

GMCtechNet

D A I L Y A R C H I V E S

June 1, 2001

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GMC/Northstar Project

PETE PAPAS

Hi fellow inmates:

Here's my Project GMC/Northstar

Project statement:

Install a late model 4.6L Northstar engine and 4T80-E transmission in a GMC Motorhome, the same way it is mounted in the caddy and run the transmission using the 4th gear as a push-button selected overdrive. Select the proper components to achieve engine RPMs of 3600 in 3rd gear @ 72 MPH. The net purpose is to provide an economical high tech solution that will yield excellent mileage and reasonable performance upon demand.

Here's my initial research data - please feel free to fill in any ??? - so that I can update my file.

Eng Specs:	mdl	Year	hp @rpms	torq@rpms	wt	Val/cyl	Comp
Olds	455	73-75	215@3600	370@2400	???	2 sohv	8.5:1
Olds	403	76-77	200@3600	330@2400	???	2 sohv	8.0:1
Northstar	DLS	93-01	275@5600	300@4000	403	4 dohv	10.0:1
Northstar	SLS	93-01	300@6000	295@4400	403	4 dohv	10.0:1

Tranny Specs:	mdl	1st	2nd	3rd	4th	final	wt max->	torq/wt	conv
Olds	403&455	th425	2.48	1.48	1.00	N/a	3:07oem	???	440 12000 12"
Northstar	DLS	4T80E	2.96	1.63	1.00	0.68	3:11	295	305 6800 10"
Northstar	SLS	4T80E	2.96	1.63	1.00	0.68	3:71	295	305 6800 10"

Concerns (in no particular order)

#Q1 - How to get the caddy PCM to function outside the caddy

a: Howell Industry harness and chip - approx \$750

notes:

- works with 93-95 TBI only & tranny connector
- contact (Troy Brown 810 765-5100)
- Criss Moore - H.S. auto Mech teacher with a '87 Fiero with a northstar
- good working knowledge of the Howell harness & able to customize the ECU 219 592-6482

b. Speedscene automotive (San Antonio Tx.) <http://www.speedscene-wiring.com/>

notes:

- Zac Fliss 210 651-1894
- works with LS1 Corvette conversion
- has done 2-3 northstar harness/pcm . Can build for 93-99 4.6 as long as >99 TBI available
- Modifies OEM harness & burns his own proms .can set cable for (push button O/D)
 - \$525 - cable mods
 - \$ 100 - VAT generator
 - \$180 - chip
 - \$30 - shipping

c. IDA Automotive <http://www.idaautomotive.com/>

- 732 591 2630 Bob IDA
- Father and son owner (35 years)
- extremely knowledgable
- they MAKE custom cars (TUCKER REPLICA) with Northstar eng/trans
- \$800 harness and chip & can work with '99 TBI
- I will most likely use this guy

d. Design 1 Systems 405 733-5505

<http://www.designonesystems.com/northstar/index.html>

- this guy has a lot to offer but what an arrogant SOB
- \$3000 to modify harness and calibrate ECM + \$100/hr programming fee
- stay away from this guy !!!!!

#Q2 Find a solution to get engine to run @ 3600 RPMs @ 72MPH in 3rd (1:1)

- Ideal final ratio (in 3rd 1:1) = $\text{RPMs} \times \text{Tire Dia.} / (336 \times \text{MPH}) = 3600 \times 29 / (336 \times 72) = 4.31 : 1$
- using standard 16.5 x 8.75 GMC tires @ approx 29" dia and the formula $\text{MPH} = \text{RPM} \times \text{Tire Dia} / (\text{final drive ratio} \times 336)$
- the standard 3.11:1 final gears @ 3600rpm = 99 mph (too fast) the optional 3:71:1 final gears @ 3600rpm = 83 mph (too fast)
- using smaller tires - like caddy 26" diameter the optional 3:71:1 final gears @ 3600rpm = 75 mph (close)
- changing the target RPMs to 3200 would lower the mph by 89% would make the 3.71:1 optional gear set @ 3200rpm = 73mph (near???)
- a 4.11 gear set & 16.5 x 8.75 (29" dia) tires @ 3600rpm = 75mph

possible solutions

- Deency Engine Shop 517 372-0644 (trying to get 4.11 gear set made)
- Thrasher Performance 765 457-8729 (have not called them yet ???)
- Pro Tech Transmissions 866 776-8321 (have not called them yet ???)

#Q3 - Find Northstar engine / trans / harness / cradle

I have located a 1999 4.6 sts (275hp) complete with everything \$2000 (20k miles)

notes

- I am taking the cradle in the off chance that it will mount to the GMC frame & at least
- I able to mount casters on the 4 corners so that the unit can be rolled around
- I have promised the wife that I would start the project till after we settle into our new house (but she has agreed that I should buy this the Northstar now because the price is great) whew !!!

#Q4 - Find GMC frame to do the mock-up fittings on

- I hope to locate a GMC front frame clip that was removed and replaced because of a rust & corrosion - that would make my life easier . will the Northstar / tranny fit with the crossmember and steering ???
- is there enough width in the engine compartment ???
- will I be able to service the engine ???
- will electric fans be able to cool the radiator enough ???

OK inmates - any ideas ???

Pete

GMC/Northstar-#Q1 #Q2 #Q3

PETE PAPAS

Hi Fellow inmates

#Q1 ...PCM function outside the caddy

I will most likely choose IDA Automotive (<http://idaautomotive.com>) to make the custom cable. They make them with all new connectors and I will have to supply them with a '93-'95 northstar PCM because they need the OBD-1 style brains (they are programmable?). All sensors, except the MAP (manifold absolute pressure) in newer than '95, are the same. I will have to locate and adapt an idle stepper motor from any early GMC to the any TBI newer than '95.

#Q2 ... final drive solution??? ...

Brent I think this one's for you - I noticed that there is a set of chain driven sprockets in the transmission - what is the possibility that these can be changed to effect the final drive ratio - (I would guess there a few shops that can make custom gears and chains??)

Now this is off the wall - but do you think that these gears could be changes to direct drive gears so that the output shafts would turn backwards. The backwards drive option would give me the opportunity to turn

the engine/trans 180 degrees - yes I realize that the exhaust would have to be modified.

Another off the wall - does the 4T80E trans have a ring and pinion gear that can be switched to the other side - to make them run backwards - like the old VW's.???

#Q4 - I need to locate a CHEAP GMC with blown engine/trans that I can drag over to Jim Bounds and remove the front engine frame. With the engine frame removed and the a-arms and most of the steering intact I should be able to evaluate the best approach to mount the Northstar eng/trans. I may have to remove the cross member (not sure yet) —but here's some rough idea of what the Northstar eng/trany dimensions are - it is almost a perfect box front

#Q3 .Find a Northstar eng/tran/ ...

Well gentleman - I TOOK THE PLUNGE - I am now the proud owner of a '99 SLS 300hp Northstar Engine & 4T80E Transmission. I purchased the complete eng - tranny - cable - PCM - axles - cradle with 18,000 miles

Graphic to place here

on it - for \$2500 Everything comes with a 105 day warranty from the day I move it from the salvage yard.

because of the 105 days - I want to be ready to test fire the engine and verify CLOSED LOOP CONTROL - This means that I have to have the cable and the correct mods to the TBI and MAP + have the engine remounted back into it's cradle + find a way to input cooling water + add a make-shift exhaust system. This will be pretty tough for me I have

NEVER worked with a PCM (ECM - ECU -whatever you call those things) but I'm learning fast. There are a few inexpensive products (under \$300) that will hook to the 12 pin ALDL port on the PCM. With the device I hope to be able to monitor any diagnose fault code that will hold me out of "closed loop control" plus read the output of any sensor on the engine - (example - tack, advance, O2 sensor, MAP, TPS, air/water temps etc) — do any of you think this is a correct strategy ???

GMC/Northstar-#Q1 #Q2 #Q3

“STEVEN D. FERGUSON”

Pete Papas wrote:

Hi Fellow inmates

#Q1 ...PCM function outside the caddy

I will most likely choose IDA Automotive (<http://idaautomotive.com>) to make the custom cable. They make them with all new connectors and I will have to supply them with a '93-'95 northstar PCM because they need the OBD-1 style brains (they are programmable?). All sensors, except the MAP (manifold absolute pressure) in newer than '95, are the same. I will have to locate and adapt an idle stepper motor from any early GMC to the any TBI newer than '95.

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Brent I think this ones for you - I noticed that there is a set of chain driven sprockets in the transmission - what is the possibility that these can be changed to effect the final drive ratio - (I would guess there a few shops that can make custom gears and chains??)

The chain drives come from TH425s and TH350s. The reduced gear ratio that Caspro sells is a combination of the two. Both use the same chains. Parts are plentiful but in the end you'll be limited to approx. the 3.42 ratio.

Steve F.

GMC/Northstar-#Q1 #Q2 #Q3

STEVEN D. FERGUSON

Oops! I meant TH425 and TH325 transmissions.
Steve F.

GMC/Northstar-#Q1 #Q2 #Q3

PETE PAPAS

Steve

You responded to:

Brent I think this ones for you - I noticed that there is a set of chaindriven sprockets in the transmission - what is the possibility that thesecan be changed to effect the final drive ratio - (I would guess there afew shops that can make custom gears and chains??)

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Steve F.

Response: The chain drive I am refering to is the one in the NORTHSTAR 4T80E transmission.

Pete

GMC/Northstar-#Q1 #Q2 #Q3

VIC MARKS

Pete wrote:

Brent I think this ones for you - I noticed that there is a set of chaindriven sprockets in the transmission - what is the possibility that thesecan be changed to effect the final drive ratio - (I would guess there a few shops that can make custom gears and chains??)

Steve wrote:

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Steve F.

Steve:

What is the TH325 transmission? I've never heard of it before. I've also been very curious where Caspro gets his chain drives. They are a fairly sophisticated piece of work and I assume that they are no longer made for any other transmission.

Vic

Northstar.

DARREN PAGET

One thing I have learned the past couple of years is that R&D is expensive. It is worth the ride though.

I don't know how much work the transfer is going to be but I applaud your perseverance. If it works I may be in line for one myself.

The chain gearing you are speaking of. Is this the same chain drive that is used to drive the transmission at the back of the engine? If it is it could be real tough to get a reverse spin off of it. Balancing the whole shebang may be a problem.

The electronics are way over my head and I will leave that to the talents of Dave M and Brent. They don't seem to have a real life anyway. :)

Darren Paget

Tires and Brakes

DARREN PAGET

I have, with the help of Dave M done some more investigating on the tire issue.

IMO the 70 series tires have more than the required capacity for the rear of my and Vics Coach. I really like the idea of a wider footprint and the shorter stance it will give the coach. The problem arises with the fact that there doesn't seem to be a tire out there with a short profile that can carry the front end weight. The highest weight I can find is 2200 lbs. This weight is exactly what I need but leaves no margin. Front of my coach with two large people is 4400 lbs. The only way to make this work is to lower the front of the coach. Back to the Wide Track.

The brake issue rears its ugly head once again. When I suggested the possibility of removing the rearmost brake drums, I wasn't even thinking of the weight issue. It would seem to me that, by Daves calculations, the rearmost brakes do almost nothing. It would be nice to simplify the brake setup by deleting the rear brakes. Maybe it can't be done but it is a thought.

Vic, I am not ignoring you, oh wait, Yep I am.

The tool situation is coming along nicely. Dave and I have been working, diligently, for a couple of weeks now. The instruction book is the last oxygen in the rocket tanks. Optimistically, 1 more month.

Darren Paget

Tires and Brakes

VIC MARKS

Darren wrote:

IMO the 70 series tires have more than the required capacity for the

rear of my and Vics Coach. I really like the idea of a wider footprint and the shorter stance it will give the coach. The problem arises with the fact that there doesn't seem to be a tire out there with a short profile that can carry the front end weight. The highest weight I can find is 2200 lbs. This weight is exactly what I need but leaves no margin. Front of my coach with two large people is 4400 lbs. The only way to make this work is to lower the front of the coach. Back to the Wide Track.

Darren: not quite true. There are wide tires to carry the weight (say BFG Radial t/a 345-55-R16 or 17). The only drawback is that they require a 10-12 inch wide rim which is one of my hobbyhorses. When you say back to the wide track, do you mean rims or suspension changes? You and I have been talking privately about wide rims for quite some time. The bottom line is \$500US for billet wheels to your own specs or a big volume casting. I'm keen to do the wide rim thing combined with a wider suspension (which I will post about a little later). As far I can gather, the critical issue for the wide rims is to bring the rims towards the center of the coach at least as much as you set them out (or even more).

The brake issue rears its ugly head once again. When I suggested the possibility of removing the rearmost brake drums, I wasn't even thinking of the weight issue. It would seem to me that, by Daves calculations, the rearmost brakes do almost nothing. It would be nice to simplify the brake setup by deleting the rear brakes. Maybe it can't be done but it is a thought.

Darren: When did you suggest removing the rear brake drums? A few weeks ago? Can you repost you're the material that you sent previously so that it is part of the forum? Interesting thought about deleting them. IIRC, Leigh Harrison in his brochure said that they are responsible for 10% of the braking. Also, which brake does the emergency cable tie into? Doesn't Emery use his last set of drums for an emergency, oops, parking brake on his 6 wheel disk brake setup?

If we changed it to a four drum system, would it not be easier to adapt an ABS setup to the coach? Put in a system out of one of the new GMC trucks? Or maybe go to four big 13 inch rotors and an adjustable proportioning valve.

Vic

Tires and Brakes

DARREN PAGET

Vic Marks wrote:

Darren: not quite true. There are wide tires to carry the weight (say BFG Radial t/a 345-55-R16 or 17).

I was trying to maintain the 16" rims. It's a little cheaper that way.

The only drawback is that they require a 10-12 inch wide rim which is one of my hobbyhorses. When you say back to the wide track, do you mean rims or suspension changes?

Both. I had actually forgotten about the wider wheels. I think that is the best way to go. Most cost effective. The problem remains that which pattern do you use for the wheels. I don't like the idea of buying 7 more wheels. Get's a little expensive that way.

As far I can gather, the critical issue for the wide rims is to bring the rims towards the center of the coach at least as much as you set them out (or even more).

Agreed. It is the only way it can work within some sort of a budget.

The brake issue rears its ugly head once again. When I suggested the possibility of removing the rearmost brake drums, I wasn't even thinking of the weight issue. It would seem to me that, by Daves calculations, the rearmost brakes do almost nothing. It would be nice to simplify the brake setup by deleting the rear brakes.

Maybe it can't be done but it is a thought.

Leigh Harrison in his brochure said that they are responsible for 10% of the braking. Also, which brake does the emergency cable tie into?

The emergency brake cable ties into all four rears. It was this 10% number which got me thinking, how much good are they anyway? The mini post above pretty much puts in a nutshell what I was thinking. I was looking for pros and cons on the suggestion.

If we changed it to a four drum system, would it not be easier to adapt an ABS setup to the coach? Put in a system out of one of the new GMC trucks? Or maybe go to four big 13 inch rotors and an adjustable proportioning valve.

You have to like an idea like that. I don't know if it makes it easier to deal with 4 instead of 6 wheels for an ABS system.

Darren Paget

GMC/Northstar Project

VIC MARKS

Pete wrote:

Project statement:

Install a late model 4.6L Northstar engine and 4T80-E transmission in a GMC Motorhome, the same way it is mounted in the caddy

and run the transmission using the 4th gear as a push-button selected overdrive. Select the proper components to achieve engine RPMs of 3600 in 3rd gear @ 72 MPH. The net purpose is to provide an economical high tech solution that will yield excellent mileage and reasonable performance upon demand.

Pete: I assume that you are proposing to mount the engine transversely as it was in the Caddie. Have you explored the idea of just mating it up to the TH425? Given the range of gearing that can be used in the GMC final drive, what advantages would there be to mounting the entire drivetrain in the GMC? I don't know whether you mentioned it to me in a phone call but is it at all feasible to mount the entire suspension clip into the GMC? It would require longer axles and other suspension extensions but that part is quite doable.

Pete wrote:

here's my initial research data - please feel free to fill in any ??? - so that I can update my file.

<i>Eng Specs:</i>	<i>mdl</i>	<i>Year</i>	<i>hp @rpms</i>	<i>torq@rpms</i>	<i>wt</i>	<i>Val/cyl</i>	<i>Comp</i>
<i>Olds</i>	<i>455</i>	<i>73-75</i>	<i>215@3600</i>	<i>370@2400</i>	<i>???</i>	<i>2 sohv</i>	<i>8.5:1</i>
<i>Olds</i>	<i>403</i>	<i>76-77</i>	<i>200@3600</i>	<i>330@2400</i>	<i>???</i>	<i>2 sohv</i>	<i>8.0:1</i>
<i>Northstar</i>	<i>DLS</i>	<i>93-01</i>	<i>275@5600</i>	<i>300@4000</i>	<i>403</i>	<i>4 dohv</i>	<i>10.0:1</i>
<i>Northstar</i>	<i>SLS</i>	<i>93-01</i>	<i>300@6000</i>	<i>295@4400</i>	<i>403</i>	<i>4 dohv</i>	<i>10.0:1</i>

Pete: does the Northstar engine run on 87 Octane? That is one design parameter that is close to my heart as you can save nearly 10% of your gas bill over an 89 Octane (at least around here). The figure that bothers me here is the low torque compared to the 403. The design parameter that I'm working with on my coach is to keep my weight under 8000 pounds, which would likely be OK with the 300 ft/lbs of torque. Also, how flat is that torque curve? Can you compare the torque results of the Northstar to the Olds engines down in the 1800-2400 rpm range? That is where a lot of time is spent in a GMC (at least in mine). For an 11,000 to 12,000 pound coach, I begin to wonder how this engine would manage it. As for the weights of the Olds engines, figure about 600 pounds.

Pete wrote:

Will electric fans be able to cool the radiator enough ???

Pete: not an issue. Use two SPAL 16 inch fans (they are the best). They will do the trick nicely. Wire them to kick in at different temperatures. I know a guy with this setup on a 500 Caddie engine in his GMC, and it works just fine (even through Death Valley in the summertime). Pricey setup though. Figure \$400-500 US.

Vic

June 2, 2001

1. GMC/Northstar-#Q1 #Q2 #Q3
2. Tires and Brakes
3. Tires
4. GMC/Northstar-#Q1 #Q2 #Q3
5. GMC/Northstar-PCM
6. GMC/Northstar-PCM
7. Brakes
8. Tires
9. Transmissions
10. GMC/Northstar Project
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12. GMC/Northstar Project
13. GMC/Northstar Project
14. GMC/Northstar Project
15. GMC/Northstar Project
16. GMC/Northstar Project-50mph
in 4th correction
17. GMC/Northstar Project-turbo
18. GMC/Northstar Project

GMC/Northstar-#Q1 #Q2 #Q3

BRENT COVEY

#Q1 ...PCM function outside the caddy

Be careful on this one- the original ECM is very integrated in Cadillac and operates or senses most accessories and you would like to retain this as much as possible. Its a pretty deep thinking ECM. I would perhaps explore how the Cadillac accessories such as the climate control head and cruise control could be used with the GMC so the integration could be retained as much as possible. You wouldn't want to essentially lobotomize the Cadillac ECM, but you will have to find ways to give it data it can work with.

Places I do feel changes may be needed is to convince the ECM that nothing is awry with driving in third gear at low vacuum with no AIR pump long distances etc.

#Q2 ...final drive solution???

I noticed that there is a set of chain driven sprockets in the transmission - what is the possibility that these can be changed to effect the final drive ratio - (I would guess there a few shops that can make custom gears and chains??)

A different Chain Drive could be added if space is available, but it would be fairly costly. There are alternate axle ratios available that may fit the 4T80E, some of the eighties cars with the smaller 440 FWD transmission had some superlow ratios available for final drive. Perhaps the manual transaxles like the Fiero 5 speed might have something useful as well. Because its a planetary setup, there might be scope for borrowing a gear(set) designed for another purpose entirely.

but do you think that these gears could be changes to direct drive gears so that the output shafts would turn backwards. The backwards drive option would give me the opportunity to turn the engine/trans 180 degrees

I'm looking at a picture of the final drive- its a planetary gear unit that strongly resembles an automatic transmission planetary carrier. This suggests that it could be modified to go wrong way around, but theres sure not much room for it. Theres also some prospect that final drive ratio could be changed. You certainly would have to make a few parts, would be worthwhile seeing one in person to get a feel for the scale of it, but yes, its likely possible. They drive the sun gear in the factory unit, lock the ring and take the output of the planet carrier.

Another off the wall - does the 4T80E trans have a ring and pinion gear that can be switched to the other side

No, there is no 'ring and pinion' its a pinion in a planetary assembly, which resembles a Powerglide reverse clutch with a differential carrier housing bolted to the back end of it.

#Q3 .Find a Northstar eng/tran/ ...

I am now the proud owner of a '99SLS 300hp Northstar Engine & 4T80E Transmission.

Sounds excellent!

because of the 105 days - I want to be ready to test fire the engine and verify CLOSED LOOP CONTROL

This would be best done in the wreckers if the engines still in the car- I'd be less worried about the electronics working than A: getting them all, including ten miles of wiring harness and B: making sure the engine doesn't have a defect mechanically. Get a shop manual posthaste from eBay if you haven't already.

Verifying closed loop off the car would be an enormous production, you'll get error messages from all sorts of stuff likely, from low A/C charge to ABS maybe.

Hope this is some help, I'll start looking for a 1999 manual myself to keep up!

Brent Covey
Vancouver BC

Tires and Brakes

BRENT COVEY

would be nice to simplify the brake setup by deleting the rear brakes. Maybe it can't be done but it is a thought.

Keep in mind, a tire develops about 1g of traction. If we have 4000 lbs on each axle static (wildly oversimplified model) I would imagine locked up the rear bogies would carry in a worst case scenario ~6000 lbs intermediate and 2000 lbs rear, as the rear axle drag is what transfers its weight to the intermediate axle, and if it didn't brake it would carry more weight. The back wheels have to brake to transfer weight to the intermediate axle, and there's going to be a point of equilibrium which is likely around the 2000 lbs zone. I wouldn't want to give away a Chevy Vega's worth of extra stopping power under any circumstances.

For best efficiency then, it's clear it would be desirable to;

A: find a way to restrict the shift in load interaxially under maximum effort stops

B; find a way to stop rear axle lockup under maximum effort stops

C: find a way to make the intermediate axle brakes three times as good as the rear axle brakes

The fastest way to fix this is by turning a pair of those arms around (either axle) but then you have to figure out how to spring it. Moving the rear arm pivot a mile up would also help. Failing that, interconnecting the two bogie arms on each side with some device that resists the torque reaction during braking might buy a lot of braking with little ride quality deterioration, which is why I suspect a heavy monoleaf across the bottom of the bogies might be an economical solution. ABS would also help, but doesn't address the weight transfer problem, and 6000 lbs is too much weight for any single axle brake assembly to contend with without enormous heat problems.

Then there's the front brakes- which also are in the 5000 lbs zone for braking.

I think ultimately, concentrating on rear suspension modification would pay the biggest dividends, if the entire 8000 lbs back there could be made to work efficiently that would offer the greatest improvements for overall braking.

Brent Covey
Vancouver BC

Tires

BRENT COVEY

I personally see NO issue running a tire at full rated capacity for its maximum pressure.

It is very clear from the images of the GMC motorhome prototypes that GM used L78-15 Bias Belted tires for their development of the GMC. This size carries 1970 lbs @ 32 psi. This tire was used also on Cadillac Limousine, which weighs 7400 lbs at design (loaded) weight. I am quite sure GM didn't expect the GMC to end up quite so heavy, but the 16.5" truck wheels are clearly a very late modification.

The Load range D vs. E controversy is likely rooted in the tradeoffs inherent in belted (especially radial ply) tires which have very little tolerance for that GMC rear suspension. Considerably overloaded Camper Special pickup trucks with D rated tires very infrequently suffer a problem. Heretofore I haven't heard of anyone having any special problems with bias ply eight ply tires that would have come on the GMC's in the first place most cases either.

My feeling is as long as you're not over the limit on front axle weight you can use any tire rated to carry the weight actually present on those wheels.

Personally I like skinny tires which save gas!

Brent Covey
Vancouver BC

GMC/Northstar-#Q1 #Q2 #Q3

STEVEN D. FERGUSON

The chain drives come from TH425s and TH350s.

Steve: What is the TH325 transmission?

Vic,

They are plentiful in vans, late model GM FWD products etc. No mystery here. The TH 325 is just a light-duty version of the TH 425. Much the same as the GM T400 and T350 relationship. The gear drives that Caspro and others sell is just the drive sprocket from a TH 425 mated with the driven sprocket from a TH325 with an appropriately shortened chain. (Or vice versa?)

Steve F.

GMC/Northstar-PCM

PETE PAPAS

Hi Fellow Inmates

brentcovey@hotmail.com Date: Sat, 2 Jun 2001 02:20:01 -0700 wrote:

.#Q1..You wouldnt want to essentially lobotomize the Cadillac ECM, but you will have to find ways to give it data it can work with.

REPLY->It's my understanding that the custom cable + the secondary chip that is added by IDA will provide the needed input to the PCM for the systems I will not be using (ABS - A/C - VAT -ETC). I need to focus, for the moment, on only engine and tranny control - using all the maps that were developed for the Northstar via the extensive dyno testing by GM + the factory diagnostic codes.

Brent wrote...places I do feel changes may be needed is to convince the ECM that nothing is awry with driving in third gear at low vacuum with no AIR pump long distances etc.

REPLY—>AIR PUMP ???? what's this please explain

Brent wrote...

#Q2 ...final drive solution???

REPLY—>I will most likely go with the standard 3:71 final drive at first. I can't have the project eat ALL my play money up with engineering new gears or chains (I sold my 2 other hobbies to finance this one - my '79

Datsun 280ZX and my '76 Bi-centennial Harley Iron Head).

With the Caddy SLS 3:71 final and 2:96 1st gear - I will wind up with an approx 11:1 engine/wheel ratio in 1st - as compared to a GMC w/3:07 final & 2.48:1 1st gear engine/wheel ratio of 7.6:1 — I believe that will offset the 30ft-lb difference in torque between the 403 and the Northstar. My simple knowledge of math says:—>44% lower gear ratio to compensate for 10% lower torque.

brent wrote—> #Q3. Get a shop manual posthaste from eBay if you haven't already.....I'll start looking for a 1999 manual myself to keep up!

REPLY—>Actually I believe I would be better off with any Northstar OBD-1 shop manual - so that I can understand any "On Board Diagnostic" codes. so I'll be scanning eBay for '93-'95 Seville and Deville Northstar shop manuals

Pete

GMC/Northstar-PCM

BRENT COVEY

From: Pete Papas

REPLY->It's my understanding that the custom cable + the secondary chip that is added by IDA will provide the needed input to the PCM for the systems I will not be using (ABS - A/C - VAT - ETC).

That should work fine, changing the inputs as opposed to tinkering with the maps is preferable.

I need to focus, for the moment, on only engine and tranny control - using all the maps that were developed for the Northstar via the extensive dyno testing by GM + the factory diagnostic codes.

I will make some inquiries and see if anyone has a map of any of the tables for the Northstar.

REPLY—>AIR PUMP ???? what's this please explain

I may have spoke too soon, Northstar may not use one- its an old fashioned emission control device, a little air compressor that's usage is nearly universal since about 1968. Its purpose is to blow air in the exhaust manifolds and catalyst to oxidize pollutants. The 4.6 litre Northstar may not use one, but its common on other engines, occasionally the pump is replaced by a reed valve device that meters air in instead. Now that you've mentioned it, I can't recall seeing one and a quick look thru the 1994 manual; doesn't show it, I'd just assumed there might be one buried down there somewhere;-)

REPLY—>I will most likely go with the standard 3:71 final drive at first.

Well, that gets you in the ballpark. I have my fingers crossed that 3.71 will be enough for this project. Think in terms of a 283 Chevrolet for a baseline on cooling and performance...that represents a 'safe' level of output for sure. Much greater performance is likely possible for short periods, but may be somewhat heat limited on a sustained basis. I am quite sure the Northstar cannot be operated at full throttle more than a few minutes without the risk of serious damage which is a problem in a GMC that may need some extra attention.

Sounds like you're off to a good start Pete!

Brent Covey
Vancouver BC

Brakes

DAVE MUMERT

Hi All

I heard the word brakes mentioned. Darren was suggesting the rear brakes are not of a lot of use. He is right, to a point. After about .7G of braking they are just along for the ride.

Brakes are a compromise between the two functions we use them for.

- 1 - Normal stops (below .4G, 300 ft stopping from 60mph)
- 2 - Emergency stops

During normal operation we are not concerned about wheel lockup as each wheel is well below that point. What we should be concerned about is trying to equalize the wear and more importantly equalize the heat build-up. We are going to be able to shed more heat if all 6 wheels are balanced and no single wheel (axle) is overheating.

During emergency braking our concern is more to do with what is in front of us, not which brake is heating up faster. Hopefully we are only going to do it once then there will be an opportunity for the brakes to cool. Now we are concerned about wheel lockup. Hopefully all 6 wheels are giving the maximum force they can.

Meeting the requirements for normal stops is easy. Each wheel has the same size disk, calliper and matching pads.

Emergency braking gets a bunch more challenging. The weight transfer between the rear bogie and front bogie is such that at .7G (173 foot stop) there is less than 135 pounds holding each back wheel down. At .8G (151 foot stop) the rear wheel is off the ground. We would obviously like to have even the small amount braking available between .4 and .7G available to us.

Balancing the front wheels and the front bogie is easy with an adjustable proportioning valve. It is possible to get them balanced within 5% from 0G-1G.

The rear bogie is all over the place. I don't know of any simple valve that

will contour the brake pressure for 0 psi to the maximum required at .4G then back to 0 at .8G. This seems to be a good application for ABS. We can tune the front axle and front bogie using a proportioning valve then let the ABS tune the rear bogie.

Using Kevlar pads and 80mm callipers on all 6 wheels we can get .8G of braking with only 1050 pounds of brake pressure.

Does anyone know how the rear wheel ABS works on the GMC pickups?

Does it do well that it is worth scrounging one?

It might be interesting to put 4 wheel ABS on the front axle and front bogies and add rear wheel ABS to the rear bogies.

Changing to 6 wheel disks should not be as expensive as some of the kits would indicate. I priced out Wilwood parts to do a conversion and it came to less in \$Can than what the Harrison kit is in \$US. This was Wilwood rotors and hats, GMC callipers, and a custom backing plate, and Wilwood park brake callipers.

I will eventually pursue a custom spacer with provision for a sensor for the ABS and Wilwood rotors.

Dave Mumert

Tires

VIC MARKS

Brent wrote:

Personally I like skinny tires which save gas!

Brent: You have put me in an economical vs handling/aesthetic bind. I love the look of wide tires. I think that they will improve the handling. I want to maximize my gas mileage. I have a conflict. The question is this: If I nearly double the amount of tread on the ground on the front of the GMC, care to guess the effect on the gas mileage of my coach?

Vic

Transmissions

VIC MARKS

I wrote: What is the TH325 transmission?

Steve wrote: They are plentiful in vans, late model GM FWD products etc.

No mystery here. The TH 325 is just a light-duty version of the TH 425. Much the same as the GM T400 and T350 relationship. The

gear drives that Caspro and others sell is just the drive sprocket from a TH 425 mated with the driven sprocket from a TH325 with an appropriately shortened chain. (Or vice versa?)

Steve: Does that mean the transmissions (and parts) are still manufactured new? Are the chains available new today? Any sense of the pricing? Are the chains exactly the same except for the length?

Vic

GMC/Northstar Project

PETE PAPA

Question:—> Pete: I assume that you are proposing to mount the engine transversely as it was in the Caddie.

RESPONSE:—yes

Question:—>Have you explored the idea of just mating it up to the TH425? Given the range of gearing that can be used in the GMC final drive, what advantages would there be to mounting the entire drivetrain in the GMC?

RESPONSE:—> Only as a last resort. I would lose the advantage of a computer control tranny with O/D (4th) and lockup.

Question—>i s it at all feasible to mount the entire suspension clip into the GMC? It would require longer axles and other suspension extensions but that part is quite doable.

RESPONSE—> I would be afraid to use the caddy suspension - I would guess that the GMC's suspension is much stronger. I would think mounting McPherson(sp) front end would be a bit difficult. - My hope is that I can mount the caddy engine cradle in the GMC frame - the cross member may have to be removed . My major concern is having enough room for the steering parts. I may be able to tilt the engine up in the front and down in the back to clear the drag link.

QUESTION—>Pete: does the Northstar engine run on 87 Octane?

RESPONSE—>absolutely (That was major requirement for me too)

QUESTION—>The figure that bothers me here is the low torque

RESPONSE—>I hope with the lower gear ratio (more pulling power) that this would not be a problem at all - The key to the design is the gearing (have it low enough for power & with and O/D for highway cruising when applicable)

QUESTION—>how flat is that torque curve?

RESPONSE—>Now this is where the Northstar shines - Incredibly 95 % (that's right 95%) is available from 1600 to 5600 rpms

QUESTION—>Can you compare the torque results of the Northstar to the Olds engines down in the 1800-2400 rpm range?

RESPONSE—>I have not been able to locate a 455 or 403 torque curve- anyone helps us out here?

Pete

GMC/Northstar Project

VIC MARKS

I wrote:—>Have you explored the idea of just mating it up to the TH425? Given the range of gearing that can be used in the GMC final drive, what advantages would there be to mounting the entire drivetrain in the GMC?

RESPONSE:—>Only as a last resort. I would loose the advantage of a computer control tranny with O/D (4th) and lockup.

Pete: I'm confused by this gain. Can you clarify the gains that you make with the computer controlled tranny. Smoother operation with the engine? I assume that at lockup you will have less torque converter loss? The issue of overdrive is interesting to me. It's the reason that I have been pursuing the Switch Pitch on my coach. But ultimately, in a vehicle like the GMC (with it's weight and RPM range), is it not mostly irrelevant? There seem to be two issues here: 1) heading across flatlands in the most economical mode possible and 2) Having lots of juice for passing and going uphill.

Heading across the flatlands is where you'd like to be in overdrive, going 70 mph, and turning over at maybe 2400-2600 rpm (assuming an engine with a flat torque curve). You've been focussing on doing 3600 RPM in 3rd. Isn't this rather high? Why have you chosen this RPM goal as your main design parameter?

What is the gas consumption difference in setting your goal at 3600 RPM vs 2800 RPM? I've been thinking about the Chev 8100 engine because of its high & flat torque curve. I figured that if it could run on the flatlands at 65 mph at 2000 rpm, then I would be making extremely good gas mileage. My assumption is that this big block would not be struggling to push the coach along (due to its 400 ft/lbs or torque), and the gas economy would follow. I'm wondering how this would play out on this much smaller engine.

One more question on the transmission: is there any connection between the 4L80E (which I understand to be the modern version of the TH400) and the 4T80E which you are using. In other words, is this a heavy duty transmission?

Question—->is it at all feasible to mount the entire suspension clip into the GMC? It would require longer axles and other suspension extensions but that part is quite doable.

RESPONSE—->I would be afraid to use the caddy suspension - I would guess that the GMC's suspension is much stronger. I would think mounting McPherson(sp) front end would be a bit difficult. - My hope is that I can mount the caddy engine cradle in the GMC frame - the cross member may have to be removed . My major concern is having enough room for the steering parts. I may be able to tilt the engine up in the front and down in the back to clear the drag link.

Pete: I have no idea of how the final drive axle system looks. Do you have any photos? Any drawings from a shop manual, or something to give us a sense of how things mate up. How much tilting are you talking about? Do you mean permanently tilted? This is in Brent's sphere but wouldn't that affect a multitude of issues in terms of oil flow through the engine? I doubt that this will make much difference to your project but Brent, Dave, Darren and I have been working on a wide track design for the front end. My goal is to switch to an air bag suspension, and omit the torsion bars all together. Assuming that I can get away sometime later this month, I'm on my way down to Southern California to talk to a couple of people about it.

QUESTION—->Pete: does the Northstar engine run on 87 Octane?

RESPONSE—->absolutely (That was major requirement for me too)

Hmmm. Now I'm getting interested.

QUESTION—->The figure that bothers me here is the low torque

RESPONSE—->I hope with the lower gear ratio (more pulling power) that this would not be a problem at all - The key to the design is the gearing (have it low enough for power & with and O/D for highway cursing when applicable)

QUESTION—->how flat is that torque curve?

RESPONSE—->Now this is where the Northstar shines - Incredibly 95 % (that's right 95%) is available from 1600 to 5600 rpms

Double Hmmm. Now I've very interested. Is there any way to increase the torque on this engine? Does Cadillac have larger versions coming down the pike? What about a turbocharged version (although that would be the end of the 87 octane gas, yes?)

GMC/Northstar Project

VIC MARKS

Pete wrote: I hope to locate a GMC front frame clip that was removed and replaced because of a rust & corrosion - that would make my life easier.

Pete: Try calling Ken Rose in San Antonio, Texas. His number is 210-681-2440. He had a front end frame mounted on wheels in the shop where he installed a 502 into a GMC stretch. He is also a whizz at fuel injection. He used the front end for mocking up the 502 installation. The shop was owned by a Texan oil guy (his house was on 25,000 acres of west Texas scrub land - dotted with oil wells) who had recently died. He was fairly well known GMC owner - CO Richards. The clip may have been trashed but you never know. If you get a chance to see the coach, do so. Ken did a very nice job finishing it off. The stretch was done by Buskirk. Everything on the coach was new or rebuilt. I'm sure that it had well over a \$100,000 into it.

Vic

GMC/Northstar Project

PETE PAPAS

Hi Fellow inmates

Vic Marks wrote: on Sat, 2 Jun 2001 14:39:27 -0700

VIC WROTE:—>There seem to be two issues here: 1) heading across flatlands in the most economical mode possible and 2) Having lots of juice for passing and going uphill...flatlands is where you'd like to be in overdrive, going 70 mph, and turning over at maybe 2400-2600 rpm ... You've been focussing on doing 3600 RPM in 3rd...Why ...

REPLY—>My original thinking was that 3600 RPMs would be a respectable power range for passing and hills in 3rd gear. My main intent is to be able to drive in 4th (O/D) most of the time. But with the 3:71 final ratio I have now in the 4t80e the following would be true: using formula
RPMs = [(gear ratio) (final ration)] (336) (MPH) / tire dia.

50mph in 3rd = 2150 rpms

50mph in 4th(O/D)= 14500 rpms

60mph in 3rd = 2600 rpms

60mph in 4th(O/D)= 1750 rpms

70mph in 3rd = 3000 rpms

70mph in 4th(O/D)= 2050 rpms

I believe that this is the bare minimum workable solution - I would like

to get a higher final to increase hill climbing and put the engine rpms more in the middle of it's very flat torque curve (that would be about 3600 rpms. I will try this STANDARD ratio first - I'm no automotive or mechanical engineer—all this is "seat of the pants" - please tell me where you guys think I going wrong/right ??? My major goal is economy first -with power "on demand".

VIC WROTE—>What is the gas consumption difference in setting your goal at 3600 RPM vs 2800 RPM?

REPLY —> don't know

VIC WROTE—>is there any connection between the 4L80E (which I understand to be the modern version of the TH400) and the 4T80E which you are using. In other words, is this a heavy duty transmission?

REPLY—>The 4T80E is the strongest transverse engine mounted FWD transmission GM makes. This is what caddy needed to put there 300 ft-lb torque 300hp engine in there models. Is it the FWD version of the 4L80 - I don't think so - The 4L80E is actually rated for a 15,000 veh. wt. where-as the 4t80e is rated for approx 8000lbs veh wt..

see—><http://www.442.com/oldfaq/oftrn.htm#Transmissions>

VIC WROTE—>any photos? Any drawings from a shop manual, or something to give us a sense of how things mate up.

REPLY —> Not yet I have just bid on a 1993 caddy shop manual on ebay

VIC WROTE—>How much tilting are you talking about? Do you mean permanently tilted? This is in Brent's sphere but wouldn't that affect a multitude of issues in terms of oil flow through the engine?

REPLY —> yes permanent - any thoughts BRENT

PETE WROTE—> torque curve? ...Now this is where the Northstar shines - Incredibly 95 % (that's right 95%) is available from 1600 to 5600 rpms

VIC RESPONDED—>Double Hmmm. Now I've very interested. Is there any way to increase the torque on this engine?

REPLY—>BY changing the intake valve timing - I understand that the totorque can be increase by up to 50ft-lbs - but I not sure if this put you cin high octane gas - not my thing for now - need 87 octane engine

VIC WROTE: What about a turbocharged version (although that would be the end of the 87 octane gas, yes?)

REPLY—>already done - there out there now—end of 87 octane though

Pete

GMC/Northstar Project

VIC MARKS

Pete wrote—> The 4L80E is actually rated for a 15,000 veh. wt. whereas the 4t80e is rated for approx 8000lbs veh wt

Pete—> I assume that your coach is about 10,000 or 11,000 lbs with a full load. How do you intend to overcome this design conflict?

Vic

GMC/Northstar Project

VIC MARKS

I wrote —> What about a turbocharged version (although that would be the end of the 87 octane gas, yes?)

Pete wrote—>already done - there out there now-end of 87 octane though

Pete: Are the turbo charged versions stock or an aftermarket add-on?

Vic

GMC/Northstar Project-turbo

PETE PAPAS

vic wrote—>Pete: Are the turbo charged versions stock or an aftermarket add-on?

REPLY—>after market - but Caddy does have a race car with twin turboNorthstar

GMC/Northstar Project

PETE PAPAS

Pete wrote—> The 4L80E is actually rated for a 15,000 veh. wt. whereas the 4t80e is rated for approx 8000lbs veh wt

Vic wrote—> I assume that your coach is about 10,000 or 11,000 lbs with a full load. How do you intend to overcome this design conflict?

REPLY—>sheer will power — nope I'm hoping that it will withstand the extra 3000lbs—plus if I find a way to gear it down that would help too

Pete

June 3, 2001

1. GMC/Northstar Project
2. Transmissions
3. GMC/Northstar Project
4. many ideas
5. Re: many ideas
6. many ideas

GMC/Northstar Project

BRENT COVEY

Regarding towing/maximum weight ratings-

Pete wrote—> The 4L80E is actually rated for a 15,000 veh. wt. whereas the 4T80E is rated for approx 8000lbs veh wt

These can be taken with a grain of salt. The THM 400 transmission for example is available in some heavy pickups/suburbans with chassis equipment and axle ratios etc. permitting a Gross Combined Weight (tow vehicle and trailer) of over 17,500 lbs. A 10,000 lbs GVW Big Dooley pickup fully loaded can move a 8,500 lbs trailer as example. GM would probably discourage this, but its legal and would work, and wouldnt spoil the warranty.

Most Trailer Special packages with 454 engines have a 14,700 lbs GCVWR as example. There have been a number of on-line admonishments regarding the desirability/necessity of ultra super duty torque converters for much lighter vehicles used for 'towing' but if you bought one of these pickups with the 14-17k GCVWR, you'd get the same converter as say, a Chevelle or Nova might use.

My feeling is the 4T80E should be nearly as strong as the 4L80E in severe towing/weight but for two aspects- no factory installed 4T80E is in a chassis that can tow more than about 4000 lbs safely, and there is a question of differential strength. The GM pickups have much higher tow ratings than the cars with similar powertrain specifications in many cases largely due to the dramatically stronger differential which also is considerably larger physically and has less chance of overheating or damage in severe service.

The planetary design of the 4T80E may be as strong but we just dont know. It does have significant advantages from a sheer friction point of view which may compensate for its smaller physical size. I have some questions about the rate of wear that will be encountered as the gears are bevel cut and will develop considerable end thrust, which may accelerate wear at high levels of output. Cutting them straight makes them stronger and likely to last longer, but would create a very loud gear whine, similar to first gear/reverse operation in many automatics at moderate speed.

Brent Covey
Vancouver BC

Transmissions

STEVEN D. FERGUSON

Steve: Does that mean the transmissions (and parts) are still manu-

factured new? Are the chains available new today? Any sense of the pricing? Are the chains exactly the same except for the length?

Vic

Vic,

I don't know the answer to the first part and yes the chains are the same pre-stretched units that last forever.

Steve

Pete—> I have not been able to locate a 455 or 403 torque curve- anyone helps us out here?

Pete,

It's going to be a while til I get to this but I'm in the process of rebuilding a 455. The crank and heads are out at this time and because of the cost of the project (plus the fact that I don't really need the engine at this time) I had planned on taking my time with the rebuild. Having said that the bottom line is that I plan on some dyno time when the engine is complete. The shop that will be doing the block work offers discounted dyno time to customers. When I built my long rod 350 Chevy I was able to get in 12 passes for just \$250.00. Sounds like you're planning on building the "Z28" of GMC motorhomes Pete. That engine will be screaming all the time if the gearing is where it should be. But then again you don't need any "wet blanket" talk here. If it weren't for experimentation we'd all still be driving flivvers.

Carry on Orvill & Wilbur

Steve F.

Many Ideas

DAVE HILSDORF

I posted this on GMCnet awhile back, but received no responses there except on the headliner and to "go to a rally". Anyone here done any of these mods or can send me URLs of where to look?

Technologically yours,

Dave Hilsdorf

- a solid or sealed pneumatic emergency replacement "airbag" I imagine this to be a more comfortable and safer option than the 14" 4x4 or all-thread bolt solutions. Possibly, a permanent replacement.
- tail lights like early 90s TranSport/APV/Silhouette in the pillars above beltline
- built-in flush clearance lights as on newer luxo-SOBs
- GM Duramax all-aluminum V8 diesel (& diesel generator?)

- Eliminate propane and generator by covering top of coach with photovoltaics or whatever the most efficient technology is nowadays. Once eliminated, put a bank of batteries where generator used to be. Use space vacated by LP tank for outside storage compartment. Fridge will run on DC, replace stove/range/oven with convection microwave. (I have seen DC air conditioning units in Pilot and at Iowa 80 Truck Stops. Opinions?)
- Make roof white (rubber?) after filling in the 100+ holes left over from roof rack, various antennae, wannabe air horn, etc. when I take 'em off.
- Replace headliner with Fiberglas-type material
- Replace rotted plywood floor with a fire/rot proof stronger & lighter material. Does it exist?
- hide-away bath module like seen in RoadTrek or Rialta.
- in-dash Clarion AutoPC 310C (does GPS) and TVX5653 TV/CD Changer Controller w/5.6" LCD (or similar items). These two are each the size of a regular car stereo. LCD doubles as display for rear view camera.
- Incorporate a subwoofer into base of dinette bench and use small satellite speakers in ceiling for midrange and treble.

Dave Hilsdorf | TZE063V101152 | 716-305-9535 | a62dave@yahoo.com

Many Ideas

DAVE MUMERT

- a solid or sealed pneumatic emergency replacement "airbag" I imagine this to be a more comfortable and safer option than the 4" 4x4 or all-thread bolt solutions. Possibly, a permanent replacement.

My brother and I were out shopping for a new Kenworth last month. He pointed out a truck that appeared to have no suspension. He pointed to a big rubber donut saying, with great disdain, 'that's the spring'. It looked as hard as steel to me, but I guess it works. A similar thing for the GMC emergency bag should work as well. Maybe you could figure out a way to get silicon to cure inside an old air bag.

- tail lights like early 90s TranSport/APV/Silhouette in the pillars above beltline

I am looking into some LED type lights. I have seen a couple of different types that may have some potential.

- built-in flush clearance lights as on newer luxu-SOBs

Gotta have LEDs, no more antique glowing filaments. Vic will go for this. I think we will need custom fabricated marker lights. There are a few available for the front but I have not seen any for the back (red). Do the SOB's have red ones on the back? Are they angle mounted or vertical? These

would need to be tested for SAE compliance.

- *GM Duramax all-aluminum V8 diesel (& diesel generator?)*

Allison automatic? Diesel boiler to heat the coach and hot water? You could lose the noisy furnace and have one less wart on the side.

- *Eliminate propane and generator by covering top of coach with photovoltaics or whatever the most efficient technology is nowadays. Once eliminated, put a bank of batteries where generator used to be. Use space vacated by LP tank for outside storage compartment. Fridge will run on DC, replace stove/range/oven with convection microwave. (I have seen DC air conditioning units in Pilot and at Iowa 80 Truck Stops. Opinions?)*

I like the idea of losing the propane fridge. You can get rid of that wart on the roof that is used to vent the heat from the fridge. Just use side louvers like the '78, maybe boosted by a little fan. The cook may object to frying a steak in the microwave. How about using a 5 pound propane bottle to supply the cooktop.

- *Make roof white (rubber?) after filling in the 100+ holes left over from roof rack, various antennae, wannabe air horn, etc. when I take 'em off.*

You only have 100 holes? There are some ceramic impregnated roof coverings available that would cut down the heat gain a lot as well as seal up a bunch of holes. With the \$8000 worth of solar panels there may not be a lot of roof showing.

So we can get rid of 11 ugly warts off the roof (10 lights and a vent) plus a couple more off the side (furnace and square fridge vent). Now we are getting close to a clean coach.

Dave Mumert

June 4, 2001

1. Fibreglas-type headliner
2. Re: many ideas
3. Re: many ideas
4. Re: many ideas
5. Tires
6. emergency air bag replacement
7. emergency air bag replacement
8. Flush mount LED clearance lights
9. Plywood floor replacement
10. Flush mount LED clearance lights
11. White rubber roof or ?
12. White rubber roof or ?
13. [Body] General ideas for a replacement body
14. Plywood floor replacement
15. Flush mount LED clearance lights
16. Plywood floor replacement
17. Flush mount LED clearance lights
18. Plywood floor replacement
19. Flush mount LED clearance lights
20. [forum][suspension]emergency air bag replacement

Fibreglas-type headliner

VIC MARKS

Dave wrote —> Anyone done this mod - Replace headliner with Fibreglas-type material?

Dave: What do you have in mind here? I have to figure out what I'm going to do with my ceiling. Once I have it sprayed with foam for insulation, I was intending to cover it with a sheet of aluminum (as per Darren's coach) and cover that with a fabric. I'm not clear at all what type of ceiling it is that you have in mind.

Vic

Many Ideas

R G F

From: Dave Hilsdorf

- a solid or sealed pneumatic emergency replacement "airbag" I imagine this to be a more comfortable and safer option than the 14" 4x4 or all-thread bolt solutions. Possibly, a permanent replacement.

Having had on my maiden voyage the personal joy of a 20 some odd mile low speed (as per manual) drive with a drooping rear bumper I too have wondered about this. Presently I carry a spare bag as it's about the same size but lighter than the 4x4, but won't solve the problem of a leaking air line or shot pump. Have considered an extra T-ed valve at the bags which would allow the bags to be inflated from a 12V compressor I seem to pack around. Either way there's always extra bits to carry.

- tail lights like early 90s TranSport/APV/Silhouette in the pillars above beltline

This is a really trick idea. Some considerations would have to be made for the shape of the replacement to meld into the body curve of the coach, removal and filling of the original light hole, depth of the new lights so as not to interfere with the frame member in the corner of the coach, etc. But very doable and a beautiful clean modern look could be gained as well as the brightness and visibility of the new lights. I like this idea so much a trip to the local auto dealers (GM first and then the others) with a cardboard cutout of the coach corner bend may be in order.

- built-in flush clearance lights as on newer luxu-SOBs

This would go along nicely with the tail lights. Vic has mentioned this idea to me previously.. very tidy. Some ideas could be obtained from the LED selections at sites like <http://www.truck-lite.com/tl/index.html> and-

<http://www.grote.com/prodcat/prodcat.htm>

- GM Duramax all-aluminum V8 diesel (& diesel generator?)

- Eliminate propane and generator

- Make roof white (rubber?) after filling in the 100+ holes left over from roof rack, various antennae, wannabe air horn, etc. when I take 'em off.

FRP/epoxy repair would probably be just as easy as the rubber coating and much more permanent as well as cleaner (smoother) and easier to paint

- Replace headliner with Fiberglas-type material

This is very doable but would require either -

1. a mold(s) being made which could include the foam. Certainly would add massive strength with the two being bonded this way and could be made to allow reasonably quick removal of the panels from the coach to expose potential overhead wiring etc. Adds sound dampening and could be any of a gel coat colour, paint colour, or fixed fabric I have seen boats with similar panels.

2. a light and thin flat panel(s) of FRP which are entirely bend able to the roof contour.. although probably not as malleable or strong as aluminium... but could be easily bonded to the ceiling foam thus competing the roof "sandwich".

3. use of a jig and then using products such as contourcore to lay over thejig, followed by glassing the surface and finishing with fabric

- Replace rotted plywood floor with a fire/rot proof stronger & lighter material. Does it exist?

You bet, there are several with a variety of properties with probably the most widely known to be Hexcel's ACG, an aluminium honeycomb. Glass it over with a fireproof or fire resistant resin or possibly Darren has a source of a similar product with aluminium faces. Other possibilities are Westwind Composites 'Weskor', Dupont's Nomex (used extensively in boats for furnishings, partitions and flooring). There are many more. In all cases it would be prudent to be sure of the localized load forces from partitions etc. so as to allow for a proper lamination schedule, which also helps cut the overall weight.

- hide-away bath module like seen in RoadTrek or Rialta.

Is this one of those fold away toilet under the vanity arrangements?

- Incorporate a subwoofer into base of dinette bench and use small satellite speakers in ceiling for midrange and treble.

I have an arrangement with one speaker on each of the cab walls about mid calf height, one each on the bottom end of each dinette bench and one at

each corner of the back end cap all controllable from the front seat. Not perfect as no big sub under the benches but pretty nice sound. Some people also consider outside satellite plugs.

Richard

Many Ideas

STEVEN D. FERGUSON

Dave Hilsdorf wrote:

Replace rotted plywood floor with a fire/rot proof stronger & lighter material. Does it exist?

This was touched on a couple of times Dave. I've seen a waffle board used for flooring that was made from the same stuff they use on newer US Navy ship bulkheads. It's aluminum sheeting with an aluminum waffle-like core sandwiched between the two sheets. Extremely strong, excellent insulator and sound deadener and best of all, very lightweight. Charles Aulgur bought some surplus and made hatch covers that he sold at rallies.

RE: Rubber roof. I think the one-piece aluminum ones we have are much better. Caulk and smooth the holes, then paint. Check out what all the high-end buses use.

Steve F.

Many Ideas

STEVEN D. FERGUSON

rgf@island.net wrote:

Presently I carry a spare bag as it's about the same size but lighter than the 4x4,

I think swapping out a blown bag for a 4 x 4 has the same level of effort as installing a new bag. A really trick idea would be to have a leaf spring bent in an S shape with a hole on each end. Use that for an emergency bag. There would be some suspension but no limit to travel speed.

Steve F.

Tires

BRENT COVEY

Brent: You have put me in an economical vs handling/aesthetic bind. I love the look of wide tires. I think that they will improve the handling.

People like the cartoon wide tire look, its been growing in popularity since the Dune Buggy days. I favour the classic car look, typified by thirties luxury makes where the wheels are extremely tall. In the end its the amount of air that holds you up. There are significant drawbacks to wide tires which are self evident, especially in low traction situations like rain and ice. If I could increase tire size, I'd want taller ones myself.

The question is this: If I nearly double the amount of tread on the ground on the front of the GMC, care to guess the effect on the gas mileage of my coach?

Tires have rolling resistance, and if large enough can also have aerodynamic impact. Rolling resistances are widely variable between different tire configurations. Even tires of an identical size at the same pressure can vary about 10% or more for resistance. Rolling resistance is speed proportional, on a typical GMC it would represent about 20-30 HP energy draw at 70 mph. At 35 it would be half as much. Aerodynamic drag increases about sevenfold when you double vehicle speed by contrast.

The main tire drag issue on the GMC is theres six of the miserable things-four would be 67% as bad as six. This is one reason I dont want a dual rear wheel pickup. Going from a standard 8.75-16.5 eight ply bias ply tire to a slightly larger radial (235-16, 9.50-16.5) probably has no economy impact as the slightly lower rolling resistance of the radials would about balance the larger tire size's drag. Going to a much wider tire might potentially double the drag at most I would imagine, depending on configuration. This could require another 5-15 hp at highway speeds to overcome.

For reference, it takes about 100 hp output to propel a GMC 70 mph. To propel a car like a Taurus that speed takes about 25 HP. The engines are about equally efficient, so you might be looking at another 1-1.5 gals/hour fuel consumption for tire drag in the worst case. Expressed as a mileage impact, if you get 12 mpg now, you'd get 10.5 mpg. So somewhere from no change to two mpg or so would be the degree of impact on economy. Because the rolling resistance is speed proportional, you'd experience this impact right across the speed ranges.

One thing that would really help I suspect on an extremely light GMC might be switching back to the Toronado rims and tires, which are drastically lighter and much lower rolling resistance than truck type tires. If you were at a low enough GVW to safely use them, you might realize a 1-2 mpg improvement which would be significant.

If you are curious about rolling resistance of two comparable tires, inflate them to the same pressure on the same axle, and take a ride and measure the temperatures after a half hours driving at high speed. The hot ones are most likely to be the high resistance ones.

Just FYI a 2 ply 4 Ply rated bias passenger car tire at 32 psi will exceed 210F tire temperature at 100 mph in 100F ambient at rated load usually.

Brent Covey
Vancouver BC

Emergency air bag replacement

PETE PAPAS

Steve wrote>...A really trick idea would be to have a leaf spring bent in an S shape with a hole on each end. Use that for an emergency bag. There would be some suspension but no limit to travel speed.

Wasn't there something on the GMCnet - a year or so back - about someone using a heavy duty chevy truck spring ???

Pete

emergency air bag replacement

FROM: "DAVE MUMERT"
<DMUMERT@TELUSPLANET.NET>

Hi All

Steve wrote>...A really trick idea would be to have a leaf spring bent in an S shape with a hole on each end. Use that for an emergency bag. There would be some suspension but no limit to travel speed.

Pete wrote>...Wasn't there something on the GMCnet - a year or so back - about someone using a heavy duty chevy truck spring ???

I think they were talking of a coil spring, which would be quite bulky, but better than a threaded rod. Maybe a U or V shaped spring could be built that would replace the air bag. I am taking my coach to Standens on Tuesday for a 6 wheel alignment and new control arm bushings. Standens make springs. I will ask them if a U shaped spring is possible and how much it would cost. A U shaped spring (or maybe a bit more V shaped so they stack) would be very compact to store and could provide enough suspension compliance to allow travel a normal speed. The S shape would also work and maybe a ring or half circle.

Dave Mumert

Flush mount LED clearance lights

VIC MARKS

Dave H. wrote —> Anyone here done any of these mods or can send me URLs of where to look—Built-in flush clearance lights as on newer luxo-SOBs?

Dave M. wrote —> Gotta have LEDs, no more antique glowing filaments. Vic will go for this. I think we will need custom fabricated marker lights. There are a few available for the front but I have not seen any for the back (red). Do the SOB's have red ones on the back? Are they angle mounted or vertical? These would need to be tested for SAE compliance.

Richard —> This would go along nicely with the tail lights. Vic has mentioned this idea to me previously.. very tidy. Some ideas could obtained be from the LED selections at sites like <http://www.truck-lite.com/tl/index.html> and <http://www.grote.com/prodcat/prodcat.htm>

Response—> This is a hot button for me. A smooth contoured top is definitely part of my design paradigm. I've already removed the air conditioner and all the other paraphernalia. I've been thinking about this for quite some time. I have all my interior ripped out and I want to get on with this right away. I've done a little bit of research on it. Basically, there is a supplier to the hot rod audience that sell LEDs plus a plexi-like (can't remember if it was Lexan) covering that is molded into the body. I have been dragging the file around with me for the last year and now I can't put my hands on it. I will update this as soon as I find it. The covering makes the lights nearly invisible when not lit. The big drawback is that they charge \$120US per pair for the lights and coverings. Given that we have 10 pairs, this is way out of the ball park financially. I've noticed that a number of the suppliers now advertise LED replacement lights for trucks and they are down in the \$10-\$15 range. This makes it more feasible. The trick is that we need five red sets and five orange sets and have to get them setup so that they show an even pattern through the curved plexi/Lexan. I believe that this means that we have to have the LEDs contoured as well, or set in a stepped frame of some sort.

Vic

Plywood floor replacement

VIC MARKS

Dave H. wrote —> Anyone here done any of these mods or can

send me URLs of where to look—Replace rotted plywood floor with a fire/rot proof stronger & lighter material. Does it exist?

Steve F. —> This was touched on a couple of times Dave. I've seen a waffle board used for flooring that was made from the same stuff they use on newer US Navy ship bulkheads. It's aluminum sheeting with an aluminum waffle-like core sandwiched between the two sheets. Extremely strong, excellent insulator and sound deadener and best of all, very lightweight. Charles Aulgur bought some surplus and made hatch covers that he sold at rallies.

Response —> You're batting 1000 on my key issues here. The floor is another one that I have to deal with right away. When I started out working on this one, I looked at Balsa wood sandwiched between fibreglass. It looked interesting and was originally designed for light weight cabinetry in marine applications. The product is made by Baltec Corporation (201 767 1400). It is very strong and I know one GMC owner based in Florida who used it for his coach. However, I do have some concerns about its safety and durability on a floor. Cost was about \$120US per sheet (or more) plus shipping IIRC. Weights are as follows: ½ inch thick - .93 lbs/sq ft; ¾ inch thick - 1.14 lbs/sq ft; 1 inch thick - .1.35 lbs/sq ft. I don't have the equivalent weights for the 1 inch plywood used in the coach. Does anybody have this? The next material that I looked at was an all aluminum sandwiched honeycomb. This may be the same material that Steve is referring to. It was used around here for the aluminum fast ferries (which sadly turned into a fiasco due to cost and technical issues) and is used extensively in the airplane industry. They're likely about \$200US for a 4 x 8 sheet. The interesting thing about this material is that it is more fireproof and very strong. It is also sandwiched between fibreglass mat. I would guess that they are about ½ the weight of the Balsa composite. Also, I think that you could go as thin as 3/8 thickness with a bit of cross bracing on the floorboard. The drawback is the cost and availability. I've seen reference on the Airstream list (no, I'm not an Airstream guy as well - Scott Nahoda led me there) to the Boeing Surplus store in Seattle (20651 84th Avenue S, Kent, WA 98032; (206) 393-4065) having some of this material from time to time. I have yet to try them out. The third product of interest is Nida-Core (<http://www.nida-core.com/product.htm>). This is also a honeycomb sandwich between fibreglass matt (is this the correct term?). It is used a lot in the marine and trucking industry. One truck manufacturer here uses it for the floorboards. The honeycomb material is polypropylene. The material is easily available and costs (IIRC) about \$150US for a 4 x 7 sheet. The only drawback that I can see for this material is the fireproofing issue. My guess is that it would melt very quickly. I understand that it acts as an excellent sound insulator. The problem to be solved with all of these materials is how to attach them, how to cut holes through them for piping (and the support issues around the holes) and how to attach furniture to them. I'd really like to hear some comments on these issues.

Flush mount LED clearance lights

DAVE MUMERT

10 pairs, this is way out of the ball park financially. I've noticed that a number of the suppliers now advertise LED replacement lights for trucks and they are down in the \$10-\$15 range. This makes it more feasible. The trick is that we need five red sets and five orange sets and have to get them set-up so that they show an even pattern through the curved plexi/Lexan. I believe that this means that we have to have the LEDs contoured as well, or set in a stepped frame of some sort.

Actually you need 7 per end. The outside marker light also functions as a side marker. If we go flush we will need to add a side marker because the flush light will not be visible from the side.

I bought 500 Hewlett Packard LEDs a year ago. These are the same LEDs used by Cadillac and the truck lights with only 9 LEDs per light. I have a bunch of red and yellow. These are so bright you cannot look at them. I thought I would mount 6 on a board (2 rows of 3) and mount them behind Plexiglas. There may be some SAE tests that need to be done but I think if we make them overly bright we will easily meet the minimum brightness required. I am also looking into smaller LEDs that will take up less space.

My original thought was to add a visor to the GM and mount the lights there. It would not matter if they leaked, but I am not sure I like the looks of the visors.

Dave

White rubber roof or ?

VIC MARKS

Dave H. wrote —> Anyone here done any of these mods or can send me URLs of where to look—Make roof white (rubber?) after filling in the 100+ holes left over from roof rack, various antennae, wannabe air horn, etc. when I take 'em off.

Dave M. wrote —>You only have 100 holes? There are some ceramic impregnated roof coverings available that would cut down the heat gain a lot as well a seal up a bunch of holes. With the \$8000 worth of solar panels there may not be a lot of roof showing

Richard wrote —> FRP/epoxy repair would probably be just as easy as the rubber coating and much more permanent as well as cleaner (smoother) and easier to paint.

Steve F. wrote —> Rubber roof. I think the one-piece aluminum ones we have are much better. Caulk and smooth the holes, then paint. Check out what all the high-end buses use.

Response —> I have the “holes in the roof” issue to deal with as well. I have wondered about the idea of covering or painting the roof at all. Given that you want to maximize the insulating value of your coach against heat gain, it would strike me that maybe the best route would be to take the aluminum down to bare metal, polish it, and then clear coat it in some fashion. We’d get the Airstream effect on the roof only. This way, we’ll have a truly reflective surface, and I would expect a much cooler coach in sunny climes. Any thoughts on this people? As for filling the holes, I’m going to try the Smooth-on Products. Apparently it was used by the military a lot for filling bullet holes in helicopters.

Vic

White rubber roof or ?

DAVE MUMERT

gain, it would strike me that maybe the best route would be to take the aluminum down to bare metal, polish it, and then clear coat it in some fashion.

Here is a page on ceramic paint on insulation.

http://users.cwnet.com/~thall/thermalcoat_applications.htm

This is just one of many of these type of pages. Some say you can cover the ceramic layer with paint and only degrade the insulating properties a small amount. I would be tempted to spray this on the inside as well if I had the coach cleaned to bare metal on the inside.

Dave

General ideas for a replacement body

STEVE CANYON

Well, this is an ambitious idea and may not be of interest to just anyone, but I’ve been entertaining this idea for a long time. Not sure if I’ll even actually do it, but at the moment, I’m seriously considering it.

Hitting the high points, here’s the basic idea:

Goal: Produce an aircraft quality, very light weight coach body replacement for 26’ GMCs. The body should be at least as strong as the original GMC body, be easily placed on an original frame (*this is still a debatable point in my mind), and incorporate advantages over the original signifi-

cant enough to make it a desirable product for the fearless. Aesthetically, it would not be a GMC knockoff, but would be very hard to distinguish by most observers.

Construction: Light weight composite construction with strategically located hard points (attachment points) for predefined uses and purposes. Materials would be appropriate for the individual purposes they serve, e.g.; Kevlar, carbon fiber, epoxy based resins, closed cell foam and aluminum ribbing & caging, hexcell stiffening materials, stainless hard points, limited steel parts mainly for collision and safety beams.

Prototypes: Prototypes would use moldless, hot wire construction techniques to speed the process and reduce the cost until the design could be frozen into a generic tooling set for molded production. This process is a well proven technique, with materials readily available.

Features: Very light, very well insulated coach body with excellent sound proofing qualities. This coach body would provide for AC/Heat ducting and cabinets, interior walls and storage spaces using the same light weight composite materials and techniques. Windows would be those available for replacement of the original GMC windows. Windshield may or may not be the same, but equivalent. Wire ducts would be provided for a wide range of needs;e.g.; lights, speakers, CAT5 compute nets, TV, etc. These ducts could be accessed by the user at strategic points.

Cost: Who knows—I've not done very exact costing for this. Best to conserve energy at this point to determining if it's a worthwhile endeavor. If it is, the cost should be controllable.

Availability: If this project gets off the ground, I have it in my mind to make it a 'kit' sort of product. When my current obligations that prevent me travelling are fulfilled, I intend to not hang around in one place for very long. Only the molded parts would be tough for most folks anyway, and then only because it would be more expensive and a shame to duplicate work already done.

*Frame: IMHO, the frame of the GMC is very well engineered. It could be used, but there are also disadvantages to using it.

1] The coach should be very light and should not require the GMC frame, as a lighter frame with better features could be used.

2] I don't believe the tires would have to be from the truck side of the market.

3] I don't like the rear suspension design, innovative as it is. It would be much better if the rear suspension used trailing arms and independent air bags at each wheel. Braking could be very easily balanced with this design, and the fragility of the leading bogies eliminated.

4] With a lighter frame and body, the coach does not need the heavy stock engine and could be quite easily powered by Pete's NorthStar project. Gas mileage would be considerably better than the stock GMC.

Anyway, this is your chance to throw rocks! Let me hear from you guys:-

)

Steve (TX)

Plywood floor replacement

VIC MARKS

Richard wrote —> You bet, there are several with a variety of properties with probably the most widely known to be Hexcel's ACG, an aluminium honeycomb. Glass it over with a fireproof or fire resistant resin or possibly Darren has a source of a similar product with aluminium faces. Other possibilities are Westwind Composites 'Weskor', Dupont's Nomex (used extensively in boats for furnishings, partitions and flooring). There are many more. In all cases it would be prudent to be sure of the localized load forces from partitions etc. so as to allow for a proper lamination schedule, which also helps cut the overall weight.

Richard —> Where can I get info on Hexcel's ACG? Any idea of the pricing?

Vic

Flush mount LED clearance lights

STEVE CLEVENGER

Dave Mumert wrote

I bought 500 Hewlett Packard LEDs a year ago. These are the same LEDs used by Cadillac and the truck lights with only 9 LEDs per light. I have a bunch of red and yellow. These are so bright you cannot look at them. I thought I would mount 6 on a board (2 rows of 3) and mount them behind Plexiglas.

There may be some SAE tests that need to be done but I think if we make them overly bright we will easily meet the minimum brightness required. I am also looking into smaller LEDs that will take up less space.

Response-> How about a reflector of some kind to produce a "glow" effect.

Maybe in the bottom of a cup-shaped reflector, not unlike the OEM taillights. I don't see where any tests would be a concern...if they are brighter than the OEMs, then we are way ahead. We aren't manufacturers & no one is going to question the "birthright" of the marker lights.

Steve Clevenger

Plywood floor replacement

R G F

Vic Marks wrote:

Richard —> Where can I get info on Hexcel's ACG? Any idea of the pricing?

The main website is at <http://www.hexcel.com/> but you may find most of what you after on <http://www.hexcelcomposites.com/>

I don't have current pricing as haven't used it for about 10 years but would bet that a quick call to Industrial Plastics in Vancouver or FibreTek over on Boundary Road would get you an answer. I'd be interested in the current cost too.

Richard

Flush mount LED clearance lights

VIC MARKS

Dave M wrote —>Actually you need 7 per end. The outside marker light also functions as a side marker. If we go flush we will need to add a side marker because the flush light will not be visible from the side.

Response —> Yeah, I seem to have a hard time counting lights, sigh . . . When you say "add a side marker", where would we do it. Literally on the side? If it is on the side, does it have to stick out? I've always wanted to design a side signal flasher that popped out when activated; shades of the English cars of the 50's. What I had in mind was some kind or stretchable plastic, with an illuminated cam behind it. As the signal was turned on, the light bulged out about 1-2 inches (rather like some alien bug from the X-files) and flashed. Turn it off and it recedes to flush. I don't imagine that there is a material out there that fits the bill. If there was, the same material could be used on the side clearance lights.

Dave wrote —>I bought 500 Hewlett Packard LEDs a year ago. These are the same LEDs used by Cadillac and the truck lights with only 9 LEDs per light. I have a bunch of red and yellow. These are so bright you cannot look at them. I thought I would mount 6 on a board (2 rows of 3) and mount them behind Plexiglas. There may be some SAE tests that need to be done but I think if we make them overly bright we will easily meet the minimum brightness required. I am also looking into smaller LEDs that will take up less space.

Response—> How much were the LEDs and are they still available? I'm curious about connecting these into the wiring system. I vaguely remember that there are some problems. Is this correct?

Dave wrote—> My original thought was to add a visor to the GM and mount the lights there. It would not matter if they leaked, but I am not sure I like the looks of the visors

Response —> I've never been keen on the look of visors at all. I'd really like to mount mine flush into the body. I've had some other design thoughts about the changing the top shape, but I'll leave that for another time.

Vic

Plywood floor replacement

VIC MARKS

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Richard —> I was too late to call the suppliers today but I'll try them tomorrow. The Hexcel site is rather daunting. What a huge product line. In regards to the Hexcel ACG, I assume that it has a skin and you don't need to apply one. Is it aluminum or fibreglass?

Vic

Flush mount LED clearance lights

STEVE CLEVENGER

Vic Marks wrote

How much were the LEDs and are they still available? I'm curious about connecting these into the wiring system. I vaguely remember that there are some problems. Is this correct?

Vic,

J.C.Whitney has an LED light that might yield some cheap LEDs:

[http://www.jcwhitney.com/product.jhtml;\\$sessionid\\$2ZOFQ5YAAA G3TWBBLJTSFE4YEF NGMIV0?CATID0759&BQ=jcw2](http://www.jcwhitney.com/product.jhtml;$sessionid$2ZOFQ5YAAA G3TWBBLJTSFE4YEF NGMIV0?CATID0759&BQ=jcw2)

Appears to be 6 Volt..not a big deal...use a resistor in the circuit.

Steve Clevenger

Emergency air bag replacement

STEVEN D. FERGUSON

Pete Papas wrote:

Steve wrote>...A really trick idea would be to have a leaf spring bent in an S shape with a hole on each end. Use that for an emergency bag. There would be some suspension but no limit to travel speed.

Wasn't there something on the GMCnet - a year or so back - about someone using a heavy duty chevy truck spring ???

Pete

I think that was for placing between the bogey arms for jacking purposes.

Steve F.

June 5, 2001

1. Plywood floor replacement
- 2 .24V electrical systems
3. many ideas
4. 24V electrical systems
5. Hide-away bath
- 6 .Flat Torque Curves/455 vs. Northstar
7. Flush mount taillights

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Vic

As I said before I haven't used the stuff in a long time but if memory serves me correctly you can purchase it either with a skin or without. I only ever saw it skinned. Don't know if they have it with aluminum skin but would imagine they might or have some other aluminum skinned similar product, possibly Fibrelam, as is used heavily in the aircraft industry. But hey! t'ain't nuthin' wrong with composites.

I find the compression properties interesting for our usage.. not that high.. but can tell you that torsionally it's Dy..no..mite as are most of the panels used for bulkheads and the like in the marine industry.

This URL may be of use to you for an overview of AGC properties

http://www.hexcelcomposites.com/downloads/download.php3?root=techdata&prodid=ACG_Commercial_Grade_Aluminium_Honeycomb&group=Honeycomb&version=Both

Here's the one for Fibrelam ... check out Grade 1.. interesting stuff..

http://www.hexcelcomposites.com/prodsel.php3?prodsel=Fibrelam_Quick_Reference&group=Panels

I must try and find the stat sheets on the balsa panels I have in the shop... have them around somewhere... maybe in the ARK. These Baltek panels are balsa cored, heavily double skinned, 1 inch, heat and press cured, panels. Curious about the weight and compression property differences compared to Hexcel's. I know that torsionally and in tear resistance the Baltek panels are stronger than my previously used Hexcel but that is due to the heavy lamination and press method more than the coring material.

24V electrical systems

STEVE CANYON

I'm sitting here contemplating the possible unforeseen effects of using a 24 volt electrical system in the coaches. Using 4 golf cart batteries and grounding the middle connections to the frame would provide + and - 12 volts or 24 volts differentially.

What's the availability like for common 24 volt items such as light bulbs, etc. at reasonable prices. The trucking industry is on 24v, isn't it?

Would there be many items that could not be adapted? I'd like to run

blowers, refer and such on 24v.

By running it center-grounded, it could always use the 12v stuff if necessary.

many ideas

RAY SWARTZENDRUBER

Dave Hilsdorf wrote: Replace rotted plywood floor with a fire/rot proof stronger & lighter material. Does it exist?

Response: I think Erv Troyer used the Nida-Core that Vic mentioned to replace the rotted plywood step in his coach. Not sure what he did about the fastener/joining problems Vic points out.

Dave wrote: hide-away bath module like seen in RoadTrek or Rialta.

Response: Carol and I have a Road Trek with a fiberglass pan in the hallway that doubles as a shower base which drains directly into the gray watertank through a P trap. I too have thought about how to incorporate some of the Roadtrek "space saver" features in the GMC but have not come up with anything profound. If you want to see pictures and floor plans, go to www.roadtrek.com. Maybe it will spark some ideas. They make use of every available cubic inch. Our Road Trek has more storage space than our Eleganza. Just what everyone needs is two motorhomes, right?

Dave wrote: in-dash Clarion AutoPC 310C (does GPS) and TVX5653 TV/CD Changer Controller w/5.6" LCD (or similar items). These two are each the size of a regular car stereo. LCD doubles as display for rear view camera.

Response: A fellow at the Las Vegas GMCMI convention had the Alpine version installed. Extremely cool. Turn it on and a decent sized LED color screen comes out and stands up. Unfortunately I did not write his name down, but he said it worked very well and it exceeded his expectations. He said it was very easy to install in place of the original radio, but as I recall, it was upwards of \$3000 with all the options he had. There were at least one, maybe two or three remote units (CD changer, GPS unit with data disk, etc.) as well as the in dash unit.

24V electrical systems

R G F

From: Steve Canyon

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batteries and grounding the middle connections to the frame would provide + and - 12 volts or 24 volts differentially.

What's the availability like for common 24 volt items such as light bulbs, etc. at reasonable prices. The trucking industry is on 24v, isn't it?

Would there be many items that could not be adapted? I'd like to run blowers, refer and such on 24v. By running it center-grounded, it could always use the 12v stuff if necessary.

Steve

There are many commercial fishing vessels in these parts running 24V but as I understand it the main reason is the number of electric motors operated for winch systems and massive refer requirements. Most of the vessels I have done FRP work on had several voltages right up to 220V but almost all of the boats I have seen with 24V also run 12V and sometimes 36V and 110V. The engines (always running) driven generators supply a goodly load to the battery banks, often a half dozen or more 8D's. Larger vessels of course have gen sets to supplement or run their requirements.

The pitfalls of 24V are often increased cost due fewer manufacturers and dramatically reduced selection, due the lesser demand and fewer manufacturers. Iso mny of the units available are built a little heavier than the average RV units (size and weight)

That said... it's doable but is it cost effective? or do we really care as long as there is real ground to be gained by making the change over? How much ground is gained ? I don't know.... but I'm gonna try and think it through...

Richard

Hide-away bath

VIC MARKS

Dave wrote —> hide-away bath module like seen in RoadTrek or Rialta. Ray wrote —> Carol and I have a Road Trek with a fiber-glas pan in the hallway that doubles as a shower base which drains directly into the gray water tank through a P trap. I too have thought about how to incorporate some of the Roadtrek "space saver" features in the GMC but have not come up with anything profound. If you want to see pictures and floor plans, go to www.roadtrek.com. Maybe it will spark some ideas. They make use of every available cubic inch. Our Road Trek has more storage space than our Eleganza. Just what everyone needs is two motorhomes, right?

Response—> This has been a goal of mine as well but I've been stumped on how to visualize it. I am going to have a totally custom interior and I would like as much as possible not to have anything above waist height so as to maximize the roominess of the coach. The shower base that slides out seems a good starter. I was thinking along the lines of having a small marine 12v sump pump mounted within it to take care of pumping the waste water to the grey tank. This gives you more flexibility in terms of placement and dealing with the sliding in and out. What is a P trap? Darren has purchased a folding bathroom vanity sink from England. It would be nice to see a picture of this Darren (on your TZE site maybe?) so that we can get an idea of how it works. I think that the solution lies in having something that slides out into the middle of the hallway, along with partition walls that slide out as well. How this can be done neatly, I don't know. I looked at the Roadtrek site Ray but couldn't get a clear idea of how the shower worked in regards to hiding away or sliding out. Any chance of you contributing some photos of it? Has anyone ever seen a fold down toilet? I'd really like to find a source, and see if it could be worked into this design.

Now about your two motorhomes Ray. I'm just in the process of purchasing two additional clapped out GMCs. Once completed, I will have matched your foolishness and upped you one!

Keep those grey cells cooking.

Vic

PS. Would somebody please tell me if it is a grey water tank or a gray water tank. Thanks.

Flat Torque Curves/455 vs. Northstar

BRENT COVEY

I wish I could scan this, hopefully it can be plotted if you like.

This is corrected to 29" Hg and 85F dry air, net rating. 1974 model Oldsmobile 455 4 V8. It's pretty torquey! Extrapolating from the line on the graph it looks like it makes 300 ish ft/lbs at 500 rpm.

Torque-

320 ft/lbs @ 800

335 ft/lbs @ 1200

350 ft/lbs @ 1600

365 ft/lbs @ 2000

370 ft/lbs @ 2400

375 ft/lbs @ 2800 (peak)

366 ft/lbs @ 3200

352 ft/lbs @ 3600

320 ft/lbs @ 4000

Horsepower-50 hp net @ 800, which rises in a perfectly straight line to 220 hp net at 3000 rpm, then;
228 hp @ 3200
242 @ 3600
245 @ 4000 (peak)
drops fast after that to about 230 @ 4800

Hope this is useful!

Brent Covey
Vancouver BC

Flush mount taillights

VIC MARKS

Dave H. wrote —> Anyone here done any of these mods or can send me URLs of where to look—tail lights like early 90s TranSport/APV/Silhouette in the pillars above beltline.

Richard wrote —> This is a really trick idea. Some considerations would have to be made for the shape of the replacement to meld into the body curve of the coach, removal and filling of the original light hole, depth of the new lights so as not to interfere with the frame member in the corner of the coach, etc. But very doable and a beautiful clean modern look could be gained as well as the brightness and visibility of the new lights. I like this idea so much a trip to the local auto dealers (GM first and then the others) with a cardboard cutout of the coach corner bend may be in order.

Response —> I find this an appealing idea but I foresee a couple of problems. I'm assuming that the lights would be mounted above beltline on the GMC as well. Due to the height of the GMC, those lights would be mounted fairly high in relation to the cars behind you. I don't know if you've ever followed one of those Silhouette's (or a Honda CRV), but I find that I am less aware of the brake/signal lights in these vehicles than a normal car or truck. I think that it has to do with one's expectation of where to be looking when behind a vehicle. The big Prevost buses have lights at this above beltline height but they also have lower stoplights. Lately I've been thinking more along the lines of incorporating the lights from one of the sport utility vehicles into the GMC (think Mercedes M class). If I could find something to match the curve of the body (or more ambitious yet, redesign the back end of the GMC to fit the perfect light), then it could be mounted at a more traditional height, and in addition, could possibly wrap to the side. That way, the signal light may be able to be spotted from the side angle as well.

June 6, 2001

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GPS & rear view - an alternate approach

VIC MARKS

Dave H. wrote —> Anyone here done any of these mods or can send me URLs of where to look - in-dash Clarion AutoPC 310C (does GPS) and TVX5653 TV/CD Changer Controller w/5.6" LCD (or similar items). These two are each the size of a regular car stereo. LCD doubles as display for rear view camera.

Response —> My approach is about 180 degrees from you on this Dave. I would like to replace all of this with a PC and 12-14 inch LCD screen. Not great savings in cost but the flexibility and future savings are massive. Heinz has done something very similar for his coach and I'd love to hear what he has to say about it. Mount a PC (desktop, not portable) in the coach somewhere. Mount the LCD screen up on the dash. I think that Heinz is currently running a Sony. Make sure that it takes an analog & digital feed. One handed keyboards are now becoming available as well as remote control for stereo and TV via PC. Install a TV/VCR card such as ATI Radeon all-in-one. Run a standard GPS program (\$200), hook up side and rear view cameras via USB, run it as a TV/VCR, radio, as well as stereo system via any number of digital combinations. An extra monitor can be hooked up within the coach for comfortable TV viewing in the rear area. You can also set up a surveillance system with outside motion detectors, infrared cameras etc. feeding into the same system. Heinz has an engine analyzer feeding into his LCD as well. It gives a number of readings on the engine health and a trip record as well. I'm going to pick up a gas consumption program with flow meter for accurate monitoring and testing of my gas consumption. The things that you can incorporate into it are endless.

Vic

Hide-away bath

RAY SWARTZENDRUBER

Vic wrote: What is a P trap?

Response: A "P" trap is simply a P shaped piece of pipe lying down, if you will, that has water in it to prevent nasty gases from escaping out the drain. Just like under your bathroom sink. Yea, well, it could be construed as something you pee in. Maybe there is a better name for them?

Vic wrote: Darren has purchased a folding bathroom vanity sink from England. It would be nice to see a picture of this Darren (on your TZE site maybe?) so that we can get an idea of how it works. I think that the solution lies in having something that slides out into

the middle of the hallway, along with partition walls that slide out as well. How this can be done neatly, I don't know. I looked at the Roadtrek site Ray but couldn't get a clear idea of how the shower worked in regards to hiding away or sliding out. Any chance of you contributing some photos of it?

Response: Vic, the Roadtrek design is not that sophisticated. The plastic shower pan is about 2' x 3' x 3" and is a permanent part of the floor. It's not on slides. It has a permanent drain (the "P" trap I was talking about) with a plug in it when not in use. A piece of carpet lies in the pan when not in use. Some people would object to the several inch drop in the floor, but Carol and I are used to it and like the extra headroom it provides. You can lock the door to the toilet open to provide privacy towards the front, then a shower curtain stored along side the toilet mounted on a ceiling track slides out and around 360 degrees to serve as the shower curtain. The closet door locked open provides privacy towards the back. The ceiling has a fantastic vent mounted directly above the shower base. The toilet, by the way, faces the hall so that when you sit on it, your feet are in the hallway (read that shower base). This all works OK, but probably has more compromises than most of us are willing to make in our GMC's. The Rialta does indeed have a shower that slides out, but I forget how it all works. As far as the pictures go, I'm hoping the birthday fairy will bring a digital camera in September, or maybe Santa Claus in December. If not, I'll have to take things in hand myself. In the meantime, this thread will disappear before I get snail pictures and post them. Maybe a better idea....Roadtrek has a video cassette that shows all this very well. Would you like me to send it to you? Funny how hard we have to work to "improve" upon the original design isn't it!

Vic wrote: Has anyone ever seen a fold down toilet? I'd really like to find a source, and see if it could be worked into this design.

Response: I saw a Clasco conversion one time that had a permanently mounted toilet with a fold down sink above it which came off pretty well. Jim Bounds and Darren could shed more light on that. Never seen a fold down toilet. That would be trick, wouldn't it.

Vic wrote: Now about your two motorhomes Ray. I'm just in the process of purchasing two additional clapped out GMCs. Once completed, I will have matched your foolishness and upped you one! Keep those grey cells cooking.

Response: Gluttons for punishment, aren't we!

Ray

Hide-away bath

STEVE CLEVENGER

Vic wrote:

PS. Would somebody please tell me if it is a grey water tank or a gray water tank. Thanks.

I don't have one, but I think it's gray water as opposed to greyhound. There may be a "u" in there, too.<G>

Steve Clevenger

Northstar Cutaway Image

BRENT COVEY

This is a link to a cutaway of an actual Northstar engine which shows some construction details.

HYPERLINK <http://www.libertysoftware.be/cml/cmlarchive/northstar.jpg> <http://www.libertysoftware.be/cml/cmlarchive/northstar.jpg>

Brent Covey
Vancouver

Northstar Cutaway Image

J DEXTER

Salutations:

Hey, has anyone ever looked seriously at mounting this motor/tranny in their coaches? Anyone think it would have the torque required for the job?

I have often wondered if it might be a workable replacement power-plant/tranny one day given that there are quite a few out there that will no doubt be available as scappers one day.. I would guess axles would have to be made up - but given it must be several hundred pounds lighter than the big-bore/425 trannies we use now it might even help with bearing issues..

Of course, there is the pwoob of further messing up the front-rear weight ratios - but it would still be interesting to consider if it has the basic torque for the gig..

your pal

J Dexter

Flush mount LED clearance lights

DAVE MUMERT

Vic wrote:

When you say “add a side marker”, where would we do it. Literally on the side? If it is on the side, does it have to stick out?

They can be flush. They just need to be visible from the side. One up front and one at the back at the top. Here are the requirements:

<http://www.nhtsa.dot.gov/cars/rules/standards/conspicuity/TBMpstr.html>

Response—> How much were the LEDs and are they still available? I'm curious about connecting these into the wiring system. I vaguely remember that there are some problems. Is this correct?

I think they were under \$1.00 each. They have to be ordered in multiples of 50 or 60. They are just connected 3 in series with a resistor to limit the current. No big deal, they are connected to the same wires as the bulbs. The tail lights are a bit trickier because of two brightness levels. I assembled some in a test fixture under one of the new style tail light lenses. They were at least twice as bright as the bulbs, too bright to look at. My intent when I bought the LEDs was to build flush marker/ID lights and convert the tail lights to LEDs.

Dave Mumert

Vic