about to be launched as an aftermarket kit. Intrak is currently exhibiting its four-wheel drive T6030 Hi-Crop around the shows in Holland and will introduce it as a County conversion. Another three kits have already been supplied to Australia.

Countytrac, drawing on M. J. Allen's expertise, makes about 90% of the conversion in-house; the exceptions being the shafts and gears. The big advantage of the design is the quick conversion time; changing from a standard tractor to a Hi-Crop or vice versa can be completed in less than a day. The four-wheel drive Hi-Crop has been developed for six-cylinder CNH tractors, while the two-wheel drive

its front axle, underwent trials with Coastal Tractors, a New Holland dealership at Salinas in California.

The two-wheel drive conversion, called the County Hi-Crop, was released for production in early 2007. A four-wheel drive version had been planned, but CNH seemed to have lost interest in this version, while Countytrac's involvement with the AWD Transit also delayed further development.

By 2009, with the Transit settled into production, Countytrac felt it was time to revive the Hi-Crop developments with interest being shown from North America, Europe and Australia. Max Sheppard took

America, but the market was changing. Europe and Australia preferred four-wheel drive variants, but with unequal-size wheels to maximise the turning circle. Furthermore, CNH had deleted many of the two-wheel drive models from its ranges, which meant that the choice of suitable skid units was now restricted.

In December 2009, Max Sheppard travelled out to California to meet Mike Rianda, the proprietor of Coastal Tractors, to evaluate the status of the market for a four-wheel drive Hi-Crop tractor. The development of a 4x4 version took more than a year

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over the tractor project leaving Eric May free to concentrate on the automotive contracts. Max, a Ford undergraduate, had met Eric while working on the AWD venture and had been persuaded to join Countytrac as its project engineering manager.

The first undertaking was, at CNH's request, to strengthen the front axle fitted to the two-wheel drive Hi-Crop. Two-wheel drive high-clearance tractors were still in demand in parts of North

and the first of two prototypes was completed in January 2011.

The four-wheel drive Hi-Crop employs an identical rear axle arrangement to the two-wheel drive models. A standard CNH front drive-axle is



version can be applied to four- or six-cylinder models.

Demand for the tractors comes particularly from areas where high-value crops are grown. In California, the main market is for fruit growing, particularly strawberries. In Holland, meanwhile, the Hi-Crop is used for a variety of crops including asparagus, brassicas, tulips and tree saplings. The four-wheel drive model offering up to 942mm under-axle clearance depending on the wheels/tyres fitted.

“It will not be massive volumes,” says Max Sheppard, “but we expect to sell between five and 10 units in each market annually. It will keep the County name alive in agriculture and show what we are capable of in terms of design and manufacture.”

Top: A four-wheel drive New Holland T6050 Elite Hi-Crop that has been converted in Australia using the County kit.

This County Hi-Crop conversion of New Holland's T6030 Elite tractor is set for 1.524m (60in) track width and has up to 942mm (37.5in) of under-axle clearance depending on the wheels/tyres fitted.



## County's first Hi-Drive



The first County Hi-Drive was based on a Fordson Diesel Major.

County's original high-clearance Hi-Drive tractor was based on the Fordson Diesel Major. Developed for the sugar-cane industry in the West Indies, the conversion was launched in 1958. A new axle was fabricated to give 76cm (30in) ground clearance, and the rear axle was raised using drop-casings with a vertical train of three gears – almost exactly the same as on the current Hi-Crop model. Hi-Drive versions of the Power Major and Super Major were also built before the front and rear axle arrangements were modified to suit the new Ford 5000 that was introduced in 1965. This

model was known as the County 652H. Most of the early Hi-Drive tractors were exported but a small handful were sold in the UK.