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VOLUME 16, No. 2, APRIL, 1977

TWO WHEELS

THE MAGAZINE OF MOTOR CYCLING

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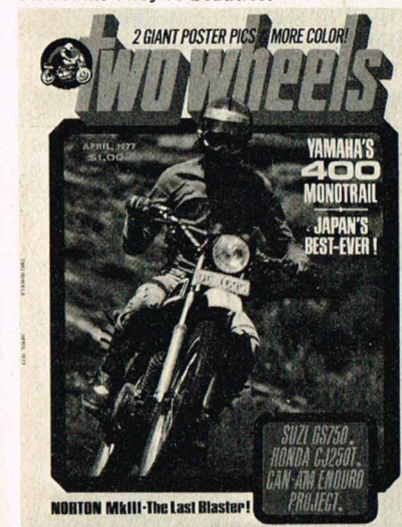
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OUR COVER: Monoshock comes to mass production — and transforms the nastiest of the big-bore trailsters into the undisputed King Of The Dirt! That's our opinion of the new-breed trail Yamahas — undoubtedly the best off-roaders out of Japan and final proof the company is way ahead of the rest with development. We've sorted out some of our own development this issue too. Puttin' together all the successes of our Can-Am 175 enduro project we realise we've built a giant-killer! Check out the detail page 34. That's where the new giant poster gatefold fits in. Dragster burnouts and Gary Flood on the KTM. They're beauties!



Freelance contributions are welcomed by this magazine and submissions should be addressed to The Editor, TWO WHEELS, 142 Clarence Street, Sydney 2000. Submissions must be accompanied by a stamped, self-addressed envelope for their return. The editor accepts no responsibility for unsolicited manuscripts, photographs or transparencies.

ADVERTISING: General Advertising Sales Manager, Michael Wright, National Advertising Manager, Ray Berghouse, Senior Representative, Chris Ferguson, Sydney Representative, John Moore, 142 Clarence St, Sydney, 2000. Phone 29-3761, 29-5606. **MELBOURNE:** Manager, R. W. Lachberg, 259 Collins St, Melbourne, Vic. 3000. Telephone 63-2294 and 63-7221. **ADELAIDE:** Harry Hastwell, 399 Glen Osmond Rd, Glen Osmond, 5064. Phones 79-1869, 79-5956. **BRISBANE:** Dick Coates, 27 Atkinson St, Hamilton, 4007. Phone 262-5384. **PERTH:** Cliff Thomas, ADREP Advertising Representatives, 62 Wickham St, East Perth, 6000. Telephones: 25-6395 and 25-9395. **LONDON:** Peter Holloway, Ludgate House, 107 Fleet St, London EC4A 2AL. Telephone 01-353-1040. **JAPAN:** Yoshio Washizu, Business Dynamics International Incorporated, 207 Yotsuyaken Daini Kyodo City Corp., 3-37-17 Miyasaka, Setagaya-ku, Tokyo. Phone (03) 325-3733.

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INSIDE BMW'S WIND TUNNEL

body-builder and stylist, Pininfarina. The company has a sophisticated wind tunnel in Turin, Italy, opened in 1972.

It's from this facility that we acquired photographs of the extensive and top secret testing conducted by BMW before the new R100RS was released. Various test techniques include use of electrodes and streamers to measure and illustrate air flow.

The shape had to improve active safety since there isn't much a motorcycle designer can do about passive safety anyway — or you might have thought so before BMW dramatically reduced the fatigue factor with its fairing.

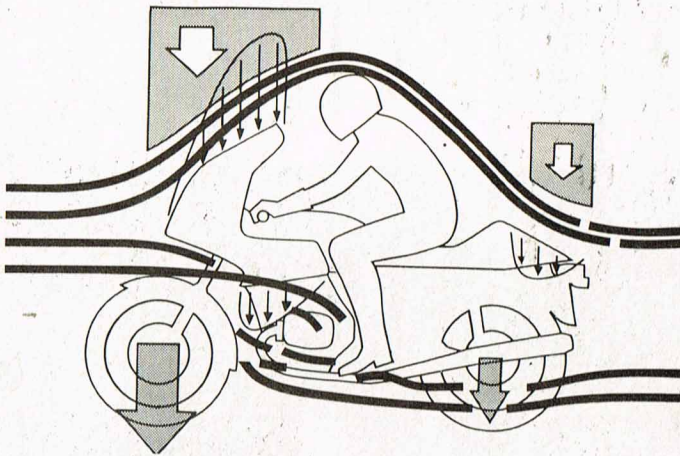
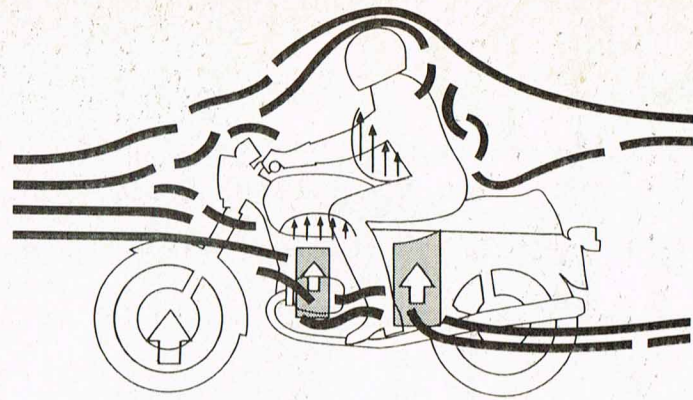
But the design's real importance is its positive effect on the big beast's handling. The company points out turbulence has been all but eliminated and a high downward pressure developed at the base of the bike has a stabilising effect which increases with speed.

The company claims a reduced lift of 17.5 percent at the front wheel and a 64 percent reduction in sidewind effect! BMW points out these value improvements are over their own R90S so the improvement factor over a totally naked bike is extremely high. We'd like to see figures on it.

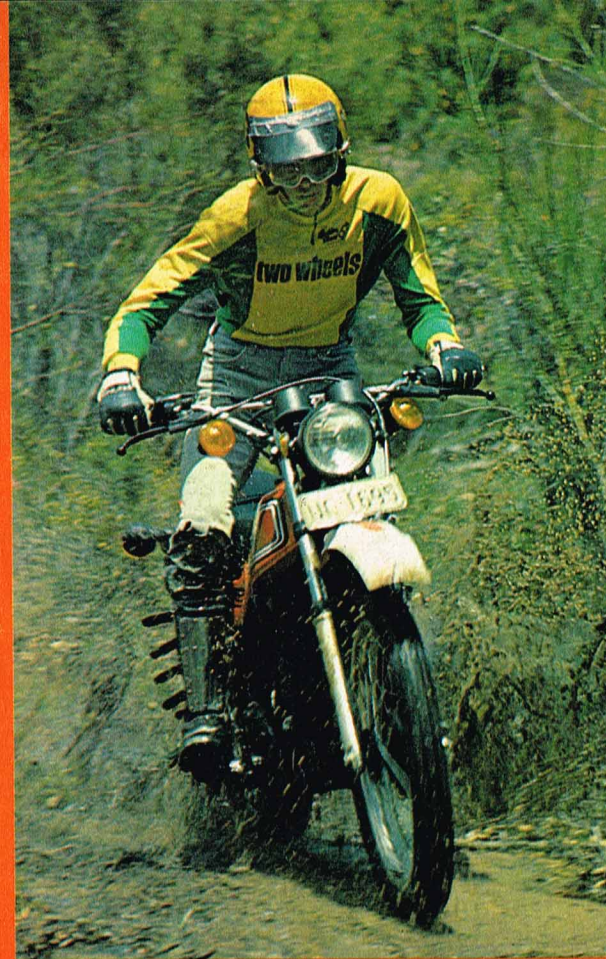
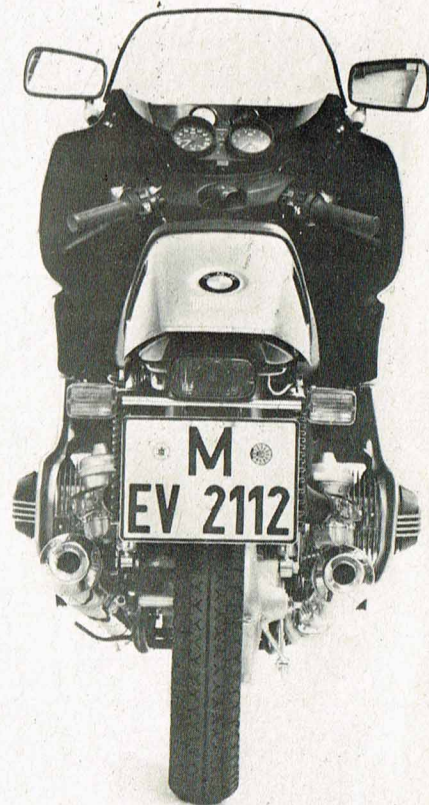
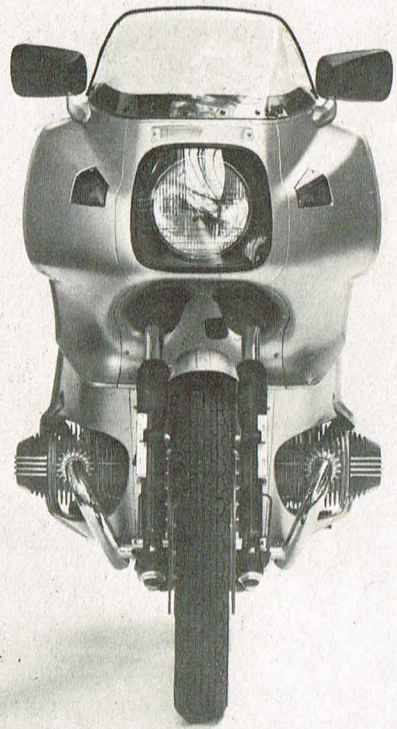
It's probably difficult to imagine just how much better the new faired BMW is over what we're used to. Just check last December's ride by Dave Minton on the big machine. Here's an enthusiast who's ridden every big and magnificent blaster the Europeans have reproduced. A rider who knows and loves bikes, but who is analytical enough to understand when they've reached their limits. He said that about the Guzzi Le Mans!

But the new BMW is obviously something else again, and our "inside" shots give some indications why. Let's repeat a point we've made before that often impresses riders who visit BMW — it helps that several of the BMW board still ride big bikes, despite the company's prestige car line! *

Final fairing still has "integrated spoiler" but it's a lot less prominent than that shown on experimental shapes. The headlight cover is inclined and runs flush with the streamlining — sharp edges cause wind currents! Despite its apparent bulk fairing weighs only 9.5kg (21 lb).



The drawing shows obvious wind current variations between the unfaired conventional bike and the integral cockpit R100RS. Unfaired machine has turbulent wake and low base pressure. Wake is reduced and high base pressure has a stabilising effect on the R100RS at high speeds.



YAMAHA'S DT400 MONOSHOCK

King of the Dirt!

...This year~for the first
time~it really gets
it all together





King of the Dirt!

FOR YEARS now, we've griped about Japan's changed design philosophy towards the dual purpose road-trail bike; an approach which has always given priorities to snappy market factors such as paint schemes, neutral indicator lights and chrome-plated headlamp

brackets. Somehow that misses the boat with basic ingredients such as suspension and frame geometry!

With few obvious exceptions, the Japanese machines were slipping backwards and further away from their original full-blooded character — snuffed out, weighed down and emasculated by the ever-increasing burden of ADR compliance equipment required to satisfy Australia's ardent but ill-informed licensing authorities.

But Yamaha has finally detached its head from the sandpile. The latest DT400D stands out as the first honest attempt by a Japanese manufacturer to produce a machine to satisfy the needs of both *enthusiast* riders and legislators.

So what's different about it?

Let's start with the obvious — the monoshock. It was pioneered on the early white tank YZ racers and Yamaha has developed it into a pre-tuned and tamperproof setup with no adjustment possible or required. In that respect it bears more resemblance to current monoshock TZ roadracers. With the DT suspension you don't need the monoshock itself "tuned" at your local Yammie shop as was the case with the motocrossers.

One adjustment is possible though — with the DT's rear suspension the pre-load on the unit's (conventional) spring can be altered. It's necessary to remove the seat first by detaching a few

Suspension performance on the Yamahas has way outgrown the standard tyres. Ease with which you quickly became "an expert" is gonna make these machines popular!

bolts, but the spring setting is straightforward: it must be if it's easily set with the one Phillips-head screwdriver in the scanty toolkit! Optional springs are also available making it possible to fine-tune the new monoshock, from simulated trials stuff to earholing around the backroads when you're fulfilling your Daytona fantasies.

Front suspension is also vastly improved, with wheel travel now boosted to 195 mm and some subtle

damping changes. Maybe it's the fork oil working more effectively than the sardine dressing Yamaha used to use! It's possible to raise or lower the fork tubes in the steel triple clamps for variations in rake and wheelbase. For high speed firetrails we dropped them all the way down (flush with the top triple clamps) and then moved them back up 25mm for the usual tighter off-road conditions in our test area.

Yamaha claims its '77 suspension is a "revolution", and we're inclined to agree, particularly considering the inadequacies of earlier DTs we've tested.

We rode the new 400 on stock trials tyres (with a very unimpressive rounded-shoulder tread pattern) along

It's the clean finish and attention to detail that stands out immediately — the approach which has put Japan on top of the motorcycle market.

with two modified TT500s and a new PE250 over a weekend of solid, friendly, trail-racing and general goofing about. The only major bitch we could offer is that the trials tyres are totally inadequate for the new DT suspension. A set of knobbies will be the first buy any ardent dirt biker will pop money for, and his next and possibly final option might be a chain tensioner. That's about all that's honestly required to convert the DT from street/trail to pure trail!



Would you believe we're just trying out the "crashproof blinkers?"



King of the Dirt!

Dampening action of the front forks felt harsh compared to the PE250 Suzuki, but was almost Maico-like after a rider had swapped from either of our TT500s. We wouldn't even recommend a fork kit for this one — maybe it will even be free of gradual sagging of the front springs, a problem absurdly common on most Japanese front suspensions.

Very few specific engine details are given in the Yamaha brochures relating to either the DT400 or DT250. The factory claims are for improved performance and more "grunt" . . . no

Motor runs clean under all conditions, sports a new Mikuni and more tractable power, but deserves far better bashplate setup than small sumpguard and ineffective plate over header loop.

more. In the dirt, every test rider confirmed that the new 400 does not have the available revs of its predecessor. The bike simply runs out of ports when it leaps above mid-range rpm. Despite this inability to rev it will pull like a freight train at all lower engine speeds. But the mono-400 does not have the instant zap and top end wheelie-power of the earlier yellow tanker and for that reason it is a far easier motor to ride and one that's far more suited to the dirt.

We were told that the tuning tricks and components from the current YZ250-400 can be fitted direct to the new DTs for more power (aimed at the enduro freaks). With a race kit, performance would be sensational for a mass-market trailbike and could make the DT enduro-competitive against Fronteras, Huskies and the like.

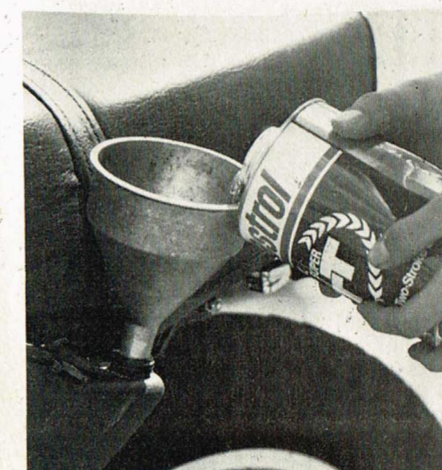
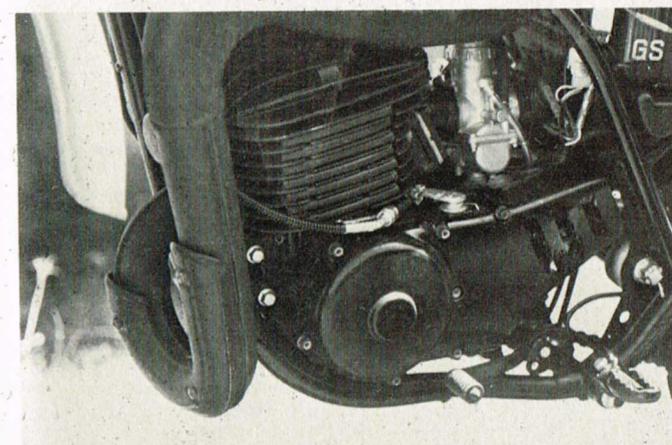
Many internal improvements incorporated in the new 400 will be welcomed by the maintenance-minded dirt rider, as well as the casual Joe Average. A redesign of the autolube pump gives improved metering at low engine speeds, and in conjunction with the DT's proven reed-valve system makes for perfect running and clean carburetion in even the tightest back

woods conditions. A "high-hat" style 34mm Mikuni (similar to the RD400) replaces the conventional "flat-top" Mikuni of earlier models, giving more positive throttle action and an inbuilt insurance against a stuck throttle.

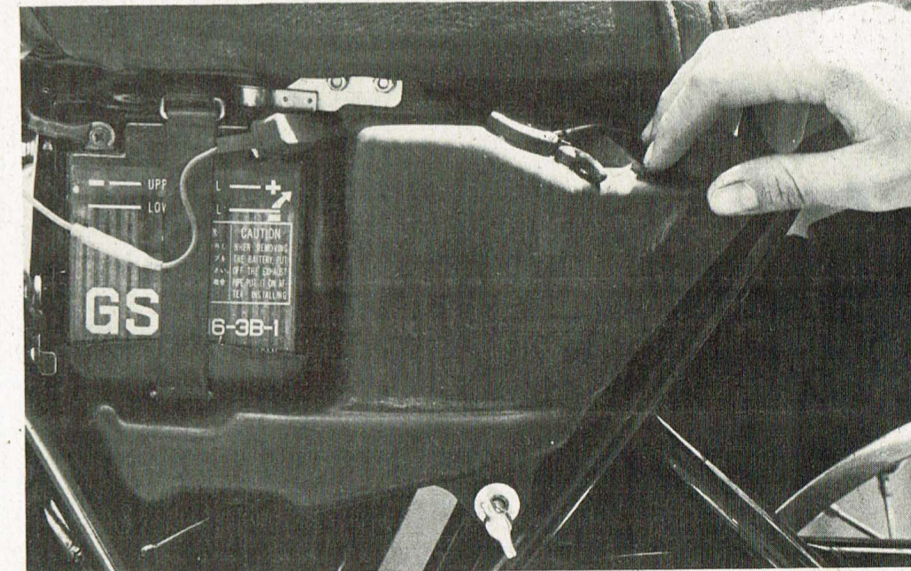
Engine waterproofing is first class and we consistently plowed our test bike through creek crossings without any loss of firepower. Cables and flexible spring guides route all the vital cables well clear of the steel gas tank, frame tubes and exhaust system — the 400 motor even carries those weird little rubber fin plugs to reduce engine noise.

The standard Yamaha sumpguard originally devised by Moses for his ride into the Promised Land is still alive and has made a re-appearance in '77 on the new DT. It's passable for the weekend-only trail rider, but that's about all. It simply doesn't afford the engine protection necessary for a bike of the DT's potential or purchase price! An extra bolt-on plate is mounted to the lowslung header loop of the Yamaha's expansion chamber, and this must stand out as the most vulnerable

Gas tank is still steel but Montesa-type styling is neat. Cap screws in.



Oil tank has dipstick and swings clear of frame — but even then it's absurdly difficult to fill. You'll need a funnel — the filler hole isn't big enough!



King of the Dirt!



point on the whole machine. The PE250 Suzuki uses a similar setup and in the weekend before our test, this particular Suzuki had completely flattened its header loop on a large stump when the bike was being ridden in a 250 km desert race. A similar spill will have equally as disastrous results on the DT400!

Apart from that vulnerability, the 400's pipe is well routed, eliminating the tyre clearance problems of the original model. It's possible to increase the rear tyre size or switch to a motocross pattern knobby without any hassles whatsoever.

A small, metal loop welded to the frame tube directly below the engine countershaft helps keep stray branches and rocks away from the drive chain, but Yamaha is still using that same, flimsy, one-size-fits-all chain guide. The device is fitted to the TT500 and during a two-months period we managed to destroy two of these before switching to an imported accessory tensioner. Since then we've had no problems.

Renewable neoprene pads are attached to the swingarm area, protecting both the chain and frame tubes, and there's been a total redesign of the DT's rear wheel adjusters. The old-style multi-spanner system has been replaced with efficient snail cams — now it's possible to adjust a Yamaha drive chain with less than a complete workshop available to handle the hassles.

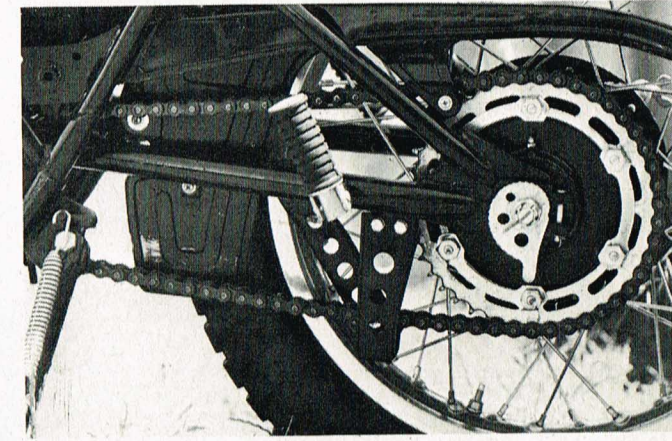
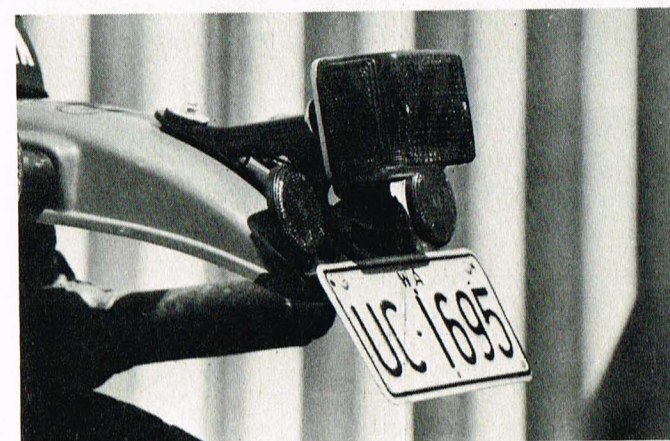
The original semi-floating rear brake has been dropped on the new DT400D, replaced by a fixed backing plate unit which slots into a small groove on the swingarm tube. Some weight is saved in the process and our overall impression was that the new rear stopper gave more feel and progressive action. Coupled with the highly efficient rear monoshock system, the DT's back wheel is always easily controlled, even in a downhill braking number over loose rocks and gravel.

We've always been convinced Yamaha's front anchors were THE best on mass-market dirt machines, so the new 400 came as a bit of a shock. It needs to be feathered oh-so-gently. Just grabbing the binder produces instant wheel lockup and quite often a big dive into the dirt. No, we don't know why it's more touchy. Externally it's the same as earlier DT250/400 models and we pulled it apart to find it's the same inside as well!

The problem can be minimised by leaving considerable pre-engagement slack in the front brake cable, and saying a few prayers when you go jamming into a corner on full power . . .

Detailing is one area where the DT has always had the fine edge over all of its competitors, but several points were left unattended over the two previous

The DT's torque overshadows lack of really big top end and will carry it through just about anything. Waterproofing is spot-on.



Much of this detail is long-overdue and new on the Yamaha but when it's all on one package that's a good deal. We put the blinkers to the "ultimate test" and it's true — they take a pounding. The serrated folding steel pegs are a good touch and note steel brush loop immediately behind. The comparatively small tail light does the job as well as any monster Honda item.

model runs of the original DT400 and we were impressed to see the improvements appear on the monoshocker.

The underslung rear brake pedal of the early 400 was prone to damage and also seizure from mud and grit. It now rides above the righthand footpeg where it's protected from the natural elements and also less likely to bend in a lowside spill. The grip serrations on the level are a lot better — and those hideous rubber-covered footpegs have finally been given the boot (get that very clever bit, did we?). The new serrated steel folding pegs are adjustable through 180 degrees.

The over-engineered locking fuel cap is replaced by a cheaper and more efficient screw-in item (as fitted to the YZ/TT range). Usually when we stop for gas, we reset the speedo tripmeter as a guide to the bike's range. But the quick-reset tripmeter has gone — replaced by a slow-reset instrument. Someone may conceive a point in its favor, but we can't think of one. The

tacho is still there, complete with the usual multi-colored red line and there's a neutral indicator light that only operates on a part-time basis. In addition there's now an oil level indicator light wired direct to the small plastic oil reservoir.

Replenishing the oil container should be a simple task: There's only one plastic sidecover to remove for access to the small filler spout. The oil bottle even swings free to make the job a little easier and there's a plastic dipstick for precision read-out. But it's still NOT possible to top up the container direct from the average oil-can or plastic bottle. You need to muck about with a small funnel for the job.

The fuzzy foam air filter is tucked away beneath the opposite sidecover, and we never had to clean or re-oil it during the test. When the need arises you'll find that it's easily serviced and quite without the sealing and bypass problems the early YZs were cursed with. We'd rate it as inobtrusively efficient.

The gearbox action of the DT was as good as we'd anticipated, and we can't recall too many problems over the years with the transmission of any Yamaha trail model. Ratios were wide and well spaced for everything from lugging up a long first/second gear hill to topping along at around 130 km/h down a long, open telegraph line access road. In speed and acceleration, the DT would stick

Look mum, no shocks. Snail cam adjusters have arrived — but nothing in sight to replace Yamaha's terribly fragile chain guard.

with both the TT500s as well as Suzuki's "Pure Enduro" 250. No amount of abuse from four different riders created any clutch slip or transmission hassles apart from an attack of "Suzuki neutral" when the bike is at rest — finding neutral is almost as difficult as it is with a Suzuki TS or RM, and the erratic "neutral indicator light" didn't make the job any easier.

Plastic guards and sidecovers are fitted to the DT and are color-impregnated. The gas tank is steel, along with the base of the non-pivoting seat.

Flexibly-mounted blinkers are used both front and rear and we had the opportunity to crash-test them several times without any damage. They are the ideal and obvious compromise between street-legality and the needs of the serious trail rider, and along with a sensibly-sized rear tail lamp they make the DT a better trail riding proposition than any Honda XL . . . the king of the multi-storey, lighting equipment.

Front lighting isn't special — adequate for the bike's performance on both road and trail.

Handlebars are reasonable in shape but well below par in durability. Yamaha is fast establishing a reputation

King of the Dirt!

for producing the softest bars in the East. Invest in a good set of accessory bars before you venture into the badlands. Soft grips are used, saving your hands from embarrassing and sometimes difficult-to-explain blisters. They appear to be identical to those fitted on the XS750 we tested recently. They're great if you're wearing gloves, but they'll leave palms coated in black rubber — a drag when you're flying into the office dressed in your civilised best.

Seating is better than we expected. Yamaha designers have eliminated the sink to the seatbase hardness inbuilt in all trail-bike seats in previous years. With the 400D you can sit down all the way without worries. It's almost big enough for two, and a set of passenger pegs are fitted so you can whip it down to the beach with your favorite lady on the back, when the summer sun begins to shine.

DID alloy rims replace the former steel items, contributing to an overall weight REDUCTION of nearly 4 kg over earlier 400 models. Rimlocks are fitted to both wheels, but are hardly necessary with the poor grip available through the stock Trials-pattern tyres. The rims are the stronger E-section rims introduced on the YZ motocrossers, and they have no durability problems for either trail or enduro riding. The spokes on our test bike stayed snug during the



course of our test. The "settling-in" period that's common to most alloy-rimmed wheels didn't occur.

The DT400D is a machine that's designed to do more than merely suffice in the dirt — and its road performance comfortably eclipses that of many small-bores with complete safety.

We'd previously regarded road and off-road as two conflicting concepts, and many of our tests stated this emphatically. If we were to base this on the current crop of street/trail bikes we believe it would continue to be well founded — but we'd be left with two

exceptions ... the DT250D and DT400D Yamahas.

We could summarise in the usual way, saying that the DT400D is the best Japanese dual-purpose big bike we've tested but that would leave too much unsaid ...

It's simply one of the finest motorcycles built for the off-road rider!

It's the first two-stroke we've ridden for a long while that has a "four-stroke approach" to hills. Steep terrain is the DT400's strength — even if your riding style calls for a bit of paddling.

SPECIFICATIONS

MAKE YAMAHA
MODEL DT400D
PRICE \$1329
ENGINE: Single-cylinder, air-cooled two-stroke. Alloy and magnesium cases. Alloy head and cylinder barrel with cast iron liner. Single ring piston. Reed valve induction.
 Bore x stroke 85 x 70 mm
 Capacity 397 cm³
 Compression ratio 6.4:1
 Lubrication Autolube
 Carburetion 1 x Mikuni VM34SC
 Air filter Oiled polyfoam
 Ignition Flywheel magneto
 Starting system Primary kick only

TRANSMISSION: Five-speed gearbox through primary gear drive and wet, multi-plate clutch. Left side gearchange. Down for first. 1-N-2-3-4-5 pattern. Final drive by No. 520 chain.

Ratios (Overall: 1)
 1st 2.714
 2nd 1.789
 3rd 1.300
 4th 1.000
 5th 0.769
 Primary reduction 65/23 ... 2.826
 Secondary reduction 43/16 ... 2.687

FRAME: Welded mild steel. Double downtube, double cradle design. Caster: 60 degrees, trail: 135 mm.

SUSPENSION:
 Front: Yamaha motocross-type forks in steel triple clamps. Alloy sliders. Oil/Spring operation. 195 mm travel.
 Rear: Yamaha sealed gas/oil monoshock system. Variable pre-load on spring, with optional springing available. 140 mm travel.

WHEELS, TYRES & BRAKES:
 Front: Shoulderless alloy rim, with rimlock. 3.00 x 21 Dunlop Trials tyre. Single leading shoe drum brake.
 Rear: Shoulderless alloy rim with dual rimlocks. 4.00 x 18 Dunlop Trials tyre. Single leading shoe, rod-actuated rear brake.
 Electrics: Flywheel magneto ignition. 6V6ah battery.

CAPACITIES:
 Fuel tank 7 litres (1.5 gal)
 Transmission oil 1200 cc
 Front forks 190.5 cc per leg

DIMENSIONS:
 Dry weight (claimed) 133 kg (293 lb)
 Wheelbase 1420 mm (56in)
 Overall length 2185 mm (86in)
 Overall width 870 mm (34in)
 Overall height 1165 mm (46in)
 Ground clearance 255 mm (10in)
 Test bike supplied by: Ken George Yamaha, 175 Albany Hwy, Victoria Park, WA.

Castrol Grand Prix for 4-strokes. It's left all the others behind.



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4-strokes have never had it so good.