Rear/side View Camera and Radio System Upgrade

When the original Panasonic camera/monitor system on my 1998 Fleetwood Discovery 36T finally gave up the ghost, I considered buying replacements for the two components from rvelectronics, but the two would cost $330 - and I'd still only have a used or refurbished B&W monitor with one camera. I searched for options and settled on a 3-camera system from Rear View Safety. Their basic 3-camera system with a 7" single view monitor costs $400. The system I bought was $525. The extra cost was principally to upgrade to a 9" split screen monitor. They also offer a 7" wireless rear view camera /monitor option with two wired side view cameras for $700, so I opted for the larger monitor and a fully-wired system. While I was installing it, I often second guessed myself as I crawled around under the coach to run the cable (more on that later). Now that I have finished the installation, I am most happy with it and glad to have saved the $175. The system I bought included the following pieces/parts.

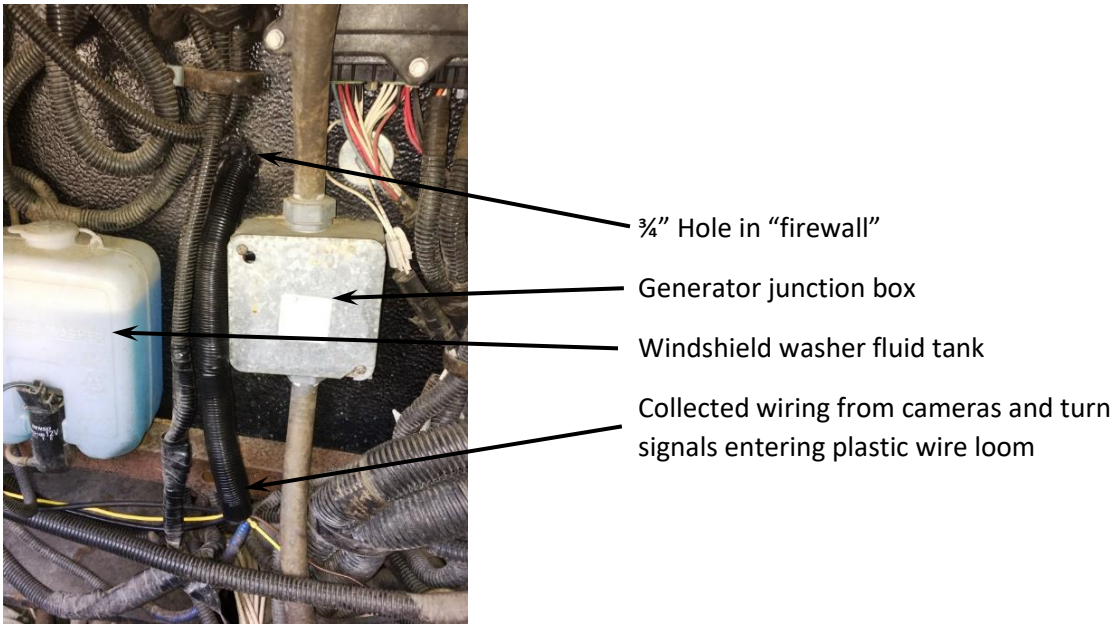
- ✓ 9" color split screen flat panel monitor (monitor can show multiple views and you can wire it to switch automatically between them as you use the turn signals or shift into reverse. When you shift into reverse, distance gridlines automatically show up on the screen, although they don't translate to feet – you have to figure that out and either post a note nearby or try to remember how many feet the 3rd gridline is from the rear of your rig.
- ✓ One waterproof 130° rear view camera with infrared night vision (a good upgrade to former system)
- ✓ Two waterproof 120° side view cameras with infrared night vision (an even better upgrade to former system)
- ✓ One 66' rear view camera cable
- ✓ Two 33' side view camera cables
- ✓ Installation instructions (pretty well-written as these things go).

Installation notes (with pictures, where I have them).

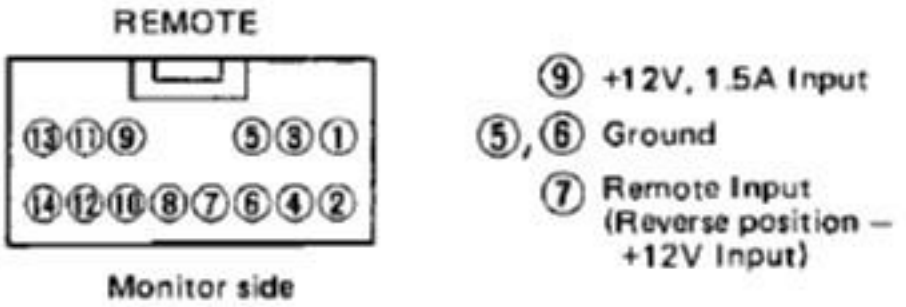
- Routing the wire from the rear camera was both time consuming and knuckle-bruising. I did this before attaching it to the camera and mounting the camera, as I needed to access the hole in the end cap to route the cable more easily. I tied off one end of the 66' cable to the camera mounting bracket to anchor it while I was routing/pulling the other end towards the front of the coach and looped a couple of feet of extra cable that I later tie wrapped to the camera bracket. I tied a long (15' or so) piece of mason's string to the other end of the cable and tied a large nut tied onto the end of the string to help gravity get it to the bottom of the end cap beside the engine access compartment, where I could grab it. I just threw it over to the driver's side of the end cap and let gravity do the rest. Once I had it to ground level, the real fun began. It needs to be run to the front of the coach on the inside of the frame rails, kept away from any moving/hot parts/systems, and tied up securely with wire ties. I used small yellow wire ties so I will be able to identify that wire easily in the future. A good electrician's fish tape helped me get it through some of the tighter spots, like beside the fuel tank.
- Mounting the rear view camera requires fabrication of an adapter bracket, since the original Panasonic camera was larger than the new camera. Blaine Hanson posted an excellent drawing for an adapter for this particular camera in his post on the DOAI Group in May of 2017. I've included it as the final page of these instructions. The new camera fits perfectly into this bracket (thanks, Blaine).
- I mounted the two side view cameras just below the line at the top of the baggage compartments to make mounting them and running the cables easier - and avoid violating the coach's integrity any more than necessary. I chose to mount them behind the door, since it was the furthest forward point I could find that offered an unrestricted view (the door's wind shield obstructed the view if mounted in front of the door and I didn't want to mount it on a spacer thick enough to avoid that obstruction). I tried to mount them at the same height and distance from the front of the coach so the views would be

as comparable as possible. The cameras come with good 3M adhesive tape, but I opted to also use small diameter bolts in addition to the tape. Four holes were required for each camera – one larger one for the camera cable and three for the mounting bolts. I bought longer bolts, flat washers, lock washers, and nuts to mount the cameras through the fiberglass and spray painted them black to match the camera bodies. Routing the camera cables for these two was much easier than the rear camera cable. Be careful routing the cable for the passenger's side, as you want to get it out of the wheel well, but stay clear of the step and step mechanicals.

- The "trigger" wires for the left and right turn signals can be tapped into any of the turn signal light harnesses on the front of the coach in the area "under the "hood." I used the same color and gage wire for each of these that was in the monitor's wiring harness, so it would be easier to wire once I got it all inside. I routed these two wires to the same place I had the three camera cables – under the "hood," just under the main connection box for the generator. I drilled a ¾" hole in the firewall just above and to the left of the generator junction box (after measuring up from the floor on the inside of the coach to make sure I wouldn't be drilling into anything) and routed/pulled the 3 camera cables and two turn signal "trigger wires" through the hole. I wrapped them in a plastic wire loom long enough to fit into the hole just a bit and sealed up around the wire loom with black silicone sealant.



- On the inside of the coach, I started by removing the plastic shroud in front of the dashboard. This is done by removing the 7-8 screws that hold it to the dashboard and pulling it forward. The old monitor can be removed by taking off the four bolts with wheeled knobs on the end, unplugging the wiring harness, and pulling it out. This would also be a good time to replace the radio, if you have a desire/need to do so. Don't cut off the monitor's wiring harness connector until you are ready to connect the wires to the new wiring harness - there are several you will want to reuse for the camera monitor's wiring harness. Here is a picture of the wiring for the Panasonic GP-RV112 monitor, which I had in my rig. If you have/had a different monitor, you will need to find that wiring diagram or determine what the wires are with a multimeter and some testing. I don't know which fuse supplies the camera, so I didn't bother pulling it before cutting the wires in the old harness and connecting them to the new monitor's harness. I didn't need to run a new reverse-sensing trigger wire because the wire going into pin #7 served that purpose for the old monitor and I used that for the new monitor's wiring harness. I used the power source for the old monitor for the new monitor (someday, I'll probably need to find that fuse). I tied both ground wires together because you can never have enough ground in an electrical system. For the rest of the wires (camera cables and left/right turn trigger wires), I followed the installation manual that came with the camera.



Panasonic GP-RV112 Monitor electrical connector pinout diagram

Rear View Safety monitor wiring harness

Power from old harness (pin #9)

Left turn trigger wire (from left turn signal)

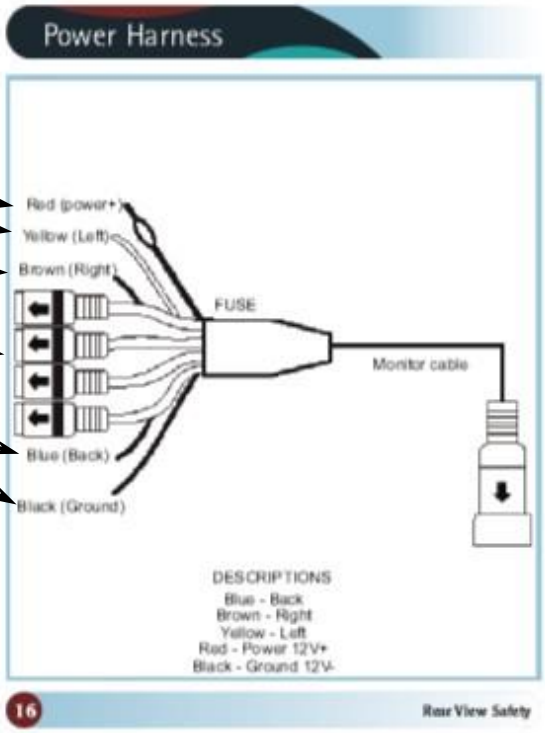
Right turn trigger wire (from left turn signal)

Camera cables (#2 – rear, #3 – left, #4 – right)

Reverse trigger from old harness (pin #7)

Ground from old harness (tie pins #5 & 6 together)

Note – the wiring harness shown is from Rear View Safety's 9" split screen monitor installation manual and may not match wiring harnesses for other monitors. Check your installation manual for your monitor's wiring colors/configurations.



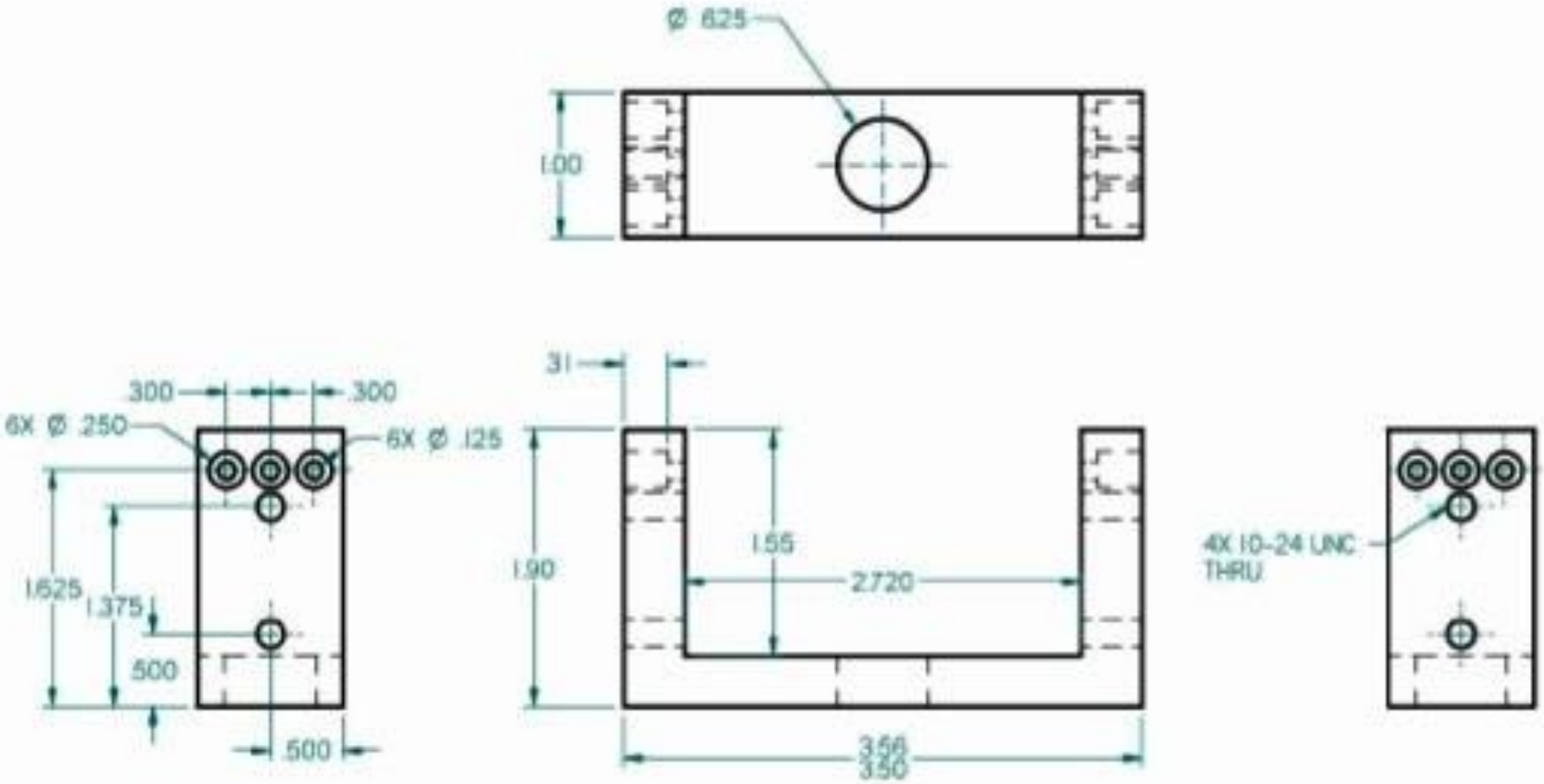
- There are several ways that the new monitor can be attached to the dash. I chose to build a wooden box frame that would slide into the mounting rails for the old monitor and bolted it to the frame using the same holes that the old monitor used such that the front of it would hold the new monitor against the opening for the old monitor (I chose not to enlarge the opening in the dash to allow me to slide the new monitor into the dash, but still can later – I still want to make an enclosed metal box for this area with some sort of swing out/up door that the monitor would be mounted on so I can use that area as a assort of "safe."). I mounted the new monitor to the front of the box with a flat-head bolt with a head that would fit into the mounting slot on the back of the monitor, tightening a nut on the back of the wooden frame just enough to hold the monitor securely, without over-tightening it to avoid damaging the mounting slot. Since this is a single point, I attached a small piece of metal to the bottom of the wooden frame and used a short bolt that fit into the threaded hole on the bottom of the monitor to hold it in position. The finished installation is shown below.

New camera system monitor, showing rear view (top), left side (bottom left), right side (bottom right), and new Kenwood stereo/CD player below it.

New monitor, showing metal mounting bracket attached to bottom of wooden frame and to bottom of monitor with small bot that fits threads in existing hole in bottom of monitor.

Wooden frame I made to mount new camera monitor to the old monitor mounting rails (black steel frame shown).

Note the mounting bolt in the front that holds the monitor to the frame.



Rear Camera Mount Adapter

1997 Fleetwood Discovery

Used in converting original camera mount to Rear View Safety camera part number RVS-771 from 4 camera kit RVS-062710

Blaine Hanson