

Trailer Antilock Braking Systems
Buckman Consulting Services, Inc.
2003

EDC Library Ref. No. 1085

DISCLAIMER

These materials are available in the public domain and are not copyrighted. Engineering Dynamics Corporation (EDC) copies and distributes these materials to provide a source of information to the accident investigation community. EDC makes no claims as to their accuracy and assumes no liability for the contents or use thereof.

TRAILER ANTILOCK BRAKE SYSTEMS

ABS CONTROL PRINCIPLES

☛ CURRENT SYSTEMS GENERALLY FIT ONE OF THE FOLLOWING:

- INDIVIDUAL CONTROL (IR)
- MODIFIED AXLE CONTROL (MAR)
- MODIFIED SELECT HIGH REGULATION (MSH)
- MODIFIED SIDE CONTROL (MSR)

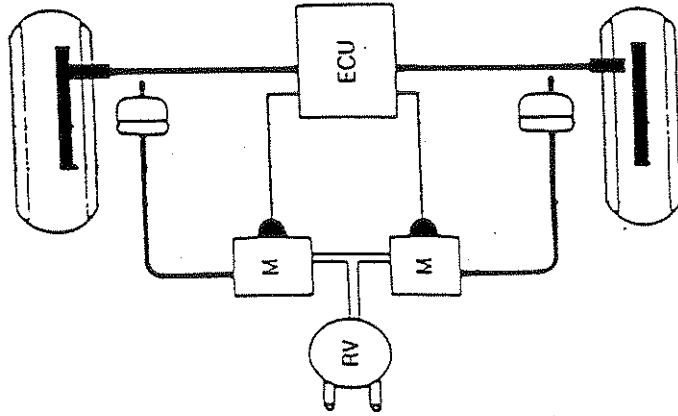
☛ TWO OTHER CLASSIFICATIONS WERE USED IN THE 1970'S

- SELECT HIGH CONTROL (SH)
- SELECT LOW CONTROL (SL)

TRAILER ANTILOCK BRAKE SYSTEMS

INDIVIDUAL CONTROL (IR)

- ☛ 2S/2M ("WHEEL BY WHEEL") CONTROL
- ☛ EACH WHEEL CONTROLLED BY ITS OWN SPEED SENSOR & MODULATOR
- ☛ OPTIMUM STABILITY AND STOPPING PERFORMANCE PARTICULARLY ON SPLIT COEFFICIENT ROAD SURFACES
- ☛ DO NOT USE ON DOLLY OR STEER AXLE OF A FULL TRAILER: SEVERE SIDE TO SIDE BRAKING FORCE COULD DESTABILIZE COMBINATION VEHICLE



Wheel-by-wheel control system.

TRAILER ANTILOCK BRAKE SYSTEMS

2S / 1M (AXLE CONTROL)

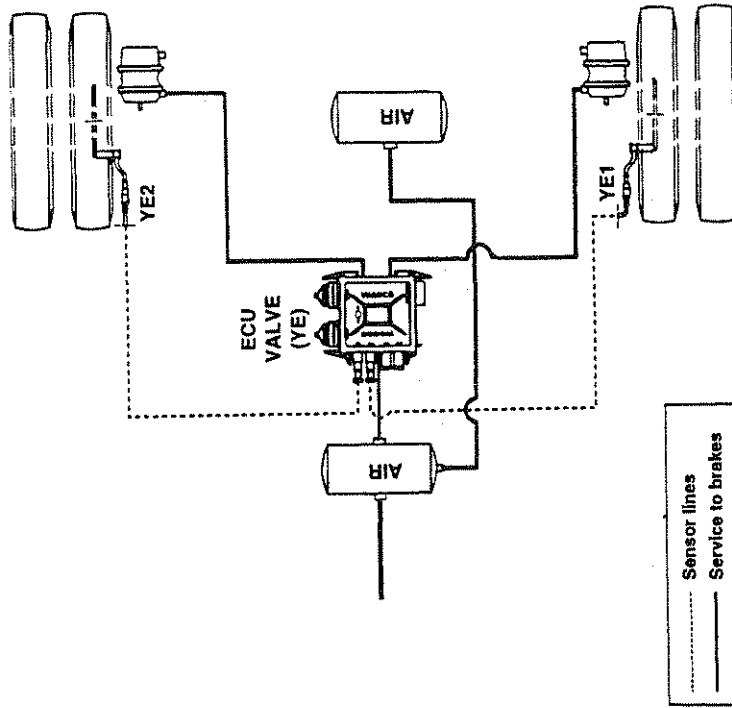
VARIETY OF CONTROL PHILOSOPHIES:

☞ SELECT LOW CONTROL (SL)

☞ SELECT HIGH CONTROL (SH)

☞ MODIFIED AXLE CONTROL (MAR)

☞ MODIFIED SELECT HIGH CONTROL (MSH)

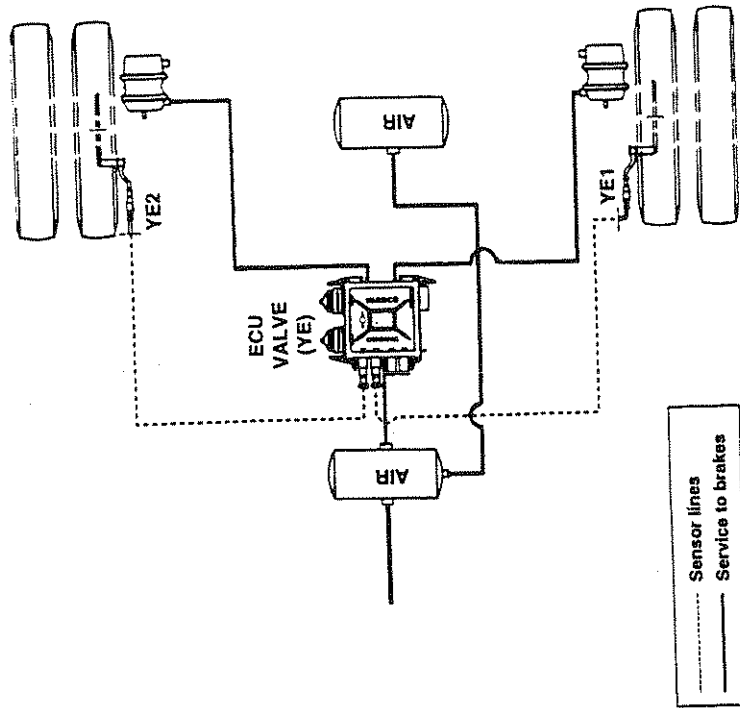


2S/1M Configuration

TRAILER ANTILOCK BRAKE SYSTEMS

SELECT LOW (SL)

- SL PHILOSOPHY USED IN 1970'S
- 2S /1M - CONTROLS BRAKING PRESSURE OF BOTH WHEELS
- CONTROL BASED ON LO-CO WHEEL
- MUCH LONGER STOPPING DISTANCES ON SPLIT CO SURFACES

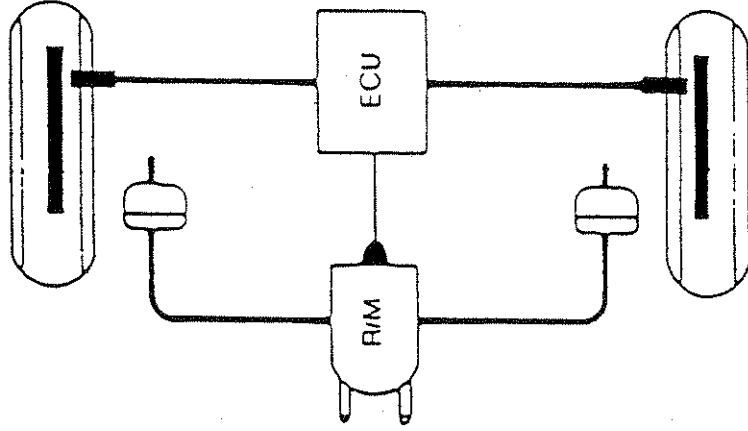


2S/1M Configuration

TRAILER ANTILOCK BRAKE SYSTEMS

SELECT HIGH (SH)

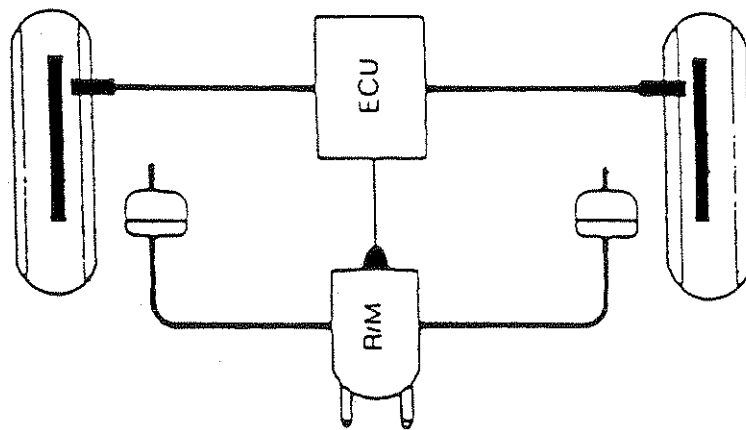
- ☞ USED IN THE 1970'S
- ☞ 2S /1M - CONTROLS BRAKING PRESSURE OF BOTH WHEELS
- ☞ CONTROL BASED ON HI CO WHEEL
- ☞ RESULTS IN SHORT STOPPING DISTANCES ON SPLIT CO SURFACES
- ☞ POTENTIAL FOR SOME TIRE FLAT-SPOTTING



TRAILER ANTILOCK BRAKE SYSTEMS

MODIFIED AXLE CONTROL (MAR)

- 2S /1M - CONTROLS BRAKING PRESSURE OF BOTH WHEELS
- SIGNIFICANTLY BETTER THAN "SELECT LOW" PHILOSOPHY
 - FAVORS LO-CO WHEEL
 - HIGHER UTILIZATION OF HI-CO WHEEL THAN SL
 - SHORTER STOPPING DISTANCE WITH SOME FLAT-SPOTTING PROTECTION

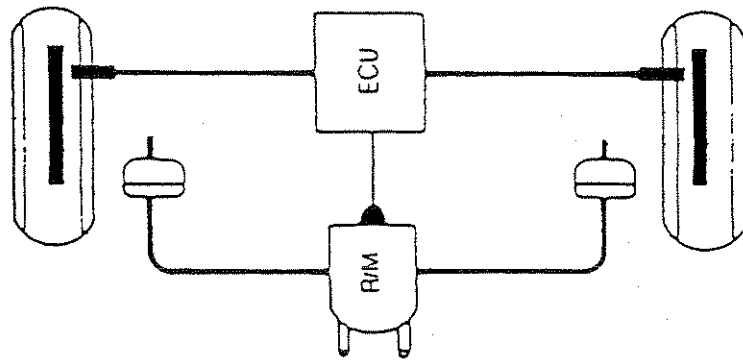


Axle-control

TRAILER ANTILOCK BRAKE SYSTEMS

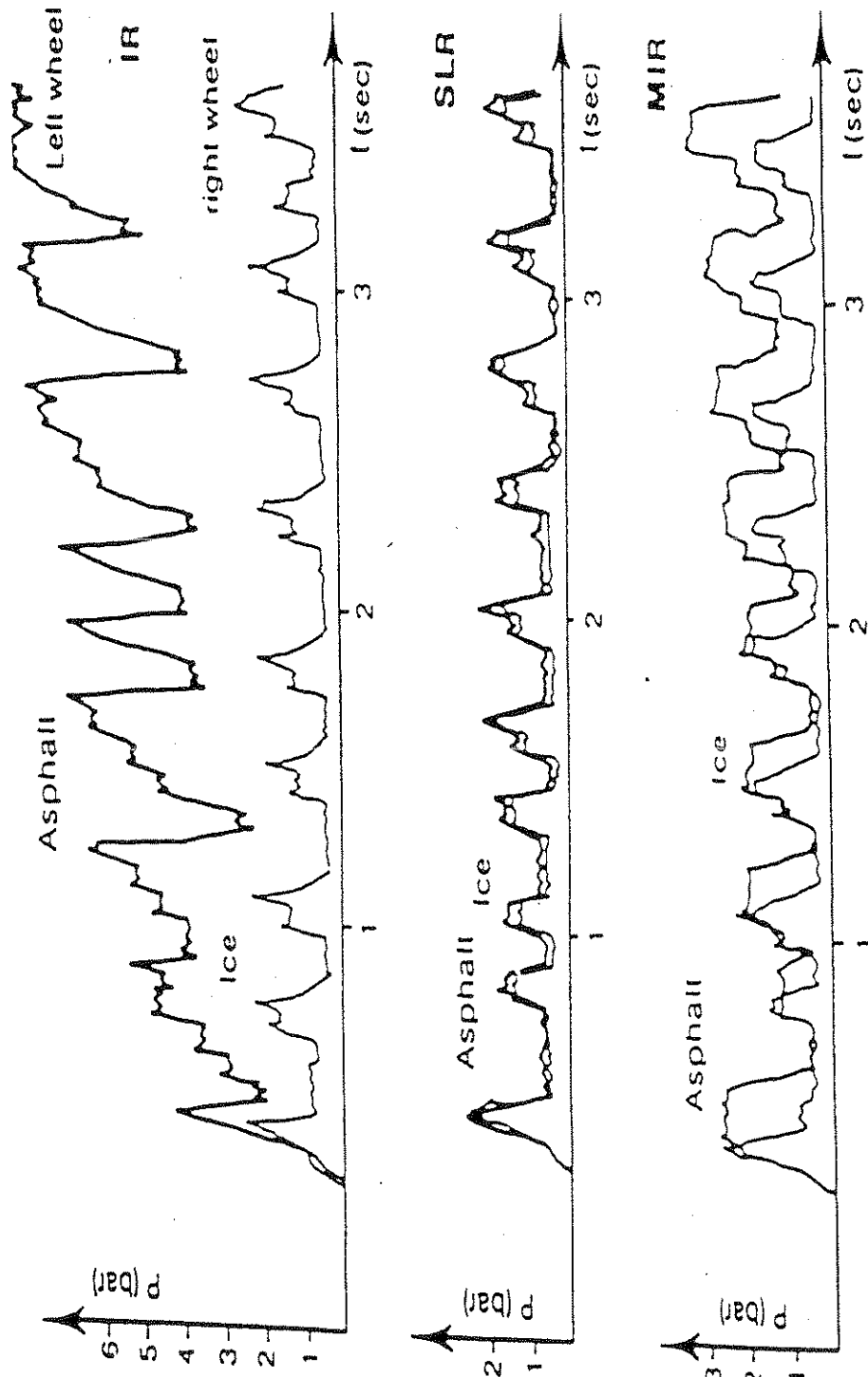
MODIFIED SELECT HIGH (MSH)

- ☞ 2S /1M - CONTROLS BRAKING PRESSURE OF BOTH WHEELS
- ☞ CONTROL FAVORS HI-CO WHEEL
- ☞ SHIFTS BALANCE TOWARD SHORTER STOPPING DISTANCES AT EXPENSE OF SOME WHL LOCK ON:
 - SPLIT CO SURFACES
 - CONDITIONS OF SIGNIFICANT TORQUE IMBALANCES.



Axle-control

TRAILER ANTILOCK BRAKE SYSTEMS



TRAILER ANTILOCK BRAKE SYSTEMS

MODIFIED SIDE CONTROL (MSR)

4S/2M – USES;

- 1 VALVE / ECU ASSEMBLY
- 1 ABS MODULATOR
- 4 SPEED SENSORS

CURB AND ROAD SIDES OF TRAILER CONTROLLED SEPARATELY

PROVIDES EXCELLENT CONTROL FOR A TANDEM AXLE TRAILER

OPTIMIZES BRAKING CAPABILITY OF EACH SIDE WHILE ASSURING THAT ALL WHEELS AVOID LOCKING.

