HP Academy Loom Course Notes

Workspace: Keep it tidy, largest flat tabletop, 2 by 0.7 m min. Tool tray. Contaminate free.

# Harness Design

List all connections to the loom

Examine physical mounting on vehicle

Breakout boxes for splicing; ease of strain relief. Simplifies loom

2 smaller wires > 1 large wire for tidiness and concentric twist. Common size better

Document sensor requirements. 1 single wire that is spliced once per sensor. Shielded cable for critical sensors.

Thermocouples require thermocouple extension wire

Star point earthing: singular earth point.

Tefzel wire search m22759/32

Raycam heatshrink dr25

Heatshrinkable shapes for branches, epoxy comppund to seal connection

Nylon rope to approximate routing lengths

Branch point placement key in tidy harness fitment

Single wire core, each additional layer has 6n + 1 wires

Single size of wire makes it simpler

Core, largest and least flexible

Twisted pairs count as a cable

Lay length generally decreases with each layer

Max 5 cables for core generally

Largest cables as core, largest to smallest for layers

Ballast and filler wires on outside as needed

Divide diameter of previous layer with diameter of new layer wire. Consult LUT for number of wires in new layer +-1 wire

Can move wires to previous layers and increase diameter if it means simplifying additional layers

Power and twisted pairs in core

Sliding boots into place but not securing until finished

# Harness Construction

Add 20% to measured length

Avoid twisted quads by twisting together in opposite lay directions

Cable tie to secure end

Cable tie every 100-200mm

Start in the middle for long lengths

Lace core and final layer to hold twist together

Lace in opposite lay direction

Secure end with Kapton tape

Remove cable ties once reached, snip head

Wires exiting harness together twisted next to each other

Lay wires onto core in groups and give one twist, cable tie after each group

First twist determines lay length, aporox 30 degrees lay angle

Mark expected lengths for rest of loom

For securing end, loose cable tie slid down length to help align twist

## Splicing

1-2 times wire diameter of exposed copper on each side of splice

Stub/parallel splices

Crimping Tools:

Sargent 3137CT

Tyco Electronics AD-1377

Daniels Manufacturing GMT-232

Stub Splices:

Red Band

Tin Plated: D-609-03

Nickel Plated: D-609-12

Blue Band:

Tin Plated: D-609-04

Nickel Plated: D-609-13

Yellow Band:

Tin Plated: D-609-05

Nickel Plated: D-609-14

Lower end of range gives cleaner splice

Do not twist wires, just press together

Insulation extends 1 wire group diameter past crimp bounds

Seal end with pliers whilst hot

## Branching