

4/7/24 Dyno

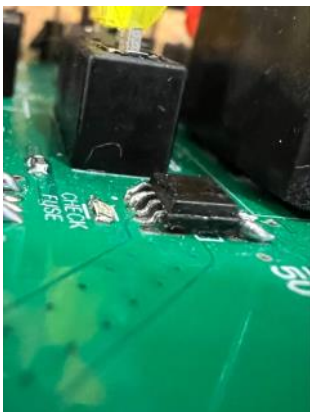
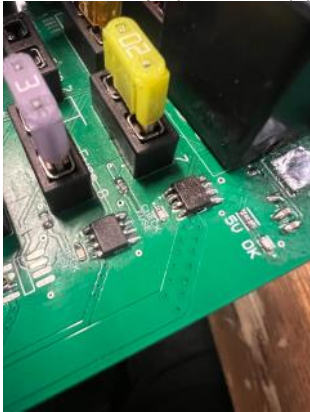
Sunday, April 7, 2024 10:01 PM

Critical Issues:

- Ignition coils would not fire
 - PDU had bad soldering on the output of the ignition current sensor IC
- No power to entire car
 - PDU 12V+ ring terminal crimp failed and pulled out
- Fuel pressure regulator started dumping fuel out of the vac/boost reference hole/fitting location
 - Assumed the internal seal failed
- Starter would not crank, and dash had no power
 - PDU output connector wasn't fully seated lol
- Fuel pump stopped working
 - PDU 0602 0 ohm jumper on the fuel pump circuit burnt up

Full description & sequence of events:

Car was strapped down to dyno and prepared to run. ECU turns on, cooling works, everything cranks, but would not fire. Test procedure was run for coils/injectors, and coils were determined to not be firing. PDU was checked, with 12V+ being received at fuse #7. While unplugging PDU to check for continuity on the output pin/wire harness, the main 12V+ crimp failed and pulled out. During fixing that crimp, it was suspected that there were poor soldering joints on the current sensor's output pins. Solder was added to the pairs of IN+ and IN-, but was advised to remove entire current sensor and instead jump/short the empty pads which was then done.



Future to-do:

Diagnose reason for lower HP numbers.

- Possible misfire/bad coil
- Check for spark plugs
- Check spark out of chamber using chassis as gnd
- New turned down coil on on cyl D from driver position may not be sitting all of the way down, could potentially need more sanding
- Use the too-tall coil we have as extra, PN 23-0438
- If buying new coil, make sure to get the shorter coil, not the too tall coil mentioned above

Top up drexler fluid

Top up slowly leaking rear left dyno tire

Fix coolant leak from oil cooler

Recharge CO2 tank

Lower CO2 pressure using the regulator

Prep for an endurance:

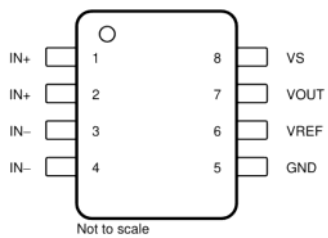
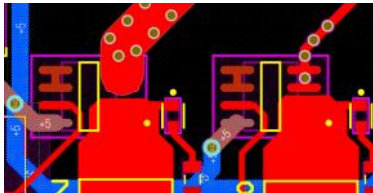
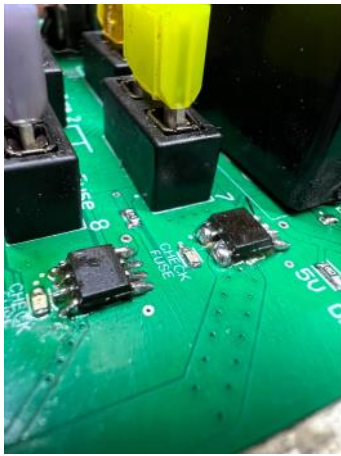
Charge batteries

Put filter on air intake

Charge CO2 tank

Corner balance

Toe



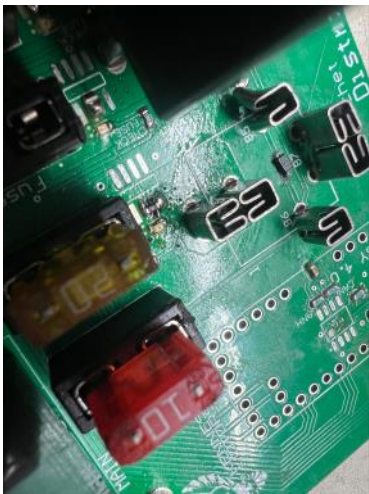
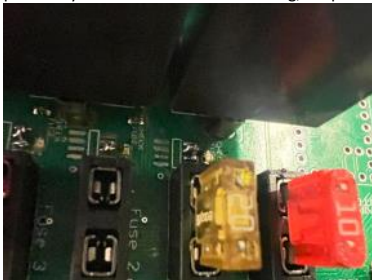
After fixing both of those items, the car ran and idled for a short amount of time before noticing the fuel pressure regulator was dumping fuel out of the vac/boost reference hole/fitting location. The spare regulator was swapped in, which remedied the issue.



After this, the dash lost power and the starter button would not cause the car to crank. Upon investigating this, it was discovered that one of the crimps inside the 2pin DT connector is missing/broke it's retainment ring and is able to be pulled out easily. Also, it happened to be noticed that the E-Stop 2pin DT does not have its locking insert/clip, and those wires could be accidentally pulled out in the future. Neither of those were the core issue, as the PDU just hadn't been fully plugged in from above. Once plugged in, dash received power and car would crank.



Next, the fuel pump began to lose pressure while idling, until it fully shut off and would not turn on at all. Probing revealed power at the fuse, but none at the output. Visual inspection showed charring on the board, and a burnt up 0 ohm 0602 jumper. With a 15A load, this makes sense. The high amperage jumpers then had adequate solder added to carry the current. The low amperage jumpers also had additional solder added mostly to prevent the small possibility of the same failure occurring, despite the lower amperage.



Finally, dyno pull was able to be completed. Graph followed same trends as previous car, but only showed 45hp peak. Theorized to be misfiring on one cylinder, which will be checked in the future. Right angle fitting on pneumatic shifting solenoid blew up during a shift, and was replaced. CO2 tank needs to be refilled and the regulator turned down some. Also, the green button on the dyno pendant does not start/stop a log anymore for some reason. Also, lower rad hose leaked, but was able to be tightened. There also is a water leak near the oil cooler, but has not been tightened yet.

Brenden:

Dyno:

Besides what Jonathan pointed out above, we should note that the fitting in the up solenoid of the shifting system blew a fitting and vented all the CO2. We replaced the fitting but never charged the tank.

4/8/24 Dyno

Monday, April 8, 2024 4:11 PM

Jonathan:

misfire on cyl. 4, swapped in spare coil & works
misfire on cyl. 2, still unsure why

swapped spark plug between 2-3, misfire stays on 2
swapped coil between 2-3, misfire stays on 2
injector 2 fires and plug is wet while cranking
coil wiring checked, has 12V+, GND, and trigger wire continuity from plug to ECU
spark plug fires strong outside of the engine grounded to chassis

Performed compression test, results were as follows:

4-3-2-1
145-140-15-145

Oil was added directly to cylinder 2, and compression (only on #2) was checked again:

4-3-2-1
145-140-25-145

Car was then attempted to drive up to main, but lower AN fitting was not tight and leaking fuel. Tightening fixed the issue. Car kept stalling and shutting off though, with the PDU constantly running the fuel pump and not providing power to the ECU. The fuel pump continually runs, and the ECU only lights up red, not green.

Brenden:

- Diagnosed the loss of power to be lack of compression in cylinder 2. Cylinder was reading 30 Psi compared to other cylinders reading 150 Psi
- In an attempt to diagnose engine, we poured 10w 30 down the spark plug well to see if the rings were causing a lack in compression. After doing this, the compression remained the same.
- My theory is a bent or sticky valve.
- We then attempted to drive the car to main, but during this we had a leaky fuel regulator, a
- After this the car died in the middle of the intersection, and would not start again until we pressed all of the relays in.
- After driving a few feet, the car shut off again and was reported that the ECU kept shutting off after the car started moving under its own power.
- After this we resorted to pushing the car up stingies

Currently - 4/8/2024/ 6:55PM

- I am taking off the intake and exhaust to visually check the valves.
- From here we should be able to diagnose if it is a valve train issue, the only other thing is to put a dial indicator on it and see if we get the same valve lift across the board.
- If it is not this, we will probably have to tear down the engine and diagnose further
- In my head we should think about what we want from invitational
 - The options we have are:
 - A. Run the car as is and hope for the best, but electrical needs to be in sound shape.
 - B. We find out it is a sticky spring or a bent valve and replace it in the head.
 - C. We rebuild the spare engine and run a untested unbroken in engine.
 - D. We take the good head we have and stick in the block in the car.
 - E. We don't run IC car at invitational and focus on making the EV as competitive as possible.

Notes:

Kinked and leaking oil cooler line.
Slight engine oil leak from pan potentially the sensor in the pan
Need a mount on secondary muffler before running at invitational

To-do from previous day:

Diagnose reason for lower HP numbers.

- Possible misfire/bad coil
- Check for spark plugs
- Check spark out of chamber using chassis as gnd
- New turned down coil on on cyl D from driver position may not be sitting all of the way down, could potentially need more sanding
- Use the too-tall coil we have as extra, PN 23-0438
- If buying new coil, make sure to get the shorter coil, not the too tall coil mentioned above

Top up drexler fluid

Fix coolant leak from oil cooler

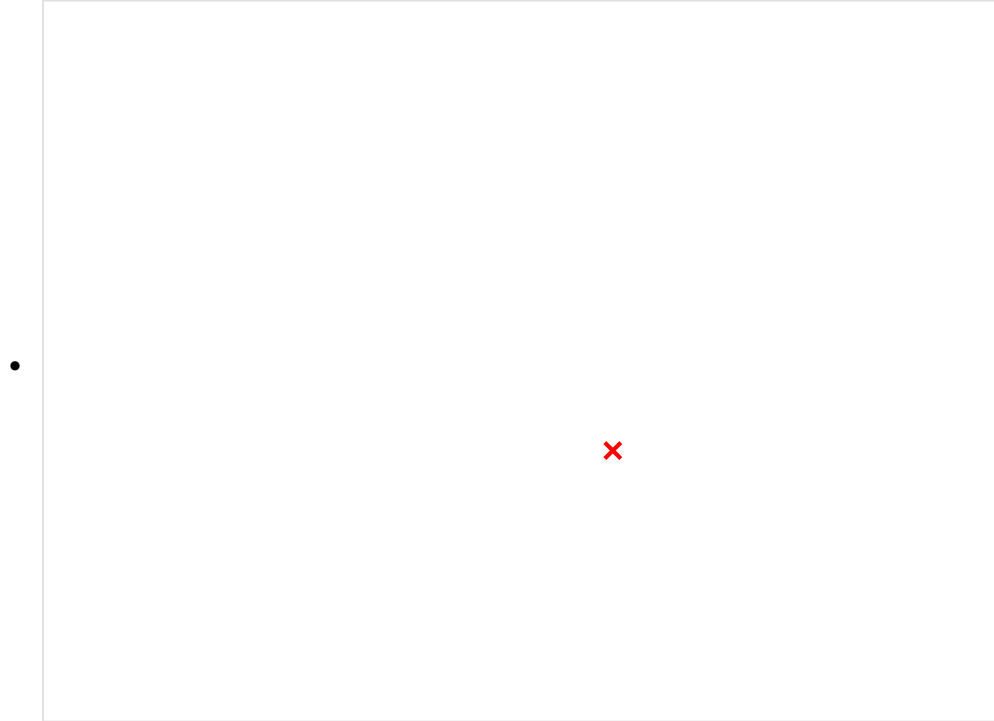
Recharge CO2 tank

Lower CO2 pressure using the regulator

4/12/24 night/ morning before day 1 invitational

Friday, April 12, 2024 2:47 AM

- Pdu Anderson connector internals were loose, causing the care to loose power , when wire was jiggled sounded like was moving total . Fixed it by removing the connector and soldering the wire down
- Pdu might get hot(consisted adding the heat shield es i) really needs its box
- Pdu plastic bolts to planting housing, couldn't remove had to cut off ,
- Seat belts are installed backwards
- Coolant leak



4/12/24 Friday daytime before invitational - Tech

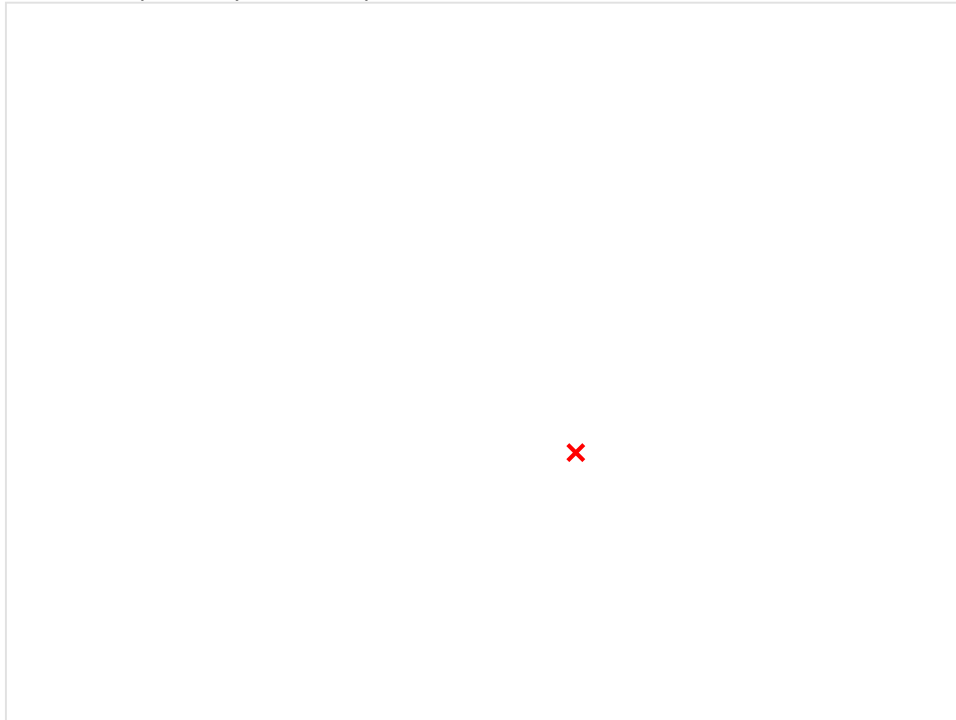
Friday, April 12, 2024 1:14 PM

Throttle bracket is missing the slot&nut that ensures efficient movement.

Missing roll hoop padding to pass tech.

Air filter missing

Small leak probably should replace hose



4/13/24 Saturday invitational

Saturday, April 13, 2024 12:30 PM

Motor mount snap
RL pickup snapped
rear motor mounts not torqued down



loose chain,
exhaust leaking from headers,
no launch control,
clicking coming from car when moving,
struggles to put power to ground,
wheel bearing about to give out on the left,
rear axle locking,
leaking fuel(may have miss heard) @ the neck
motor mount bolts loose,
no clevis pin in clutch pneumatic shifter on right side,
master link on chain gave out,
right left pickup had broke

Master link broke
Leaking coolant







4/19/24 IC Skidpad Test

Friday, April 19, 2024 9:46 AM

EXCEL SHEET FOR TIMING

TEAMS FOLDER WITH LOGS

Shit to do before the car goes out as of 9:46 AM

- Bleed brakes- 30 mins
- Toe aligned- 20 mins
- Zero steering- 5 mins
- Corner balance or atleast ensure corner balance is within +/- 5lbs.- Range

After FB game expecting car in shop and starting to get worked on at 9:30. Shooting to get car out at around 11:00-11:30 PM. Want to end sometime around 1AM-2AM.

Notes

- Testing packing list
- Check why RL shock pot not functioning
- Pace of testing was slow, defined roster for test and jobs for people

Leaky rear brakes

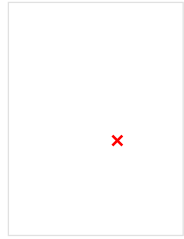


Brief:

- Only ran on 5F/2R shim setup for toe
- Data is in teams
- Clutch was lost middle of the test
- ON Monday need to investigate, brakes leak was coming from rear left T nut split on the hard lines
- Excess motor movement, need to check motor mounts

4/22/24 IC Shakedown

Tuesday, April 23, 2024 2:25 AM



Hose clamp made contact with chassis as it was loose,
Tightened it up and no more sound was heard

4-22-24 Notes

Front left wheel did not lock at 12PSI 50F outside temp
Brake over-travel switch was hit
Gear indicator does not change (Stays at 0)

Driver Note:

Heard a pop pop when launching, Theory is hose clamp was hitting the chassis.



Left Side Toe
Rod Ends are show much more threads



Right Side Toe
Rod ends show less threads,
Could be causing the below



Front Right Upper Control arm is in contact with rim at full right steering
Hypothesis is the toe isn't centered as the front left side has no damage



GEN. TEST PACKING

Monday, April 22, 2024 10:32 AM

The General Packing list for a Test Day:

MUST HAVE:

- Test Day Box (bruh)
 - o Tire pyrometer
 - o Toughbook
 - o Toughbook charger
 - o Tire pyrometer
 - o Longacre (red) tire pressure gauge
 - o HV Gloves
- Test Day Documents
 - o Test Plan/Proposal
 - o Results logging (excel or paper)
- Two Jack Stands
- Timing Gates
- Cones
- Tools
 - o HV Tools Box
 - o 7/16 Wrench or Socket
 - o 5/16 Wrench or Socket
 - o 5/8 Socket
 - o 3/16 Allen
- Fire Extinguisher

4/24/2024 IC Skidpad

Wednesday, April 24, 2024 1:01 AM

- Wanted to revisit Skidpad testing day from 4/19
- Not very effective for a couple of reasons and data was not very useful
 - o Measured ride heights and off rear there was a 1/4 inch delta between left rear chassis points
 - o Skidpad lot was not setup well and would affect data bc it confused driver
 - o Toe and camber was visually not square
- Shit to fix before next test day
 - o Easier, repeatable, and more effective way of aligning and setting toe
 - o Ensuring all pushrod lengths are the same in CAD with degree of adjustment we want from rod ends
 - o Make rope for Skidpad and make sure we have chalk for cone lines

4/26/2024 Testing

Saturday, April 27, 2024 4:42 AM

IC Car Testing : Accel + Skidpad

Setup:

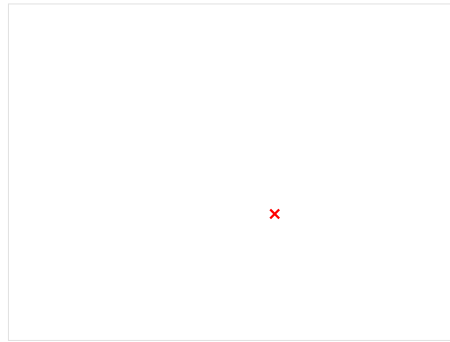
- Full Aero (Low Drag for Accel)
- Corner Balanced and Toe Aligned before
- Put aluminum push rods for the rears
- Goal was to run quick Accel setup tests and skidpad tests (see VD test plans)

Shit that happened:

- Went to lot car did two accel runs (one of which was 4.265) after car was coming out of gear
- Following this filled with fuel and checked air regulator but was still happening, launches off the line were noticeably slow and seemed difficult
- Did one more pull and car still was having trouble even looked at drexler to see if spinning at different rates as tires, final conclusion was to replace clutch
- Idea was that clutch was ran very hard that year (off of dyno and lot testing) so replacement was inevitable
- That 4.265 run was bad ass but no logs sage

Post-mortem

1. Car was towed/pushed back to shop, this went fine. Removed aero once there, @mihai checked ride height once undertray was off - (mihai record it here?)
2. Oil drained from motor to look for indicators of excessive clutch wear/dying. Not sure of conclusion - matthew (need brenden, carter, mihai to say)
3. Wheels were taken off and found tripod that exploded on rear left.
4. Tripod replaced and slipping problem seems better when on stands



UPDATE: (clutch didn't seem to be the issues and it was never replaced (updated 4/28/2024)

UPDATE: slipping continued look at 4/27/2024 Endurance log for more information (updated 4/28/2024)



Video of tripod barring of left rear, It lost its rollers/ exploded

IMG_3404

Saturday, April 27, 2024 11:59 PM

- Car setup was left the same from the testing the night before
- Main goals for the test were, see if car could survive a full endurance with no major issues, if there are issues spot them out and fix them, then make small tire pressure adjustments in between runs to characterize static tire pressures

- On the drive to the lot, this was noticed, with that driver left axle was pulled out Rear left tripod came too far up on the axle and ate the splines possibly? Added two spacers to the inner (drexler) side of the axle and removed the end cap, and it seems to have a better engagement and fixed the issue

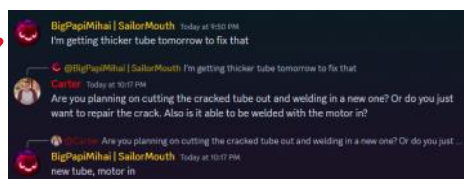
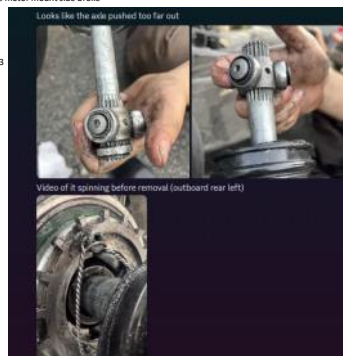
Code that was on it:
Seems to always be pulling high on the board. megasquirt was showing constant input with pulling it low

With the above branch, flipped the logic on the board to drive low most of the time and then high on the other times, this resulted in constant surging (activation) of the input

Flashed an even older branch, non state machine with my name on commit, same issue

To-do for 4/29/23 before testing again:

- FEA Did Projects with jesse load case (the new diff carter was with jette jetted at GT the other day)
- Link to Project proposal design referenced ([https://www.saeeds.sharepoint.com/:file?Item=7f8e6c9d-336c-409ed9-b200c0-000000000000/Design%20Proposal/Proposals%20System/Mechanics%20Proposals/4-Component%20Modalization/Different%20Modes%20Load%20Cases/NutAndBolt](#))
 - o if pass through nut
- Machine mount mounts for (Nilder needed) *(this is what I am talking about pulling from the file)*
- Diagnose no lift shift issues (electrical knowledge would be appreciated)
- Change out all FT Nuts on car
- Loctite pull cups and do a full driveline check (PLEASE BE THOROUGH!!!!!!)
- Test out front wheel mounting?



5/1/2024 Shakedown

Thursday, May 2, 2024 2:11 AM

Rear Sprocket was ground down to fit the chain.
Oil to cooler to top of radiator leaking water

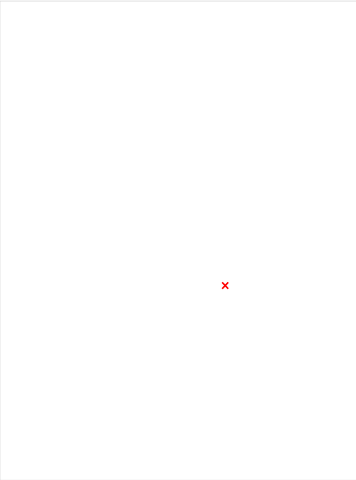
Down shift solenoid leaking pressure



Axle on left side was popping out of the hub while installing chain
The inner groove was made to retain the tripod inside the hub.



Drexler side the tripod fit nice and had move to room



On the wheel side the tripod did not want to fit inside the hub



As seen below blue hose is minimally attached on the flange.

This was fixed, hose clamps were undone and tube was moved up and re-tightened



5/3 shakedown

Saturday, May 4, 2024 5:04 PM

Shit that happened before car went out (a lot)

- Intake had a crack so had to be rewelded
- Set of wheels were resealed and rains put on

Took car out after installing the shims that have clearance holes instead of aslot.

Emil drove entrance track

After 9 laps, found that car was overheating

After stopping the car found the bearing was almost out of the right bearing carrier

5/4 Endurance Car Log

Saturday, May 4, 2024 11:00 PM

Sound does not pass. Idle 105 and running 112.7 Repack muffler. Make sure riv nuts are in trailer
Possibly add riv nuts to muffler.
Battery is not charging. - can you multimeter the rectifier? Or its not charging off car?
We will be checking the rectifier soon. So far battery actually seems to be charging now.
Fiber glass packing is coming out of the muffler.
ECU is not connecting , car is throwing check engine light and throwing a limp mode.
Changed ECU
Ecu is preventing shifts
Right side tripod exploded now it's being replaced. Splines on half shaft are damaged.

q

Swapped shift in from pin 20 on grey connector to pin 32 on white connector, this is with the "old" ecu which was on the car 4/29? And swapped bc weird pins

To-do list

Down Shifting Issues:
Car seems to half shift between 1st and 2nd into neutral on upshifts only (120 psi), seems like the clutch and downshifting works fine. The tank was empty when bray arrived back at the garage which is why it was not shifting.

Pedal box cover was drilled with the extra hole like requested, could not find brake sensor cover though (however, it is 6am so)

Could not check water and oil leak bc not enough people to turn car on side

Did not want to mess with throttle cable because did not want to mess up and was doing other things, should be simple to fix though

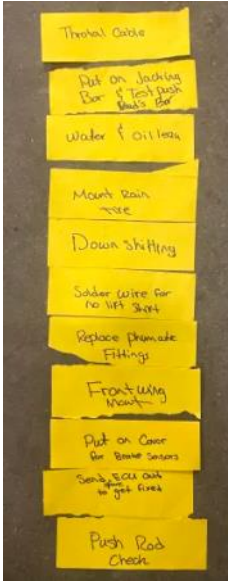
Jacking bar was put on but not tested with the push bar, bc noticed driveline was bad right then

Other issues not on list:

Motor mount bolts were loose again, despite being tightened
-Tightened them all and put new red loctite on it

Chain was super loose (possibly) due to the diff carriers moving under load and sliding closer to the engine after the motor mounts loosened
-Added back the same number of shims we had previously and tightened the bolts down

Both bolts going to the tulip cups were loose, red loctite was not set/gummy.
-Measured bolts, both were slightly too short according to the reddit post but one was very much so too short, so another bolt was ground/cut to be the proper length and red loctited after a thorough cleaning and reinstalled
Exhaust is cracked again, see discord for pics



8/29/24 Dyno

Thursday, August 29, 2024 10:45 PM

Compression Test

Cylinder 1: 125 Psi

Cylinder 2: 125 Psi

Cylinder 3: 125 Psi

Cylinder 4: 125 Psi

Compression fine; Cyl 3 Sparkplug shot out





Cylinder 3 Coil contacting wall, Fuck cylinder 3

9/5/2024 Tasks

Thursday, September 5, 2024 12:04 AM

To do by EoD:

- Move dyno tires onto the combustion car
- Put new rectifier into combustion
 - o Retrieve the one in dyno
 - o Test the rectifier
- Check if the car is charging
- AMP Clamp after rectifier, see if current coming out of rectifier is larger than current going into battery (Get help from @ LV Newbie)
- Hook up car battery and see if that works to check if there is voltage sag, should do this on dyno
- POST FINDINGS INTO COMBUSTION CHAT

Side Quests:

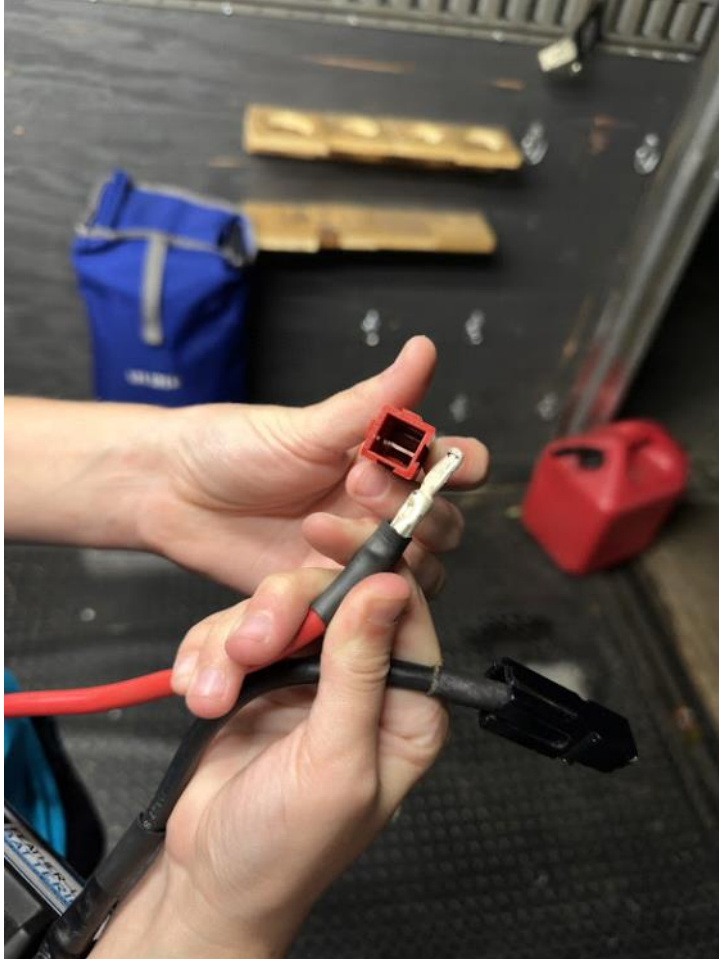
- Source V-Bands
- Figure out how to headers are going to be merging into the muffler
- Get Header Bung Drawing and CAD to be Ready for Manufacturing
- Order Header Flanges
- Order Exhaust Crush Washers
- Leak Down Test (Worst Case Scenario)

9-25-14

Tuesday, June 18, 2024 12:01 AM

Dash fuse blew
Shifter fuse blew

Anderson connector on IC battery broke
Battery was not secured properly before drive
Positive anderson connector missing metal locking feature



9/29/2024 Checklist for Testing

Sunday, September 29, 2024 5:50 PM

List to get starting for Testing:

- ☐ Mechanical Tech Inspection (SAM)
- ☐ Paint Marker Suspension
- ☐

10/11/24 Shakedown

Sunday, October 13, 2024 9:21 PM

Session

Session was meant to shakedown the IC Car after the Drexler ramp angles were flipped and bearing carrier was replaced. Car drove down to west lot and started doing some small pulls. Some left and right hand circles were performed to ensure axles would not bind under lateral load. During the shakedown shifting issues were prevalent. They were resolved by increasing the regulator pressure from 70PSI to 125 PSI. Up and down shifting worked from then on. Brake pedal travel was observed and it went all the way down to the BOTS. Driver said car pulled left but no obvious reasons were noted. Tire pressures were ~10psi. Car drove back up to main.

Driver Feedback

Car pulled to left

Brake pressure was nonexistent but it stopped

Co2 regulator keeps changing pressure and so had to be increased to get shifting to work

Would investigate shifting problems more

When we pulled up to the shop we vented all the co2 so we have to fix a leak now

To Do

Bleed Brakes

Set Toe

Investigate Pnuematic Lines/ Fittings for leak/ blown fitting

11/1 - 11/2 Barnesville

Sunday, November 10, 2024 2:09 PM

Overview of the purpose of the test/event:

Future to-do:

-

Critical Issues:

-
-
- LV - ECU 5v fuse blew at the end of the day ish. After coming to the shop it was digosned to be the oil presure sensor blowing the fuse. It has bin disconed from the 5v reff untill the sensor can be replsed.

Full description & sequence of events:

11/8 Shakedown

Sunday, November 10, 2024 2:10 PM

Overview of the purpose of the test/event:

Future to-do:

Critical Issues:

Full description & sequence of events:

11/9 Driver Day

Sunday, November 10, 2024 2:11 PM

Overview of the purpose of the test/event:

Let non-drivers get in the car and drive for a short time

Future to-do:

-

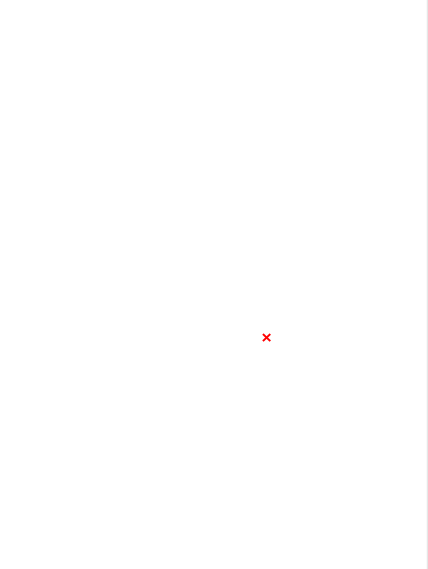
Critical Issues:

-

Full description & sequence of events:

Micah notes:

Tire:
Rear left tire came off bead at approx. 11:30 AM
Looks like bead on tire was broken (not 100% sure)
Rim has major dent, I believe that it was dented before the flat but would need to be confirmed by someone else.
Attempted to repair the continuing leak with bead sealer. Was not very successful as the tire would be at 14psi at the start of a run then 8-10 min later would be at 4 psi



Lower control arm:
Driver hit curb at approx. 12:45 PM
Front left wheel hit curb, it was the only one to make contact and rise up on the curb.
Lower control arm broke in 3 places.
The rear arm was bent down about halfway down the length of the pipe with a crack in the inner elbow of the bend. See image 1
The front and rear pipes cracked about 70% of the way through both left with a small tab of metal holding them still on. Front looked to have a little more remaining than the rear but not 100% sure. They were broken near the upright just past the welded plate. See image 2
The rear pipe that was also bent, broke on the top side with a small tab holding it on underneath. The front pipe was broken on the top side directly opposite the way the rear broke. See image 3
Someone noted that the bushing on the upright seemed loose, unsure of who it was and did not confirm myself yet.



Image 1



Image 2

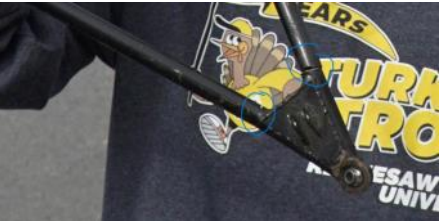


Image 3

11/14 Shake down before Michelin

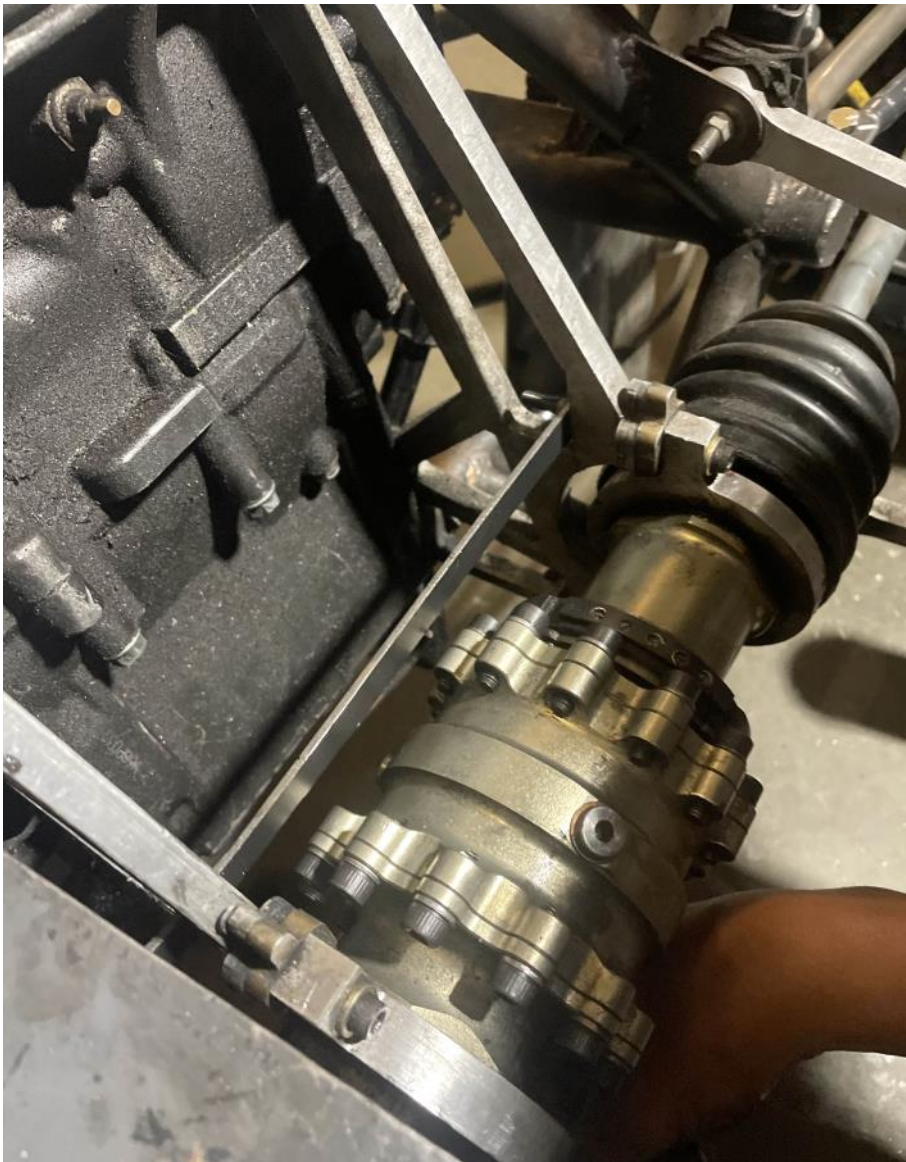
Thursday, November 14, 2024 10:46 PM

Overview of the purpose of the test/event:

Shakedown meant to test the car after the driver day/
ensure car still felt the similar in terms of performance as
before.

Full description & sequence of events:

- When we got down to the lot the car driver noted down shifting was not working. Issue was that the pneumatic tank was not screwed all the way onto the regulator.
- Driver did a few laps for shakedown
Chain flew off the rear end. When car was analyzed the sprocket was loose.
Car was towed up to shop
- When analyzed the motor mounts had once again become loose (Last time this happened was 11-02 at Barnesville)
- Bearing carriers also appeared to have shifted. Bearings were tapped back into correct location
- We added 2 steel bars connecting left and right carriers to prevent above
- Sprocket bolts were loctited and will be allowed to set for 24 hours
- New Master link installed





Future to-do: Shakedown tomorrow before packing for Michelin

11/15/24 Shake down before Michelin

Friday, November 15, 2024 1:14 PM

Overview of the purpose of the test/event:

Let non-drivers get in the car and drive for a short time

Future to-do:

-

Critical Issues:

-

-

Full description & sequence of events:

11/16 Michelin

Thursday, November 14, 2024 10:47 PM

Overview of the purpose of the test/event:

Let non-drivers get in the car and drive for a short time

Future to-do:

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Critical Issues:

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Aero Notes:

AutoX
- Looks like oversteer

Full description & sequence of events:

11/23 Driver Day

Sunday, November 24, 2024 11:45 PM

Overview of the purpose of the test/event:

Let non-drivers get in the car and drive for a short time

Critical Issues:

-Dyno Tire leaked under load

- It would get down to 3-4 PSI after being inflated to 12-13 PSI. New tire was mounted. Pressure leak stopped

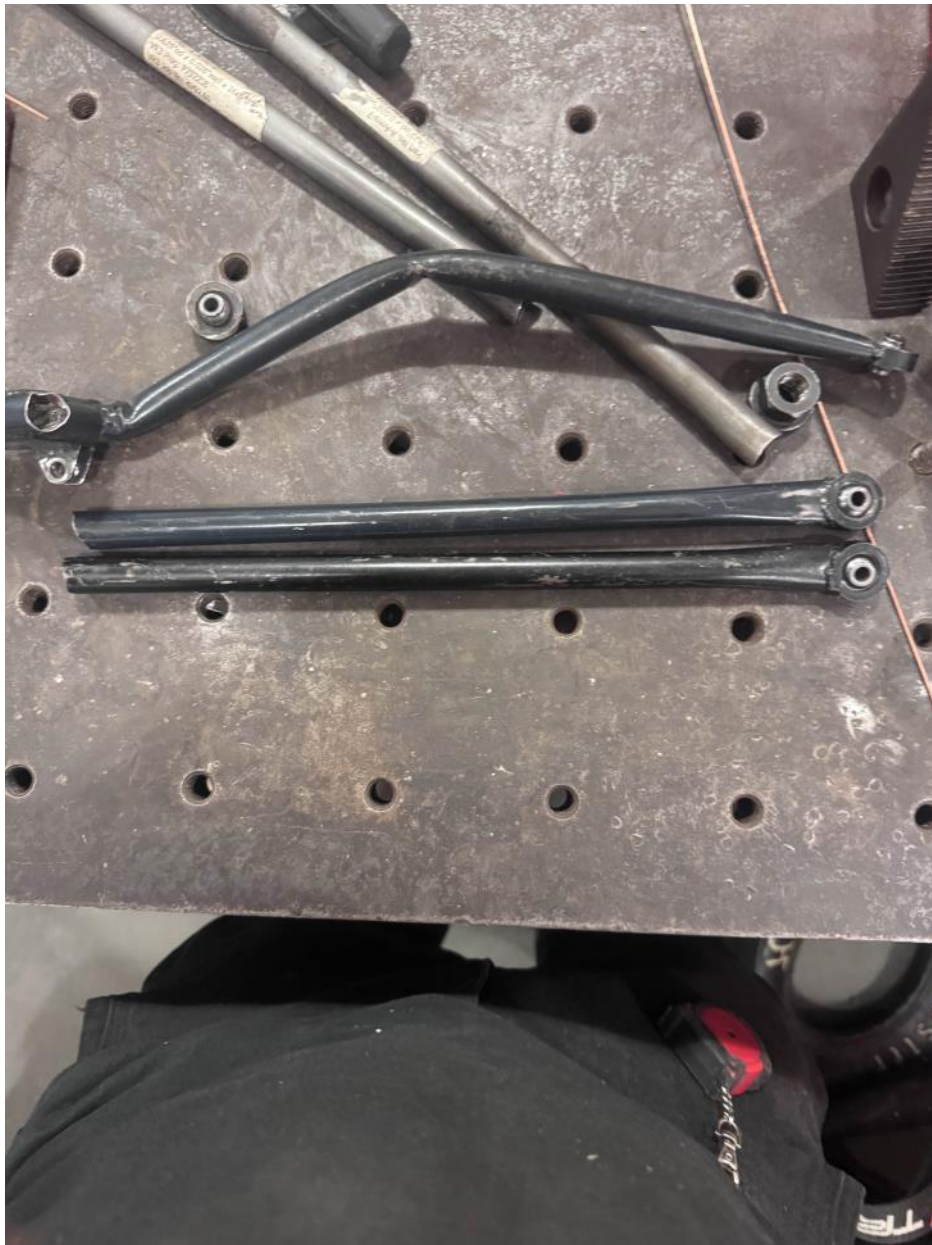
-Sprocket nuts were swapped for jam nuts

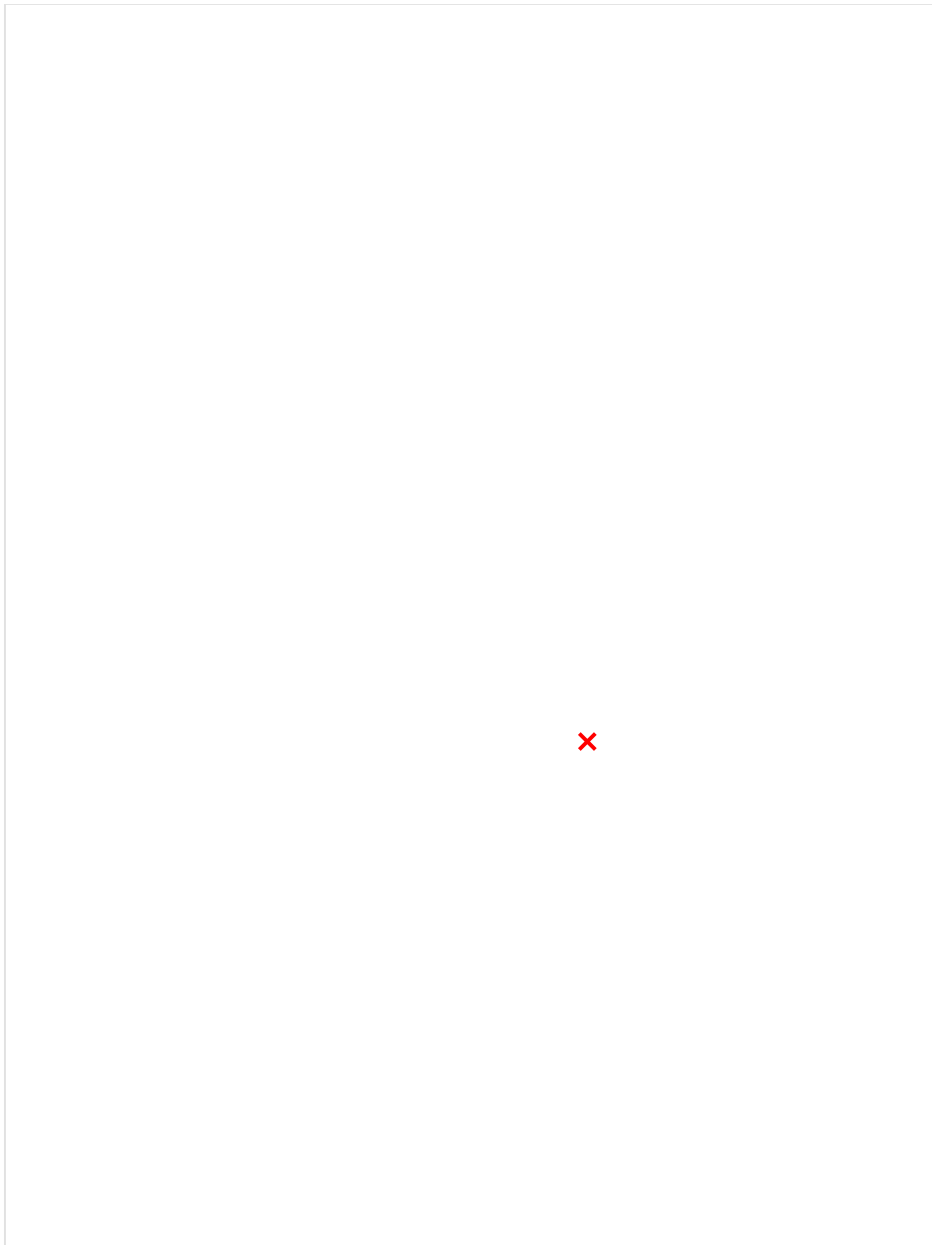
- Only 1 bolt became loose with jam nuts and was tightened other bolts held up

-Car Hit Curb













Driver states foot fell off brake pedal and knee got caught up, was unable to find brakes and ended up hitting the curb with front right tire

When front right suspension was removed the Rod Ends on push rods and toe rods were bent.

Toe rod and push rod were examined and were visibly straight

Top and Bottom control arms were damaged as seen above

Top Control Arm Replaced & New Bottom Control Arm

Top control arm was replaced with a spare

Bottom control arm was replaced with a new made control arm. The stock was from the 22' car and cups and sphericals were from the previously damaged control arm



Car was shaken down after new suspension on
Toe was not set and ride heights were not set up (They were set up to similar as before)
Car pulls right currently

Future to-do:
Corner Balance
Set Toe

05/10/25 testing

Sunday, May 11, 2025

12:27 AM

Current Weather



55°F

Light rain

Wind Gusts

11 mph

Goals For this shakedown/ Endurance

- Aero testing: Testing aero in general
 1. Aero pressure tap
 2. Yarn tough flow vis
 3. Shakedown
(Seth will fill in later)

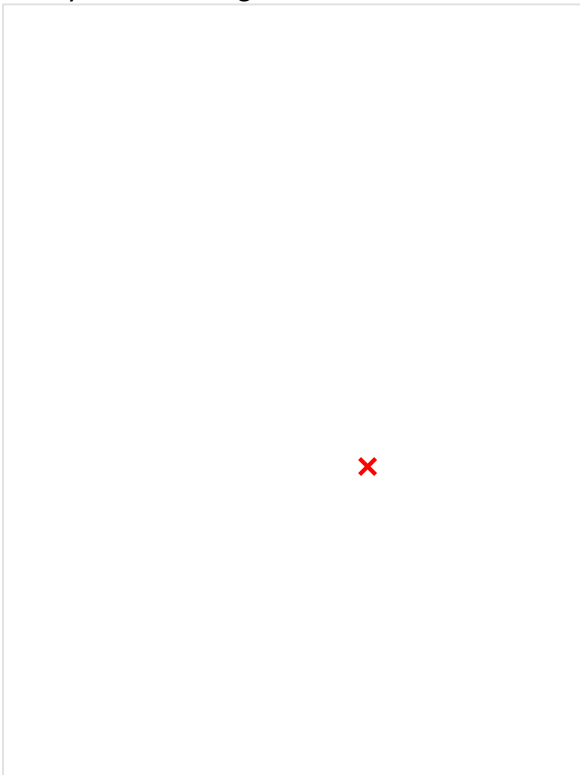
Brakes test:

Hit over travel need to rebleed brakes

Passed while on wet track

Problems Occurred:

- Shifting is not working
 - No lift shift un up shifts do not work well
 - Downshifts seem to work fine
 - The cylinder was angled too far and should be inline with the shifting fork



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